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A relação entre atividades empreendedoras e o crescimento
econômico: uma análise comparativa entre capitais brasileiras

Article

Relationship between entrepreneurial activities and economic growth: a comparative analysis of Brazilian capitals

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Abstract

Entrepreneurship has brought positive results contributing to build prosperous and growing economies. This article aims to analyze the long-term relationship between entrepreneurship and the economic growth of Brazilian states' capitals from 2013 to 2021. The methodology was based on a quantitative approach using time series to evaluate representative entrepreneurship and economic development variables. The chosen variables were: the number of individual micro-entrepreneurs (known as MEIs), Firjan Tax Management Index (IFGF), population number, demographic density, Municipal Human Development Index (HDI-M), and GDP per capita. The results were interpreted based on descriptive and inferential analysis using the econometric model of Regression with Panel Data. The main results showed that the fiscal management of the Brazilian states' capitals remained within the limit classified as good fiscal management; however, when comparing the capitals separately, some presented low indicators suggesting difficulties in financial sustainability, while others created strategies for economic growth. The presence of MEIs was a factor that generated gains for the municipalities' economy and greater local development by generating jobs, and the inferential analysis of the econometric model proved the significant influence of entrepreneurship rates on the economic growth of the investigated capitals. The findings of this article highlight the importance of policies to promote MEISs and recognize their role in local economies.

KEYWORDS: Brazilian capitals. Economic growth. Entrepreneurship. Time series.

A relação entre atividades empreendedoras e o crescimento econômico: uma análise comparativa entre capitais brasileiras

Resumo

O empreendedorismo tem contribuído ao fornecer resultados positivos para tornar uma economia próspera e crescente para sua população. O objetivo deste artigo é, portanto, analisar a relação de longo prazo entre o empreendedorismo e o crescimento econômico de capitais brasileiras no período de 2013 a 2021. A metodologia foi baseada em uma abordagem quantitativa, na qual fez-se o uso de séries temporais para avaliar variáveis representativas do empreendedorismo, bem como de desenvolvimento econômico. As variáveis escolhidas foram: número de microempreendedores individuais (MEIs); Índice Firjan de Gestão Fiscal (IFGF); número da população; densidade demográfica; Índice de Desenvolvimento Humano Municipal (IDHM) e PIB per capita. A interpretação dos resultados foi baseada na análise descritiva e inferencial com o uso do modelo econométrico de Regressão com Dados em Painel. Os principais resultados evidenciaram, de forma geral, a gestão fiscal das capitais brasileiras, mantendo-se dentro do limite classificado como de boa gestão fiscal, no entanto, ao comparar as capitais isoladamente, algumas apresentaram indicadores baixos, sugerindo dificuldades na sustentabilidade financeira, enquanto outras criaram estratégias para avanços econômicos. A presença de microempreendedores individuais foi um fator que gerou ganhos na economia dos municípios, com maior desenvolvimento local ao criar mais empregos. No tocante à análise inferencial do modelo econométrico, foi possível comprovar a significativa influência das taxas de empreendedorismo no crescimento econômico das capitais investigadas. As descobertas deste artigo ressaltam a importância da promoção dos microempreendedores individuais a ponto de reconhecer o papel destes na economia das cidades. Assim, gestores podem elaborar políticas de incentivo à criação e ao desenvolvimento de empreendedores.

Palavras-chave: Capitais brasileiras. Crescimento econômico. Empreendedorismo. Séries temporais.

Relación entre actividades emprendedoras y crecimiento económico: un análisis comparativo de las capitales brasileñas

Resumen

El emprendimiento ha contribuido brindando resultados positivos para hacer una economía próspera y creciente para su población. El objetivo de este artículo es, por lo tanto, analizar la relación de largo plazo entre el emprendimiento y el crecimiento económico de las capitales brasileñas en el período de 2013 a 2021. La metodología se basó en un enfoque cuantitativo, que hizo uso de series de tiempo para evaluar variables representativas del emprendimiento, así como del desarrollo económico. Las variables escogidas fueron: número de microempresarios individuales (MEI), Índice Firjan de Gestión Fiscal (IFGF), número de población, densidad demográfica, Índice de Desarrollo Humano Municipal (IDH-M) y PIB per cápita. La interpretación de los resultados se basó en el análisis descriptivo e inferencial utilizando el modelo econométrico de regresión con datos de panel. Los principales resultados mostraron en general que la gestión fiscal de las capitales brasileñas se mantuvo dentro del límite clasificado como buena gestión fiscal, sin embargo, al comparar las capitales por separado, algunas presentaron indicadores bajos que sugieren dificultades en la sostenibilidad financiera, mientras que otras crearon estrategias para avances económicos. La presencia de microempresarios individuales fue un factor que generó ganancias en la economía de los municipios, con mayor desarrollo local al generar más empleos. En cuanto al análisis inferencial del modelo econométrico, fue posible comprobar la influencia significativa de las tasas de emprendimiento en el crecimiento económico de las capitales investigadas. Los hallazgos de este artículo destacan la importancia de promover a los microempresarios individuales hasta el punto de reconocer su papel en la economía de las ciudades. Así, los directivos pueden desarrollar políticas para fomentar la creación y el desarrollo de emprendedores.

Palabras clave: Capitales brasileñas. Crecimiento económico. Emprendimiento. Series de tiempo.

INTRODUCTION

The literature has recognized that, regardless of city, state, region, or country, entrepreneurship can be associated with economic progress, innovation, and competitiveness, despite its absence in most traditional economic models. In *The theory of economic development*, Schumpeter (1911) argues that entrepreneurs are the driving force of economic growth. That is because they launch innovative products and services into the market. These, in turn, make pre-existing ones obsolete. In addition, entrepreneurs also create jobs, promote economic development and competitiveness (PATAH, FERREIRA, and PUGAS, 2017).

In a world where globalization and the opening of the economy have been established as important scenarios, both economic integration and promotion of competitiveness reach everyone. Therefore, they allow the opportunity for new learning and better coexistence among every individual in modern society. The era of entrepreneurship emerges due to the speed with which economic, technological, and related changes occur. In this context, entrepreneurship has become fundamental for the prosperity of the nation and has increasingly been studied, analyzed, and stimulated (PATAH, FERREIRA, and PUGAS, 2017).

Thus, it is possible to recognize that entrepreneurship relates to both broad and specific issues. One of them is focused on the economic growth of countries, which makes the research field complex and interdisciplinary. Moreover, policymakers are interested in data and contextual characteristics of entrepreneurship. This is evidenced by the publication of reports such as the Global Entrepreneurship Monitor (GEM) and the Brazilian Micro and Small Business Support Service (Serviço Brasileiro de Apoio às Micro e Pequenas Empresas, henceforth Sebrae). Both are issued annually, and the results are compared among countries, cities, and regions.

It is worth mentioning that Sebrae is a Brazilian entity that promotes the development of small companies that have annual gross revenues up to R$4.9 million. There is what seems to be a direct relation between entrepreneurship and economic growth. This relation, which has already been studied and proven in previous research, suggests that one influences the other. However, some regional characteristics may be associated with the greater explanatory potential of the link between entrepreneurship and economic growth (NOGAMI and MACHADO, 2011).

The geographical context and its variables have been the subject of interest in the literature investigating the relationship between cities, regions, states, and countries with entrepreneurship. In this line, Spies (2018) found that entrepreneurship has a small yet relevant influence on poverty rates in Brazil, suggesting that poverty tends to be lower in cities where entrepreneurship is prevalent. Silva and Silva (2019) noted that there was significant growth in entrepreneurship in Brazil between 2002 and 2016. Likewise, there was an increase in female contribution to the economy and in the survival time of existing businesses. Morais and Emmendoerfer (2018) analyzed that individual micro entrepreneurship affects social conditions, expanding job formalization, income growth, and tax collection.

There is, however, a gap in the existing literature. Few studies have evaluated the impact of entrepreneurial variables over time by analyzing their effect using time series which compare results across Brazilian capital cities in order to explore the individual impact in these regions.

