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Efficiency and profitability of development finance agencies

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Development Finance Agencies (DFAs) carry out public investments and development policies. In Brazil, their main objective is to promote welfare, contribute to the states' social and economic development, guarantee sustainability, and reduce regional and social inequalities. This descriptive research adopted a quantitative approach and aimed to analyze the efficiency and profitability levels of DFAs in Brazilian states. Standard indicators were used to analyze these agencies' efficiency and profitability and median tests were conducted to verify whether the size of the agency influences the performance of the observed indicators. The sample consisted of 14 DFAs, in the period from 2012 to 2018. The results showed that larger DFAs tend to show an excellent efficiency level, while agencies with less infrastructure demonstrated regular and unsatisfactory efficiency. Also, DFAs with more significant total assets were more likely to present regular or unsatisfactory profitability. Finally, efficiency ratio (ER) and average return on credit operations (RCO) were identified as adequate indicators to analyze the DFAs' performance.
Keywords: development agencies; efficiency; profitability; development finance institutions.

Eficiência e rentabilidade das agências financeiras de fomento

As agências financeiras de fomento (AFFs) configuram mecanismos de realização de políticas públicas de investimento e desenvolvimento, cujo objetivo maior é a propagação do bem-estar social, contribuindo para o desenvolvimento social e econômico dos estados, a fim de garantir sua sustentabilidade e reduzir as desigualdades regionais e sociais. Diante desse contexto, o objetivo do presente estudo é analisar o nível de eficiência e rentabilidade das AFFs brasileiras. O exame se caracteriza como pesquisa descritiva, com abordagem quantitativa. Empregou-se a análise de índices-padrão para analisar a eficiência e a rentabilidade dessas agências, bem como testes de medianas para verificar se o tamanho da agência influencia nesses indicadores de desempenho. A amostra foi composta por 14 AFFs, no período de 2012 a 2018. Os resultados apontaram que as AFFs de maior porte tendem a obter nível excelente de eficiência, enquanto agências com menor infraestrutura se encontraram classificadas nos níveis regular e insatisfatório. Por outro lado, as AFFs com maior ativo total têm maior probabilidade de obter nível regular ou insatisfatório em sua rentabilidade. Além disso, os índices de eficiência (IE) e o retorno médio das operações de crédito (RET) foram apontados como indicadores propícios à análise de desempenho das AFFs.
Palavras-chave: agências de fomento; eficiência; rentabilidade; instituições financeiras de desenvolvimento.

Eficiencia y rentabilidad de las agencias financieras de desarrollo

Las agencias financieras de desarrollo (AFF, por sus siglas en portugués) establecieron mecanismos para llevar a cabo políticas públicas de inversión y desarrollo, cuyo objetivo principal es la propagación del bienestar social, contribuyendo al desarrollo social y económico de los estados, con el fin de garantizar su sostenibilidad y reducir las desigualdades regionales y sociales. Dado este contexto, el objetivo del presente estudio fue analizar el nivel de eficiencia y rentabilidad de las AFF brasileñas. El estudio se caracteriza como una investigación descriptiva con enfoque cuantitativo. El análisis de los índices estándar se utilizó para analizar la eficiencia y la rentabilidad de estas agencias, así como las pruebas de medianas para verificar si el tamaño de la agencia influye en estos indicadores de desempeño. La muestra consistió en 14 AFF, en el período de 2012 a 2018. Los resultados mostraron que las AFF de mayor porte tienden a obtener un excelente nivel de eficiencia, mientras que las agencias con menos infraestructura se clasificaron como regulares e insatisfactorias; y que las AFF con mayores activos totales tienen más probabilidades de alcanzar un nivel de rentabilidad regular o insatisfactorio. Además, los índices de eficiencia (IE) y la rentabilidad media de las operaciones crediticias se identificaron como indicadores favorables para el análisis del desempeño de las AFF.
Palabras clave: agencias de desarrollo; eficiencia; rentabilidad; instituciones financieras de desarrollo.

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1. INTRODUCTION

The discussion on social welfare includes major controversies regarding the social contribution resulting from state interventions in the financial market (Martins, Bortuluzzo & Lazzarini, 2014). This occurs mainly through state-owned development finance institutions such as development banks and agencies. These organizations can operate in areas or segments that are of little interest to private companies.

Megginson (2005) states that state-owned companies tend to be less efficient than private companies. According to Bartel and Harrison (2000), public-sector enterprises (PSEs) are less efficient for two reasons. First, there are agency problems due to low level of monitoring associated with government control. The second reason is the external environment, traditionally marked by a state monopoly, and the fact that the state may bail out the PSE in case of insolvency – therefore, these firms tend to present soft budget constraints.

Studies indicate that in times of economic difficulties, state-owned banks may exercise an anti-cyclical function, i.e., reducing lending in a period of economic growth and expanding in times of recession (Fuchsloch, 2018; Micco & Panizza, 2006). An explanation for such behavior is that these financial institutions' goals are not limited to profit. They also have a social purpose, different from private institutions that operate the other way around, in a pro-cyclical movement – lending in periods of economic growth and reducing credit in times of recession (Oliveira, 2006).

State-owned financial institutions focused on welfare include development finance institutions (DFIs), which can be development finance agencies (DFAs) (sub-national government's development agencies) and development banks (DBs). According to the financial market's normative bodies, these two types of institutions have the same goal, "to provide opportune and adequate funding supply to allow, in the medium and long term, programs and projects to promote economic development and social security of its respective state" (Resolução Bacen, 2019, our translation). The central difference lies in the origin of the funds raised. Unlike development banks, DFAs cannot accept resources from third parties. They can only operate with their own resources, use funds earmarked for specific programs, or funds received from the government. In Brazil, DFAs are unique in each state, and the corporate purpose of each one is to finance fixed and working capital associated with projects related to the state where it has its headquarters (Resolução Bacen nº. 2828, 2001).

According to Fuchsloch (2018, p.44), DFAs and DBs have faced great pressure to maintain financial sustainability. They do not have public, fiscal or parafiscal funding, they cannot seek deposits in the market, and at the same time they are submitted to the regulatory requirements of the Basel Accords and treated in the same way as the other institutions of the national financial system. According to the author, they are institutions operating in sectors where private companies are not willing to work. Therefore, they are usually operating in higher-risk sectors and, although

more exposed to risk, are submitted to pressure for high performance – which seems to be against the nature of state-owned banks.

According to Martins (2018), given the new macroeconomic context, it is necessary to analyze the operation of such agencies. Given a scenario of growing competition and constant interest rates, agencies must stand out and adopt the logic of complementarity. Considering the particularities of each Brazilian state, Martins (2018) reinforces that some agencies perform activities that are little explored and that private institutions are not interested in funding. The author offers examples of the development agencies of Paraná and São Paulo. The first focuses on financing municipalities of the state of Paraná, which represented approximately BRL 600 million or 96.2% of its lending operations in 2012. The second dedicates its operations to small and medium enterprises (SMEs). In the same year, 92% of its lending operations were directed to these companies.

