



The effects of the national simple tax regime on the small businesses revenue and tax payment in the Ceará state – Brazil

Os efeitos do regime fiscal simples nacional sobre a receita e o pagamento de impostos das pequenas empresas no estado do Ceará – Brasil

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ABSTRACT

This research examines the impact of the Simples Nacional policy on the revenue of Micro and Small Enterprises (MSEs) and their payment of taxes on goods and services (ICMS) in the State of Ceará, Brazil. The Simples Nacional is a tax collection regime created by Complementary Law No. 123/2006, with the purpose of reducing the tax burden for companies classified as Micro and Small Enterprises. The data utilized in this

study was obtained from the State Treasury Department of Ceará (SEFAZ), Institute of Economic Research and Strategy of Ceará (IPECE), and Brazilian Institute of Geography and Statistics (IBGE). The difference-in-differences method was employed on a panel data structure. The results reveal an average increase in MSEs revenue ranging from 45.9% to 96.4% and an average reduction in ICMS payment between 8.5% and 11.2%. The data used in this study was not publicly accessible, thereby contributing to the literature on this subject.

Keywords: small enterprises, tax burden, simples nacional, policy evaluation.

RESUMO

Esta pesquisa examina o impacto da política do Simples Nacional na receita das Micro e Pequenas Empresas (MSEs) e seu pagamento de impostos sobre bens e serviços (ICMS) no Estado do Ceará, Brasil. O Simples Nacional é um regime de cobrança de impostos criado pela Lei Complementar nº 123/2006, com o objetivo de reduzir a carga tributária para as empresas classificadas como Micro e Pequenas Empresas. Os dados utilizados nesse estudo foram obtidos na Secretaria Estadual da Fazenda do Ceará (SEFAZ), Instituto de Pesquisa Econômica e Estratégia do Ceará (Ipece) e Instituto Brasileiro de Geografia e Estatística (IBGE). O método da diferença nas diferenças foi empregado em uma estrutura de dados do painel. Os resultados revelam um aumento médio das receitas das PME que variam entre 45,9% e 96,4% e uma redução média nos pagamentos de ICMS entre 8,5% e 11,2%. Os dados utilizados neste estudo não foram acessíveis ao público, contribuindo assim para a literatura sobre o assunto.

Palavras-chave: pequenas empresas, carga tributária, simples nacional, avaliação de políticas.

1 INTRODUCTION

According to a recent report from the Brazilian Support Service for Micro and Small Enterprises (SEBRAE, 2021), small businesses make up 99% of Brazilian companies and are considered crucial for the nation's economy. These small businesses are comprised of micro and small enterprises (MSE), totaling 7.2 million, and individual micro-entrepreneurs (IME), totaling 11.1 million, resulting in a total of 18.3 million small businesses. Geographically, these small businesses are predominantly located in the Southeast (51%), South (18%), and Northeast (17%) regions of Brazil.

MSEs in Brazil are responsible for creating three times more jobs than medium and large-sized companies. Notably, even during the COVID-19 pandemic, these

companies were accountable for 70% of the jobs created in 2021 and contribute 30% to the country's Gross Domestic Product (GDP).

These small businesses play a fundamental role in the Brazilian economy. In addition to their economic impact, they also provide a substantial share of formal employment and wages. As per SEBRAE (2011), small businesses are responsible for 53.4% of the GDP in commerce, while in the industry and services sectors, their contribution represents 22.5% and 36.3%, respectively. These enterprises also account for 52% of formal employment and 40% of wages paid in the Brazilian economy.

In the year 2010, MSEs played a substantial role in the economy of Ceará state, with a total of 173,906 companies concentrated in various sectors, including commerce, industry, services, and construction. These companies employed a significant workforce of 378,821 workers, representing 48.6% of the total labor force in the state, and contributed 41.8% of the employee remuneration mass (SEBRAE, 2011). Therefore, these enterprises are critical for generating employment opportunities and income, forming the Gross Domestic Product (GDP), and collecting tax revenues.

