



Administração Pública e Gestão Social  
ISSN: 2175-5787  
revistaapgs@ufv.br  
Universidade Federal de Viçosa  
Brasil

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Measurement and Analysis of Institutional Efficiency of Developed and Developing Countries  
Administração Pública e Gestão Social, vol. 17, no. 3, 1011, 2025, July-September  
Universidade Federal de Viçosa  
Viçosa, Brasil

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# Measurement and Analysis of Institutional Efficiency in Developed and Developing Countries

Medición y Análisis de la Eficiencia Institucional en Países Desarrollados y en Desarrollo  
Measurement and Analysis of Institutional Efficiency in Developed and Developing Countries

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Recepción: 20 Diciembre 2023

Aprobación: 24 Julio 2024

Publicación: 30 Septiembre 2025

## Abstract

**Research objective:** To measure the efficiency of institutions in developed and developing countries, highlighting characteristics of institutionally efficient countries and Brazil's situation in this context.

**Theoretical framework:** The research is theoretically based on New Institutional Economics, which highlights the importance of institutions for economic growth, and studies that relate institutions to the economic performance of countries.

**Methodology:** This is a quantitative study. Through data envelopment analysis, using the unit input model and global governance indicators, the institutional efficiency index of 129 countries was calculated. Additionally, some characteristics of institutionally efficient countries have been identified, such as the Corruption Perceptions Index, the Human Development Index, the Political Freedom Index, and the Tax Burden.

**Results:** The results reveal that eight countries are institutionally efficient. It was found that these countries are developed and less corrupt. In relation to Brazil, its efficiency index was lower than the sample average. Furthermore, the high tax burden and the perception of corruption in the country stand out.

**Originality:** This study innovates by creating an institutional efficiency index that simultaneously considers several measures related to institutions. It is noteworthy that studies on institutions mostly consider isolated variables as institutional measures, which can limit the evaluation. Furthermore, this study stands out in calculating an index that can be used by decision makers and policy makers as an institutional assessment measure.

**Theoretical and practical contributions:** This study contributes to the literature related to Public Administration by confirming the importance of institutions for economic development. Additionally, the results can help policy makers in directing strategies that aim to increase the efficiency of institutions, favoring the economic prosperity of countries and, consequently, the quality of life of the population.

**Keywords:** Public management, Economic growth, Data Envelopment Analysis.

## Resumo

**Objetivo da pesquisa:** Mensurar a eficiência das instituições de países desenvolvidos e em desenvolvimento, destacando características dos países institucionalmente eficientes e a situação do Brasil nesse contexto.

**Enquadramento teórico:** A pesquisa tem como base teórica a Nova Economia Institucional, que destaca a importância das instituições para o crescimento econômico, e estudos que relacionam as instituições com a performance econômica dos países.

**Metodologia:** Trata-se de uma pesquisa quantitativa. Por meio da análise envoltória de dados, utilizando o modelo de insumo unitário e os indicadores mundiais de governança, calculou-se o índice de eficiência institucional de 129 países. Adicionalmente, foram identificadas algumas características dos países institucionalmente eficientes, por meio do Índice de Percepção de Corrupção, do Índice de desenvolvimento Humano, do Índice de Liberdade Política e da Carga Tributária.

**Resultados:** Os resultados revelam que oito países são institucionalmente eficientes. Constatou-se que esses países são desenvolvidos e, também, menos corruptos. Em relação ao Brasil, seu índice de eficiência foi inferior à média da amostra. Ademais, destaca-se a elevada carga tributária e a percepção da corrupção no país.

**Originalidade:** Esta pesquisa inova ao criar um índice de eficiência institucional que considera simultaneamente diversas medidas relacionadas a instituições. Ressalta-se que os estudos sobre instituições consideram, em sua maioria, variáveis isoladas como medidas institucionais, o que pode limitar a avaliação. Isso posto, esta pesquisa se destaca ao calcular um índice que pode ser utilizado pelos tomadores de decisão e formuladores de políticas como medida de avaliação institucional.

**Contribuições teóricas e práticas:** Esta pesquisa contribui com a literatura relacionada à Administração Pública ao ratificar a importância das instituições para o desenvolvimento econômico. Adicionalmente, os resultados podem auxiliar os *policy makers* no direcionamento de estratégias que visem ao aumento da eficiência das instituições, favorecendo a prosperidade econômica dos países e, por conseguinte, a qualidade de vida da população.

**Palavras-chave:** Gestão pública, Crescimento econômico, Análise envoltória de dados.

## Resumen

**Objetivo de la investigación:** Medir la eficiencia de las instituciones en países desarrollados y en desarrollo, destacando las características de los países institucionalmente eficientes y la situación de Brasil en ese contexto.

**Marco teórico:** La investigación se basa teóricamente en la Nueva Economía Institucional, que destaca la importancia de las instituciones para el crecimiento económico, y estudios que relacionan las instituciones con el desempeño económico de los países.

**Metodología:** Se trata de una investigación cuantitativa. A través del análisis envoltorio de datos, utilizando el modelo de insumo unitario e indicadores de gobernanza global, se calculó el índice de eficiencia institucional de 129 países. Además, se han identificado algunas características de los países institucionalmente eficientes, como el Índice de Percepción de la Corrupción, el Índice de Desarrollo Humano, el Índice de Libertad Política y la Carga Tributaria.**Resultados:** Ocho países son institucionalmente eficientes. Estos países son desarrollados y también menos corruptos. En relación con Brasil, su índice de eficiencia fue inferior al promedio de la muestra. Destaca la alta carga tributaria y la percepción de corrupción en el país.

**Originalidad:** Esta investigación innova al crear un índice de eficiencia institucional que considera simultáneamente varias medidas relacionadas con las instituciones. Los estudios sobre instituciones consideran en su mayoría variables aisladas como medidas institucionales, lo que puede limitar la evaluación. Esta investigación se destaca al calcular un índice que puede ser utilizado por tomadores de decisiones y formuladores de políticas como medida de evaluación institucional.

**Aportes teóricos y prácticos:** Esta investigación contribuye a la literatura de Administración Pública al confirmar la importancia de las instituciones para el desarrollo económico. Los resultados pueden ayudar a los formuladores de políticas a dirigir estrategias para aumentar la eficiencia de las instituciones, favoreciendo la prosperidad económica de los países y la calidad de vida de la población.

**Palabras clave:** Gestión pública, Crecimiento económico, Análisis envoltorio de datos.

**JEL:** D02; D72; D73.

## 1. Introduction

Currently, it is widely accepted that capital accumulation and technological innovation alone are not sufficient to ensure sustained economic growth in countries. In this context, the quality of institutions becomes key to explain the differences between their productive environments (Law & Banny-Ariffin, 2008; Rocha, Khan & Lima, 2010).

In light of this, according to Acemoglu and Robinson (2012), what defines a nation's development is not its natural resources, but rather its institutions.

The institutional structure shapes social behavior and articulates collective action, functioning as a mechanism that reduces discretionary behavior and limits opportunism (Alonso & Garcimartín, 2013). Furlanetto (2008) underscores the importance of institutions in the process of regional economic development, highlighting the role of social capital in the formation of efficient institutions.

On the other hand, Alonso and Garcimartín (2013) add that deficient institutions encourage unproductive behavior, as in the case of rent-seeking activities. For North (2006), the economic decline of countries is mainly caused by the inefficiency of their institutions. In other words, the existence of institutions is not enough; they must be efficient in order to create an environment conducive to economic growth.