Furthermore, the analysis of the projects developed by the DFAs is usually based on criteria that only assess the return on investment (ROI). The DFAs' global efficiency is not considered in the analyses, nor is their sustainability based on the management of financial resources, even though their sustainability is essential when considering their goals of promoting social welfare and fostering the economy.

Against this backdrop, this article carries out analyses to answer the following question: what are the efficiency and profitability levels of development finance agencies operating in Brazilian states?

The relevance of studying financial institutions, such as those directly related to development, is that despite several other sources of credit – such as government bonds, debentures, friends and family – they are still the primary source used by individuals and legal entities (Jacob, 2003). In other words, they are predominantly responsible for financial intermediation between savers and borrowers, facilitating access to credit and boosting the economy. As contributions, this study disseminates information to Brazilian agencies and collaborates with the literature since DFAs are organizations still little researched.

Regarding the market, analyzing the DFAs' efficiency and profitability offers essential data to evaluate their performance while giving an idea of the Brazilian development sector's status quo. Finally, for society in general, as public-sector financial institutions have social functions and their goal encompasses profit and welfare, this study helps to assess whether such institutions are fulfilling their roles, allowing citizens to check whether the DFA in their state has appropriately managed resources and invested in development.

This article is organized into five sections including this introduction that presented and contextualized the DFAs and exposed the study objectives, justification, and contribution. The second section presents the literature review on the DFAs and their characteristics, the theoretical and empirical discussions on performance and metrics to assess these agencies. The third section demonstrates the methodological procedures used, while the fourth presents the analysis of the results. The last section contains the final considerations.

2. LITERATURE REVIEW

2.1 Development agencies and their particularities

In the 1990s, macroeconomic changes caused restructuring in the Brazilian credit sector. According to Martins et al. (2014), as there were no systems to manage credit risks, in 1995, the changes culminated in a sharp rise in default rates and generated financial problems in large banks, making it necessary for the Central Bank of Brazil (Bacen) to intervene. This intervention resulted, among the measures, in the creation of the Program to Encourage Restructuring and Strengthening the Financial System (PROER) in the same year ([Proer] Braga, 1998).

PROER implemented incentives to incorporate insolvent banks by other institutions and led the country to adhere to the Basel Accords, aiming to guarantee a robust financial system. The Brazilian government created, through a provisional measure, the Program of Incentive Reduction of the State Participation in Banking Activity (Proes), which provided that "financial institutions controlled by state governments would be extinguished, privatized, or transformed into finance institutions dedicated to the financing of fixed capital and working capital associated with projects in the country, designated as *Agências de Fomento* (development agencies)" (Resolução Bacen, 2019, our translation). In this article, these agencies are called development finance agencies (DFAs).

Fuchsloch (2018) points out that development finance institutions (DFIs) are instruments for the implementation of public policies and include, in addition to DFAs, development banks (DBs), and non-financial agencies for development support (NFAs). In general, these institutions pursue more than profit – the primary objective of any company – and also aim to contribute to social welfare, serve riskier consumers, and help developing regions far from commercial centers, for example (Shapiro & Willig, 1990).

DFAs, following Bacen Resolution 2828/2001, must be legally created as a business corporation, with the purpose of financing fixed and working capital associated with projects in their state of origin. Projects, in this sense, are initiatives to expand or preserve the capacity to produce goods and services designed in economic and social development programs within the state (Resolução nº 3757, Bacen, 2009). Also, DFAs are considered auxiliary bodies related to the Brazilian National Rural Credit System (NRCS) and are expected to respond to demands made to the group of Brazilain DFIs.

Box 1 summarizes the particularities of the DFAs from their constitution to the list of activities they carry out. In addition, it presents prohibitions, limits, and legislation pertinent to the operations of these agencies, showing that they, like most public entities, are subject to numerous regulations.

BOX 1 PARTICULARITIES OF THE DEVELOPMENT FINANCIAL AGENCIES (DFAS)

Constitution/Creation	Resource origins	Operation and activities	DFAs are not permitted	Limits	Related legislation
Business corporation (not publicly traded).	Own sources.	Funding fixed capital and working capital associated with projects; lending; rural credit operations; financial leasing operations; application in microfinance operations.	Access to Bacen's financial assistance and rediscount lines.	Minimum paid-in capital and reference equity (RE) of BRL 4 million.	Bacen Resolution 2828/2001.
States and the federal district can establish only one agency each.	Official funds and programs.	Offering guarantees in operations related to its corporate purpose; providing consultancy and financial agent services; managing development funds.	Access to bank "reserves" account at Bacen.	Liquidity fund equivalent, at least, to 10% of the value of its obligations, to be fully invested in federal public securities.	Law 6404/1976 (Law on business corporations – *Sociedades Anônimas*).
It is controlled by the state (or federal district) where it is constituted.	Federal, state, and municipal budgets.	Buying equity of non-financial business corporations; payment of shares of funds with participation of the union.	Raise funds from the general public (including international), except from national and international development agencies.		Law 4595/1964 (general norms for financial institutions).
The terms "*agência de fomento*" (development agency) must be part of the institution's name.	National and international development financial institutions and agencies.	Investing cash and cash equivalents in federal public securities, or in quotas of investment funds whose portfolios are represented exclusively by federal public securities, provided that this is stated in the funds' regulations.	Contracting interbank deposits, as depositor or depository, except for microfinance operations.	Same operating conditions and limits applied to other financial institutions.	Complementary law 101/2000.
	Seeking interfinancial deposits related to microfinance operations.	Buying credit default Swap to protect its own positions; carry out specific exchange operations; acquiring credits from operations related to the corporate purpose.			Bacen Resolution 3339/2006.
					Bacen Resolution 3834/2010.
					Bacen Resolution 4023/2011.
					Law 13303/2016.
					Budget Guidelines Law.

Source: Elaborated by the authors based on Resolution 2828/2001 and Bacen (2019).

DFAs' operations, as shown in Box 1, take place through their own resources. However, in the case of passive operations, they can only use resources from (i) official funds and programs; (ii) federal, state, and municipal budgets; (iii) national and international development financial institutions and agencies; (iv) resources from interfinancial deposits related to microfinance operations (Bacen, 2019). Raising funds from the general public is prohibited. Thus, DFAs must adapt their operations to raise funds and efficiently manage their resources to be financially sustainable, meet goals and fulfill their social role.

Among the primary operations carried out by the DFAs covered in this study is financing the fixed capital and working capital of SMEs. Most agencies also engage in lending to specific segments, such as tourism, innovation, research and development projects, environmentally sustainable initiatives (especially in the area of renewable energies), rural credit for family farming, and credit for entrepreneurs and freelance professionals. Part of the DFAs follows their borrowers' activities to help implement the plans agreed and control the credit offered to individuals or companies.

