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EVIDENCE OF THE NEGATIVE RELATIONSHIP BETWEEN TRANSACTION COSTS AND ECONOMIC PERFORMANCE IN G7+BRICS COUNTRIES

The object of this research is the relationship between Transaction Costs and economic performance. Weak or unreliable institutions open space for corruption, generating a negative externality, increasing the economy's Transaction Costs, inhibiting doing business, and reducing economic growth. Although there is a broad debate about the negative relationship between Transaction Costs and economic performance, little is known about this relationship's strength and significance. This gap occurs because most Transaction Costs estimates are performed at the microeconomic level. Besides, the few estimates of countries' Transaction Costs at the national level are from different periods, which make any analysis unfeasible. The objective of this research is twofold. First, to introduce a comparative index of the Transaction Costs of the countries. Second, to analyze the relationship between the Transaction Costs Index and economic performance. The robustness analysis reveals that the Transaction Costs Index is reliable because the countries' average variation in the ranking is relatively low (1.5 positions), serving as an alternative to the Transaction Costs estimates. The research results show a significant (p-value=0.0054), strong, and negative (R=−0.746) correlation between the Transaction Costs Index and the Gross National Income per capita of G7+BRICS countries. BRICS countries and Italy have lower economic performance, and higher scores on the Transaction Costs Index, suggesting that these countries' institutions are more inefficient than other G7 countries. These results reinforce the current understanding of the negative relationship between Transaction Costs and countries' economic performance. Understanding the effects of Transaction Costs on business activity and, consequently, on economic performance is extremely important for governments to promote adjustments in the regulatory environment that encourage business activity.

Keywords: *institutions, transaction costs, economic performance, composite indicators, G7 and BRICS countries.*

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1. Introduction

There is abundant literature that links a country's Transaction Costs [1] to:

– the quality of the regulatory environment [2–4];
– economic growth [5, 6].

However, researchers show that most Transaction Costs estimates refer to companies, and the Transaction Costs estimates for countries' economies are not always from the same period [7]. Since the author of [5] estimated the Transaction Costs of the 1970s American economy to be 45 % of the Gross National Product (GNP), few studies have followed [8, 9].

Naturally, data unavailability makes it impossible to produce evidence about the strength and significance of the relationship between Transaction Costs and countries' economic performance.

2. The object of research and its technological audit

The object of this research is the negative relationship between Transaction Costs and economic performance. Weak or unreliable institutions open space for corruption, generating a negative externality, increasing the economy's Transaction Costs, inhibiting doing business, and reducing economic growth. Although there is a broad debate about the negative relationship between Transaction Costs and economic performance, little is known about this relationship's strength and significance.

This research has a twofold direction. First, to introduce a comparative index of the countries' Transaction Costs (TC). Second, analyze the relationship between the Index of Transaction Costs (I–TC) and economic performance. For

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this, let's use the, using as an example, the case of the G7 countries (Canada, France, Germany, Italy, Japan, United Kingdom-UK, and United States-US) and BRICS (Brazil, Russia, India, China, and South Africa).

3. The aim and objectives of research

The research seeks to bring to light methods and evidence for a better understanding of the indicators that increase the Transaction Costs of countries in an attempt to identify opportunities to reduce these costs and improve the competitiveness of products in the companies. First, it seeks to offer a way to compare the Transaction Costs of different countries, regardless of Transaction Cost estimates' unavailability at the country level. Second, it seeks to provide evidence on how countries' Transaction Costs reflect the adverse effects of the countries' regulatory framework's inefficiency in their economic performance.

Achieving these aim and objectives is important as a better understanding of the influence of Transaction Costs on economic performance allows governments to adjust the regulatory environment and, consequently, reduce Transaction Costs for companies.

4. Research of existing solutions to the problem

According to [10], a country's economic performance is a function of the institutions' reliability that determines the «rules of the game», or, more formally, the normative framework that limits human and business interactions. Generally, this normative framework regulates how transactions or contracts are carried out in the economy and, consequently, the costs of these transactions [11].