Even in light of the importance of efficient institutions, the literature on the topic is still scarce. Although several studies relate institutions to the economic performance of countries (Furlanetto, 2008; Law & Banny-Ariffin, 2008; Rocha et al., 2010; Ugur, 2010; Sachsida, 2011; Javed, 2014), only Votápková and Zák (2013) have measured the efficiency of institutions. Using data envelopment analysis (DEA) and worldwide governance indicators (WGI), the authors estimated the institutional efficiency of some countries in the European Union and the Organization for Economic Cooperation and Development (OECD) and concluded that countries located in northern Europe are institutionally more efficient and that the areas to be prioritized to increase institutional efficiency are government effectiveness and control of corruption.

Given the factors listed above, this study aims to measure the efficiency of institutions in 129 countries for the year 2016 using data envelopment analysis (DEA). In addition, some characteristics of countries with efficient institutions were identified, highlighting the situation of Brazil.

Given the aforementioned scarcity of studies measuring the efficiency of public institutions, this study contributes to the literature by creating an institutional efficiency index that can be used by decision makers and policymakers as a measure of institutional evaluation. Additionally, through the results obtained, it is possible to identify some characteristics of institutionally efficient countries, guiding public policies that aim to increase the efficiency of institutions, contributing to their economic development process.

The paper is organized into five sections, including this introduction. The second section presents a brief theoretical framework, followed by a presentation of the methodology used in the study. The fourth section consists of the results and discussion, and the fifth section presents the conclusions of the paper.

## 2. The Importance of Efficient Institutions and their Characteristics

Long before economists acknowledged the importance of institutions in the economic development process, thinkers such as Adam Smith had already highlighted their prominence in this process, even pointing to institutions as responsible for the underlying differences between countries and regions (Javed, 2013).

However, neoclassical economists considered only the factors of production capital and labor as determinants of economic growth, which did not fully explain the differences between developed and developing countries (Ugur, 2010).

At the end of the 19th century, the study of institutions in the field of organizational theories started, gaining momentum from the second half of the 20th century onward, becoming known as new institutionalism or New Institutional Economics – NIE (Furlanetto, 2008). This new school emphasized the importance of institutions in the economic growth process of countries.

It is worth noting that although there are several definitions for institutions, according to North (2006), one of

the leading scholars of NEI, institutions are the “rules of the game” in a society, that is, they are rules that define the behavior of individuals in society. In addition, De Vaal and Ebben (2011) highlight that institutions can be formal, that is, composed of formal rules (laws and contracts), or informal, which are often embedded in the culture of society and, as such, change very slowly.

Furthermore, the authors emphasize that institutions are important insofar as they reduce uncertainty, facilitate cooperation, and reduce the costs of economic transactions.

Thus, efficient institutions promote economic growth as they establish an environment of trust and order, with well-established property rights and routines (De Vaal and Ebben, 2011).

In addition, Alonso and Garcimartín (2013) state that efficient institutions inhibit unproductive behavior by individuals, contributing to the economic growth process in developed and developing countries, which was also found by Poniatowicz et al. (2020) and Rodrigues et al. (2023).

The aforementioned effects of institutional quality on economic growth occur through several mechanisms, one of which is a higher level of human development, due to improvements in education and health indicators (Musah, 2023; Rehmat et al., 2020; Ouedraogo et al., 2020). Thus, verifying the efficiency of countries’ institutions by identifying their characteristics can help promote economic growth in those countries.

Efficient institutions are capable of facilitating coordination among economic agents and reducing transaction costs, providing security and predictability to social interaction (Alonso & Garcimartín, 2013). In addition, North (2006) highlights that efficient institutions promote an environment that encourages innovation, creativity, the pursuit of knowledge, and greater risk-taking, which are essential factors for growth in a world filled with uncertainty. In this context, it is clear that measuring the efficiency of countries’ institutions, that is, measuring the extent to which institutions promote an environment where there are civil, political, and economic freedoms, is of paramount importance, given their relevance to the process of economic growth and development.

### 3. Data Envelopment Analysis

Data envelopment analysis (DEA) has been widely used in studies measuring public sector efficiency (Negri & Dinca, 2023; Mitu & Stanciu, 2023; Wanke et al., 2023; Yadava & Neog, 2022; Votápková & Zák, 2013). This method is the result of studies conducted by Charnes, Cooper, and Rhodes (1978), as well as Banker, Charnes, and Cooper (1984), regarding the nonparametric approach to analyzing the relative efficiency of decision-making units (DMUs) with multiple inputs and outputs.

Through this methodology, an efficient frontier is created, composed of the units that yielded the best performance from the point of view of technical efficiency. Based on the frontier created, the performance of the other production units in the sample can be verified. A DMU is considered efficient if it produces more with the same amount of inputs (product orientation) or produces the same amount with proportionally fewer inputs (input orientation).

To demonstrate the proposed method, consider the existence of  $k$  inputs and  $m$  outputs for each  $n$  DMUs. An input matrix  $X$ , with dimensions  $(k \times n)$ , and an output matrix  $Y$ , with dimensions  $(m \times n)$ , are constructed, representing the data for all  $n$  DMUs. In both matrices, the coefficients must be non-negative, and each row and column must contain at least one positive coefficient.

Thus, based on the ratio between all products and inputs, the efficiency measure for each DMU is obtained. Formally, this is expressed as:

$$Efficiency\ of\ DMU_i = \frac{u' y_i}{v' x_i} = \frac{u_1 y_{1i} + u_2 y_{2i} + \dots + u_m y_{mi}}{v_1 x_{1i} + v_2 x_{2i} + \dots + v_k x_{ki}} \quad (1)$$

where  $u$  is a vector  $(m \times 1)$  of weights in products and  $v$  is a vector  $(k \times 1)$  of weights in inputs.

Considering that each country has a single government and assuming that how it is run can affect the level of institutional quality of countries, the unit input model is used, where  $v$  is a  $1 \times 1$  vector set equal to 1 for all

observations, that is,  $v'x_i = 1$ . Therefore, the institutional efficiency (IE) of each country is obtained as follows:

$$EI_i = \frac{u'y_i}{v'x_i} = \frac{u_1VR_{1i} + u_2PS_{2i} + u_3GE_{3i} + u_4RQ_{4i} + u_5RL_{5i} + u_6CC_{6i}}{1} \quad (2)$$

where VR refers to the country’s voice and responsibility; PS to political stability; GE to government effectiveness; RQ to regulatory quality; RL to rule of law; and CC to control of corruption. These variables correspond to the World Governance Indicators (WGI)<sup>i</sup> calculated by the World Bank. In the case of this study, an institutionally efficient country is one that maximizes all six indicators simultaneously.

It should be noted that one of the challenges faced when measuring the efficiency of units, considering several inputs and/or products simultaneously, is the weighting of these variables. The proposed method overcomes this challenge through a mathematical programming problem, which selects a set of optimal weights for each production unit. This avoids the bias that could be caused by the subjectivity of choosing these weights.

Formally, considering the product-oriented model<sup>ii</sup> and constant yields to scale, efficiency measures are obtained from the following maximization problem (Coelli, Rao & Battese, 1998):

$$\begin{aligned} &Max_{\phi, \lambda} \phi, \\ &subject\ to: \\ &-\phi y_i + Y\lambda \geq 0, \\ &x_i - X\lambda \geq 0, \\ &\lambda \geq 0, \end{aligned} \quad (3)$$

where  $1 \leq \phi < \infty$  e  $\phi - 1$  is the proportional increase in products that could be obtained by the i-th country, while maintaining constant input use. The measure of technical efficiency is given by  $1/\phi$ , which varies from zero to one. An institutionally efficient country is one that scores a value of  $1/\phi$  equal to one. The parameter  $\lambda$  is a vector ( $n \times 1$ ), whose values are calculated in order to obtain the optimal solution. If the country is institutionally efficient, all  $\lambda$  values will be zero. Otherwise, the  $\lambda$  values will be the weights used in the linear combination of other efficient countries, which influence the projection of the inefficient country on the calculated frontier. In other words, it can be noted that there is at least one institutionally efficient benchmark country for each inefficient unit.

