



HOW DO CITATIONS IN SCOPUS AND THE TIMING OF ECONOMICS AND FINANCE RESEARCH PREDICT CITATION IN POLICY DOCUMENTS IN BRAZIL?

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Abstract: This study delves into the impact of Brazilian academic research on policymaking by analyzing citations in academic and policy document databases (2002 to 2022). Employing Scopus and Overton databases, we identified 2,258 studies that mentioned Brazil in the abstract field and prioritized 487 research papers cited by Brazilian policy sources. A key finding was the emergence of the Instituto de Pesquisa Econômica Aplicada (IPEA) as a dominant source, indicating its pivotal role in shaping Brazilian policymaking. Our multivariate analysis revealed a significant correlation between citations in Scopus and policy documents. At the same time, our negative binomial regression highlighted the influence of economics and finance studies on policy citations, emphasizing academic popularity over publication timing.

Keywords: Economics research. Brazilian policymaking. Negative binomial regression.



1 INTRODUCTION

The social impact of research encompasses its implications for economic, health, and social domains (Bornmann, 2013). Despite the growing recognition of this importance, evaluating the social relevance of research remains predominantly qualitative, posing several challenges to replicability. The Research Quality Plus (RQ+) framework, developed by the International Development Research Centre (Level; McLean, 2018), exemplifies this qualitative approach. However, a more balanced perspective should include qualitative and quantitative approaches (e.g., mentions of research output in news articles or social media). One promising perspective for quantifying societal relevance is examining citations to research within policy documents, particularly concerning specific countries or regions (e.g., Global North vs Global South countries). From this perspective, scholars can start by targeting societal challenges to examine the research's social relevance. Then, track the citations in policy documents.

Pressing societal issues has been studied worldwide. In Latin America, scholarly attention has focused on pressing social issues, such as rural poverty and health (Alvarez-Risco *et al.*, 2021), poverty alleviation, and cash transfer programs (Amarante; Brun, 2018; Molyneux; Thomson, 2011), access to and quality of education (Angrist *et al.*, 2002, 2006; Lara *et al.*, 2011; Mizala; Torche, 2012), and indigenous rights and land disputes (Jameson, 2011; Mestanza-Ramón *et al.*, 2021), to mention a few.

Once there is a significant number of scholarly publications on pressing societal issues, it is possible to predict the citation in policy documents. At this point, one main challenge is to identify the most relevant factors that predict citation in policy documents, as evidenced in studies that analyzed the altmetric activity produced by research results (Bornmann *et al.*, 2016; Kassab *et al.*, 2020). Understanding citation patterns on multidisciplinary databases and considering the timing of the investigation can help predict the relevance of research results for policymaking. Policy documents are one of the few altmetrics sources that can be used for goal-oriented impact measurement (Szomszor and Adie, 2022). In that sense, our study introduces a novel and replicable method for examining the inclusion of studies into policy documents addressing economic and socially significant issues.

Based on this revision, we formulate this research question: How do citations in Scopus and the timing of research in economics and finance predict citation policy documents in Brazil? Studies analyzing citation prediction in policy documents contribute to bridging the gap between academia and policymaking, ensuring evidence-driven decisions and societal benefits (Pinheiro *et al.*, 2021; Szomszor and Adie, 2022).

2 METHODS

2.1 Data Collection

In this study, data collection involved an extensive search within the Scopus database, targeting studies with mentions of Brazil in the abstract field. We selected publications spanning the years 2002 to 2022 to encapsulate significant political shifts commencing with the election of President Luiz Inácio Lula da Silva and concluding with his reelection in 2022, reflecting his enduring impact on Brazilian po-

itics over the past 25 years. We defined this time framework because this period can be characterized by a particular political and social perspective that would have an effect on the policymaking efforts of Brazilian institutions. On the other hand, we decided to examine economics and finance publications without access restrictions because we consider that subscription-based publications could create barriers in the policymaking process. In that sense, we excluded the studies published in subscription-based academic journals. Therefore, we applied inclusion criteria based on document type (article), open-access model (gold), and publication language (English and Portuguese). At the end of this step, we obtained 2,258 relevant entries from the Scopus database.

Subsequently, utilizing digital object identifiers (DOIs), we cross-referenced these publications with the Overton database, prioritizing studies cited at least twice by Brazilian policy sources ($n = 487$). This approach ensured the exclusion of non-Brazilian policy entities such as the European Union (EU), International Monetary Fund (IMF), and United Nations (UN), among others. Overton's extensive repository of academic paper citations within more than 12 million policy documents offers invaluable insights into the practical implications and policy relevance of research endeavors (Pinheiro *et al.*, 2021; Szomszor; Adie, 2022).