Transaction Costs [12, 13] are non-operational costs related to the functioning of the economic system that is carried out through transactions or contracts [1], being influenced by both the regulatory framework and the corruption of countries [3, 14, 15]. According to [16], efficient institutions reduce corruption levels, create a safe business environment, and reduce Transaction Costs. Weak or unreliable institutions open space for corruption, elevate the Transaction Costs in the economy, inhibit doing business, and, ultimately, reduce economic growth [10].

Several studies relate institutions and Transaction Costs based on regulatory aspects. In [17], the authors state that contractual protection regulations reduce Transaction Costs because they sign a safe business environment. In [4], the authors state that the bureaucracy related to companies' opening, operation, and closing is reflected in higher Transaction Costs. In [18], the authors state that the Transaction Costs that focus on construction activity tend to be higher in countries where procedures are more bureaucratic, decentralized, and little digitalized. The works [19, 20] show that Transaction Costs influence companies' chances to grow. In [21], the authors state that both the absence and the excess of regulations increase Transaction Costs, impair domestic companies' operations, reduce the levels of domestic and foreign direct investment and slow down economic growth per capita.

The literature reveals a consolidated understanding of the relationship between Transaction Costs, the efficiency of regulatory aspects, and economic growth. However, studies show that most Transaction Cost estimates are performed at the microeconomic level and that countries' Transaction Cost estimates are not always available for the same period [7]. Since the author of [5] estimated the Transaction Costs of the 1970s American economy to be 45 % of the Gross National Product (GNP), few studies have followed [8, 9].

Although there is a consolidated understanding in the literature about the negative effects of high Transaction Costs on economic performance [6, 10], the vast majority of Transaction Cost estimates are performed at the microeconomic level [7]. Consequently, few studies estimate the Transaction Costs at the macroeconomic level [8, 9].

To overcome the unavailability of countries' Transaction Cost estimates and to bring evidence of the relationship between Transaction Costs and economic performance, this research proposes the construction of an indicator composed of Transaction Costs.

5. Methods of research

The composite indicators are mathematical tools that represent multidimensional phenomena by aggregating multiple indicators in a synthesis indicator [22, 23]. This property makes composite indicators a valuable and popular tool in several knowledge areas [24, 25]. Composite indicators can represent, for example:

– the living conditions of the population [26, 27];
– health, and social well-being [28];
– the levels of technology and innovation [28–30];
– environmental sustainability [31].

Of course, composite indicators have also been widely used in the economic area to represent:

– the conditions of the business environment [32–34];
– the degree of competitiveness between countries [35];
– the countries' innovation environment [36, 37].

The works [38, 39] show that these composite indicators provide information to compare countries' performance.

The literature presents a reasonable number of methods for building composite indicators [40]. Regardless of the method, the construction of composite indicators can be summarized in the five steps shown in Fig. 1.

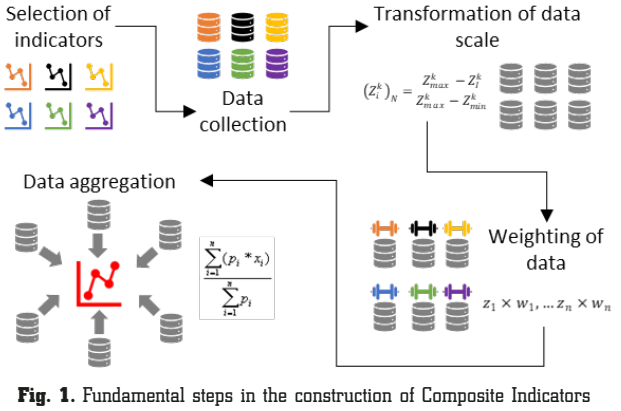

Fig. 1. Fundamental steps in the construction of Composite Indicators

The work [22] offers a detailed explanation of the construction of composite indicators that can be summarized as follows:

1) selection of indicators that will be considered in the composite indicator based on the theoretical aspects of what is to be measured;

2) data collection according to the availability and accessibility of the data of the selected indicators;

3) presentation of indicators on a single scale through normalization by minimum-maximum values, and standardization by *z*-scores, among others;

4) the weighting of the data according to the relative importance of the indicators in representing the phenomenon;

5) aggregation of indicators in the composite indicator employing arithmetic, geometric, harmonic, or other means.