The variables used to obtain efficiency measures are presented in Table 1 and, as previously mentioned, correspond to the six dimensions that comprise the World Governance Indicators (WGI). These variables were selected from the work of Votápková and Zák (2013). These indicators were also used by Musah (2023) to construct an institutional quality index.

Chart 1 - Description of variables used in the institutional efficiency model

Variables	Description
Voice and responsibility (VR)	Tracks perceptions of the extent to which citizens of the country are able to participate in government selection, as well as freedom of expression, freedom of association, and free media.
Political stability and absence of violence/terrorism (PS)	Tracks perceptions of the probability of political instability and/or politically motivated violence, including terrorist acts.
Government effectiveness (GE)	Tracks perceptions of the quality of public and civil services and the degree of independence from political pressure, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies.
Regulatory quality	Tracks perceptions of the government’s ability to formulate and

(RQ)	implement solid policies and regulations that enable and promote private sector development.
Rule of law (RL)	Tracks perceptions of the extent to which agents trust and respect society's rules, and in particular the quality of contract enforcement, property rights, law enforcement, courts, as well as the probability of crime and violence.
Control of corruption (CC)	Tracks perceptions of the extent to which public power is exercised for "private/personal" gain, including small and large forms of corruption, as well as the "capture" of the state by elites and private interests.

Source: Prepared by the authors based on data from WGI (2017).

Worldwide governance indicators are directly related to institutional efficiency. Wanke et al. (2023) demonstrate that democracy, represented by the variable voice and responsibility, and political stability have a positive relationship with productivity. Corruption, on the other hand, is associated with lower levels of public efficiency and quality of public administration (Musah, 2023; Rodrigues et al., 2023; Dinca et al., 2021; Afonso et al., 2010).

In summary, the absence of freedom of expression, as well as political and economic freedoms, deficits in the rule of law, and levels of corruption and dysfunctional governments can be decisive factors in institutional inefficiency (MUSAH, 2023). Therefore, these variables are considered in measuring the efficiency of institutions in the countries analyzed in this study.

It should be noted that studies related to institutions mostly consider isolated variables as institutional measures, which may limit the assessment. Therefore, one of the contributions of this study is the calculation of an index that simultaneously considers the six global governance indicators.

The data used were obtained from Transparency International, from the *Worldwide Governance Indicators – World Bank*, do *Heritage Foundation*, from the *Freedom House*, from the United Nations Development Program (UNDP) and the World Bank, all available on the official websites of the respective organizations, and refer to the year 2016, as this is the most recent year for which data is available for the period covered by this study.

## 4. RESULTS AND DISCUSSION

### 4.1. Analysis of countries according to institutional efficiency index

The institutional efficiency model adopted in this study considers that institutionally efficient countries are those that have achieved the best global governance indicators in relative terms.

Table 1 shows the descriptive statistics of the variables used to calculate institutional efficiency. It should be noted that the indicators range from 0 to 100 and that the higher the score, the better the governance in the dimension analyzed. It can be noted that the mean of the variables political stability (PS), rule of law (RL), and control of corruption (CC) was below 50, revealing that it is necessary to increase the values of these indicators. It should also be noted that the mean of all variables exceeds the median, meaning that more than half of the countries obtained values below the mean.

Table 1 - Descriptive statistics of worldwide governance indicators

Specification	Mean	Median	Maximum	Minimum	Standard Deviation
Voice and responsibility	50.05	48.28	100.00	0.00	27.67
Political stability	46.54	45.24	99.52	1.43	27.05
Government effectiveness	50.50	50.00	100.00	0.96	29.09
Regulatory quality	50.13	46.63	100.00	0.00	29.16

Rules of law	49.37	46.15	100.00	0.48	28.84
Control of corruption	49.26	45.19	100.00	3.85	29.07

Source: Prepared by the authors based on WGI data (2016).

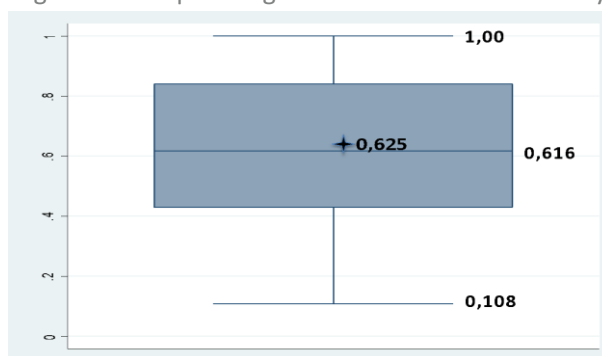
The minimum values of the variables highlight how poor the quality of governance is in certain countries. North Korea stands out, with a score of zero in the voice and responsibility (VR) and regulatory quality (RQ) indicators. This can be explained by the country’s political regime, given the relationship between these variables and factors such as political freedom, freedom of expression, participation in government selection, and the implementation of policies and regulations that promote private sector development.

According to Hayashi (2012), the North Korean regime is highly repressive, preventing citizens from expressing any opinion contrary to the government’s ideology. For the author, in addition to violating civil and political rights, the regime also violates the economic and cultural rights of society.

The countries with the minimum scores for political stability (PS), government effectiveness (GE), rule of law (RL), and control of corruption (CC) were, respectively, Pakistan, Haiti, Venezuela, and Guinea-Bissau.

Figure 1 shows the maximum (1), minimum (0.108), median (0.616), and mean (0.625) values of the institutional efficiency index scored by the countries. Eight countries (Denmark, Finland, New Zealand, Norway, the Netherlands, Singapore, Sweden, and Switzerland) scored the maximum value, meaning they have efficient institutions. These results corroborate those found by Votápková and Zák (2013), in which Denmark, Finland, Luxembourg, New Zealand, Norway, Sweden, and Switzerland were institutionally efficient.

Figure 1 - Box-plot diagram of institutional efficiency



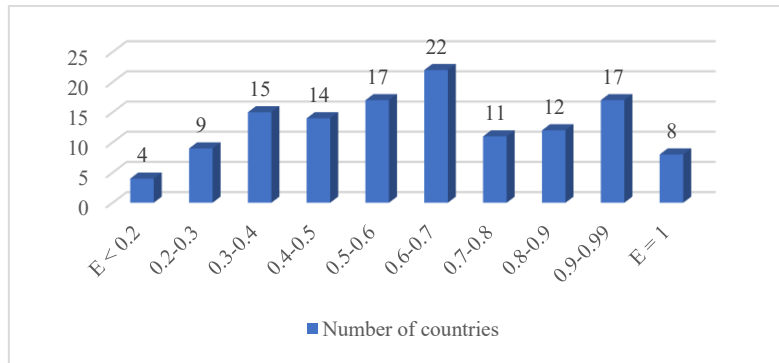
Source: Research results.

The mean institutional efficiency of the countries was 0.625, pointing to significant room for improvement in the quality of institutions. As expected, due to the composition of the sample, this measure is lower than that obtained by Votápková and Zák (2013), who found a mean institutional efficiency of 0.811 for a sample of European Union and OECD countries. This difference is an indication that developed countries are institutionally more efficient.