2.2 Variables Measurement and Data Analysis

In this study, we assessed three key variables: citations in Scopus, citations in policy documents, and timing. We operationalized citations as the number of citations received in the Scopus database. To ensure a comprehensive scope, we considered citations accumulated across the entire period from 2002 to 2022, rather than limiting them by publication year. Additionally, we measured citations within Brazilian policy documents by examining how frequently studies in the field of economics and finance were cited. Furthermore, the timing was operationalized as the duration in months between the publication of a study and its first citation within a Brazilian policy document. Following the initial exploration through descriptive statistics, correlation analysis, and text data visualization, we employed negative binomial regression for our data analysis. This method was chosen based on recommendations by Chen (2011), McDonald (2006), and Walters (2006), particularly suitable when the predicted variable adheres to a power-law distribution and the predictors exhibit non-normal distributions.

Regarding data visualization, we worked with VOSviewer, version 1.6.20 for co-word analysis of terms included in the Abstract field. We used the standard parameters to obtain the term map in VOSviewer: layout attraction = 2, layout repulsion = 1, and clustering resolution = 1.00.

3 RESULTS

First, we present the descriptive results, then the finding of validating the empirical model.

The descriptive analysis suggests a strong influence and recognition of economic journals within the scholarly community. Additionally, the data underscores the importance of specialized journals such as those focusing on rural economics and political economy in the Brazilian academic landscape

(see Table 1).

Table 1 – Most cited journals in Scopus for Brazilian studies on economics and finance

Order	Journal title	Citations
1	Revista de Economia e Sociologia Rural	2,048
2	Revista de Economia Política	1,058
3	Estudos Econômicos	910
4	Revista Brasileira de Economia	786
5	Economia Aplicada	712
6	Nova Economia	631
7	Economia	624
8	Revista de Economia Contemporânea	448
9	Revista Contabilidade e Finanças	396
10	Revista Brasileira de Marketing	162

Source: The authors (2024).

Regarding the analysis of policy sources in Brazil, we found a striking dominance of citations from the Instituto de Pesquisa Econômica Aplicada (IPEA), far surpassing other sources. This suggests a significant reliance on academic research for the policy documents elaborated by this Brazilian think tank. Also, this indicates its prominent role in contributing to the policy discourse and decision-making in Brazil (see Table 2).

Table 2 – Most citing Brazilian policy sources for economics and business research

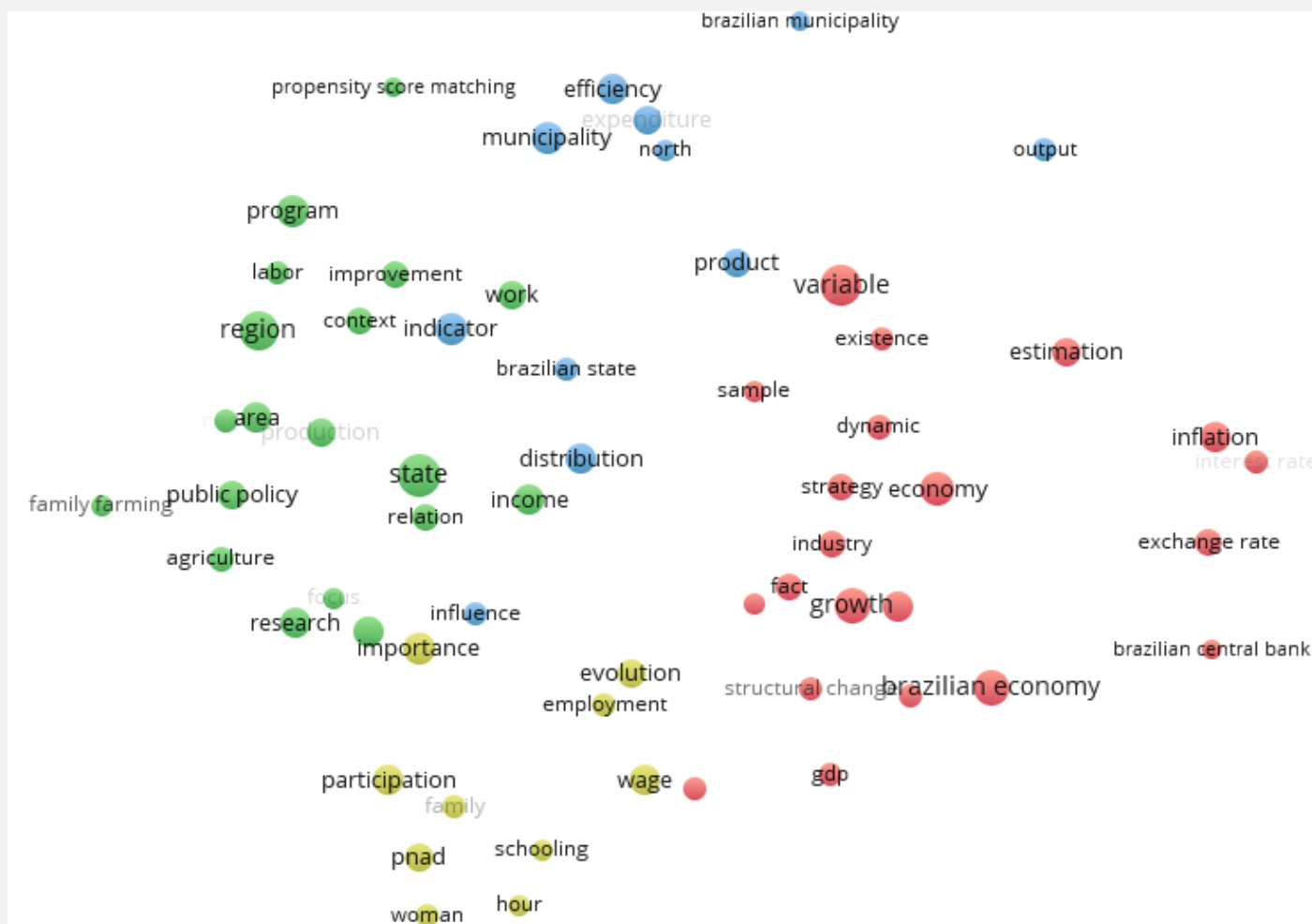
Order	Policy source	Citations
1	Instituto de Pesquisa Econômica Aplicada	10,978
2	Banco Central do Brasil	264
3	Centro de Desenvolvimento e Planejamento	198
4	Governo do Brasil	42