A small portion of the DFAs offers specific lines of credit for franchises, credit unions, lottery stores, taxis, school transportation, radio stations, private schools, and young entrepreneurs. The development agencies of the states of Amazonas and Amapá stand out, offering credit to markets the state has difficulty serving. The Amazonas DFA offers, for example, credit to dentistry students so that they have the resources to acquire the necessary equipment to open a dentist office. The DFA in Amapá covers the following credits: for extractivists of local products, such as açaí berry and nuts, for the acquisition of vessels for the transportation of people, masters students in planning and public policy programs, aiming to make up for the lack of these professionals in the state market.

Finally, most of the DFAs have credit lines to finance the public sector, mainly infrastructure, sanitation, the environment, education, social and community facilities, and improving local administrations to meet their social-economic development goals.

2.2 Development finance agencies' performance

The Brazilian development finance agencies (DFAs), unlike development banks (DBs), have reduced equity, making their operating revenues low and, in some cases, insufficient to maintain the organizational structure. Because of the low volume of resources and consequent fewer returns, these agencies can support economic and social development only if strengthened by governments through measures that guarantee the availability of public funds to encourage productive activity (Assis, 2018).

The DFAs and DBs end up competing with private banks. However, it is unfair competition since these development institutions do not have a continuous relationship with their beneficiaries, such as the relationship private banks have with account holders. They also have a higher operating cost to perform registration and credit risk analysis of their customers (Fuchsloch, 2018). In addition, the amount of DFA credit operations is influenced by this competition, so that the lack of scale and competition for market shares damage the result. Finally, the tax obligations of development agencies are identical to those of any other type of financial institution, but the agencies are not allowed to charge

fees for services not related to credit operations (Martins, 2018), which increases their disadvantage in a competitive environment.

According to Souza (2018), private financial institutions use their profit to expand operations and increase assets, while development finance institutions use profits to invest in projects that seek social welfare. The development institutions practice lower interest rates and operate in riskier conditions, consequently obtaining less profit. Pereira (2018, p. 89), points out that one of the biggest problems for systematization is the diversity of scenarios within the same type of agent, as in the cases of development agencies, in which the disparities in size, organization, number of resources, and ways of acting are evident.

Given this comparative scenario, Matias and Fávero (2014) emphasize that the supply of credit intended for development is a multiplying factor regarding the economy as a whole, which means that the credit available is a proactive catalyst for economic development. Stultz (2001) emphasizes the structure of finance and highlights that the financial system provides facilities such as the transmission of resources over time and space, forms to handle uncertainty and control risks, price information for better allocation of investments, and ways of dealing with information asymmetry issues. These aspects of the financial structure are fundamental for financial development and economic growth (Stultz, 2001), and the DFAs have such characteristics.

For Andrade (2009), financial development is related to measures such as turnover in the stock market, the ratio between trade in the stock market and the gross domestic product (GDP), the capitalization of the stock market related to GDP, the proportion of funds raised outside the firm. King and Levine (1993) infer that the level of financial development is strongly associated with economic growth in terms of GDP per capita, accumulation of capital, and efficiency improvements in the allocation of physical capital. DFAs play a fundamental role in economic and social development in their regions since they are economic catalysts and act via organized groups such as cooperatives, membership organizations, production chains, local productive arrangements, business centers, local innovation systems (Leão, 2018). For Leão (2018), it is important to validate the agencies' role in organizing the demand to calibrate the supply of tailored credit in the local economy. Thus, they contribute to the emergence of the national system of development finance institutions (NSDFI).

For DFAs to fulfill their role of contributing to regional development, they must be efficient, both in operational and financial sustainability aspects. It is then possible to verify a special relationship between finance and economic and social development, which stresses the relevance of examining their financial attributes. Such analysis, among other benefits, allows financial intermediaries and investors to develop specialized knowledge, which increases the DFAs' usefulness to organizations and people served and their ability to monitor them.

Another aspect is the relationship between the system to support development and efficiency at the microeconomic level, generating systemic effects. According to Giambiagi and Além (2000), economic decision-making by companies and individuals is inseparable from life and influenced by what is happening or will happen in the macroeconomic environment. Thus, the challenge proposed to development agencies, from the point of view of economic development, is not to increase the sale

of financial products but to seek a macroeconomic gain capable of generating economic and social development.

For Martins (2018), the primary objective for which DFAs were created cannot be overlooked. The activity of fostering economic development needs a differentiated action from the state – such as providing long-term loans – since DFAs should not act as regular private banks. Therefore, the performance of each DFA must be analyzed to demonstrate which of them better performs its activities. The management strategies of the best agencies must be taken as a benchmark, seeking to achieve consistent development.

The performance of operational activities by DFAs is subject to a set of public administration rules, which make the management process highly bureaucratic and hinder the achievement of goals, as shown in Box 1. These agencies still follow the same regulations as private institutions, including the taxation of their operations. Therefore, it is essential to evaluate and highlight the status of DFAs performance to inform the responsible actors and society as a whole. Such assessment also contributes to improving DFAs monitoring and management. Leão (2018) states that the mission of these institutions is to be the catalyst of the economy, the market's stimulating agent.

From the academic perspective, the discussion regarding DFAs performance as a central object of analysis is still incipient. More studies investigating development banks (DBs) are found in the literature. One example is Stephanou (2005), who carried out a comparative analysis of the evaluation methodologies applied by two relevant international development finance agencies – the World Bank and the Inter-American Development Bank (IADB) – supporting social projects developed in Brazil. The author observed the importance and impact of the agencies' commitment in the country, the methodologies they adopted to evaluate the projects (comparing the project cycle), and the so-called logframe.

Cunha, Carvalho, and Prates (2018) analyzed the current profile of the NSDFI in Brazil, highlighting its peculiarities and advancing in the normative discussion regarding credit mechanisms and policies and an institutional organization to strengthen the system. When presenting the evolution and recent characteristics of the NSDFI, the authors found that reducing state participation in financial intermediation produced the desired effects. They observed this phenomenon particularly in the segment of institutions controlled by state governments, reducing their participation in the national financial system.

Specifically concerning DFAs, Schechter's (2016) research resembles the objective of this study. The author analyzed the performance of a specific development agency (AgeRio, in the State of Rio de Janeiro) compared to the eight largest DFIs in Brazil. The author used descriptive analysis to assess financial indicators in the period from 2010 to June 2016. The results revealed that AgeRio presented poor performance in terms of efficiency and needed to increase its credit portfolio. The same result was observed for profitability, where AgeRio had the worst return on equity (ROE) of the sample. The study suggested that the agency should carry out a sustainable expansion of its credit portfolio to obtain the benefits of risk diversification (Schechter, 2016).

The market's increasing competition due to technological transformations and the increasing globalization of information show that organizations willing to survive have to demonstrate efficient

administration and resource management (Apergis & Alevizopoulou, 2011; Matias, Quaglio, Lima & Magnani, 2014). This task requires the use of different methodologies, especially techniques to measure efficiency.