Bearing that in mind, this paper aims to analyze the long-term relation between entrepreneurship and economic growth of Brazilian capital cities from 2013 to 2021. In order to conduct this analysis, secondary data on characteristic variables of both economic growth and entrepreneurship were

collected, as well as sociodemographic indicators. The variables were collected annually in 25 Brazilian cities and formed a panel with a total of 225 observations. The interpretation of the results was based on descriptive and inferential analysis using the Panel Data Analysis econometric model.

This paper contributes to the presentation of economic indicators in the analyzed capital cities, in order to identify and explain the effect of the relationship between entrepreneurial activities and economic growth in such cities. This study also may evidence the advance or decline in the development of capital cities. This is because the relationship between the geographical context and its variables indicates the individual impact of the relationship per city, which makes the results more robust and practical for public managers to apply them. Therefore, they may evaluate actions and strategies that can be implemented to improve or maintain their indicators.

The present paper is structured as follows: the first section explores the theoretical basis regarding entrepreneurship and economic growth. Then, the methodology is presented, followed by the analysis and results which highlight the main findings. Finally, the conclusion of the study is addressed.

THEORETICAL FOUNDATION

In this section, the theoretical background is presented. This background is related to both the concepts of economic indicators and to the general characteristics of Brazilian cities. Besides these aspects, the economic growth of the cities, which supported this study, is explored.

Entrepreneurship and economic growth

Entrepreneurship terms the studies related to entrepreneurs, their profile, their origins, their activity system, their acting universe (JANSEN, 2020). It is the involvement of people and processes that, together, leads to the transformation of ideas into opportunities. It is also the perfect implementation of these opportunities that creates successful businesses (VALENCIANO and BARBOZA, 2005). The focus of entrepreneurship on creating new businesses arises much more as a consequence of technological changes and their speed, therefore it does not qualify simply as a fad. The competitive market also makes new entrepreneurs adopt innovative measures (DOLABELA, 1999). Schumpeter (1961, p. 110) comments that capitalism is "by nature a form or method of economic change and, not only never is, but never can be stationary".

In *The theory of economic development*, Schumpeter (1911) argues that entrepreneurs are the driving force behind economic growth. His statement is based on the fact that they introduce, into the market, innovative products and services that make existing ones obsolete. In addition, entrepreneurs may also create jobs, promote economic development, and make the economy competitive (PATAH, FERREIRA, and PUGAS, 2017).

Schumpeter (1961) also contributed to the study of entrepreneurship by revisiting the figure of the entrepreneur in the economy. The author presents entrepreneurs as the main promoters of economic development, thanks to their capacity to incorporate innovations and new technologies and to its contribution to the replacement of outdated products and processes. Thus, the entrepreneur has a central role in the advancement and development of the economy and society. This individual

also plays a key role in the evolution of business life and the replacement of established companies by new organizations (FONTENELE, SOUZA, and LIMA, 2011).

Considered a global phenomenon, entrepreneurship occupies a prominent position in various scenarios of society, namely in the political, economic, and social spheres (SILVA, 2019). It fosters an important perspective for the economic development and job generation (BRUTON and AHLSTROM, 2010).

Among the previously mentioned arguments, it is possible to mention those related to resilience, since innovative companies recover from economic crises more easily (WYMENGA et al., 2011). Following Dionísio, Inácio Júnior and Carvalho (2018), in the economic sphere, entrepreneurship generates results associated with entrepreneurial action. The latter involves the development of new businesses that generate: value measured by the creation of superior organizational performance, qualified and well-paid jobs, introduction of new and/or significantly improved products and/or services, or the implementation of technology in production processes that make them less aggressive to the environment.

The entrepreneurial process fosters great benefits to countries, ranging from the generation of jobs and income to the promotion of competitiveness and innovation. The entrepreneur can operate in all branches of any industry. During an economic stagnation, for example, entrepreneurship can be seen as a solution because it fosters innovative activities that can make the economy recover (JANSEN, 2020).

Newly established businesses also tend to be more efficient and create more jobs than older, established companies. Furthermore, these businesses foster competitive pressure and stimulate other businesses to increase their productivity and economic efficiency. Increasing competitiveness, therefore, is an inherent consequence of encouraging entrepreneurship, but cooperation among ventures is also of great importance (JANSEN, 2020).

Due to the speed of contextual changes, entrepreneurship becomes fundamental to the prosperity of the nation and has been increasingly studied, analyzed, and stimulated (PATAH, FERREIRA, and PUGAS, 2017). Hence the recognition that it relates to both broad and specific topics. One of these topics focuses on the economic growth of countries, which makes the research field complex and interdisciplinary. In addition, policymakers are interested in data and contextual entrepreneurship, a fact that is evidenced in reports such as the Global Entrepreneurship Monitor (GEM).

The investigations conducted by the GEM, an international organization based in England, are among various studies related to entrepreneurship in the world. Every year, the GEM conducts studies on entrepreneurship and makes them available on its portal[1].

For the GEM Brazil (2012, p. 8, our translation), "when individuals are able to recognize business opportunities and exploit them, the whole society benefits." Under this interpretation, "entrepreneurship" is understood as the creation of a new venture in the form of a new activity or the expansion of an existing one (GEM, 2012, p. 7).

In a study on social entrepreneurship practices in Brazilian cities, Couto, Vasquez, and Correia (2020) observed that some commercial activities financially sustain activities that are not profitable, but which promote social welfare. Thus, there is a link among social goals, non-profit organizations, and the dynamic, innovative, and entrepreneurial aspects of the business sector. Such link is based on the emergence of new social entrepreneurship practices, which can be understood as bold actions

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[1] Available at: <http://www.gemconsortium.org/>. Accessed on: Apr. 22, 2023.

towards positive socio-environmental impact. This happens because there is a search for effective solutions to problems as well as to the state subsidies deficit in Brazilian cities (COUTO, VAZQUEZ, and CORREA, 2020).

Figueiredo and Leite (2006) mention that different factors tend to make some cities more developed than others which means they receive more resources and have greater availability of skilled workforce. Entrepreneurship arises when regional inequalities are admitted and domination can make way for interdependence, as localities gain conditions to explore their potential and promote the development of technology-based companies. The convergence of interests around a productive focus is the main factor driving development, because it is the only way that peripheral cities have to encourage private investment. This takes place through the emergence of business incubators.

Flor and Teixeira (2018) point out that cities need to become smarter and combine technology and urban development to meet the demands of population growth. It is also necessary that cities associate both technology and urban development with entrepreneurship. This is necessary because the relationship between technology, urban development and entrepreneurship are the backbones of the concept of entrepreneurial smart cities. The referred cities foster urban development alongside social and environmental development, since one of the reasons for improving the quality of life is the link between the locality and entrepreneurial activities.

When comparing the indicators from the rankings of smart cities (Connected Smart Cities) and entrepreneurial cities (Endeavor), similarities between the classifications were verified. These similarities are found mainly in aspects such as infrastructure, however, depending on the region, the focal points are different so that they meet the need each one proposes itself to (FLOR and TEIXEIRA, 2018).

Céspedes and Fochezatto (2018) analyzed the emergence of companies in municipalities of Rio Grande do Sul over the period between 2007 and 2013. To do so, they used exploratory data analysis and panel data analysis approaches. The results indicated the existence of spatial autocorrelation between firm birth and the formation of some clusters of municipalities with high numbers of emergence of firms and spillover effect of such births. This allowed the measurement of the direct and indirect impacts of the independent variables resulting from this occurrence.

The literature in the field of entrepreneurship has increasingly shown interest in geographic location, especially when analyzing cities, countries, and regions. From this perspective, Spies (2018) found that entrepreneurship has a small, yet relevant, influence on poverty rates in Brazil. This information suggests that poverty tends to be lower in cities where entrepreneurship is prevalent. In addition, Silva and Silva (2019) noted that there was significant growth in entrepreneurship in Brazil between 2002 and 2016. Likewise, both female contribution to the economy and the survival time of existing businesses increased.