It is also noteworthy that most countries scored below average. This reveals that there are several countries with low levels of institutional efficiency. In this context, there is a clear need to develop policies aimed at increasing institutional efficiency, given its importance for economic growth. Rodrigues et al. (2023) reveal that a 10% increase in institutional efficiency can result in an increase of up to 0.99% in countries’ economic growth. Thus, such policies can have a significant impact on countries’ economic performance.

Figure 2 shows the distribution of countries according to their institutional efficiency measures. Although most countries scored below average, seventeen scored above 0.9. Among these, Hong Kong stands out with a score of 0.998.

Figure 2 - Distribution of countries according to institutional efficiency measure ranges



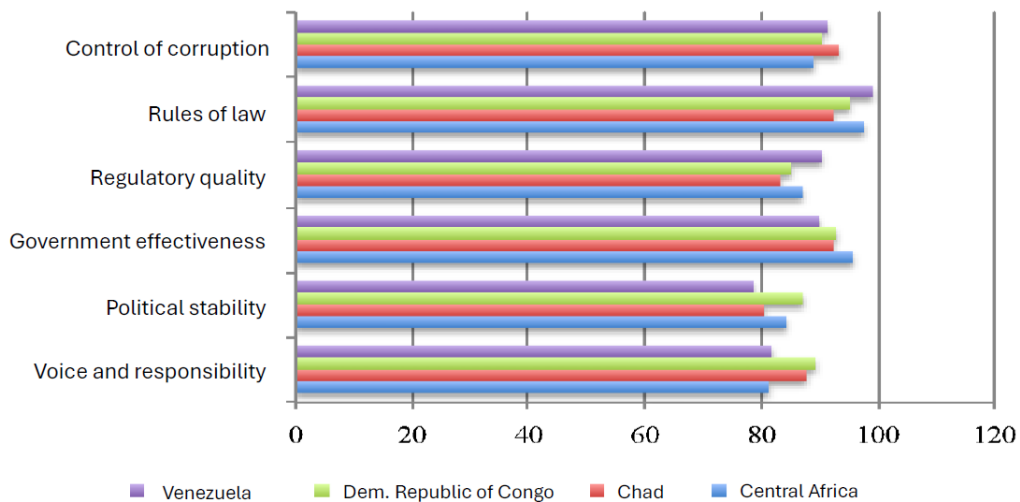
Source: Research results.

The largest share of the countries analyzed (17%) falls within the range where the institutional efficiency index is between 0.6 and 0.7. Central Africa, Chad, the Democratic Republic of Congo, and Venezuela scored below 0.2, with the Democratic Republic of Congo having the lowest efficiency score (0.108).

These results are not surprising, given the economic and political crises faced by Venezuela and the political instability resulting from conflicts and civil wars in African countries. It is worth noting that political stability, civil liberties, political rights, economic freedom, and property rights are characteristics of high-quality institutions (Barro, 1991; Sachsida, 2011; Musah, 2023; Negri and Dinca, 2023).

In order to verify the extent to which each of these countries needs to improve their governance indicators to reach the efficient frontier, Figure 3 shows the improvements needed, in absolute terms, for each of the countries that obtained an institutional efficiency index below 0.2, in relation to the values obtained by institutionally efficient countries.

Figure 3 - Comparison between the four countries that are the least institutionally efficient in terms of improvements, in absolute terms, to reach the efficient frontier



Source: Research results.

It is worth noting that the lower the indicators obtained by a country, the greater the margin for improvement. Thus, although the Democratic Republic of Congo has the lowest index, it is not the country most in need of improvement in all areas, but rather the country most in need of improvement in two of the six indicators: political stability and voice and responsibility.

In terms of government effectiveness, the country most in need of improvement is Central Africa. Regarding regulatory quality and the rule of law, Venezuela ranks first, while Chad is the country that most needs to improve in terms of controlling corruption.

These results can be explained by the fact that, among these countries, the Democratic Republic of Congo scored lowest on the indicators of voice and accountability and political stability; Central Africa on government effectiveness; Venezuela on regulatory quality and rule of law; and Chad on control of corruption.

In light of the results presented, the means of worldwide governance indicators were compared between two groups of countries: one composed of institutionally efficient countries and the other of inefficient countries. The discrepancy between the means of all variables between the two groups is significant (Table 3). On average, the indicators of countries with inefficient institutions correspond to 48.8% of those with efficient institutions.

Table 3 - Worldwide governance indicators mean by country group

Specification	Efficient	Inefficient	General Mean
Voice and responsibility	90.83	47.35	50.05
Political stability	87.68	43.82	46.54
Government effectiveness	97.72	47.37	50.50
Regulatory quality	96.81	47.04	50.13
Rules of law	98.26	46.13	49.37
Control of corruption	97.90	46.05	49.26

Source: Prepared by the authors based on WGI data (2016).

The greatest difference is related to the rule of law variable (RL), which reveals the extent to which agents trust and respect society's rules. This difference is due to the low mean value of this indicator in institutionally inefficient countries. While the rule of law indicator has the highest mean value in the efficient group, it is one of the three indicators with the lowest mean values in the inefficient group.

The minimum, but still significant, difference is 43.48, referring to the voice and responsibility (VR) variable, which is related to freedom of expression, free media, and society's participation in the choice of government. It should also be noted that the smallest discrepancy between the groups regarding this variable is not due to institutionally inefficient countries having achieved a high indicator, since the mean for this variable for this group of countries is 47.35. In fact, efficient countries obtained a relatively low mean for this indicator, given that the second lowest mean in this group of countries refers to the voice and responsibility variable.

The variable with the highest mean among efficient countries was rule of law (RL), followed by control of corruption (CC) and government effectiveness (GE). In the group of institutionally inefficient countries, the order is: government effectiveness (GE), voice and responsibility (VR), and regulatory quality (RQ). Political stability (PS) was the indicator with the lowest mean in both groups.

Isso pode ser justificado pelos ataques terroristas ocorridos em diversos países, já que esse indicador inclui o terrorismo como uma das formas de aumentar a instabilidade e violência por motivos políticos. Segundo o Instituto para Economia e Paz (2017), em 2016, ano referente à análise realizada neste estudo, houve aumento no número de países que experimentaram pelo menos uma morte por ataque terrorista, resultando na piora do índice global do terrorismo em 4%, relativamente à 2015.

In addition, 2016 was a US election year, in which uncertainty over who would represent the world's largest economy and the possibility of a businessman being elected may have increased global political instability.

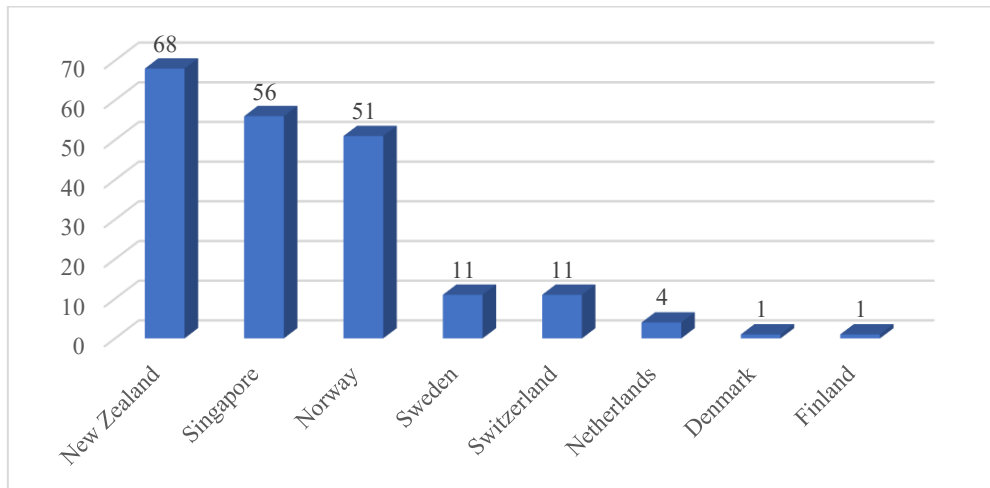
It should be noted that the group of institutionally inefficient countries had a mean score for all variables below the general mean. This result reveals that most of the countries analyzed have relatively weak institutions. Of the countries analyzed, only 6.2% have efficient institutions.