Among such techniques, the efficiency criterion associated with the concepts of economic rationality and material productivity stand out, which demonstrates the organization's capacity to produce maximum results with minimum resources. However, efficiency should not be understood only as profit maximization (Aragão, 2004). In the scope of economic sciences, profit refers to the optimization of resources and the absence of loss. It can result from the maximum use of resources (inputs) existing in the company in order to reach the largest possible volume of outputs, satisfying the needs and desires of individuals and organizations (Pindyck & Rubinfeld, 2010). Thus, production efficiency can be analyzed from two perspectives: productive or technical efficiency and allocative efficiency.

Farrell (1957) developed these two components of efficiency; the technical or productive efficiency reflects the ability of a firm to obtain maximum production from specific inputs, while allocative efficiency is related to a firm's ability to use inputs in optimal proportions given their respective prices. The combination of the two components provides a measure of total economic efficiency, which shows the function of absolute efficient production (in practice, this function is unknown). Therefore, Farrel (1957) suggested estimating this function based on sample data, testing some models, and developing the stochastic frontier methodology. According to Kumbhakar, Subal, and Lovell (2003), the stochastic frontier methodology consists of an econometric model that seeks to estimate production, cost, or profit for a producer, allowing failure in optimization attempts. Thus, the calculation of productive efficiency requires estimating a production frontier – since the deviation in relation to the frontier is the measure of technical inefficiency (or efficiency) (Silveira, Lanzer & Pereira, 1995).

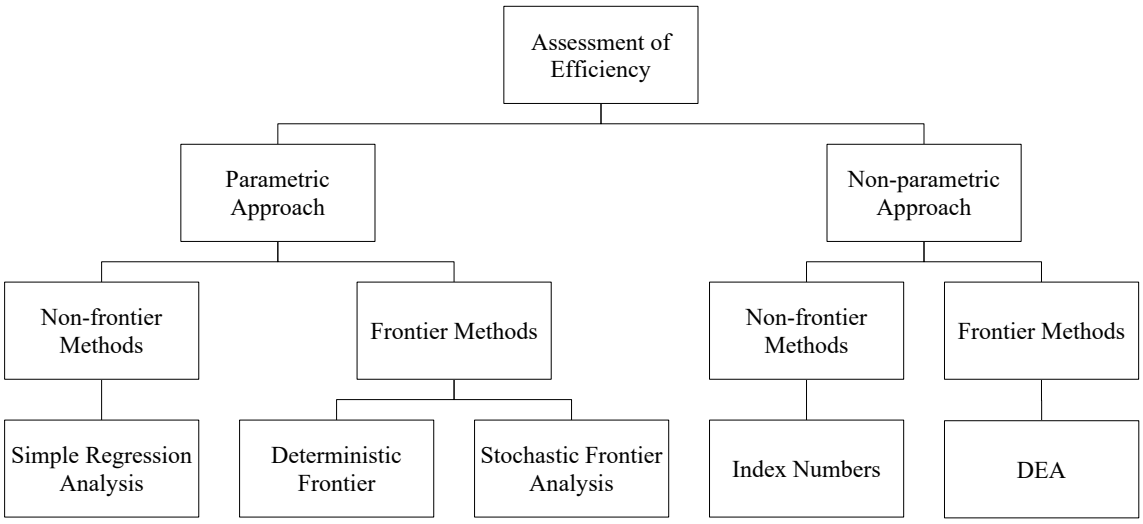
Another method of frontier construction widely applied in efficiency analysis in the public sector and non-profit organizations is data envelopment analysis (DEA) (Afonso, 2007). According to Cavalcante and Andriola (2012), based on the evaluation of efficiency proposed by Farrell (1957), Charnes, Cooper, and Rhodes (1978) started the study of the non-parametric approach for efficiency analysis with multiple inputs and outputs (products). Using linear programming, they operationalized Farrell's efficiency method (1957) and called it DEA. This model allows determining the relative performance of units, called decision-making units (DMUs), which use the same types of inputs to produce the same goods and/or services (outputs).

Finally, efficiency analysis through performance indicators can be performed, measuring numerical indicators, multipliers, amounts, quotients, and percentages. Assaf (2015) states that to better understand the assessment carried out using indicators, the idea is to divide them into homogeneous groups: liquidity; activity, indebtedness, and structure; profitability; and stocks analysis. Thus, an organization's economic and financial performance can be understood as an analysis of value creation and measured in a way that indicates profitability, market value, and, consequently, the institution's efficiency.

Thus, according to Almeida (2012), the assessment of efficiency has two main approaches: the parametric and the non-parametric. The main technique of the parametric approach is econometric

analysis, which can be stochastic or deterministic. Regarding the non-parametric approach, DEA and index numbers are the most used, as shown in Figure 1.

FIGURE 1 METHODOLOGIES TO ASSESS EFFICIENCY



Source: Adapted from Sarafidis (2002).

Due to the absence of specific methods to analyze the performance of development finance institutions, this research used index numbers, also known as the analysis of economic and financial indicators, and commonly applied in the literature to examine other types of financial institutions. This choice was made after verifying the suitability of these tools to assess the performance of Brazilian DFAs.

Assaf (2006) argues that the efficiency indicator most used in the analysis of financial institutions is the operational efficiency ratio (OER), which establishes the relation between the institution's operating expenses with the revenues from financial intermediation. Matias (1999) also developed an efficiency indicator applied to financial institutions. The author's efficiency ratio (ER) is calculated considering the gross return from financial intermediation (GRFI), plus revenue from services rendered and estimated losses from doubtful accounts (ELDA), divided by overhead expenses (administrative and personnel expenses).

In addition to the analysis of the DFAs' efficiency, we analyzed the profitability of these organizations. Among the main profitability indicators of the banking sector are the return on equity (ROE) and the average return on credit operations (RCO). ROE is calculated by the ratio net profit to net equity, while RCO is represented by the division of revenues from credit operations by total credit operations.

These efficiency and profitability indicators were used to assess Brazilian DFAs. The calculation methodology and the interpretation of these indicators are specified in the following section.

3. METHODOLOGY

Considering the characterization of scientific research defined by Beuren et al. (2012), this study is descriptive – it analyzes the efficiency and profitability of Brazilian DFAs; documentary – based on data from financial statements; and quantitative – using statistical methods such as descriptive analysis, standard indicators, and Mann-Whitney test. The study sample is composed of 14 Brazilian state-owned development finance agencies, characterized according to Bacen regulations.

Agencies from the Brazilian states of Pernambuco and Roraima were excluded from the study population, as there was no available data. The period of analysis was, initially, from 2013 to 2018. This choice was made due to the Ordinance of the National Treasury Secretariat (STN) 828, of December 14, 2011, which in art. 3 made mandatory, as of 2013, the adoption of the Chart of Accounts and Financial Statements applied to the Public Sector in order to standardize accounting procedures and statements, thus providing greater transparency of public accounts. However, as the format of the statements present data from both the year analyzed and the previous one for comparison purposes, it was possible to obtain data for 2012 so that the final period analyzed was from 2012 to 2018. The study variables consist of the efficiency and profitability indicators described in section 2, which were operationalized as described in Box 2.