Morais and Emmendoerfer (2018) analyzed the potential effect of Individual Microentrepreneurship (Microempreendedor Individual, henceforth MEI) on social conditions in municipalities. Considering the effects of MEI formalization on employment, income, and tax collection recorded in the literature, the authors tested the hypothesis that MEI tends to positively affect social conditions.

In the international context, the link between entrepreneurship and economic growth has also been evaluated in different countries. Saberi and Hamdan (2018) conducted this analysis from the perspective of the role of government officials of countries that belong to the Historic Gulf Cooperation Council. This group comprises Saudi Arabia, Bahrain, Qatar, the United Arab Emirates, Kuwait, and

Oman. The most significant of those authors' findings highlights that government support has a moderating effect and a relevant role in promoting entrepreneurship.

Meyer and Meyer (2020) evaluated the effects of entrepreneurship among countries such as Austria, Croatia, Hungary, Poland, and Slovenia. The authors point out that entrepreneurship can have direct and indirect impacts on a country's economic activities. They also identified that early-stage and development-stage entrepreneurial actions affected the development of the analyzed countries.

Based on econometric causality analysis, Davari et al. (2022) analyzed the link between entrepreneurship, economic growth, and unemployment in 39 countries over the period from 2006 to 2016. The study found evidence that economic growth causes entrepreneurship to increase and unemployment to decrease. However, this relation was not confirmed regarding the impact of entrepreneurship on economic growth because it results from the development of public policies that may differ from country to country.

Al-Qudah, Al-Okaily, and Alqudah (2021) observed that there is a positive influence in the relationship between social and sustainable entrepreneurship and economic growth, and such relation is an alternative to traditional economic development. In this respect, the authors point out social entrepreneurship as a means to promote the growth and evolution of countries. As for the context of analysis, this research was conducted with the following countries: Australia, Brunei, Cambodia, China, Indonesia, Japan, Laos, Malaysia, Myanmar, New Zealand, Philippines, Singapore, South Korea, Thailand, and Vietnam.The evaluation period was from 2015 to 2019.

METHODOLOGY

A quantitative approach was adopted with the use of time series to meet the objective of analyzing the long-term relationship between entrepreneurship and economic growth of Brazilian capital cities in the period from 2013 to 2021. The Brazilian capital cities under study in this research were: Salvador, Manaus, Vitória, Boa Vista, Rio Branco, Goiânia, São Paulo, Curitiba, Fortaleza, São Luís, Aracaju, Belo Horizonte, João Pessoa, Porto Alegre, Palmas, Florianópolis, Recife, Maceió, Teresina, Campo Grande, Porto Velho, Natal, Cuiabá, Macapá, and Rio de Janeiro.

Initially, the variables of entrepreneurial activities and economic growth were defined based on their theoretical consistency to compose the secondary data source of this study and the analyzed time series. Once the definition of the variables was available, a search in Brazilian databases was conducted to identify, collect, and record them in a spreadsheet.

The period between 2013 and 2021 was chosen for the study, limiting the time series to a nine-year time frame of the Brazilian cities. The choice of this analysis time frame (2013 to 2021) is due to the fact that the release of data for a variable began in 2013, as well as its most recent information was released by 2021.

The variables used, which also presented consistency in the literature, were the following: number of individual microentrepreneurs (MEIs); Firjan[2] Fiscal Management Index (IFGF); population number; population density; Municipal Human Development Index (MHDI), and GDP

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per capita. They were collected annually for each city and formed an unbalanced panel with a total of 225 observations.

The sources for data collection were: Firjan System, Brazilian Federal Revenue Service, and Brazilian Institute of Geography and Statistics (IBGE). The information from the different databases was organized by capital, year, and variable collected in a spreadsheet. Box 1 presents the description of the variables collected, their meaning, and the collection source .

BOX 1

Description of the variables that are characteristic of Brazilian capitals collected from 2013 to 2021

Variable	Model	Acronym	Explanation	Collection source	Work
IFGF	Independent variable	Firjan Fiscal Management Index	It evaluates the socioeconomic development of Brazilian municipalities in terms of employment and income, education, and health.	Firjan	Variable added by the authors of this research
MEI	Independent variable	Established number of MEIs	The individual microentrepreneur (MEI) is the individual entrepreneur who meets the requirements established by Complementary Law No. 123/2006 and CGSN Resolution No. 140/2018, which determine, in summary, that for the taxpayer to fit as MEI he must meet some requirements.	Federal Revenue	Morais and Emmendoerfer (2018)
Population	Independent variable	Estimated population number	Absolute number of population in each municipality analyzed.	IBGE Cidades	Morais and Emmendoerfer (2018)
Population density	Independent variable	Population density (inhabitants/km²)	It is the relative proportion of the population of each city in relation to a certain area.	IBGE Cidades	Céspedes and Fochezatto (2019)
Municipal HDI	Independent variable	Municipal HDI	The Municipal Human Development Index (MHDI) is a composite measure of indicators from three dimensions of human development: longevity, education, and income. The index ranges from 0 to 1. The closer to 1, the higher the human development.	IBGE cidades	Morais and Emmendoerfer (2018)
GDP per capita	Dependent variable	GDP per capita	It is the gross domestic product divided by the number of inhabitants of a country/state/city.	IBGE Cidades	Céspedes and Fochezatto (2019)

Source: Research data.

As shown in Box 1, the variables were collected with information on the Firjan Index, the number of created MEIs, population density, population census, Human Development Index, and GDP per capita. In the estimation model, the GDP per capita for each year was used as a dependent variable, and the other characteristic variables for each period were used as independent variables.

Initially, the descriptive statistics of the characteristic variables of the selected Brazilian cities were analyzed, establishing parameters for comparison among them. In this step, the median, the mean, the minimum value, the maximum value, the standard deviation, the skewness, and the kurtosis were analyzed. The descriptive analysis allowed us to evaluate the cities with the highest and lowest rates in terms of fiscal management, number of microentrepreneurs, and GDP per capita over time. The analysis also allowed establishment of parameters for comparison. Correlation analysis was also carried out to evaluate the relationship between the variables, in order to identify whether increases in a certain variable cause the indicators of other variables to increase or decrease.

After that, the inferential analysis was performed using the Panel Data Analysis econometric model with 225 observations over nine years. In order to do this, the data of the capitals were used as time series data and cross-sectional data, also called pooled data. The use of this model was adequate to find the best explanation of the effect on the long-term relation on each capital, meeting the parameters of econometric analysis suggested by Gujarati and Porter (2011).

Four econometric regression models for the time series were tested, including the static and dynamic model in the Gretl software: Ordinary Least Squares (OLS); Weighted Least Squares; Fixed Effects Panel and Random Effects Panel. Finally, the model chosen was the Random Effects Panel Data Analysis, whose measures of significance met Gujarati and Porter's (2011) validity parameters.

After the estimation of the chosen econometric model and its respective regression equation were done, the calculation of the regression equation for each individual capital over the time series was performed. Thus, the impact of the entrepreneurial activities exclusively represented by the number of MEIs on the economic development of each city was evaluated. In this evaluation, the GDP per capita was the dependent variable which tested the effect of each entrepreneurial variable on the cities development.

The analyses of the collected data and the identified results are presented in the next section.

DATA ANALYSIS AND RESULTS

Initially, the descriptive statistics of the characteristic variables of the Brazilian cities were analyzed, establishing parameters for comparison between them. Subsequently, the inferential analysis was performed using an econometric model. Such model presents the results of the long-term estimation of the relation between entrepreneurial activities and economic growth.