Given that the Tax on Circulation of Goods and Services (ICMS) represents the primary source of revenue for Brazilian states, tax policies such as the Simples Nacional (a Nacional Simple Tax Regime) hold importance in formalizing small businesses and ensuring the level of state tax collection. It is noteworthy that, as of 2021, out of the 18.3 million small businesses in Brazil, approximately 16 million companies opted out of this special tax regime (SEBRAE, 2021).

The effectiveness of Complementary Law No. 123, enacted on December 14, 2006, which established the Simples Nacional (SN) to unify tax collection from Brazilian Micro and Small Enterprises (MSEs) at the federal, state, and municipal levels, has prompted questions about its ability to create a more favorable economic environment for MSEs and enhance their competitiveness and sustainability. The simplification of tax obligations has been expected to increase the revenue of MSEs by reducing their tax burden while encouraging formalization. It is yet to be determined whether this particular legislation has been successful in achieving these objectives in the state of Ceará.

According to data from the General Balance of the State issued by the Government of the State of Ceará, the average annual growth rate of tax revenues increased by 6.6% during the period from 2003 to 2013. The observed growth rate varied between a minimum of 0.5% and a maximum of 14.3% during the period (CEARÁ, 2019). Likewise, the average annual growth rate of Ceará's gross domestic product (GDP) at current prices was 12.9% during the same period. This growth rate ranged between a minimum of 8.1% and a maximum of 18.9%, according to data from the Regional Accounts (IPECE/IBGE).

Therefore, given the importance of Micro and Small Enterprises (MSEs) and their effect on tax collection in the state, the present study aims to evaluate the implications of the Simples Nacional policy on the revenue of MSEs and the payment of ICMS in the state of Ceará during the period of 2003 to 2013. One of the primary contributions of this study is that the data on the revenue of businesses, which is not publicly available, is employed for analysis, thereby providing a unique contribution to the literature at this level of examination.

In view of the aforementioned considerations, this research is structured into five distinct sections in addition to this introduction. The second section presents the theoretical framework, while the third section provides a comprehensive overview of Micro and Small Enterprises. The fourth section details the methodological, whereas the fifth section brings the findings of the estimations conducted. Lastly, the sixth section features the concluding remarks, summarizing the key takeaways of the study.

2 THEORETICAL FRAMEWORK

The economic literature suggests that implementing tax policies that are more beneficial to small businesses aims to address market failures and mitigate the inherent disadvantages of their small size. Tax regimes such as the Simples Nacional aim to alleviate the tax burden and positively impact the development of micro and small enterprises. Giambiagi and Além (2011) argue that government intervention is necessary to correct market failures, particularly when market power asymmetries impact competition.

In this context, several studies have attempted to evaluate the impact of the Simples Nacional on MSEs and the Brazilian economy. For instance, some research has examined the effects of it on employment (Wilbert, Alcântara, and Serrano, 2015; Paes, 2015; Zarlenga and Beviláqua, 2018), while others have investigated its impact on ICMS collection (Andrade, 2010; Paes, 2014; Cordeiro, 2019).

Araújo (2004) and Monteiro and Assunção (2004) investigated the effects of the former Federal Simples on the formation of new businesses and job creation, and found positive outcomes in reducing informality in the Brazilian economy. Santos (2005) and Rocha Filho (2007) examined the impact of Simples Nacional on job creation and business formalization, concluding that it made a positive contribution. Over time, more micro-entrepreneurs have joined this tax regime, increasing employment. Therefore, these authors suggested that the initial version of Simples Nacional, introduced in 1996, had positive implications for the number of micro and small businesses, as well as for the job market.

Nevertheless, some studies question whether the implementation of Simples Nacional has increased tax revenue for federal, state, and municipal governments. Research conducted across various Brazilian states, such as Ceará and Alagoas, has shown that the program has encouraged informal businesses to enter the formal market, resulting in a positive impact on tax revenue. However, this has also led to dissatisfaction among some local entrepreneurs (Romero, 2009; Lima et al., 2011). In contrast, Paiva (2010) found no significant differences in the collection of ICMS between companies that opted for Simples Nacional and those that did not. Moreover, the study identified a decrease in ICMS collection for industrial companies that joined the simplified tax regime.