As previously mentioned, institutions hold a key role in the process of economic growth and development in countries, contributing to the quality of life of the population. Quality institutions contribute to the reduction of income inequality (Kunawotor et al., 2020), poverty reduction (Dossou et al., 2023), increased life expectancy, and reduced infant mortality rates (Rehmat et al., 2020). Thus, the importance of institutional efficiency is confirmed.

Therefore, one way for countries to increase the efficiency of their institutions is to adopt the best practices of those at the forefront. The method used in this study enables the identification of "benchmark" countries for those who wish to make their institutions more efficient.

Figure 4 shows the number of times each institutionally efficient country was used as a benchmark for inefficient countries. If the latter adopt the practices of their benchmarks, their institutions may become efficient. It should be noted that cultural and geographical issues must be considered in a more detailed and individualized analysis of the practices adopted.

Figure 4 - Number of times each institutionally efficient country was used as a benchmark for inefficient countries



Source: Research results.

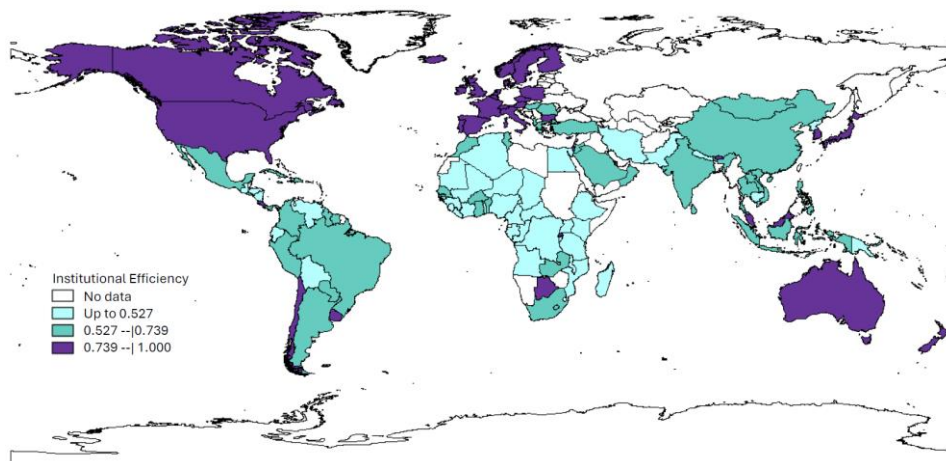
New Zealand was the country most often regarded as a reference, being a benchmark for 68 countries (approximately 56% of inefficient countries), followed by Singapore and Norway, which were benchmarks for 56 and 51 countries, respectively. Denmark and Finland were benchmarks for only one country.

It is worth mentioning that New Zealand obtained the highest mean score in global governance indicators (98.39), which may explain why it was used as a benchmark for the largest number of countries. In addition, the country has the highest score in the control of corruption (CC) indicator, which, on average, is the indicator that most needs to be improved for countries to reach the efficient frontier. As noted by Rodrigues et al. (2020), corruption is one of the factors that negatively affects institutions, rendering them less efficient. The authors emphasize the importance of combating corruption for institutional efficiency and, consequently, for the economic growth of countries.

It should also be noted that, just as one country can be a benchmark for more than one inefficient country, the latter may have more than one benchmark. In other words, the measures adopted to reach the frontier may be a combination of practices from two or more institutionally efficient countries.

Another factor that may be related to efficient institutions is the level of development of countries. Figure 5 shows the geographical distribution of countries according to their institutional efficiency measures. It can be seen that most of the countries with higher measures (represented on the map by darker shades) are classified as developed.

Figure 5 - Geographical distribution of countries according to institutional efficiency measure ranges



Source: Research results.

Note: The countries were divided into three equal ranges, from the least to the most efficient, represented by lighter to darker shades, respectively. Countries that were not analyzed are blank.

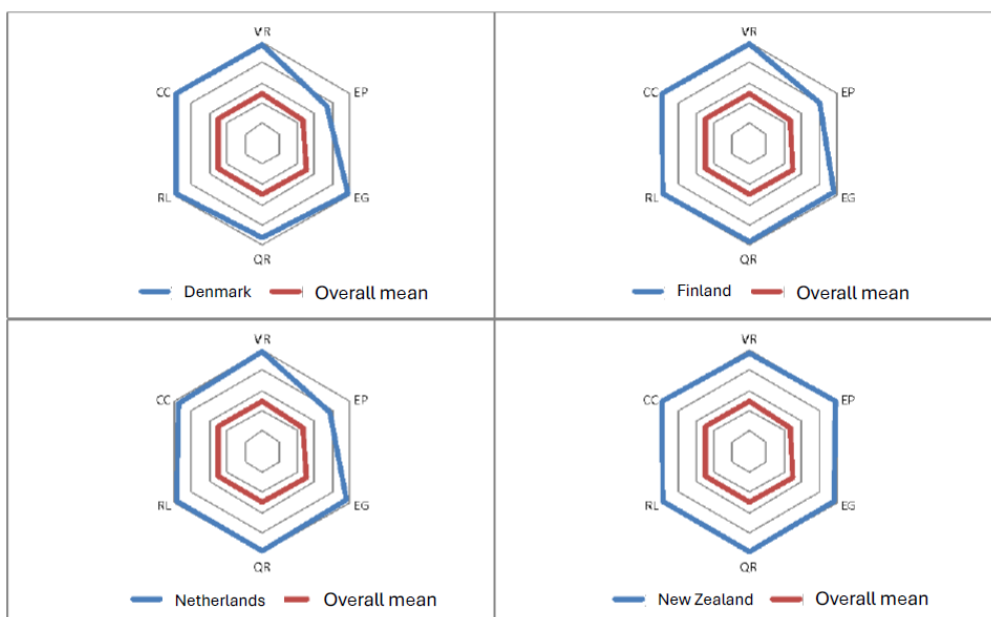
According to North (2006), Furlanetto (2008), Alonso, and Garcimartín (2013), and Musah (2023), countries with efficient institutions tend to be more developed. Thus, researching the factors that determine institutional efficiency is of paramount importance.