Descriptive analysis of the characteristic variables of Brazilian cities

TABLE 1

Descriptive statistics of the characteristic variables of entrepreneurial activities and economic growth of Brazilian capital cities from 2013 to 2021

Variables	Mean()	Median (M_d)	Median (M_d 13-21)	Minimum value	Maximum value	Standard deviation	Skewness	Kurtosis
IFGF 2013	0,678	0,689		0,420	0,949	0,116049	-0,68816	0,008672
IFGF 2014	0,691	0,733		0,417	0,924	0,105015	-0,26095	-0,4479
IFGF 2015	0,618	0,643		0,307	0,941	0,141637	-0,76729	-0,14337
IFGF 2016	0,642	0,666		0,334	0,877	0,114082	-0,29482	-0,45466
IFGF 2017	0,623	0,621	0,689	0,384	0,832	0,097286	-0,72307	-0,06097
IFGF 2018	0,652	0,637		0,358	0,862	0,104239	-0,27776	-0,39246
IFGF 2019	0,686	0,725		0,350	0,920	0,117151	-0,30455	-0,52317
IFGF 2020	0,715	0,750		0,304	0,940	0,125273	0,579721	-0,99406
IFGF 2021	0,715	0,750		0,304	0,940	0,125273	0,579721	-0,99406
MEI 2013	41169,2	17571		6252	288563	37400,32	10,56836	3,145354
MEI 2014	51714,28	22042		7260	366113	47253,01	10,67231	3,160666
MEI 2015	63105,08	26969		8418	445868	58099,48	10,35016	3,131643
MEI 2016	73765,24	29425		9295	523743	68569,88	10,15912	3,120283
MEI 2017	96575,32	38456	36093	10352	607305	94553,07	8,270574	2,99163
MEI 2018	83767,2	36093		2058	603955	78361,66	10,4177	3,14801
MEI 2019	103541,3	43072		6668	754236	96616,03	10,77221	3,190636
MEI 2020	125048,3	52131		9860	903047	115444,4	10,80204	3,192528
MEI 2021	146994,4	62624		13058	1056738	133647,8	10,99779	3,216056
GDP per capita 2013	R$ 29.417,00	R$ 24.124,00		R$ 15.511,00	R$ 83.887,00	R$ 9.939,00	R$ 7,53	R$ 2,41
GDP per capita 2014	R$ 31.102,00	R$ 25.896,00		R$ 18.170,00	R$ 65.566,00	R$ 9.286,00	R$ 1,59	R$ 1,33
GDP per capita 2015	R$ 31.827,00	R$ 27.788,00	R$ 30.933,62,00	R$ 19.828,00	R$ 64.800,00	R$ 9.480,00	R$ 1,08	R$ 1,26
GDP per capita 2016	R$ 32.400,00	R$ 28.946,00		R$ 20.059,00	R$ 60.441,00	R$ 9.213,00	R$ 0,32	R$ 1,11
GDP per capita 2017	R$ 33.083,00	R$ 30.934,00		R$ 21.057,00	R$ 57.732,00	R$ 8.817,00	-R$ 0,17	R$ 0,91

Continue

Variables	Mean()	Median (M$_d$)	Median (M$_d$13-21)	Minimum value	Maximum value	Standard deviation	Skewness	Kurtosis
GDP per capita 2018	R$ 34.574,00	R$ 32.059,00		R$ 22.123,00	R$ 59.694,00	R$ 9.330,00	-R$ 0,12	R$ 0,95
GDP per capita 2019	R$ 35.972,00	R$ 33.745,00		R$ 22.213,00	R$ 71.227,00	R$ 10.213,00	R$ 0,85	R$ 1,20
GDP per capita 2020	R$ 35.117,00	R$ 32.453,00		R$ 20.417,00	R$ 69.268,00	R$ 10.020,00	R$ 0,95	R$ 1,14
GDP per capita 2021	R$ 34.690,00	R$ 31.212,00		R$ 19.519,00	R$ 68.289,00	R$ 10.010,00	R$ 0,92	R$ 1,09
Population	102.653.52	916.001	916.001	82.579	213.317.639	16.414.664	24,78777	4,970201
Density	2672,814	1854,1	1854,1	12,57	7786,44	2241,029	-0,80264	0,687922
Municipal HDI	0,77584	0,77	0,77	0,721	0,847	0,028461	-0,45506	0,412032

Source: Research data.

The descriptive analysis demonstrates the characteristics of the variables analyzed in the Brazilian capitals. Regarding the first variable presented in Table 1, the Firjan Fiscal Management Index (IFGF), alterations in its indicator can be observed over nine years. It is worth mentioning that the IFGF is a variable that evaluates the development of the fiscal management of cities. Thus, the IFGF is an economic measure calculated by the Brazilian government based on unanalyzed data (gross data) sent to the National Treasury, which examines and qualifies the Brazilian cities in terms of their efficiency in the financing capacity of their administrative structure and fiscal balance. Four indicators are evaluated to construct the IFGF index: i) autonomy to finance its administrative structure; ii) personnel expenses; iii) compliance with financial obligations; and iv) investments to generate well-being and competitiveness (FIRJAN, 2021a).

The analysis of the set of indicators generates an index that classifies the fiscal management of the municipality into the following levels: excellent management (IFGF between 0.8 and 1.0), good management (IFGF between 0.6 and 0.8), difficult management (IFGF between 0.4 and 0.6), and critical management (IFGF below 0.4) (FIRJAN, 2022).

In general, when observing the cities altogether, it is possible to observe that their median IFGF value is above 0.6, indicating good fiscal management. Specifically, between the first index releases of 2013 and 2014, the value was within acceptable limits (M_d = 0.689 and 0.733). In the following years, 2015 and 2018, its value decreased, remaining below the median value for the period (M_d 13-21 = 0.689), but still classified as good management. However, it is noticeable that the Brazilian capitals presented a more optimistic scenario when observing that the IFGF exceeded the median value of the last three years (2019 M_d = 0.725; 2020 and 2021 M_d = 0.750).

By taking a more detailed look at the IFGF indicator (IFGF$_{Salvador\ 2021}$ = 0.940), it is observable that Salvador had the highest index among Brazilian capitals. Especially in the last three analyzed years, this city has maintained values above 0.860, and has been configured as excellent management. Overall, Salvador showed IFGF equal to or higher than 0.800 in 2014, 2015, and from 2017 to 2021. Another municipality whose fiscal management index was similar to Salvador, BA, was Manaus, AM.

Although this city had the second highest IFGF over the analyzed time series, its indicators were higher than Salvador's in 2013, 2016, and 2017 ($IFGF_{Manaus\ 2013} = 0.864$; $_{2014} = 0.827$; $_{2017} = 0.920$).

Moreover, another relevant city in terms of fiscal management is Rio Branco, which obtained the best indexes among the capitals analyzed between 2013 and 2015 ($IFGF_{Rio\ Branco\ 2013} = 0.949$; $_{2014} = 0.924$; $_{2015} = 0.941$). Rio Branco is considered the city with the highest median IFGF value over the nine years analyzed. In the subsequent years, the index has registered small decreases but was still above 800.

In spite of the previous explored, it is necessary to consider that some capitals had the lowest IFGF values. Overall, the lowest median IFGF value was 0.621 in 2017, still within the standards classified as good management (IFGF between 0.6 and 0.8).

However, regarding the minimum values of each period, there are six municipalities that presented indexes below 0.4 in at least one of the analyzed periods. Thus, the methodology of the index classifies it as critical management. The cities with indexes below this threshold were Florianópolis (IFGF 2016 = 0.369), Campo Grande ($IFGF_{2016} = 0.334$), São Luís ($IFGF_{2018} = 0.358$), Natal ($IFGF_{2015} = 0.329$), Macapá, AP ($IFGF_{2015} = 0.307$) and Rio de Janeiro ($IFGF_{2019} = 0.350$ and $IFGF_{2020/2021} = 0.304$). These indexes suggest that the cities presented difficulties in terms of autonomy in their financial sustainability.

It is worth noting that some capital cities with lower IFGF have addressed their fiscal management and restored their indexes. The city of Florianópolis increased its score from 2017, improving its rating from critical management to difficult management ($IFGF_{2017} = 0.537$ and $IFGF_{2018} = 0.594$). In the following years, from 2019 to 2021, the city ranked as good management by obtaining values above 0.726. Similarly, São Luís improved its index by presenting values between 0.559 and 0.793 between 2019 and 2021. It is important to mention that São Luís presented IFGF values between 0.4 and 0.6 (difficult management) and 0.6 and 0.8 (good management) from 2013 to 2017. Another city that recovered was Natal, obtaining values close to 0.5 in the last analysis periods.