BOX 2 VARIABLES

Index	Formula	Authors
Operational Efficiency ratio (OER)	$OER = \frac{Operational\ expenses}{Revenues\ from\ financial\ intermediation}$	Assaf (2006)
Efficiency ratio (ER)	$ER = \frac{GRFI + Revenues\ from\ services + ELDA}{Overhead\ expenses}$	Matias (1999)
Return on Equity (ROE)	$ROE = \frac{Net\ profit}{Net\ asset}$	Assaf (2006)
Average Return on Credit Operations (RCO)	$RCO = \frac{Revenues\ from\ credit\ operations}{Credit\ operations}$	Assaf (2006)

Note: GRFI = Gross Return from Financial Intermediation; ELDA = Estimated Losses from Doubtful Accounts.
Source: Elaborated based on Matias (1999) and Assaf (2006).

The operational efficiency ratio (OER) is analyzed considering the interpretation that the lower, the better. The lower the OER, the greater the productivity, showing that the institution needs a smaller operational structure to conduct its activities. On the other hand, the efficiency indicator (ER) shows how much revenue is generated by the institution for each real expense. Thus, the higher the index, the greater the economic efficiency of the DFA.

As for the indicators of DFAs' profitability, the return on equity (ROE) allows us to observe the percentage gain earned by the business owners as a consequence of the profit margins and the efficient planning (Assaf, 2006). On the other hand, the average return on credit operations (RCO) is a specific indicator of the financial sector as it deals with credit/lending operations. Mohanram, Saiy, and Vyas (2018) point out that ROE may not be an ideal indicator to analyze the banking sector's profitability, requiring a specific indicator for this type of institution. Therefore, this study also intends to verify whether the finding by Mohanram et al. (2018) is also valid for DFAs.

The use of financial-only variables may restrict the results of this study regarding these institutions' role, depending on the particularities of the DFAs. In order to minimize this limitation, the results of the efficiency and profitability indicators were compared with GDP and the *indicador social de desenvolvimento dos municípios* (ISDM) (municipal development social indicator), which demonstrate the development of the state and the municipalities, respectively.

The data were collected from the financial statements of the DFAs available at their websites and treated using Microsoft Excel and Stata software. The final sample of the study included 88 observations. For data analysis, descriptive statistics were used to characterize the sample and the description of its characteristics regarding the variables distribution, efficiency indicators, and profitability of Brazilian development agencies.

The standard indicator methodology was used to individually evaluate the evolution of the DFAs' efficiency and profitability indicators during the analyzed period. Matarazzo (2008) exposes that the analysis of financial statements using indicators only becomes consistent and objective when the analyzed indexes are compared with standards; otherwise, the results of the analysis are subject to the researcher's opinion.

This technique consists of reference measures for comparison with the organization's situation. A certain indicator of an institution is compared with a standard indicator – calculated with data from all participants of the category to which the institution belongs – to verify if the analyzed institution is in a better, worse, or similar (relative to the standard) position (Matarazzo, 2008). Thus, it is possible to establish an analysis of the behavior of this institution over time in relation to the standard of the category to which it belongs.

Therefore, the indicators were arranged in quartiles, aiming to classify the DFAs according to efficiency and profitability levels for better comparability between them within each indicator. The quartiles were classified based on performance quality, according to Assaf (2015), divided into: 1st quartile: unsatisfactory; 2nd quartile: regular; 3rd quartile: good; 4th quartile: excellent. The standard indicator generated was derived from the original, but considering all organizations in the sector, which served as a standard to evaluate the indicator of each organization individually, thus providing a benchmark. For example, in the original methodology, the organization's ROE for 2012 was compared with the "standard ROE" obtained in the calculations of the standard indicator for 2012, and so on for each indicator. In this study, the average ROE for the period was used, for example, to define the ROE of each DFA, and from this average ROE the standard indicator was found and the comparison performed. Then, a rating was given (unsatisfactory, regular, good, and excellent) to the organization, given its position in relation to the benchmark value for that indicator.

Finally, to verify whether the DFAs' efficiency and profitability levels of the DFAs presented statistical differences as a function of size, the Mann-Whitney non-parametric mean test was carried out. According to Maroco (2010, p. 305), this test is adequate to compare the distribution functions of at least an ordinal variable measured in two independent samples. The hypotheses for the Mann-Whitney test are: H0 = the average of the groups is statistically equal, and H1 = the average of the groups is statistically different. The natural total asset logarithm was used as a proxy to measure the DFAs' size. This measure was used because the literature uses total assets, in general, as a proxy for the size of organizations. The logarithmic form derives from the fact that this function minimizes the variability and heterogeneity of asset values among DFAs.

4. ANALYSIS OF RESULTS

4.1 Descriptive statistics

The results of the descriptive statistics of the variables presented in Table 1 reveal that, on average, the DFAs have an operational efficiency ratio (OER) of 1.43, with the highest average of 1.99 in 2016 – i.e., 2016 was the year with the worst level of efficiency, since this indicator is interpreted as the lower, the better. On the other hand, 2014 had an average of 1.16, the lowest in the period, showing that this year had the highest efficiency level according to the OER since the DFAs incurred fewer expenses to generate their revenues. In addition, for the OER, there was no pattern of values over the years analyzed. As for the variability of data around the mean, a high variation of the DFAs' efficiency was found (114%), with indicators ranging from 0.24 to 11.47.

The second efficiency indicator was the efficiency ratio(ER) proposed by Matias (1999). It reached an average value of 2.15, and DFAs achieved an average greater efficiency in 2018 when the index reached 2.28 (considering the higher, the better). In addition to obtaining better average results than the OER, the ER also found less variability than the OER, but it was still a considerable variation, around 0.57. In addition, ER has shown a growth trend over the years, i.e., specifically for this indicator, DFAs have improved their efficiency over time. As the agencies' focus is not profit, as it is for banks, the fact that they are generating twice as much revenue in relation to expenses shows that they are efficient.

Regarding the DFAs' profitability, the ROE reached average values almost nil throughout the period from 2012 to 2018. Even from 2016, the average returns were negative, suggesting that the national economic recession of 2016 harmed DFAs' profitability with losses for the period from 2016 to 2018. Regarding the variability of this indicator, the values were high. The ROE, in 2015, stands out with a variation coefficient of 66.06. Thus, it is clear that the DFAs' profitability is highly heterogeneous. One explanation for this may be the size of the agencies, which is also quite divergent. In 2018, the DFAs of Piauí had assets of BRL 11.04 million reais, while the one in Rio Grande do Sul, obtained a total asset of approximately BRL 2.99 billion reais, more than 272 times greater than the assets of the Piauí agency.