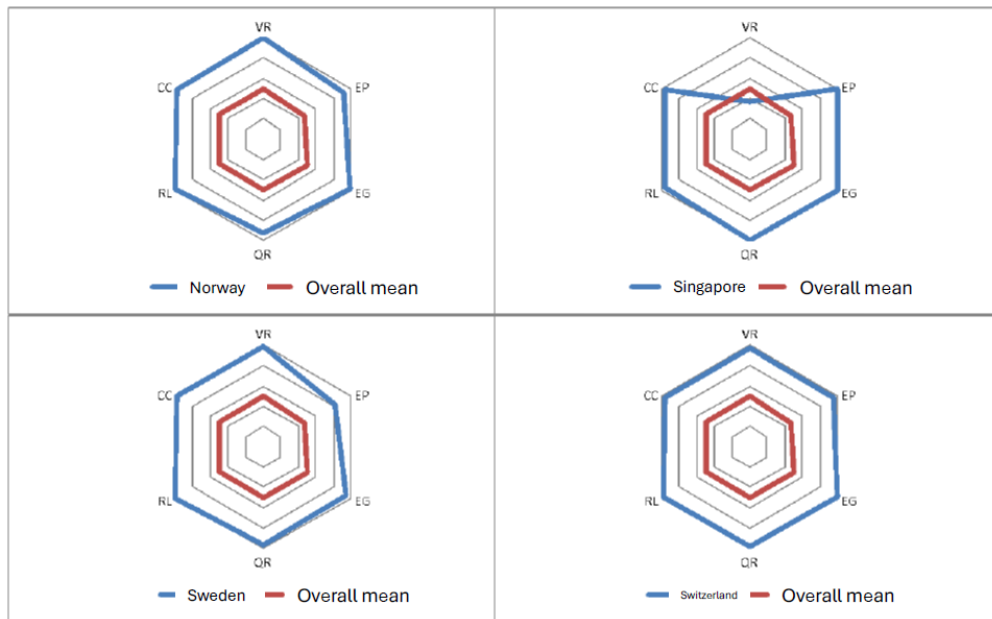
#### 4.2. Characterization of institutionally efficient countries

Considering the importance of institutions for countries' economic performance and aiming to identify factors that may influence their efficiency, this study sought to identify some characteristics of countries that achieved maximum efficiency scores. It is worth highlighting these countries as they represent possible benchmarks for others.

Figure 6 shows the global governance indicator values for each country on the frontier, and as can be seen, there is no significant difference between them.

Figure 6 - Indicadores mundiais de governança dos países institucionalmente eficientes





Source: Research results.

Key: VR: voice and responsibility; EP: political stability; EG: government effectiveness; QR: regulatory quality; RL: rule of law; CC: control of corruption.

Note: The scale, represented by the grid lines, ranges from 20 to 100, in ascending order, from the center to the ends.

Most indicators, with the exception of political stability (EP), are above 90, and virtually all countries, except Singapore, scored above the total sample mean on all variables.

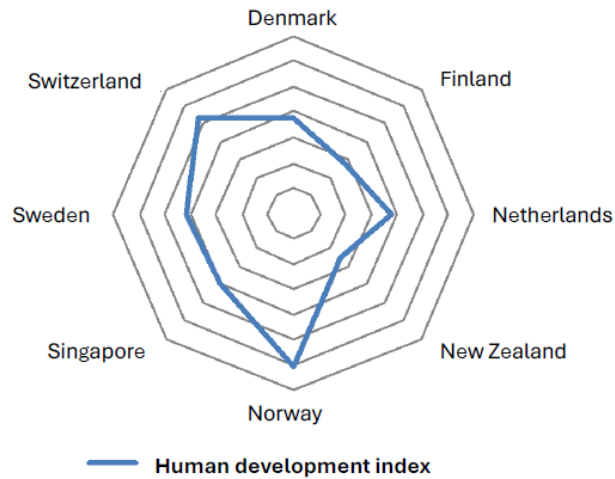
In this sense, although Singapore scored below average on the voice and responsibility (VR) variable, the country scored highest on three indicators: political stability (EP), government effectiveness (EG), and regulatory quality (QR), which justifies its institutions being considered efficient. The highest scores for the variables voice and responsibility (VR), rule of law (RL), and control of corruption (CC) were obtained by Norway, Sweden, and New Zealand, respectively.

Countries with efficient institutions have at least five of the six governance indicators above 90, with New Zealand, Norway, and Switzerland scoring above 90 on all indicators.

In addition to governance indicators, other characteristics draw attention to the group of efficient countries. According to the International Monetary Fund (2017), all are classified as developed, and according to Transparency International (2016), they are the least corrupt countries in the sample analyzed. In light of this result, Rehmat et al. (2020) and Dossou et al. (2023) highlight the impact of quality institutions on life expectancy and poverty reduction, factors associated with a higher level of development. In turn, Rodrigues et al. (2020) and Musah (2023) report the negative effect of corruption on institutional efficiency.

Figures 7 and 8 show, in this order, the human development index (HDI) and corruption perception index (CPI) scores for each institutionally efficient country. The mean values for these variables for the sample are 0.70 and 44.57, respectively. It can be noted that all countries obtained values above these means.

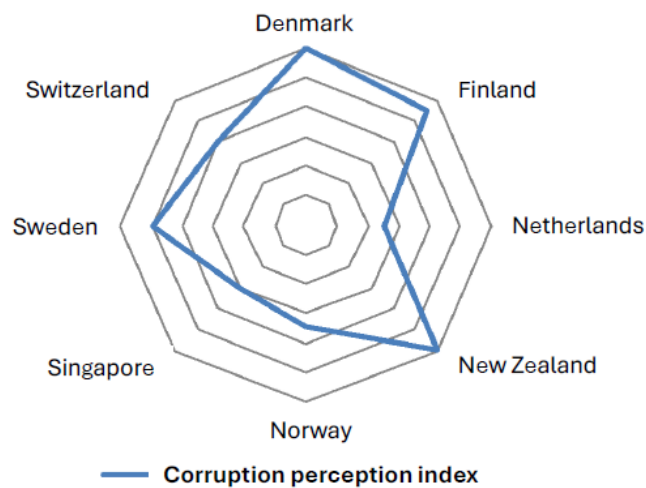
Figure 7 - Human development index of institutionally efficient countries



Source: Research results.

Note: The scale, represented by the grid lines, ranges from 0.89 to 0.96, in ascending order, from the center to the extremities.

Figure 8 - Corruption perception index of institutionally efficient countries



Source: Research results.

Note: The CPI is calculated yearly by Transparency International and ranges from 0 to 100. The higher the score, the lower the perception of corruption in the country. The scale, represented by the grid lines, ranges from 78 to 90, in ascending order, from the center to the extremities.

In terms of HDI, six of the eight countries in the group are among the top 10, with Norway and Switzerland occupying the top two positions. Although New Zealand was the country with the lowest HDI among the efficient countries, it ranks 15th in the sample, with a high HDI of 0.915. The ranking from most to least developed is: Norway (0.951), Switzerland (0.943), Sweden (0.932), Singapore (0.93), Denmark (0.928), the Netherlands (0.928), Finland (0.918), and New Zealand (0.915).

Regarding the CPI, which shows that the higher the score, the lower the perception of corruption in the country, institutionally efficient countries lead the list and are considered the least corrupt in the sample. As shown in Figure 8, the order of the least corrupt countries (highest CPI) to the most corrupt is as follows: Denmark (90), New Zealand (90), Finland (89), Sweden (88), Switzerland (86), Norway (85), Singapore (84), and the Netherlands (83). It should be noted that all countries obtained scores above 80, which is significantly higher than the mean (44.57).