Considering the analyzed time span, in recent years, cities like Rio de Janeiro and Macapá maintained low IFGF values, suggesting that they had difficulties in terms of autonomy in their financial sustainability.

Table 1 also illustrates the descriptive statistics for the number of Individual Microentrepreneurs (MEIs). The time series analyzed suggests the number of microentrepreneurs increased over time. This is visible through the median values of 17,571 in 2013, which, after some increments, rose to 62,624 in 2021. Such a peculiar fact suggests that, increasingly, new micro-enterprises are created, especially in periods with political and economic turmoil, such as the years of 2020 and 2021. When analyzing the sample set, the median represents an average estimate of 36,093 MEIs per Brazilian capital.

It is perceivable that, from the standpoint of percentage variation, there was a 25% increase in the number of microentrepreneurs between the years of 2013 and 2014. This number slightly dropped in the year of 2015, and the increase was of 22%. However, in 2016, there was another drop, only growing 9%. A decrease is visible in 2018, with the number of MEIs decreasing by 6%. The percentage stabilized in the last three years, from 2019 to 2021, with varying increases between 19% and 20% per year.

When analyzing the capital cities individually throughout the analyzed period, the city of São Paulo obtained the highest number of MEIs, reaching the figure of 1,056,738 individual microentrepreneurs in 2021. The capital city with the lowest number was Boa Vista, which reached

a total of 6,252 MEIs in 2013. In general, in most of the years of the analyzed time span the number of MEIs in the cities increased, although it varied in some years.

When observing the median values, an increase in the Gross Domestic Product (GDP) per capita was found during the period between the years 2013 and 2020. In 2013, the median GDP was R$24,124.00 and it increased thereafter to R$32,453.00 in 2020. A point to highlight is that in 2021 a slight decrease of 4% in GDP was evident among the analyzed capitals. Throughout the evaluated time series, the city with the highest GDP per capita was Vitória, which reached this value in 2013 (GDP = R$83,886.70). In the following years, Vitória's GDP per capita remained between R$60,000 and R$70,000. Still in 2013, the city with the lowest GDP rate was Maceió, with a GDP amount of R$15,510.67.

Regarding the population indicator, the capital city with the lowest population number is João Pessoa (826), according to the 2010 Census, while Manaus (21,331,763) has the highest population number. In 2010, the capital city with the lowest population density (hab/km²) was Porto Velho (13), and the highest density belonged to Fortaleza (7,786). The 2010 Municipal Human Development Index (MHDI) indicated Maceió (0.721) as the capital city with the highest index, while Florianópolis was indicated as the capital with the lowest (0.847).

Table 1 also shows the statistical measures of skewness and kurtosis. It is worth noting that these values were presented as analytical measures for the variation in data. They may statistically indicate inconsistency in the sample when the variability is high. However, all values are in the expected range, i.e., with low variation, according to Hair Junior et al. (2009).

Complementary to what is shown in Table 1, the performance of the cities was evaluated in terms of IFGF, MEIs, and GDP per capita over time. The median value of the variables in the period was estimated to establish parameters for comparison. Graph 1 presents the median value of the IFGF within the years of 2013 to 2021 for all the cities analyzed.

GRAPH 1
Brazilian capital cities with the highest median IFGF index between 2013 and 2021
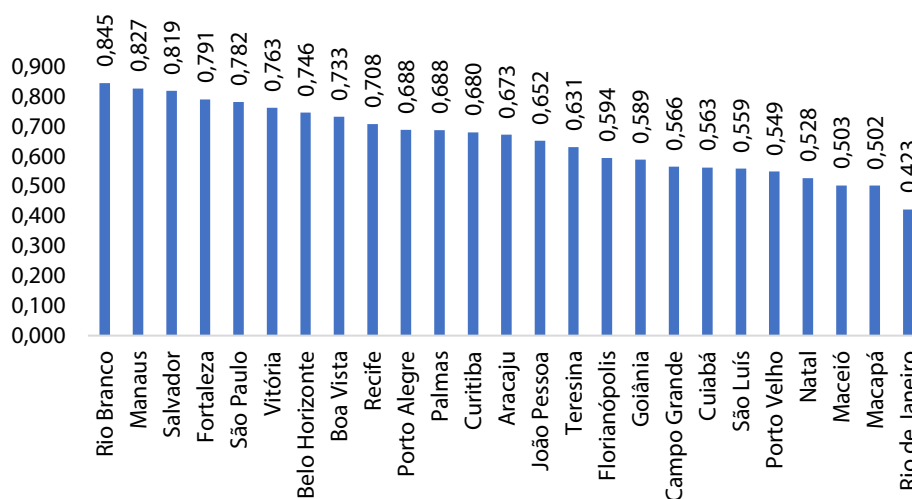
Source: Research data.

Graph 1 shows the cities with the highest fiscal management index, ordered by the highest median indicator from the year of 2013 to 2021. Rio Branco, Manaus, and Salvador demonstrated excellence in tax management, with IFGFs between 0.800 and 1.00 during the analyzed time span. These municipalities are located in the North and Northeast Regions of Brazil, and some strategies aimed at economic advancement have been created to present such indicators.

Concerning Rio Branco, in Acre, the actions were aimed at increasing tax collection capacity. Due to the increased tax collection, cities can invest in the improvement of the public services they provide (CARNEIRO et al., 2020).

According to data released by Manaus's City Hall, some actions adopted by public management contributed to the punctuality in server payment, financial balance, and expansion of investment capacity through financial institutions (PREFEITURA DE MANAUS, 2019).

Salvador, the capital city of the state of Bahia, presented high indicators, especially in the last years. According to Sefaz[3] (2021), the creation of effective strategies was aimed at the financial planning of revenues and expenses, considered as public management oriented to fiscal responsibility. Thus, in Salvador, the creation of strategies was organized according to the following: availability of resources, priority areas, and control of personnel expenses, besides the formalization of economic activities.

The results of the IFGF indicator highlight the importance of good fiscal management for improving the public accounts and economic structure of the municipalities. Therefore, the indicator is relevant to analyze the strategies adopted by the cities which have had an impact that increased the index. Consequently, such impact can also be observed in the efficiency of public fiscal management. Thus, the efficient model of the cities can be reproduced in other capitals.

However, Firjan (2021b) has highlighted that generating revenues for municipalities has become the main obstacle to improve spendings on public expenditure in Brazil. An analysis of the 2015 indicator showed that more than 5,000 cities had indicators below 0.390 in the last release of the index. In part, this was publicized by the entity as an emergency measure to meet health and economic needs during the COVID-19 pandemic.

In line with Nogami and Machado (2011), the evidence found confirms that the characteristics of cities, regions, or countries may be associated with the index's higher development potential. In fact, this occurred when analyzing the cities in North and Northeast Regions of the country.

Efficient fiscal management can also be associated with higher job creation, considering that the indicator also focuses on investments and competitiveness (FIRJAN, 2021a). Graph s 2 and 3 illustrate the median value of the number of MEIs and GDP per capita within the years of 2013 to 2021 of the cities analyzed.
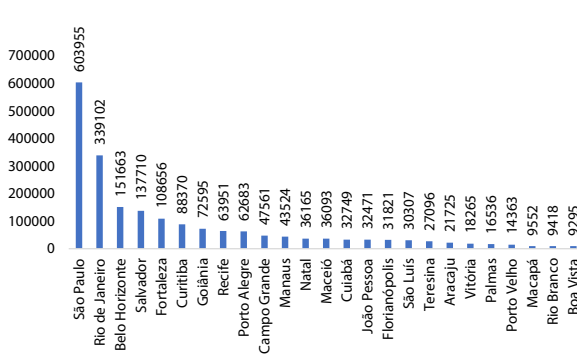
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[3] SEFAZ (Secretaria Municipal da Fazenda of the states of the federation) is a public entity linked to the Ministry of Finance that manages the finances of each state.
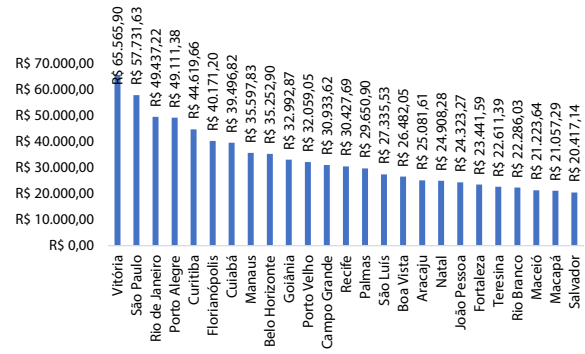
Brazilian capital cities with the highest median index of MEIs and GDP per capita between 2013 and 2021

Median of the number of MEIs between 2013 and 2021

Median of the GDP per capita between 2013 and 2021

Source: Research data.