The purpose of this study is to make a contribution to the existing literature by examining the effects of Simples Nacional on the revenue of micro and small enterprises, which are the direct beneficiaries of the SN law. Furthermore, the research intends to assess the impact of the program on the payment of ICMS.

3 METHODOLOGICAL STRATEGY AND DATA

3.1 DATA

The dataset was obtained from the State Finance Secretariat of Ceará (SEFAZ) and encompasses the period from 2003 to 2013. It contains 763,287 observations pertaining to micro and small enterprises operating within the 184 municipalities of Ceará, which were categorized into 934 distinct lines of business in accordance with the National Classification of Economic Activities (CNAE). The range of industries represented in the dataset is extensive and includes, for example, the processing of poultry and small animals, leather shoe finishing, construction management, cargo agency, advertising and travel, equipment rental, agricultural, mineral extraction and livestock activities, coffee and rice processing, retail and wholesale trade, cultivation of fruits, manufacturing of machinery, equipment, medicines, refrigerators, hotels, transportation.

The variables under consideration in this study refer to the value of the Tax on Circulation of Goods and Services (ICMS), the revenue of micro and small enterprises (MSEs), the value of purchases made by companies within the state, the value of purchases made by companies outside the state, and the value of imports made by companies from outside the country, average years of education of employees, unemployment rate, Gini index, and real average remuneration of MSE employees. All monetary variables were converted into real values at constant prices of 2013, based on the General Market Price Index (IGP-M), which is calculated by the Getúlio Vargas Foundation (FGV). To account for regional differences, dummy variables were created for the 7 mesoregions of the Ceará state, according to the classification of the Brazilian Institute of Geography and Statistics (IBGE), namely, Center-South, Jaguaribe, Metropolitan Region of Fortaleza, Northwest, Northern Ceará, Sertões, and South.

The present study draws upon the information regarding MSEs retrieved from SEFAZ, providing insights into the distribution of the participating firms as follows: out of the total sample of 763,287 companies over the period of 2003-2013, 64.44% of these entities were found to have opted for the simplified tax regime, Simples Nacional, thus constituting the treatment group. Meanwhile, the remaining 35.56% comprised non-opters, who form the control group. This distribution is presented in Table 1.

Table 1 - Frequency Distribution between Companies opting and non-opting for the Simples Nacional

Treatment (Simples Nacional)	Frequency	Percentage (%)
Non-Optant	271.405	35,56
Optant	491.882	64,44
Total	763.287	100,00

Source: The authors.

Prior to the implementation of the Simples Nacional policy, from 2003 to 2007 the Ceará state had a total of 207,128 companies, which corresponds to about 27% of the sample used in this study. In contrast, following the implementation of the policy, from 2008 to 2013, the number of companies increased substantially, reaching a total of 556,159 companies, which corresponds to approximately 72% of the sample size, as presented in Table 2.

Table 2 - Frequency Distribution Before and After the Implementation of Simples Nacional

Time	Frequency	Percentage (%)
2003 - 2007	207.128	27,14
2008 - 2013	556.159	72,86
Total	763.287	100,00

Source: The authors.

During the pre-implementation period of Simples Nacional, the total number of non-optant companies was 114,101. Following the policy implementation from 2008 to 2013, this figure increased to 157,304 companies, which represents a growth of 37.9%. In parallel, there was a substantial surge in the number of companies that chose to opt for the simplified tax regime, indicating an elevated level of adherence among companies (328.8%). These observations suggest that the law has created favorable conditions for the formalization of previously informal companies, as indicated in Table 3

Table 3 - Cross Frequency Distribution (Category x Period)

Treatment (Simple national)	Time		Percent Change	Total
	2003 - 2007	2008 - 2013		
Non-Optant	114.101	157.304	37,9%	271.405
Optant	93.027	398.855	328,8%	491.882
Total	207.128	556.159	168,5%	763.287

Source: The authors.