TABLE 1 DESCRIPTIVE STATISTICS OF EFFICIENCY AND PROFITIBILITY INDICATORS

OER	2012	2013	2014	2015	2016	2017	2018	Total
Average	1.27	1.43	1.16	1.22	1.99	1.61	1.19	1.43
Standard deviation	1.30	1.33	1.09	1.20	2.95	1.67	0.90	1.63
Coefficient of variation	1.02	0.93	0.94	0.98	1.48	1.04	0.76	1.14
Minimum	0.32	0.26	0.33	0.31	0.24	0.25	0.24	0.24
Maximum	4.87	4.75	4.42	4.65	11.46	5.82	2.90	11.47
ER	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**Total**
Average	2.05	1.97	2.12	2.24	2.18	2.20	2.28	2.15
Standard deviation	0.99	0.96	1.02	1.14	1.43	1.39	1.73	1.23
Coefficient of variation	0.49	0.49	0.48	0.51	0.66	0.63	0.76	0.57
Minimum	0.66	0.65	1.16	1.08	1.06	0.72	0.48	0.48
Maximum	3.97	3.99	4.48	4.38	6.39	5.60	6.57	6.57
ROE	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**Total**
Average	0.03	0.03	0.03	0.01	-0.02	-0.02	-0.02	0.01
Standard deviation	0.05	0.04	0.02	0.08	0.08	0.10	0.09	0.07
Coefficient of variation	1.55	1.18	0.86	66.06	-3.95	-5.66	-4.35	15.33
Minimum	-0.06	-0.05	0.01	-0.25	-0.19	-0.20	-0.23	-0.25
Maximum	0.14	0.09	0.09	0.11	0.07	0.09	0.05	0.14
RCO	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**Total**
Average	0.14	0.12	0.12	0.13	0.14	0.15	0.19	0.14
Standard deviation	0.06	0.04	0.04	0.04	0.05	0.06	0.11	0.06
Coefficient of variation	0.43	0.30	0.36	0.31	0.37	0.43	0.57	0.43
Minimum	0.07	0.06	0.07	0.08	0.10	0.07	0.09	0.06
Maximum	0.29	0.19	0.23	0.22	0.29	0.29	0.45	0.45

Source: Research data.

Finally, the average return on credit operations (RCO), which is calculated for companies in the financial sector, showed better results than ROE. The RCO average in 2018 was the highest in the analyzed period, with a 19% return. The variation coefficient also obtained results closer to the average, with the lowest variability in 2013 (0.30) and the highest variation in 2018 (0.57). As RCO does not focus on profitability over profit, but on financial income from credit operations, there were no negative values. The lowest value found for this indicator was 6% for the DFAs of Rio Grande do Sul, in 2013. In contrast, in 2018, the DFA of the state of Amazonas reached 45%, the highest in the analyzed sample.

In general, the results of descriptive statistics highlight that DFAs were more focused on efficiency than on profitability since, as of 2016, ER increased and ROE decreased. DFAs tended to increase the efficiency indicator during this period, while ROE tended to decrease in periods of economic recession. As described before in this article, this can be explained by the fact that these agencies are related to social welfare, contribute to the promotion of the economy (mainly of SMEs), and are not primarily aimed at profit, as private financial institutions are. DFAs are focused on their financial sustainability. They try to enter the market in which private institutions have no interest precisely because it is less profitable, so the findings that DFAs are profitable when measured by ROE, are almost non-existent.

The finding that ROE decreased over the years and RCO increased, especially after 2016, corroborates Mohanram et al. (2018), who pointed out that ROE is not an appropriate indicator for financial institutions in times of economic recession. The authors state that it is preferable to use a specific profitability indicator for the financial sector to capture the organizations' profitability more accurately. The evidence pointed out by this study is consistent with the study by Schechter (2016), who analyzed the performance of the DFA of the state of Rio de Janeiro, observing that ROE is not a good proxy to evaluate the performance of these particular agencies.

4.2 Analysis of standard efficiency and profitability indices

In the analysis of the standard indicators, the indices and, consequently, the DFAs were classified in quartiles that formed a ranking according to efficiency and profitability levels, following the decreasing order: excellent, good, regular, and unsatisfactory. In the standard indicator analysis technique, the classifications occur by indicator, individually, so the agencies were analyzed and classified separately for each indicator, with no ordering among them or any comparison between indicators to define the ranking. Thus, the results for the efficiency indicators are detailed in Table 2, presented by indicator.

TABLE 2 CLASSIFICATION OF STANDARD INDICATORS FOR DFAS' EFFICIENCY

DFA	OER			ER		
	Value	Quartile	Classification	Value	Quartile	Classification
AF do Rio Grande do Sul S/A	0.28	4	Excellent	5.00	4	Excellent
AF do Paraná S/A	0.36	4	Excellent	3.49	4	Excellent
AF do Estado de São Paulo S/A	0.37	4	Excellent	3.22	4	Excellent
AF do Estado da Bahia S/A	0.76	3	Good	1.78	3	Good
AF do Estado do Rio de Janeiro S/A	0.82	3	Good	2.03	3	Good
AF do Estado de Santa Catarina S/A	0.45	3	Good	2.98	3	Good
AF de Alagoas S/A	1.04	3	Good	1.22	1	Unsatisfactory
AF de Goiás S/A	1.18	1	Regular	1.64	2	Regular
AF e Desenv. do Estado do Piauí S/A	1.21	2	Regular	1.00	1	Unsatisfactory
AF do Estado do Tocantins S/A	1.41	2	Regular	1.20	1	Unsatisfactory
AF do Estado do Amazonas S/A	1.43	2	Regular	1.84	3	Good
AF do Rio Grande do Norte S/A	2.19	2	Unsatisfactory	1.25	2	Regular
AF do Amapá S/A	2.76	1	Unsatisfactory	1.54	2	Regular
AF do Estado de Mato Grosso S/A	4.72	1	Unsatisfactory	1.50	2	Regular

Source: Research data.

Regarding the DFAs' efficiency from 2012 to 2018, divergences were found in the results for the OER and ER indicators. The OER represents the proportion of expenses necessary for the agency to generate revenues from financial intermediation. Thus, DFAs in Paraná, São Paulo, and Rio Grande do Sul obtained the highest level of efficiency and were classified as excellent, confirming the findings in the literature that larger DFAs tend to be more efficient.

The second efficiency indicator (ER) is contrary to the OER. In this case, the higher the result, the better, since the indicator expresses the revenues divided by the expenditures and, therefore, the higher the revenues in relation to administrative and personnel expenses, the greater the value of the indicator. The DFAs of Paraná, São Paulo, and Rio Grande do Sul presented excellent performance for the ER, indicating these agencies are well managed.