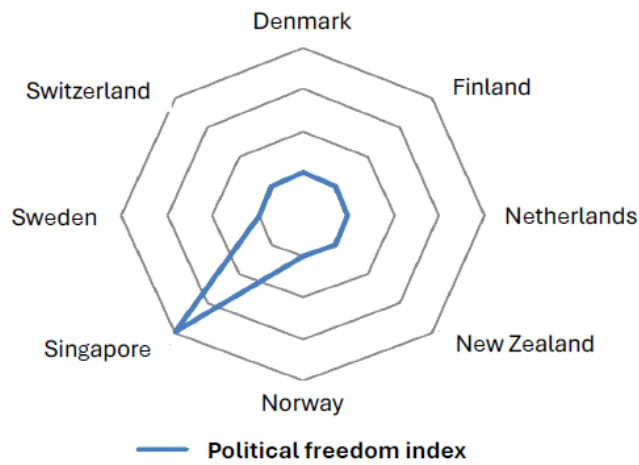
In light of the results analyzed, it is worth noting the potential of these variables to influence institutional efficiency in some way, given that institutionally efficient countries are among the top 20 in the ranking of both

indices. According to Alonso and Garcimartín (2013), developed countries tend to have more efficient institutions. Negri and Dinca (2023) highlight that the HDI, through education and health, contributes to improvements in institutional quality. Corruption, on the other hand, interferes with public investment, hindering the efficient allocation of resources and, consequently, reducing their productivity (Tanzi & Davoodi, 1997; Musah, 2023). In this context, Rodrigues et al. (2020) point out that a 10% increase in corruption can result in a 7.3% reduction in institutional efficiency.

Another noteworthy characteristic was that five of the eight efficient countries are monarchies. In this regard, Figure 9 shows the political freedom index (PFI) values, which consider civil liberties and political rights in each country. It is also worth noting that these variables are more related to democracy than to the form of government. Considering that these countries are democratic and that the higher the index, the less free a country is, it is expected that the political freedom index will be below average (3.28).

It can be seen that, with the exception of Singapore, the other countries scored the minimum index value (one), which demonstrates how high political freedom is. Singapore was the country with the lowest index (four) and is a parliamentary republic.

Figure 9 - Political freedom index of institutionally efficient countries



Source: Research results.

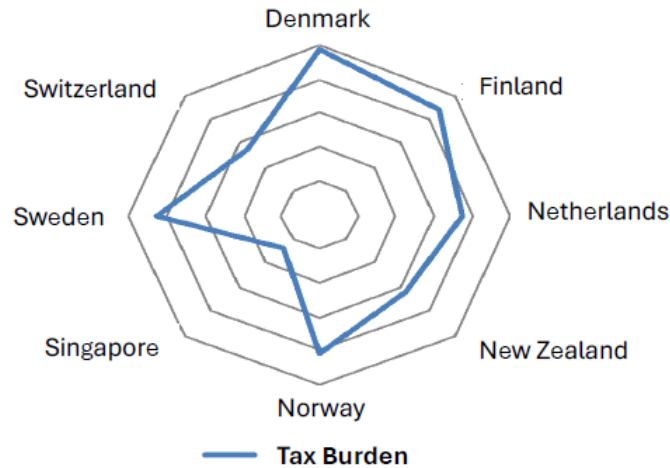
Note: The scale, represented by the grid lines, ranges from 1 to 4, in ascending order, from the center to the extremities.

Another characteristic that, according to Alonso and Garcimartín (2013), can affect institutions is the tax burden. For the authors, countries with a higher tax burden have a certain level of financial independence, which enables their institutions to be more efficient, as they become less vulnerable to pressure to obtain resources from other sources.

As can be seen in Figure 10, Denmark, Finland, Sweden, and Norway have tax burdens exceeding 40% of their GDP. These countries are among the ten with the highest tax burdens.

Therefore, it is possible that tax collection in relation to countries' production has some influence on institutions. According to Alonso and Garcimartín (2013), citizens who pay more taxes have a closer relationship with the state, demanding greater responsibility and transparency in the allocation of public resources, which can significantly influence the efficiency of institutions.

Figure 10 - Tax burden of institutionally efficient countries

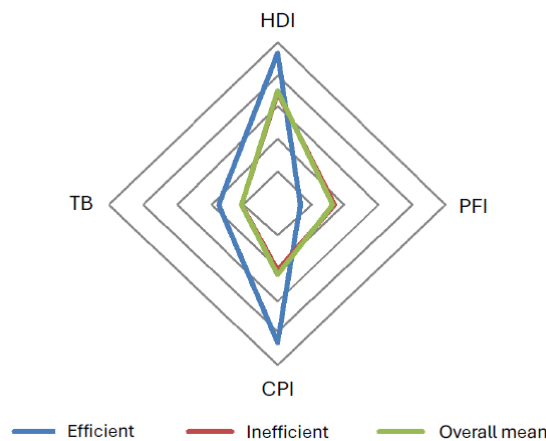


Source: Research results.

Note: The scale, represented by the grid lines, ranges from 10 to 50, in ascending order, from the center to the extremities.

In light of the above, it is possible that these variables influence the institutional efficiency index in some way. Figure 11 compares these variables between institutionally efficient and inefficient country groups. It can be noted that while the measures of all variables for efficient countries are above the mean, those for inefficient countries are very close to or marginally below the mean. Thus, these variables have the potential to significantly impact the efficiency of institutions and should be prioritized by policymakers.

Figure 11 - Means of human development index, political freedom index, corruption perception index, and tax burden by country group



Source: Research results.

Key: HDI: Human Development Index; PFI: Political Freedom Index; CPI: Corruption Perception Index; and TB: Tax Burden.

Note: The scale, represented by the grid lines, ranges from 20 to 100, in ascending order, from the center to the ends. The HDI and PFI variables were multiplied by 100 and 10, respectively.

#### 4.3. The Brazilian situation in terms of institutional efficiency

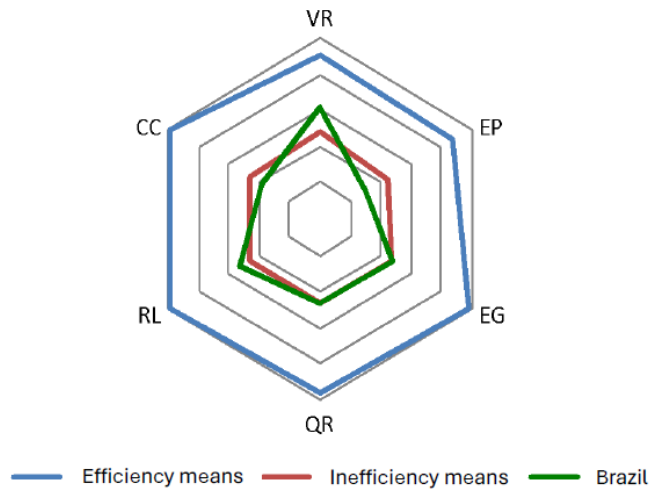
Given the importance of institutions in the growth and development of a nation, this subsection aims to highlight Brazil's situation in terms of the efficiency of its institutions and the variables that may determine them.

The institutional efficiency index scored by Brazil was 0.616. The country ranks 65th in institutional efficiency, demonstrating that there is significant potential for improvement in order for Brazilian institutions to become efficient. It should be noted that the score obtained by the country is below the sample mean (0.625).

Figure 12 shows Brazil's position in relation to worldwide governance indicators. All of the country's indicators are below the mean for efficient countries. In relation to inefficient countries, Brazil scored above average in the

variables of voice and responsibility, government effectiveness, and rule of law. It should be noted that, in terms of government effectiveness, Brazil scored 47.6, which is very close to the mean score obtained by institutionally inefficient countries (47.37).

Figure 12 - Comparison of Brazil's worldwide governance indicators with groups of institutionally efficient and inefficient countries



Source: Research results.

Key: VR: voice and responsibility; EP: political stability; EG: government effectiveness; QR: regulatory quality; RL: rule of law; CC: control of corruption.

Note: The scale, represented by the grid lines, ranges from 20 to 100, in ascending order, from the center to the extremities.