The analysis of the influence of Transaction Costs on the economic development of the G7+BRICS countries was carried out in four stages. First, 41 indicators on the number of procedures, days, and costs to carry out entrepreneurial activities [41] were extracted from the Doing Business year 2019 [42]. Although indicators on the number of procedures and days also refer to Transaction Costs, researchers say that these indicators may not represent all companies in the economy because the company size may influence these data [3, 19]. For this reason, the I–TC considers the 17 cost indicators (taxes, fees, and fares) that apply to all companies in the economy [43–45]. These indicators are presented in Table 1 and can be accessed in [46].

Second, the indicators in Table 1 were normalized by the min-max method and added additively without weighting to construct the I–CT.

Table 1

Transaction Costs Indicators

Dimension	Indicator	Reference
Construction permits *Cp*	Construction permits *Cp*1	[47]
Enforcing contracts *Ec*	Attorney hours *Ec*1; Contracting cost *Ec*2; Court fees *Ec*3; Execution fees *Ec*4	[48]
Get Electricity *Ge*	Cost of getting electricity *Ge*1	[49]
Paying taxes *Pt*	Contributions and labor taxes *Pt*1; Profit tax *Pt*2; Other fees and taxes *Pt*3	[50]
Resolving insolvency *Ri*	Insolvency cost *Ri*1	[2]
Register property *Rp*	Registration cost *Rp*1	[51]
Start Business *St*	Fees and taxes to start a business (% of men's income) *St*1; Fees and taxes to start a business (% of women's income) *St*2	[52]
Trade across-borders *Tb*	Exp. Customs compliance *TB*1; Exp. Documentary compliance *TB*2; Imp. customs compliance *TB*3; Imp. documentary compliance *TB*4	[53]

In other words, the research applies the literature's most popular composite indicator construction method [40].

Third, the I–TC's robustness analysis was carried out through the MCDA Index Tool [54]. This robustness analysis indicates how much a country varies in the ranking due to the different ways of normalizing and aggregating individual indicators [22]. A total of ten comparisons of composite indicators were performed in the MCDA Index Tool. These ten composite indicators were constructed using the max-min normalization, *z*-score, and logistic methods and aggregated using the additive, geometric and harmonic methods.

Fourth, the relationship between the Transaction Costs and the economic performance of the G7+BRICS countries was analyzed by Pearson's [55] correlation between the GNP per-capita (1,000 USD: Atlas method) and the I–TC. The GNP per-capita data for 2019 were extracted from the World Development Indicators [42], which uses the per-capita Gross National Income (GNI) nomenclature. The boxplot and Shapiro-Wilk methods and the scatter plot analysis [56] were applied to detect outliers, verify the data's normality, and analyze the covariance between the I–TC and the GNI per capita.

6. Research results

The I–TC of the G7+BRICS countries is shown in Fig. 2. It can be seen from the map that Italy's I–TC is on the same level as the I–TC of the BRICS countries, suggesting that Italian institutions are as efficient as institutions in the BRICS countries. In turn, the Transaction Costs in China are closer to the Transaction Costs in the G7 countries, suggesting that the country's institutions are efficient.

The average I–TC of the G7 (0.27) and BRICS (0.38) countries suggests that the difference in Transaction Costs between these countries maybe 40 %. It is possible to infer from this result that there is an absence or excess of regulations in the BRICS countries and Italy.

The I–TC's robustness shown in Fig. 3 shows how often a country's ranking is repeated among the 11 composite indicators constructed in the MCDA Index Tool [54].

The results in Fig. 3 suggest that the I–TC is reliable because the countries' average variation in the ranking is relatively low (1.5 positions). Only the UK has an I–TC with more critical variations. Based on the robustness analysis, the I–TC offers a reliable comparative measure of the countries' Transaction Costs, serving as an input variable to analyze the Transaction Costs' relationship with the countries' economic performance.

It can be seen from Fig. 4 that no outliers were detected in the I–TC or GNI per-capita data.