Table 4 presents the summary statistics of ICMS payment and revenue of MSEs in the state of Ceará between 2003 and 2013. The average ICMS payment for MSEs during this period was R\$ 8,414.72, while the average revenue was R\$ 219,699.00. It is worth noting that both variables exhibit a considerable degree of variability, as evidenced by their large standard deviations.

The present analysis reveals that, on average, purchases made by MSEs within the state of Ceará amounted to R\$ 128,310.10, although considerable variation exists in these amounts across individual enterprises. Similarly, purchases made by firms outside the state had an average value of R\$ 63,712.11, while those made from foreign sources had a substantially higher average value, reflecting both the prevailing exchange rate and the nature of the imported goods or services.

Table 4 - Descriptive Statistics of Variables for the Period from 2003 to 2013

VARIABLES	OBSERVATIONS	MEAN	STANDARD DEVIATION	MIN	MAX
ICMS	763287	8.414,72	41.324,78	0	7.559.314,00
REVENUE	763287	219.699,00	474.632,10	0	4.605.770,00
IN-STATE PURCHASES	763287	128.310,10	1.169.899,00	0	901.000.000,00
OUT-OF-STATE PURCHASES	763287	63.712,11	548.293,80	0	191.000.000,00
FOREIGN PURCHASES	763287	2.147.199,00	617.557,90	0	488.000.000,00

Source: The authors.

3.2 ECONOMETRIC APPROACH

To examine the effects of the Simples Nacional policy on the revenue of Micro and Small Enterprises (MSEs) and the payment of ICMS in the state of Ceará from 2003



to 2013, the basic differences-in-differences model was employed for two periods using a panel data structure. The use of panel data is advantageous in controlling for unobserved characteristics that remain constant over time and may be correlated with explanatory variables in the model (WOOLDRIDGE, 2008).

The panel data approach can be implemented using different estimation methods, such as the pooled model, the fixed effects model, and the random effects model. The pooled model assumes that the effects of the explanatory variables are homogeneous across all individuals in the sample, while the fixed effects model takes into account the individual-specific differences by including individual-specific intercepts in the model. In this way, the fixed effects model can control for unobserved heterogeneity that is constant over time. The Fixed Effects model is represented by the expression below:

$$Y_{it} = \alpha_i + \beta X_{it} + u_{it} \quad (1)$$

Where:

Y_{it} is the dependent variable; α_i represents the individual-specific intercept, X_{it} represents the explanatory variables and u_{it} is the stochastic error term.

The Random Effects model entails the incorporation of individual heterogeneity as an intrinsic aspect of the error term in estimation. The model is expressed as follows:

$$Y_{it} = \alpha + \beta X_{it} + (\eta_i + u_{it}) \quad (2)$$

Where:

$\alpha_i = \alpha + \eta_i$ and η_i represents the unobservable individual random effect. That is, random effects models consider the constant not as a fixed parameter, but as an unobservable random parameter.

The main difference between the two models lies in the way they handle the individual differences. Specifically, the Fixed Effects model assumes that the

discrepancies among individuals are accounted for by the constant part, while the Random Effects model considers these distinctions to be an inherent component of the error term..

3.2.1 Difference-in-Differences (DID)

The Difference-in-Differences (DID) technique has proven to be suitable for evaluating public or private policies. Initially proposed by Ashenfelter and Card (1985), this method consists of a double subtraction calculation process: first, the difference between the averages of the outcome variable before and after an event or policy implementation is calculated for both the treatment and control groups; then, the difference between these differences is computed for both groups. In this context, the treatment group represents the group directly impacted by the policy action, while the control group represents the group that was not affected by the same policy. This procedure is represented below.

Table 5 - Summary of the Difference-in-Differences Method

	Before (B)	After (A)	Difference (A-B)
Treatment	\bar{Y}_0^T	\bar{Y}_1^T	$\bar{Y}_1^T - \bar{Y}_0^T$
Control	\bar{Y}_0^C	\bar{Y}_1^C	$\bar{Y}_1^C - \bar{Y}_0^C$
Differences between Treatment and Control (T-C)	$\bar{Y}_0^T - \bar{Y}_0^C$	$\bar{Y}_1^T - \bar{Y}_1^C$	$(\bar{Y}_1^T - \bar{Y}_1^C) - (\bar{Y}_0^T - \bar{Y}_0^C)$

Source: The authors.