The DFAs of Paraná, São Paulo, and Rio Grande do Sul had the lowest ELDA in the analyzed period, i.e., they had the lowest credit risk. Finance institutions that have a better screening process when selecting new clients and good control over bad debt concentrate less risky credit portfolios and, as a result, tend to be more efficient (Schechter, 2016). The DFA in the state of Paraná presented the best ELDA, reaching almost zero from 2012 to 2014.

According to the findings of Schechter (2016), the DFA of Paraná's ELDA can be explained by the nature of the agency's credit operations, which focus on lending to the public sector. Largely, its borrowers are municipalities that have high liquidity guarantees, such as tax credits, and receive

transfers from the Municipality Participation Fund. Thus, the credit risk rating of the DFA in Paraná is low, resulting in a small ELDA. As of 2015, the percentage of ELDA for this DFA increased slightly, peaking in 2015 at 3.30%.

There are, however, DFAs with divergent behavior between these efficiency indicators. The agency of Alagoas is an example, classified as good for OER and unsatisfactory when considering the ER. The ER indicator considers the gross result of financial intermediation in its denominator, which may suggest that, although the DFA has good management of operating expenses (as the results of the OER indicated), the costs of financial intermediation may be high or the related revenues are not sufficient to show, at least, regular efficiency (Matias, 1999).

Piauí, Tocantins, and Amapá, which were among the DFAs with the lowest total assets, were classified as regular and unsatisfactory, varying according to the efficiency indicator adopted. This can also suggest that the agency's size is relevant to efficiency since these smaller agencies have achieved lower efficiency levels. It is important to observe a potential relationship between these results and the GDP of the states mentioned above. According to IBGE (2020), among the 26 Brazilian states and the federal district, Piauí's GDP is the 21st, Tocantins, 24th, and the GDP of Amapá is the 25th. As GDP is the sum of all final goods and services produced by a country, state, or city, usually in one year, it reveals that, in addition to these three states having low GDP, their agencies cannot contribute efficiently to improve that index.

Another indicator that can contribute to a better discussion of these results is the *indicador social de desenvolvimento dos municípios* (ISDM) (municipal development social indicator), calculated by the Center for Applied Microeconomics of Fundação Getulio Vargas (C-Micro/FGV). This indicator provides a synthetic measure of welfare for municipalities, considering characteristics such as income, housing, education, work, health, and safety. In the last survey that C-Micro/FGV carried out (2000-2010), the Brazilian municipalities' geographic distribution based on ISDM revealed a concentration of municipalities with the social indicator above the national average (about 40% of the total) in the Southeast Region of the country. There is also a high incidence of municipalities with high ISDM in the South. The performance in ISDM 2010 observing geographic location reveals a group of municipalities with lower performance in the North and Northeast Regions. This finding explains why the DFAs in Piauí, Tocantins, and Amapá were classified as regular and unsatisfactory.

Also, the percentage of the DFAs' ELDA varies considerably due to the borrowers' payment delay. The longer the payment is late, the greater the credit risk of that agency and the higher the ELDA. In general, DFAs experienced increases in their ELDA, mainly from 2015 onwards. This increase may have been due to the recession of the Brazilian market at the end of 2014, since the reduction in economic activities may impact the increase in credit risks of institutions and, consequently, increase the percentage of the DFAs ELDA.

As for the DFAs' profitability (Table 3), the ROE of the agencies in Bahia, Paraná, and Rio Grande do Norte was classified as excellent in relation to the other DFAs analyzed. It is noteworthy that the DFA of Paraná was the only other agency that appeared as excellent regarding efficiency. The agencies of Bahia and Rio Grande do Norte were characterized as good and regular, respectively, whereas Piauí and Tocantins, in the same way as in efficiency levels, obtained unsatisfactory profitability levels according to ROE.

TABLE 3 CLASSIFICATION OF STANDARD INDICATORS FOR DFA'S PROFITABILITY

DFA	ROE			RCO		
	Value	Quartile	Classification	Value	Quartile	Classification
AF do Estado da Bahia S/A	0.06	4	Excellent	0.13	2	Regular
AF do Paraná S/A	0.06	4	Excellent	0.11	1	Unsatisfactory
AF do Rio Grande do Norte S/A	0.06	4	Excellent	0.14	3	Good
AF do Estado de Santa Catarina S/A	0.03	3	Good	0.15	3	Good
AF do Estado de São Paulo S/A	0.03	3	Good	0.11	2	Regular
AF de Goiás S/A	0.02	3	Good	0.12	2	Regular
AF do Estado do Rio de Janeiro S/A	0.01	3	Good	0.10	1	Unsatisfactory
AF do Amapá S/A	0.01	2	Regular	0.17	3	Good
AF do Rio Grande do Sul S/A	0.01	2	Regular	0.09	1	Unsatisfactory
AF de Alagoas S/A	-0.01	2	Regular	0.21	4	Excellent
AF do Estado de Mato Grosso S/A	-0.04	2	Regular	0.11	2	Regular
AF e Desenv. do Estado do Piauí S/A	-0.04	1	Unsatisfactory	0.18	3	Good
AF do Estado do Tocantins S/A	-0.06	1	Unsatisfactory	0.22	4	Excellent
AF do Estado do Amazonas S/A	-0.16	1	Unsatisfactory	0.22	4	Excellent

Source: Research data.

Regarding the average return on credit operations (RCO), results were different from those observed for ROE. Paraná, for example, achieved an unsatisfactory performance for RCO, whereas it obtained an excellent level for ROE. This can be explained by the particularities of the DFAs' core activities and the competition with private institutions. This comparison with private institutions makes credit operations the DFAs' weak point since they are prohibited from seeking deposits and do not count on fiscal or parafiscal funding from the public in general. Thus, the revenues of the DFA of the state of Paraná are largely derived from other types of operations that increase its net profit and, consequently, its ROE.

The DFA of Rio Grande do Sul obtained an unsatisfactory RCO, and that of São Paulo achieved a regular level in the same indicator. The DFAs of Tocantins and Amazonas, which achieved unsatisfactory profitability for ROE, reached an excellent level for RCO, indicating that, although having high buy-and-hold returns, these two DFAs did not reach the level of revenues from other

sources when compared to other larger DFAs. Therefore, their net profit could not even be classified as regular.

DFAs do not have high profitability, which can be explained mainly due to their purpose of entering small markets and regions that are not commercially appealing to private institutions. In addition, in the same way as the study by Schechter (2016), the ROE proved to be unsuitable for evaluating DFAs as it obtained different results from the RCO, considered a more appropriate indicator for financial institutions because it takes into account credit operations.

As highlighted by Schecter (2016), DFAs have heterogeneous capital structures, some of which receive a large part of their resources from third parties, such as the Brazilian National Development Bank (BNDES), when they take the role of intermediaries between BNDES and the borrower. On the other hand, ROE considers net profit in relation only to own resources. This finding also confirms Mohanram et al. (2018), who state that ROE is not an adequate indicator for analyzing the profitability of companies in the financial sector and that other specific indicators can be more accurate.