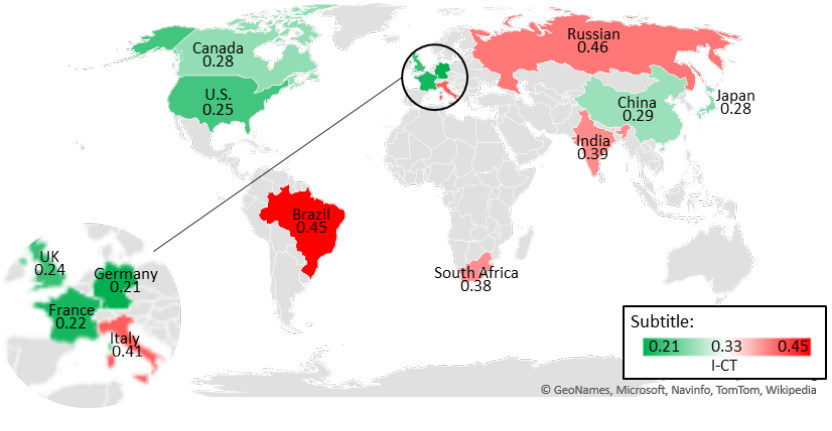

Fig. 2. I–TC of the G7+BRICS

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Country / Ranking	1	2	3	4	5	6	7	8	9	10	11	12	*v*
Germany	91	9											0.1
United States		55	27	18									1.4
France	9	36	9		18	18	9						2.0
Japan			45	27	9	9	9						1.6
China				45	27	9	18						2.1
Canada					45	55							0.6
United Kingdom			18	9			36	18	9		9		4.0
India						9	27	45	9		9		1.6
South Africa								27	45	18	9		1.0
Italy									27	55	18		1.1
Brazil									9	18	45	27	1.1
Russian Federation								9		9	9	73	1.9

Low ← I-CT Robustness → High Average ranking variation *V* = 1.5

Fig. 3. I–TC robustness

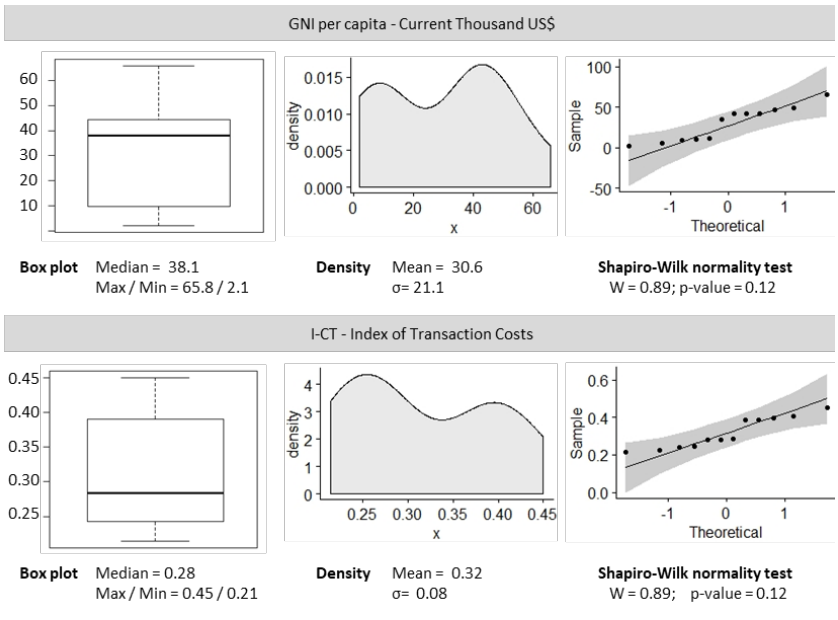

Fig. 4. Outliers and data normality

The *p*-values of the Shapiro-Wilk test are higher than the 0.05 significance level, indicating that they have a normal distribution.

7. SWOT analysis of research results

Strengths. The results of this research show that the costs of doing business harm companies and, consequently, the economic performance of countries. Fig. 5 shows that the costs of doing business, as measured by the I–TC, strongly correlate with the GNI per capita of the G7+BRICS countries.