The DID approach serves to compare the effects of a policy by contrasting a group that was exposed to it with another group that was not. Nonetheless, the suitability of the control group as a comparison base may be hampered by disparities between the groups. To overcome this issue, the method incorporates pre-existing differences between the groups. Moreover, the availability of information concerning both groups prior and subsequent to the policy is crucial for its successful application.

The objective is to evaluate the impact of a program on a treatment or outcome variable Y . Given that there are two groups indexed by the treatment status $T = 0,1$, where 0 denotes individuals who do not receive treatment (the control group), and 1 denotes individuals who receive treatment (the treatment group).



Each observation in the sample is indexed as $i = 1, \dots, N$. Thus, the outcome variable Y_i , which in this case is represented by the revenue of MSEs or the payment of ICMS, is modeled by the following equation:

$$Y_i = \alpha + \beta T_i + \gamma t_i + \delta(T_i \cdot t_i) + \varepsilon_i \quad (3)$$

Where:

α is the intercept; β is the specific effect of the treatment group that explains the average permanent differences between treatment and control; γ is the common time trend between the control and treatment groups; δ is the true treatment effect, and ε_i is the random error term that contains all the determinants of Y_i that the model omits.

The fundamental aim of program evaluation is to obtain the estimator of δ . However, prior to this, the estimator that is based on the difference in the mean of the dependent variable Y_i before and after the application of policy must be taken into account solely for the treatment group.:

$$\hat{\delta}_1 = \bar{Y}_1^T - \bar{Y}_0^T \quad (4)$$

Taking the expectation of this estimator:

$$E[\hat{\delta}_1] = E[\bar{Y}_1^T] - E[\bar{Y}_0^T] = \gamma + \delta \quad (5)$$

It means that this estimator will be biased when $\gamma \neq 0$. It means that there is a time trend on the dependent variable Y_i that could be part of the policy effect on the treatment group.

Subsequently, it is necessary to contemplate the estimator that compares the difference between the means of Y_i during the post-treatment period (after policy



implementation) for the treatment and control groups, disregarding the pre-treatment outcomes (before policy application).

$$\hat{\delta}_2 = \bar{Y}_1^T - \bar{Y}_1^C \quad (6)$$

Taking the expectation of this estimator:

$$E[\hat{\delta}_2] = E[\bar{Y}_1^T] - E[\bar{Y}_1^C] = \beta + \delta \quad (7)$$

Similarly to the case in equation 5, this estimator is biased when $\beta \neq 0$. In this case, there are differences in the means of Y_i between the treatment and control groups after policy application. However, the real effect of the policy will be confounded by permanent differences between the treatment and control groups that existed before any policy. The DID estimator, $\hat{\delta}_{DD}$, is defined as the difference in the mean of the dependent variable in the treatment group between the period before and after policy application, $(\bar{Y}_1^T - \bar{Y}_0^T)$, minus the difference in the mean of the control group between the period before and after policy application, $(\bar{Y}_1^C - \bar{Y}_0^C)$.

$$\hat{\delta}_{DD} = \bar{Y}_1^T - \bar{Y}_0^T - (\bar{Y}_1^C - \bar{Y}_0^C) \quad (8)$$

Taking the expectation of this estimator, it can be established that it is unbiased, as it follows:

$$E[\hat{\delta}_{DD}] = E[\bar{Y}_1^T] - E[\bar{Y}_0^T] - (E[\bar{Y}_1^C] - E[\bar{Y}_0^C]) = \delta \quad (9)$$

Rearranging the terms in equation (8), the DID estimator can be interpreted as the difference estimator between the current value \bar{Y}_1^T for the treated group and the value \bar{Y}_{cf}^T



that would occur after the policy application period if the treatment group had not been exposed to that policy, which means if \bar{Y}_{cf}^T behaved like a counterfactual (cf) of \bar{Y}_1^T .