Regarding the number of individual microentrepreneurs (MEIs) registered in the period, it is possible to verify, through the median values presented in Graph 2, that the cities of São Paulo and Rio de Janeiro were the most prominent in terms of the number of microentrepreneurs throughout the period. Capitals such as Belo Horizonte and Salvador also presented relevant numbers of MEIs - the latter was one of the cities with an index of excellence in fiscal management, as shown in Graph 1. On the other hand, Macapá, Rio Branco, and Boa Vista had the lowest numbers among the capitals. That said, the presence of many individual microentrepreneurs suggests gains in the economy of the municipality since they are associated with higher local development, creating more jobs.

Graph 3 presents GDP per capita, in the median comparison from the year of 2013 to 2021. Such index points to a remarkable figure for Vitória, which presented the highest GDP per capita among all the capitals analyzed. The results for São Paulo and Rio de Janeiro were similar in terms of values. The municipality with the lowest GDP per capita was Salvador, a prominent city regarding the number of MEIs and IFGF.

Econometric analysis of the spatial panel analysis

Four econometric models were tested to analyze the long-term relation between entrepreneurship rates and economic growth in the capital cities investigated. The aim was to find the best explanation for the effect of the long-term relation on each capital, meeting the analysis parameters suggested in the econometric literature. The tests were estimated in the Gretl software.

To verify the degree of association between the variables, the statistical test of correlation was estimated, whose purpose is to verify the effect of the relation between them.

FIGURE 1

Long-term correlation matrix between the representative variables of economic growth and entrepreneurship
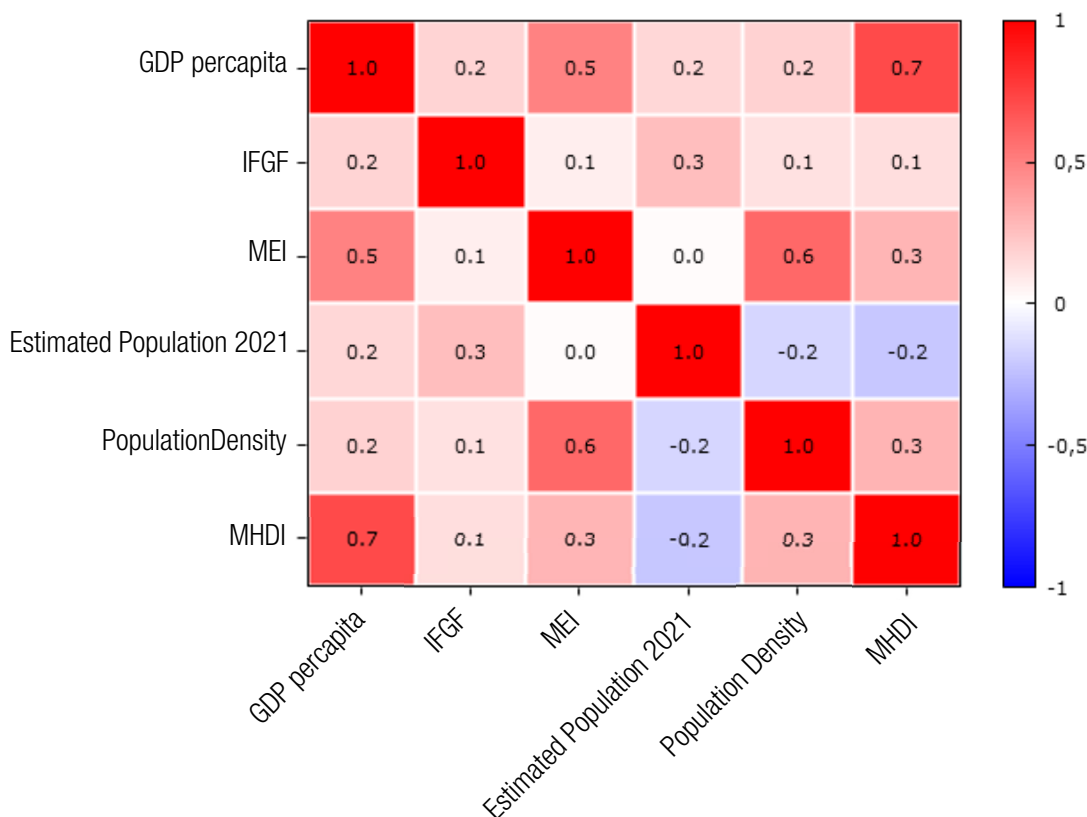
Source: Research data.

The results of the correlation matrix, presented in Figure 1, indicate significant correspondence, which ranges from weak to moderate, among the variables. This occurs between the coefficients of the number of individual microentrepreneurs and GDP per capita ($\beta = 0,5$), population density and the number of MEIs ($\beta = 0,5$), as well as between the MHDI and GDP per capita ($\beta = 0.7$). Such positive relation suggests that changes in each unit in these variables also increases the other. Thus, the higher the number of individual microentrepreneurs, the higher the GDP per capita will be, i.e. it tends to increase with each new microentrepreneur. The same situation also occurs with population density, suggesting that the higher the presence of individuals in urban territorial areas, the higher the number of microentrepreneurs. Similarly, the Municipal Human Development Index (MHDI) has also increased the GDP of the analyzed capitals.

To analyze the relationship between long-term variables representing entrepreneurial activities and economic growth in the capital cities, the Panel Data Analysis Model was estimated using 225 observations throughout nine years, combining time-series and cross-section data from the capital cities, also termed pooled data.

Table 2 presents the results for the estimation of the random effects panel. This is the best model chosen to explain the relation between the dependent variable, that is the GDP per capita, and the independent variables which are: the IFGF, MEI, population census, population density, and the municipal HDI.

TABLE 2

Estimation of the Random-effects Panel Data Analysis Model with the Generalized Least Squares (GLS) method using 225 observations

	Coefficient	Standard error	z	p-value	
const	-180584	33194,5	-5,440	< 0,0001	***
IFGF	1294,21	2075,29	0,6236	0,5329	
MEI	0,0179234	0,00322346	5,560	< 0,0001	***
Population	7,04535e-05	3,43356e-05	2,052	0,0402	**
Population Density	-0,165629	0,567151	-0,2920	0,7703	
MHDI	271968	43116,6	6,308	< 0,0001	***
Mean dependent Var	33131,32	S.D. dependent var		12337,76	
Sum square resid	1,05e+10	S.E. of regression		6907,759	
Log-likelihood	-2305,823	Akaike Criteria		4623,646	
Schwarz Criteria	4644,143	Hannan-Quinn Criteria		4631,919	

Joint test on named regressors – asymptotic test: Chi-square(5) = 80,8183, with p-value = 5,65748e-016
Breusch-Pagan test – asymptotic test: Chi-square(1) = 549,837, with p-value = 1,36567e-121
Hausman test – asymptotic test: Chi-square(2) = 1,14044, com p-valor = 0,5654
Dependent variable: GDP per capita
***Statistically significant at 99% confidence level.
**Statistically significant at 95% confidence level.
Source: Research data.

As Table 2 presents, the statistical estimation was significant and showed that, through the period of nine years, the number of MEIs has positively influenced economic growth. Thus, each new microentrepreneur increases the GDP per capita by R$0.018 in Brazilian capital cities. The impact was also significant for the population and municipal development index (MHDI), as both positively influence and increase the economic development of the capital cities analyzed.