From the point of view of the set of indicators adopted in this research, the DFA of Paraná, although not achieving a satisfactory average buy-and-hold return, was the one that obtained the best overall performance for efficiency and profitability. Mato Grosso, on the other hand, had the worst performance in both components.

Although the development agencies in Amazonas and Tocantins obtained an excellent rating in the average return on their credit operations, the vast majority of agencies in the Central-West and North regions of Brazil performed poorly in both efficiency indicators (OER and ER). Those from the South and Southeast were the ones that showed the best efficiency.

The unsatisfactory result presented in the DFAs' average return on credit operations indicator the South can be explained by the level of development and the size of the borrowers in this region, who can obtain credit at a lower cost than the others.

4.3 Test of Median Differences

The study sample was divided into two groups, according to the size (size) of the DFAs, with Group 1 formed by the largest and Group 2 by the smallest agencies. Thus, each group summed 44 observations and seven agencies. First, the Shapiro-Wilk test was performed to ascertain the normality of the data and what type of mean/median test would be used. The normality test indicated that the variables are not normal, so the appropriate test is the non-parametric Mann-Whitney test. Then, the median of the two groups was calculated to determine which has the highest median of the profitability and efficiency indicators analyzed, as shown in Table 4.

TABLE 4 AGENCY GROUP MEDIANS, ACCORDING TO THEIR SIZE

Variables	Larger	Smaller
OER	0.42	1.55
ER	2.91	1.30
ROE	0.03	0.01
RCO	0.11	0.15

Source: Research data.

Table 5 shows the results of the Mann-Whitney test for each indicator. All were statistically significant, showing a difference between the efficiency and profitability of DFAs due to their size.

TABLE 5 MANN-WHITNEY TEST

Variables	Z	Prob > |z|	Decision – α = 5%
OER	7.12	0.00	Reject H_0
ER	-6.97	0.00	Reject H_0
ROE	-2.58	0.01	Reject H_0
RCO	4.59	0.00	Reject H_0

Source: Research data.

Thus, considering the results presented in Tables 4 and 5, it appears that larger agencies have a lower median when compared to smaller ones for the OER, concluding that the larger agencies, according to this indicator, are approximately 3.7 times more efficient than smaller ones.

The efficiency ratio (ER), on the other hand, has a higher median for larger agencies. Thus, ER also suggests that larger agencies are more efficient than smaller ones. However, this indicator shows less disparity between the groups – approximately twice as much efficiency for larger agencies against the 3.7 times observed with the OER. The results of the median tests confirm and add robustness to the findings of the standard indicator that showed that larger DFAs were more efficient.

Regarding the profitability of the analyzed DFAs, unlike the efficiency indicators, ROE and RCO showed different results. ROE suggested that the larger DFAs were more profitable, while the RCO indicated that the smaller ones were more profitable. As already observed, this discrepancy is due to the particularities of the DFAs' core activities and to competition with private institutions, which make the credit operations of the development agencies a weak point. Revenues are largely derived from other types of operations that increase net income and, consequently, the ROE of larger agencies. However, smaller DFAs stand out when managing their credit/lending operations more effectively and ensuring financial sustainability.

5. FINAL CONSIDERATIONS

This study analyzed the development finance agencies' (DFAs) efficiency and profitability level, considering their financial sustainability to keep pursuing the goal of generating social welfare and fostering the economy. The outcomes of this research offered citizens the capacity to assess whether the DFA in their state has been well managed and performed sustainably. Also, it is important to stress that these agencies' primary focus is financing SMEs, organizations that represent the basis for employment growth and per capita income in Brazil (Pinto, Paula & Salles, 2007).

This research contributed to assess the performance of the Brazilian DFAs as a sector, using standard indicators to compare the agencies' efficiency and profitability. The sample included 14 agencies analyzed from 2012 to 2018. The results pointed out that larger DFAs tend to obtain an excellent efficiency level, while those with less infrastructure demonstrated regular and unsatisfactory efficiency. On the other hand, DFAs with more significant total assets were more likely to show regular or unsatisfactory profitability since the results achieved have almost zero or negative representativeness regarding equity. This finding may be related to the competition with private financial institutions, considering that DFAs work with risky sectors (neglected by the private banks), offering more favorable rates and terms for borrowers, as pointed out by Souza (2018).

In addition to financial indicators, the study reinforced the importance of considering external indicators such as the GDP of the states and the *Indicador Social de Desenvolvimento dos Municípios* (ISDM) (municipal development social indicator) to analyze what represents, in the economic-social context, the results found when examining the DFA's performance. When observing the states' GDPs, states with lower GDP in the national ranking host DFAs with poor performance. Therefore, it is possible to infer that these agencies are not efficiently contributing to improving the states' GDP.

The analysis of the ISDM shows that agencies in states in the South and Southeast regions of Brazil are classified as efficient. The indicator points out that this efficiency is influenced by the concentration of municipalities with high ISMD in these regions. In turn, the DFAs of Piauí, Tocantins, and Amapá, states in the North and Northeast region of Brazil, show poor performance and regular and unsatisfactory efficiency, which has to do with the fact that the municipalities in those regions have the low ISMD.

Furthermore, despite having different characteristics and purposes compared to other financial institutions, DFAs are subject to the same regulations, making them less competitive. Another unfavorable characteristic is that DFAs are not allowed to raise private funds, limited only to public funds, i.e., depending on the government's financing policies. Thus, private financial institutions, even DBs, are ahead of DFAs regarding profitability (since DBs can raise funds from citizens).

Thus, as pointed out by Fuchsloch (2018), there should be changes in the legislation of DFAs and BDs, in such a way that these institutions should be independent in their region, but at the same time be part of a national system of development finance institutions, working together to establish goals and elaborate plans for the development of the states and, consequently, the country.

The research limitations lie in the scarcity of previous studies addressing the DFAs to support the findings and for comparison. Also, the fact that indicators aimed at DFAs and DBs (which are institutions in specific segments) are scarce hinders the applicability of the indices used in studies on financial institutions in general. However, the results showed that Matias' (1999) ER proved to be

more effective in capturing the efficiency of these agencies than Assaf's OER (2006) since it presented better results and less variability. Similarly, there is evidence of the suitability of RCO as an indicator for the analysis of the DFAs' profitability, which showed better results and less variability than ROE. Thus, ER and RCO are identified as appropriate indicators for the analysis of the DFAs' performance.

Future research should explore factors that influence DFAs' performance and analyze other performance indicators such as liquidity and debt structure. In addition, given that corporate governance practices contribute to improving management and, consequently, the organizations' operations and activities, the use of techniques and methodologies related to this topic may lead to DFAs' efficiency and profitability. We recommend further studies adopting qualitative approaches to examine DFAs, using interviews, for example, to explore the point of view of managers, representatives, and professionals working in these agencies, building a better understanding of management strategies and governance practices used to achieve the goal of supporting the economic and social development of the Brazilian states.

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