$$\bar{Y}_{cf}^T = \bar{Y}_0^T + (\bar{Y}_1^C - \bar{Y}_0^C) \quad (10)$$

Thus, the DID estimator is given by:

$$\hat{\delta}_{DD} = \bar{Y}_1^T - \bar{Y}_{cf}^T \quad (11)$$

It is important to emphasize that the counterfactual \bar{Y}_{cf}^T does not exist, as the name itself implies, it is a theoretical construct that is impossible to observe or measure because the treatment has already been administered. Nevertheless, it is feasible to construct an unbiased estimator of \bar{Y}_{cf}^T that provides a reasonable approximation to the hypothetical outcome by utilizing a sample that resembles the treatment group as closely as possible to account for the differences between the two groups that emerge after the policy intervention.

In order to assess the impact of a policy change, it is crucial to identify appropriate groups for comparison. In the case of evaluating the effect of Simples Nacional on MSEs, the treatment group would consist of MSEs that have chosen to opt-in to the program, while the control group would comprise of MSEs who have not chosen to participate, despite being eligible. It is important that the groups have similar characteristics, such as being at the same revenue level, and the only distinguishing factor being their decision to opt into the program. This approach enables an unbiased evaluation of the policy effect.

3.2.2 Model Specification

In line with the objectives outlined in this study that aim to evaluate the effects of Simples Nacional on the collection of the tax on the circulation of goods and services (ICMS) and on the revenue of micro and small enterprises (MSEs), two difference-in-

differences (DID) models will be employed. The first model, as demonstrated in equation (12), features the revenue of MSEs as the dependent variable, while the second model, presented in equation (13), employs the payment of ICMS in real values at 2013 prices as the dependent variable.

$$\begin{aligned} \log(Fat_{it}) = & C + \beta_1 * (dTreatment)_{it} + \beta_2 * (dTime)_{it} + \beta_3 \\ & * (dTreatment * dTime)_{it} + \beta_4 * D_{CSit} + \beta_5 * D_{JAGit} \\ & + \beta_6 * D_{RMit} + \beta_7 * D_{NORit} + \beta_8 * D_{NTit} + \beta_9 * D_{SERit} \\ & + \beta_{10} * D_{SULit} + \gamma X_{it} + \varepsilon_{it} \end{aligned} \quad (12)$$

$$\begin{aligned} \log(ICMS_{it}) = & C + \beta_1 * (dTreatment)_{it} + \beta_2 * (dTime)_{it} + \beta_3 \\ & * (dTreatment * dTime)_{it} + \beta_4 * D_{CSit} + \beta_5 * D_{JAGit} \\ & + \beta_6 * D_{RMit} + \beta_7 * D_{NORit} + \beta_8 * D_{NTit} + \beta_9 * D_{SERit} \\ & + \beta_{10} * D_{SULit} + \gamma X_{it} + \varepsilon_{it} \end{aligned} \quad (13)$$

Where:

$\log(Fat_{it})$ is the logarithm of the revenue of the MSEs; $\log(ICMS_{it})$ is the logarithm of the ICMS payment of company i in period t ; $(dTreatment)_{it}$ is a binary variable for the treatment group; $(dTime)_{it}$ is a binary variable that takes the value 1 if the information is up to the year 2007 and 0 if it is for the period after 2007; $(dTreatment * dTime)_{it}$ is the product of the two previous variables; a set of binary variables represent the mesoregions of the Ceará state, namely, South Center (D_{CSit}), Jaguaribe (D_{JAGit}), Metropolitan Region of Fortaleza (D_{RMit}), Northwest (D_{NORit}), North (D_{NTit}), hinterlands (D_{SERit}) and South (D_{SULit}); X_{it} is a vector of covariates that directly impact the outcome variable, such as the origin of the purchases made by the companies, whether in the state, outside the state, or abroad, Average Years of Education of Employees, Unemployment Rate, Gini Index, and Real Average Remuneration of MSE Employees.

4 RESULTS OF ECONOMETRIC ESTIMATES

The parameters were estimated by applying the panel data technique using robust estimation with heteroskedasticity correction and random effects. Notably, the coefficient of interest in this study is the interaction between the binary variables of time versus treatment, represented by, β_3 . This coefficient provides a measurement of the impact of

the Simples Nacional policy or the difference-in-differences coefficient on the revenue and ICMS payment by micro and small businesses in the Ceará state.