The estimation of the model satisfied the confirmation assumptions of the econometric model, which suggests that this result reflects reality throughout the time series. Thus, the Hausman Test confirmed that the random effects panel model is the most appropriate. The model was confirmed to be free of multicollinearity, heteroscedasticity, and autocorrelation. The Wald Test evaluated heteroscedasticity and, as recommended by Gujarati and Porter (2011), the Durbin-Watson test measured autocorrelation.

Equation 1. represents the influence of entrepreneurship and socio-demographic variables on economic growth.

<div align="center">**EQUATION 1**</div>

Panel Data Analysis Equation Model for the significant variables

$$\text{GDP per capita}_{\text{2013 a 2021}} = -1{,}81e + 05_{\text{(constant)}} + 0{,}0179^*{}_{\text{MEI}} + 7{,}05e\text{-}05^*{}_{\text{Population}} + 2{,}72e + 05_{\text{MHDI}} + {}_{e}$$

Source: Research data.

Based on Equation 1, it is possible to observe the impact on Brazilian capital cities collectively over the nine years analyzed. Above all, such impact occurs differently for each city, since each one presents its own indicators in relation to the variables.

In a more detailed way, the calculation based on Equation 1 was performed for each capital individually over the time series. Thus, the impact of entrepreneurial activities, represented by the number of MEIs on economic development, which is characterized by GDP per capita, was evaluated. In addition, the overall impact of the equation and its variables on cities was assessed. Therefore, this analysis demonstrates the cities with the highest percentage of impact of entrepreneurial activities on GDP. This analysis also displays the impact of the overall equation model on GDP. Following, the results are presented in Table 3.

<div align="center">**TABLE 3**</div>

Estimation of the result of the equation of the Panel Data Analysis Model with the value of the impact of MEIs on GDP and the general model by capital in the period from 2013 to 2021

Capitals	Impact of the MEI on the GDP (0,0179*MEI) 2013 toa 2021*	% Impact of the MEI on the GDP 2013-2021*	GDP per capita 2013-2021*	Impact of the GDP in the general model 2013-2021*
São Paulo	R$ 10.810,79	32%	R$ 59.954,53	R$ 9.670,08
Rio de Janeiro	R$ 6.863,25	24%	R$ 47.224,98	R$ 6.036,90
Salvador	R$ 2.465,01	21%	R$ 19.519,09	R$ 1.844,79
Fortaleza	R$ 1.944,94	14%	R$ 23.753,68	R$ 671,45
Belo Horizonte	R$ 2.714,77	12%	R$ 39.590,46	R$ 1.542,89
Curitiba	R$ 1.581,82	7%	R$ 43.124,37	R$ 927,18
Goiânia	R$ 1.299,45	7%	R$ 33.289,59	R$ 1.015,48
Recife	R$ 1.144,72	7%	R$ 29.025,41	-R$ 12,15
Maceió	R$ 646,06	5%	R$ 21.972,32	R$ 345,56
Natal	R$ 647,35	4%	R$ 24.231,35	-R$ 143,99
Campo Grande	R$ 851,34	4%	R$ 32.992,96	R$ 841,66
João Pessoa	R$ 581,23	4%	R$ 25.219,21	R$ 13,88
Porto Alegre	R$ 1.122,03	4%	R$ 48.897,39	R$ 661,52

Capitals	Impact of the MEI on the GDP (0,0179*MEI) 2013 toa 2021*	% Impact of the MEI on the GDP 2013-2021*	GDP per capita 2013-2021*	Impact of the GDP in the general model 2013-2021*
Manaus	R$ 779,08	4%	R$ 42.577,30	R$ 2.256,73
Teresina	R$ 485,02	3%	R$ 24.558,22	R$ 394,06
Aracaju	R$ 388,88	3%	R$ 23.759,75	-R$ 127,73
São Luís	R$ 542,50	3%	R$ 30.168,27	R$ 348,56
Florianópolis	R$ 569,60	3%	R$ 40.907,03	R$ 469,71
Cuiabá	R$ 586,21	2%	R$ 44.277,91	R$ 564,43
Palmas	R$ 295,99	2%	R$ 31.212,01	R$ 281,12
Macapá	R$ 170,98	1%	R$ 22.961,91	R$ 164,35
Porto Velho	R$ 257,10	1%	R$ 37.176,31	R$ 258,88
Boa Vista	R$ 166,38	1%	R$ 29.030,46	R$ 161,16
Rio Branco	R$ 168,58	1%	R$ 23.533,39	R$ 165,23
Vitória	R$ 326,94	1%	R$ 68.289,32	-R$ 224,61

*Calculated using the median of the equation's estimation result from 2013 to 2021.
Source: Research data.

Table 3 details, by city, the value of the impact of each new individual microentrepreneur on GDP per capita. In general, it is possible to analyze that, in the period, there was a significant influence of entrepreneurship rates on economic growth during the evaluation of this indicator isolatedly (impact of MEI on GDP: 0.0179*MEI).

Especially cities like São Paulo, Rio de Janeiro, Salvador, Fortaleza, and Belo Horizonte showed the impact of individual microentrepreneurs in more than 10% of the GDP per capita. Such finding evidences the high relevance of this segment of entrepreneurs for the city's economic development.

In the capital city of São Paulo, the result of the calculation of the regression equation was the highest, which demonstrates the importance of entrepreneurs for the development of the city. It is possible to statistically prove that, from 2013 to 2021, the increase in MEIs generated a GDP growth of R$10,810.79. This means that MEIs alone would account for 32% of the total GDP per capita during the period. On the other hand, for a GDP per capita of R$59,954.53, the MEIs represent more than R$10,000 of this amount. This indicator suggests to municipal managers the creation of strategies that stimulate the implementation of means to continue and increase the development of this important part of the economic segment: the individual microentrepreneurs. Among all the variables, more emphasis is given to MEIs. When the overall model is evaluated, the impact is still high and it considers the population and the MHDI, in addition to MEI.

Similar to São Paulo, MEIs were also prominent in Rio de Janeiro and Salvador. Their impact was statistically significant over the time series, and their quantity increased the GDP by 24%, in Rio de Janeiro, and 21%, in Salvador. Concerning Rio de Janeiro, out of each R$19,519.09 of GDP per capita, the impact of the MEIs represented R$2,465.01. In Fortaleza, out of the R$23,753.68 of the GDP per capita throughout the period, R$1,944.94 corresponds to MEIs.

Although the impact of microentrepreneurs was significant for economic growth, in the other analyzed capital cities the result of the estimation of the equation model showed that the impact reduces economic growth. In other words, when analyzing all variables together in capitals such as Recife, Natal, Aracaju and Vitória, it is possible to verify that the population density contributes to the reduction of the GDP.

Another point to analyze is that the impact of the fiscal management index (IFGF) variable on economic growth was not statistically significant. Although cities like Rio de Janeiro have shown reduced levels of fiscal management, it has not impacted on the performance of the number of microentrepreneurs in economic growth.

In general, the present study validates the growth in absolute numbers of data related to entrepreneurship concerning the number of MEIs and the IFGF. Moreover, it also validates the characteristic variables of the MDHI and the number of the population in the Brazilian capitals in the selected period of time.

This research corroborates Silva and Silva's (2019) study, which evaluated the relationship between entrepreneurship rates and economic growth from 2002 to 2016. The authors also found the same result when they indicated the need for the creation of public strategies aimed at promoting entrepreneurship.

FINAL REMARKS

The objective of this paper was to analyze the long-term relation between entrepreneurship and economic growth of capital cities in Brazil between the years of 2013 and 2021. Based on the analyzed time series, the regression model for panel data was estimated for 25 Brazilian cities annually.