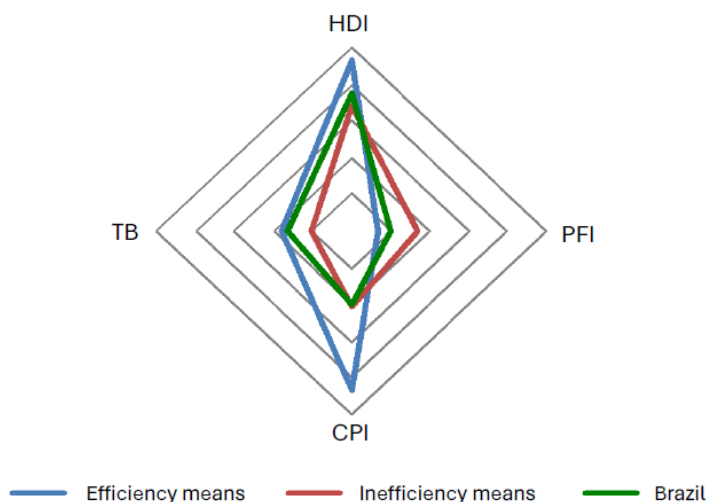
The lowest score obtained by the country (30) relates to political stability. It is worth noting that, in 2016, Brazil was undergoing the impeachment process of then-President Dilma Rousseff, which may have influenced the low score obtained in this index, which reflects precisely the probability of political instability and/or politically motivated violence in the country.

The scores obtained by Brazil in each of the six dimensions of the worldwide governance indicators, in descending order, were: voice and responsibility (61.58); rule of law (51.92); government effectiveness (47.6); regulatory quality (46.63); control of corruption (38.46); and political stability (30).

In light of this result, it is important for the Brazilian government to prioritize policies and create strategies aimed at improving these indicators, which are essential for greater institutional quality. In other words, the country needs to improve its governance, which plays a decisive role in the performance of the public sector (Negri & Dinca, 2023). Furthermore, quality governance can lead to several benefits for society, such as poverty reduction and socioeconomic development (Dossou et al., 2023; Mitu & Stanciu, 2023).

In terms of variables that may somehow impact institutional efficiency, Brazil's situation is slightly better than that of inefficient countries, as shown in Figure 13. Brazil is close to the mean of efficient countries when considering the variables political freedom index (PFI) and tax burden (TB), and is closer to inefficient countries in terms of the human development index (HDI) and corruption perception index (CPI), with Brazil's situation in the latter being worse than the mean of inefficient countries.

Figure 13 - Comparison of Brazil’s human development index, political freedom index, corruption perception index, and tax burden with institutionally efficient and inefficient country groups



Key: HDI: Human Development Index; PFI: Political Freedom Index; CPI: Corruption Perceptions Index; and TB: Tax Burden.  
 Note: The scale, represented by the grid lines, ranges from 20 to 100, in ascending order, from the center to the extremities. The HDI and PFI variables were multiplied by 100 and 10, respectively.

It should also be noted that among the 129 countries analyzed in this research, Brazil ranks 59th in the CPI ranking, with an index of 40. Considering the 176 countries evaluated by Transparency International in 2016, Brazil’s position drops to 79th. It is worth noting that the perception of corruption in Brazil exceeds the global mean of the CPI in 2016, which according to Transparency International (2016) was 43, revealing the severity of the country’s situation in relation to its level of corruption.

According to Carraro, Fochezatto, and Hillbrecht (2006), the volume of Brazilian resources implicated in corruption exceeds 10% of GDP. For Hayashi (2012), the effects of corruption are even more significant on the poorest segment of the population, given the damage caused, mainly in the areas of health, education, sanitation, security, and housing.

According to Lopes and Toyoshima (2013), corruption negatively impacts the efficient allocation of resources directed towards health and education, considerably reducing the well-being of the population. In this context, it is important for government officials and society as a whole to mobilize and create mechanisms that inhibit corrupt behavior among all citizens, whether politicians or not.

For the other variables, Brazil's situation is relatively better. Brazil has an HDI of 0.758, which is higher than the mean for inefficient countries (0.687). However, in terms of the political freedom index (PFI), the country's score is lower than the mean for this group of countries (34.05). It is also worth mentioning that the lower the PFI, the greater the civil liberties and political rights in the country, showing that, on average, there is greater political freedom in Brazil than in other inefficient countries.

Regarding the tax burden, as expected, Brazil is among the countries with the highest taxation in relation to GDP. According to data from the World Bank (2016), the Brazilian tax burden corresponds to approximately 33% of GDP in 2016, surpassing countries such as New Zealand (32.09%) and Switzerland (27.05%).

However, contrary to what occurs in these countries, in Brazil, public services are of inferior quality, revealing a possible inefficiency in the management of these resources. According to the Brazilian Institute of Planning and Taxation - IBPT (2017), among the 30 countries with the highest tax burden in the world, Brazil offers the worst return to the population in terms of health, education, and security. In light of this, some studies have revealed inefficiency in the management of public resources allocated to the aforementioned areas (Araújo et al., 2022; Rodrigues, 2024; Monte & Leopoldino, 2020, Lopes & Toyoshima, 2013).

According to Lopes and Toyoshima (2013), approximately 60% of the Brazilian population lives in regions where the management of resources allocated to education and health is inefficient. The authors highlight that the

situation is even more critical in the states of the North and Northeast regions, where corruption has been one of the determining factors in the mismanagement of these resources.

## 5. CONCLUSIONS

Institutions play a key role in countries' economic growth. Countries with solid and efficient institutions contribute to an environment conducive to better economic performance, promoting better quality of life for the population.

Therefore, the present study aimed to verify the efficiency of institutions in some countries, comparing them according to the measures obtained. To achieve this objective, data envelopment analysis and worldwide governance indicators were used to calculate the institutional efficiency index for each country in the sample. A product-oriented model was used, in which institutionally efficient countries were those that maximized worldwide governance indicators. In other words, countries with efficient institutions were those that obtained, relatively, the highest measures in the variables of voice and responsibility, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption. Another objective was to identify some characteristics of efficient countries, in addition to highlighting the Brazilian situation.

The results revealed that Denmark, Finland, New Zealand, Norway, the Netherlands, Singapore, Sweden, and Switzerland have relatively efficient institutions. Of these, New Zealand stands out as a benchmark for most inefficient countries. The mean institutional efficiency score was 0.625, and most countries, including Brazil, scored below this, revealing the need for public policies and strategies to improve the quality of these institutions.

Furthermore, a possible relationship was found between corruption, development, tax burden, political freedom, and institutional efficiency. It should be noted that all institutionally efficient countries are classified as developed, corroborating the theoretical precepts that associate quality institutions with economic development.

In light of this result, the importance of institutions is highlighted, particularly in terms of improving the provision of public services such as education and healthcare. Considering that these factors are decisive for the development of human capital, institutional efficiency can lead to even more significant benefits in the long term.

In addition, policies aimed at controlling corruption; political stability, with the strengthening of democracy; and greater guarantees of property rights and freedom of expression can also contribute to more efficient institutions.

The results regarding the Brazilian situation reveal that the country's main challenge is controlling corruption. Corruption in institutions can cause countless problems, including the mismanagement of public resources, thereby harming society as a whole. Therefore, combating corruption stands out as one of the ways in which the country can improve the quality of its institutions.

In summary, this research contributes to the existing literature by providing useful information for policymakers. Based on the results found, it is possible to direct efforts to raise the institutional quality of countries, thereby influencing their economic performance.

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