4.1 RESULTS FOR THE IMPACT OF THE SIMPLES NACIONAL ON THE REVENUE OF MSE'S

Table 6 displays the results of the models that have been estimated through various methods, namely, Ordinary Least Squares (OLS), fixed effects, and random effects. All the models provide a consistent outcome for the difference-in-differences (DID) estimator.

The first result to highlight is that the estimated coefficient is positive and exhibits statistical significance, indicating that the group that adopted the new tax regime experienced an increase in revenue. This finding is consistent with the hypothesis proposed in this study. Moreover, the more robust methods utilized for this analysis, namely fixed and random effects, resulted in a larger effect.

Table 6 - Results of estimates for MSEs Revenues

Variables	OLS	Fixed Effects (FE)	Random Effects (RE)
DTime	-0.219 (-1.71)	-0.134 (-0.49)	-0.316 (-1.21)
DTreatment	-0.377*** (-3.85)	-0.629*** (-3.43)	-0.619*** (-3.61)
Time x Treatment	0.459*** (4.01)	0.964*** (4.96)	0.924*** (5.09)
In-State Purchases	0.248*** (14.55)	0.314*** (20.14)	0.313*** (21.06)
Out-State Purchases	0.215*** (16.82)	0.260*** (18.35)	0.259*** (19.20)
Foreign Purchases	0.108*** (11.32)	0.088*** (8.11)	0.083*** (8.09)
Years of Education	0.429 (1.50)	-0.080 (-0.14)	0.366 (0.63)
Unemployment Rate	0.097 (1.85)	0.104 (1.02)	0.095 (0.94)
Gini Index	-4.368	1.913	-5.139



	(-1.22)	(0.28)	(-0.66)
Real Average Remuneration	-1.721	0.697	-1.994
	(-1.75)	(0.74)	(-0.98)
D_South Center	0.413*		0.284
	(2.24)		(0.65)
D_Jaguaribe	0.525*		0.416
	(2.46)		(1.14)
D_Metropolitan Region	1.010***		0.900***
	(8.03)		(3.45)
D_Northwest	0.536***		0.373
	(3.52)		(1.19)
D_North	0.657***		0.483
	(3.78)		(1.42)
D_South	0.666***		0.477
	(4.67)		(1.54)
Constant	16.840**	-3.304***	18.584
	(2.62)	(-98.05)	(1.35)
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N	2.424	2.292	2.424
R^2	0.445	-	-
R^2 Overall		0.374	0.433
R^2 Between		0.525	0.653
R^2 Within		0.726	0.371

Source: prepared by the authors based on the results of the estimates.

Note: the values in parentheses refer to the t-statistic.

The variables pertaining to firm purchases, namely, in-state purchases, out-state purchases, and foreign purchases, exhibit a positive and statistically significant impact on the average level of revenue among micro and small enterprises between 2003 and 2013. This outcome implies that more dynamic firms in terms of their purchases of production factors tend to achieve higher revenue levels.

Moreover, it is noteworthy that the effect of revenue growth was significantly more prominent in companies situated in the metropolitan region compared to those in other regions. This impact can potentially be explained by spillover effects resulting from certain characteristics that are stronger in this region. Specifically, the metropolitan region has a high concentration of companies and factories, which contributes to its relatively more dynamic nature.

In contrast, the variables related to the unemployment rate, years of schooling, Gini coefficient, and average workers' earnings, did not demonstrate any significant impact, despite their expected sign alignment.

4.2 RESULTS FOR THE IMPACT OF THE SIMPLES NATIONAL ON ICMS PAYMENT OF MSE'S

Table 7 displays the outcomes of the models computed with the tax on goods and services (ICMS) as the dependent variable. The difference-in-differences (DID) coefficient, estimated through the models, showed a negative and statistically significant impact. The obtained results suggest that the implementation of the National Simple policy led to a reduction in ICMS payment, ranging from 8.5% to 11.2% throughout the analyzed period.