The descriptive analysis made it possible to notice that the Firjan Fiscal Management Index (IFGF) of the cities is above 0.6. Such finding indicates the existence of good fiscal management with values within the acceptable limit between the first releases of the index (2013 and 2014). Subsequently, between 2015 and 2018, the IFGF decreased and remained below expectations, but was still rated as good management. In recent years, Brazilian capital cities have presented a more optimistic scenario, considering that the IFGF has surpassed previous values.

Based on the study, it was possible to observe that Salvador had the highest index among Brazilian capitals, maintaining values of excellent management, especially in the last three analyzed years. Manaus was also an outstanding city in terms of fiscal management in the analyzed period, as was Rio Branco.

The aforementioned results may be associated with the creation of some strategies so these capitals could have economic advances, such as a higher tax collection capacity, investments, punctuality in the payment of public servants, financial balance, expansion of the investment capacity, and creation of effective strategies for the financial planning of revenues and expenses.

It is worth noting that some capitals that with lower ranks in the IFGF have developed strategies for their fiscal management and improved their indexes. Some examples of these capitals are Florianópolis, São Luís, and Natal. However, other cities, such as Rio de Janeiro and Macapá, have maintained low IFGF values in recent years which, in fact, suggests that they have encountered difficulties in terms of their financial sustainability autonomy.

Regarding the number of individual microentrepreneurs (MEIs), São Paulo and Rio de Janeiro were the most prominent throughout the analyzed period. Capital cities like Belo Horizonte and Salvador also presented relevant figures in terms of the amount of MEIs. The presence of many individual microentrepreneurs suggests gains in the municipality's economy, since they are associated with greater local development for creating jobs.

As for the inferential analysis of the econometric model, it was possible to prove the significant influence of the entrepreneurship rates on the economic growth of the observed capital cities. Over the nine-year time series, the economic growth has been positively influenced by the number of MEIs. That is, each new micro entrepreneur in Brazilian capitals increases the GDP per capita by R$0.018. The impact was also significant for the population and the municipal human development index (MHDI). In this sense, it was possible to observe that both the population and the MHDI positively influence and increase the economic development of the analyzed capital cities.

Moreover, especially cities like São Paulo, Rio de Janeiro, Salvador, Fortaleza, and Belo Horizonte had individual microentrepreneurs impacting on more than 10% of the value of the GDP per capita. The finding stresses the high relevance of this segment for the economic development of the city.

Therefore, the findings which resulted from the present study emphasize the importance of promoting individual microentrepreneurs to the extent of recognizing their role for the economy of cities. Thus, managers can develop incentive policies for the fostering and development of entrepreneurs.

This article also contributes to present economic indicators in the analyzed capital cities, by trying to identify and explain the effect of the relation between entrepreneurial activities and economic growth in these places. This study also presents evidence that can demonstrate the advance or decline in the development of capital cities. Thus, the research presents the individual impact of the relation per city, which makes the results more robust and of practical applicability. Besides, with the information about the impact in each city, public managers can evaluate actions and strategies that can be taken to improve or maintain their indicators.

Regarding limitations, this research makes a general analysis of the Brazilian capitals, therefore, its results emphasized the most relevant cities in the country. Another limiting factor was the lack of complete information on other public indicators, which should be made available by web portals and which could have contributed to the research.

As a suggestion for future studies, analyses could be carried out by regions in one or more states of the country. This would be a way to verify if there are peculiarities between how entrepreneurship and economic growth take place per region. In addition, this type of analysis would allow the verification of whether the effect of stimulating entrepreneurship in the regions may change, depending on the location being analyzed and the economic scenario.

ACKNOWLEDGMENTS

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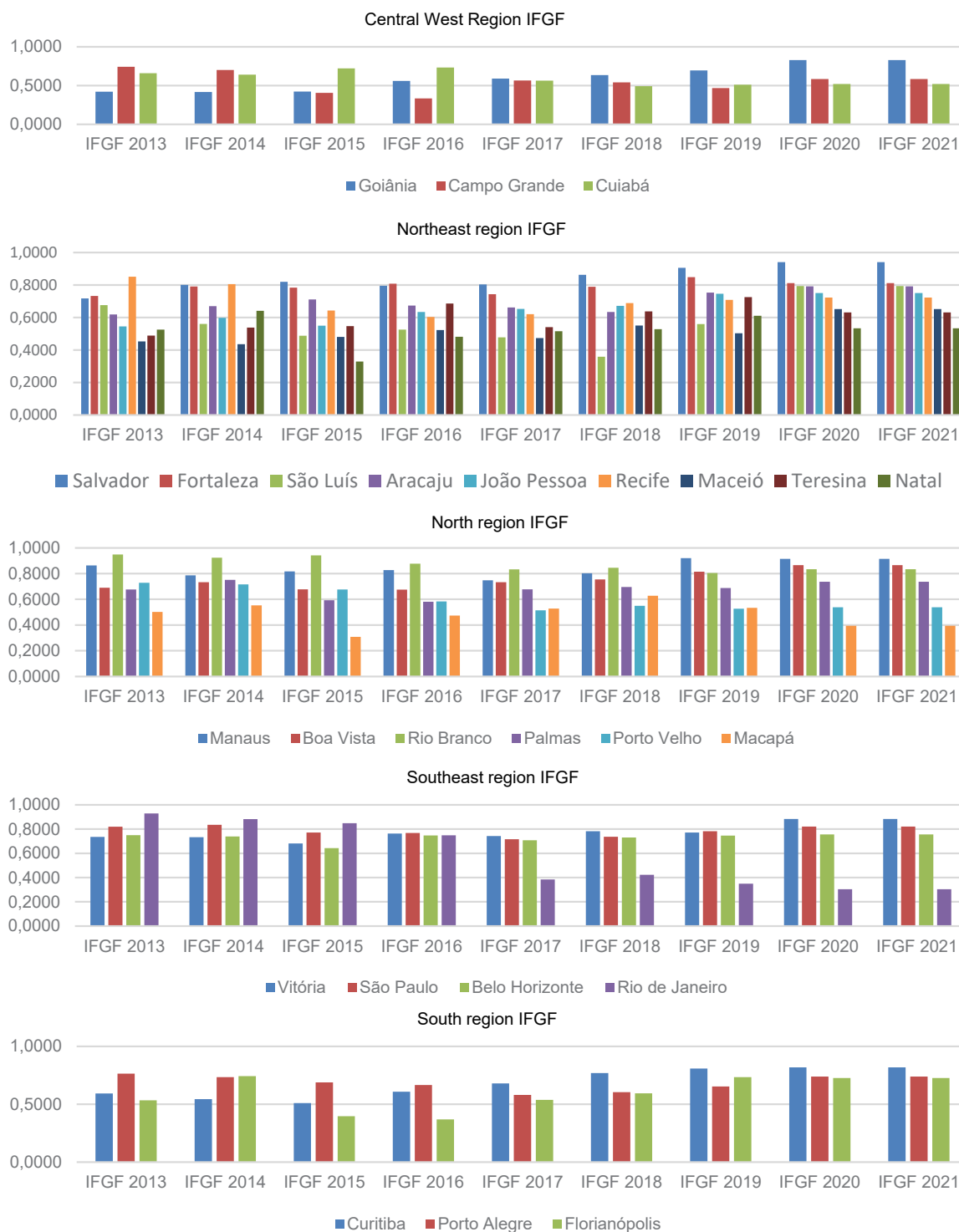
Silvana Anita Walter: Project administration (Supporting); Validation (Lead); Visualization (Lead); Writing - original draft (Supporting).

GRAPH 4

Comparison between the IFGF of Brazilian capitals, by region from 2013 to 2021

Central West Region IFGF

Legend: Goiânia, Campo Grande, Cuiabá

Northeast region IFGF

Legend: Salvador, Fortaleza, São Luís, Aracaju, João Pessoa, Recife, Maceió, Teresina, Natal

North region IFGF

Legend: Manaus, Boa Vista, Rio Branco, Palmas, Porto Velho, Macapá

Southeast region IFGF

Legend: Vitória, São Paulo, Belo Horizonte, Rio de Janeiro

South region IFGF

Legend: Curitiba, Porto Alegre, Florianópolis

Source: Elaborated by the authors.