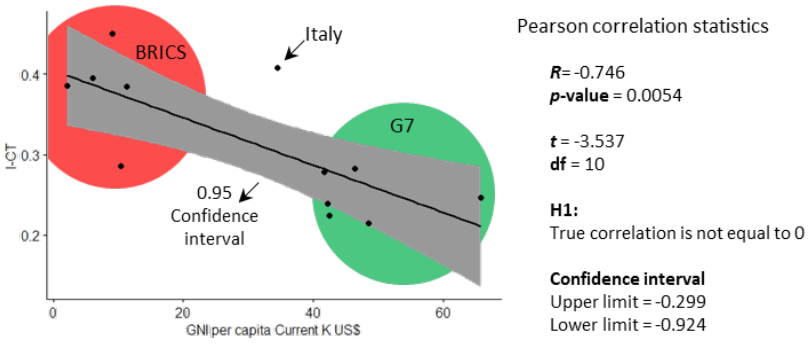

Fig. 5. Scatter plot and correlation summary

At least three conclusions can be taken from the reading of Fig. 5. First, there is a significant (*p-value*=0.0054), strong and negative (*R*=–0.746) correlation between the I–TC and the GNI per capita of G7+BRICS countries. This evidence reinforces the current understanding of the negative relationship between the regulatory aspects reflected in the Transaction Costs and countries' economic performance. Second, there is a relevant gap in the Scatter plot between the G7 and the BRICS countries. This evidence suggests that the negative effect between Transaction Costs and GNI per capita is not negligible. Third, Italy's position on the Scatter plot reflects an I–TC close to that observed in the BRICS countries and a GNI per capita lower than that of the G7 countries. This evidence shows that Transaction Costs' negative effect on economic performance can occur in developing and developed countries.

These results suggest that the BRICS countries and Italy have lower economic performance due to the lack of or excess regulation. The results suggest that I–TC from BRICS and Italy is higher than the G7 I–TC from countries, and the GNI per capita of BRICS countries is lower because the institutions in these countries are less efficient.

Weaknesses. Understanding the negative relationship between business costs and economic performance is very important for governments to promote policies and reforms that improve the business environment.

However, the I–TC calculation used to represent the costs of doing business in the G7+BRICS countries has two limitations in its calculation. First, the I–TC does not consider that the 17 indicators impact business costs at different intensities. Second, underperforming indicators are fully offset by above-average performance indicators.

Opportunities. These limitations open the opportunity to improve the I–TC calculation and, consequently, for greater precision of the results and analysis. This enhancement may include questioning experts to assess the relative importance of each of the seventeen indicators in the costs of doing business. Besides, it is possible to explore other aggregation schemes that, unlike the arithmetical mean, do not allow for a trade-off between poor and above-average performance indicators.

Threats. Asking experts about the relative importance of the sub-indicators in the costs of doing business can increase the accuracy of the I–TC in reflecting the business environment. However, the assessment of weights by experts is a subjective process associated with problems such as judgment errors and evaluation biases. These problems are significant threats for two reasons.

First, weights significantly alter I–TC results. Second, experts can be biased in the evaluations to improve the country's position in the ranking since companies can use the I–TC to decide the countries in which they will make new investments.

8. Conclusions

This research presents an index (I–TC) that provides a measure of the countries' Transaction Costs. This index allows the comparison of the costs of doing business in different countries, offering evidence of the negative relationship between Transaction Costs and economic performance (GNI per capita). The robustness analysis reveals that the I–TC is reliable, serving as an alternative to the Transaction Costs estimates, which are not always available for all countries in the same period.

Understanding the effects of Transaction Costs on business activity and, consequently, on economic performance is extremely important for governments to promote adjustments in the regulatory environment that encourage business activity.

Conflict of interest

The authors declare that they have no conflict of interest concerning this research, whether financial, personal, authorship, or otherwise, that could affect the research and its results presented in this paper.

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Data availability

Libório, M. (2020). *Cost of doing business index in Latin America*. Mendeley Data, V1, doi: 10.17632/b3yvn2pph9.1

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