Table 7 - Results of estimates for MSEs ICMS payments

Variables	OLS	Fixed Effects (FE)	Random Effects (RE)
Dtime	0.132*** (9.58)	0.175*** (9.52)	0.157*** (8.19)
DTreatment	0.003 (0.35)	0.036*** (4.20)	0.036*** (4.22)
Time x Treatment	-0.085*** (-7.16)	-0.112*** (-10.49)	-0.109*** (-10.17)
In-State Purchases	0.106*** (74.74)	0.108*** (86.27)	0.108*** (86.44)
Out-State Purchases	0.668*** (459.03)	0.662*** (615.46)	0.662*** (615.53)
Years of Education	-0.440*** (-16.53)	-0.506*** (-12.94)	-0.448*** (-10.16)
Unemployment Rate	-0.080*** (-16.18)	-0.067*** (-8.47)	-0.075*** (-9.01)
Gini Index	-2.970*** (-8.48)	-1.846*** (-3.81)	-2.932*** (-5.02)
Real Average Remuneration	0.150 (1.61)	0.665*** (10.19)	0.243 (1.59)
D_South Center	0.000		-0.065



	(0.04)		(-1.14)
D_Jaguaribe	0.052***		-0.001
	(4.84)		(-0.03)
D_ Metropolitan Region	0.558***		0.357***
	(73.24)		(6.13)
D_Northwest	0.028***		-0.054
	(3.33)		(-1.30)
D_North	0.212***		0.218***
	(20.87)		(4.92)
D_South	0.142***		-0.050
	(16.19)		(-1.04)
Constant	3.522***	0.007	2.875**
	(5.72)	(0.73)	(2.83)
N	339550	339366	339550
R ² Overall	0.595		
R ² Between		0.581	0.593
R ² Within		0.931	0.829
R ² Overall		0.657	0.561

Source: prepared by the authors based on the results of the estimates.

Note: the values in parentheses refer to the t-statistic.

This paper examines the variables that reflect the value of purchases made by micro and small businesses within and outside the state of Ceará, Brazil, which play a crucial role in determining the level of tax payment by these enterprises. The findings reveal that both variables have a positive and statistically significant impact on the increase in ICMS tax paid by micro and small businesses.

In contrast to the previous analysis, it was found that the education level of employees, unemployment rate, and average worker wages have a statistically significant impact on the ICMS payment by micro and small businesses.

The present study has identified that the Simples Nacional program has been beneficial for micro and small businesses, leading to a surge in revenue while simultaneously reducing ICMS payment. Our findings confirm the hypothesis that the Simples Nacional program has a positive impact on the revenue of micro and small businesses while having a negative impact on ICMS payment for participating firms.

Furthermore, we have identified the mesoregions that contributed the most to this difference in ICMS payment.

5 FINAL REMARKS

The study has yielded notable findings pertaining to the variables of interest. In particular, the implementation of the Simples Nacional policy has been associated with a rise in the revenue of micro and small businesses as compared to non-participants, as well as a decrease in the payment of ICMS.

In terms of magnitude, the study's estimates indicate that the implementation of the Simples Nacional policy resulted in a significant increase in revenue for micro and small businesses, with a range of 45.9% to 96.4%. Moreover, the study also found that this policy led to a reduction in the payment of ICMS by participating companies, ranging from 8.5% to 11.2%. It is important to emphasize that the reduction in tax payment refers to a decrease in taxes paid by individual businesses, and not necessarily implies in a reduction in aggregate tax revenue collected by the government.

To complement the analysis present in the end of the previous paragraph, another noteworthy finding is the increase in formalizations of businesses, which is one of the main objectives of the tax simplification policy. Although this result was derived from descriptive statistics, it is still significant as the data used in this research is unpublished.

This study underscores the importance of evaluating public policies as tools for decision-makers. The authors recommend that future research should extend the analysis to other approaches, including the consideration of spatial dependence. Despite the challenges encountered in selecting variables for the econometric models due to limited data availability, the data on businesses' revenues, which are not publicly accessible, represents one of the salient features of this study.

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