Source: The authors (2024).

Regarding the predominant topics in the abstract of the most cited studies in Brazilian policy documents, we identified four significant ones: Cluster 1 (red) delves into the Brazilian economy, focusing on aspects such as estimation, exchange rate, growth, and inflation. This cluster highlights strategic approaches and insights crucial for understanding and navigating Brazil's economic landscape. Cluster 2 (green) centers around agriculture and public policy, emphasizing improvements, income, and labor-related issues. This cluster sheds light on the intersection of agricultural development, regional dynamics, and governmental interventions, providing insights into enhancing agricultural productivity and socio-economic outcomes. Cluster 3 (blue) explores the dynamics within Brazilian municipalities and states, examining distribution, efficiency, and expenditure patterns. This cluster offers insights into regional disparities and resource allocation, contributing to informed decision-making processes at various administrative levels. Cluster 4 (yellow) addresses employment dynamics, particularly focusing on factors such as evolution, participation, and wage disparities. It highlights the importance of factors like education and family dynamics in shaping employment outcomes, offering implications for policies aimed at

promoting inclusive growth (see Figure 1). The examination of Figure 1 reveals an orientation toward a prominent role of the public sector in promoting economic development. For example, we observed a significant presence of terms like income distribution, municipality, or state, which resembles a political and economic orientation similar to the primary topics supported by Lula Da Silva's perspective.

Figure 1 – Topic clusters for economics and finance studies cited in Brazilian policy documents



Source: The authors (2024).

Note: Co-word analysis for the abstract of 148 studies cited in Brazilian policy documents for those terms with a minimum frequency of five occurrences in the abstracts.

Quantitative variables showed a high dispersion: citations in Scopus (10.32 ± 11.46), citations in policy documents (8.54 ± 5.55), and timing (45.47 ± 31.78). According to the Spearman correlation, there was a significant and positive correlation between citations in Scopus and citations in policy documents ($\rho = 0.280$, $p = 0.001$), but there was an inverse significant correlation between citations in policy documents and timing ($\rho = -0.195$, $p = 0.018$).

Our negative binomial regression analysis yielded several noteworthy findings. Firstly, the intercept estimate indicates a baseline level for the citations in policy documents, suggesting an inherent tendency regardless of other factors. The coefficient for citations in Scopus is positive (0.0189), suggesting that studies in economics and finance positively influence the citations in Brazilian policy documents. However, the timing coefficient is negative (-0.0036), suggesting that the timing of publication may have a detrimental effect on citations in policy documents (see Table 3). These preliminary results reinforce the

importance of academic popularity, measured by citations in Scopus rather than the timely availability of research results for producing policy documents (Yang; Huang, 2024; Zong *et al.*, 2023).

Table 3 - Predicting citations in policy documents [95% confidence interval: lower - upper]

Variable	Estimate	Robust S.E.	Lower	Upper	z-value	p-value
Intercept	2.0729	0.0806	1.9150	2.2308	25.73	0.000
Citations in Scopus	0.0189	0.0020	0.0149	0.0229	9.30	0.000
Timing	-0.0036	0.0012	-0.0061	-0.0012	-2.90	0.004
Alpha	-0.2605	0.0295	0.2559	0.1578		

Source: The authors (2024).

Note: S. E. = Standard error

4 CONCLUSION

In conclusion, our study shed light on the intricate relationship between academic research and policymaking in Brazil. Through an extensive analysis of citations in Scopus and policy documents, we found a significant positive association between academic citations and their influence on policy documents. This underscores the crucial role of scholarly contributions in shaping policy decisions and discourse within Brazil. Furthermore, our findings the dominance of the Instituto de Pesquisa Econômica Aplicada (IPEA) as a key source of policy citations, indicating its pivotal role in informing policy discussions and decision-making in Brazil.

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