


Analysis of the impact of public inspections disclosure on the economic growth of Brazilian municipalities


Análise do impacto da divulgação de fiscalizações públicas no crescimento econômico dos municípios brasileiros

Análisis del impacto de la divulgación de las inspecciones públicas sobre el crecimiento económico de los municipios brasileños

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Abstract

The disclosure of inspection findings by public control bodies has the potential to cause impacts on public management. Since there was a gap in the economic consequences of these control bodies, this research used the Brazilian case to verify the extent to which the effect of the disclosure of inspection reports affects local governments' economic dynamics. Using data from Brazilian municipalities, panel models were estimated to ascertain the impact of the various types of disclosure of public inspection findings on municipal economic growth. The results show that the disclosure of inspection reports with critical failures negatively affected the economy of Brazilian municipalities. These results contribute to the debate regarding disclosure in the work of public control bodies. In the field of accounting, the results presented here have the potential to impact public inspection rules, procedures, and their relationship with its auditees, to mitigate adverse economic effects.

Keywords: Disclosure; Fiscal Policy; Economic Growth

Resumo

A divulgação de resultados de fiscalizações por órgãos públicos de controle tem potencial para causar impactos na gestão pública. Como havia uma lacuna nas consequências econômicas da atuação desses órgãos, esta pesquisa utilizou o caso brasileiro para verificar em que medida o efeito da divulgação dos relatórios de fiscalização afeta a dinâmica econômica dos governos locais. Usando dados de municípios brasileiros, modelos de painel foram estimados para verificar o impacto dos vários tipos de divulgação de resultados de fiscalizações públicas sobre o crescimento econômico municipal. Os resultados mostram que a divulgação de relatórios contendo falhas críticas afetou negativamente a economia dos municípios brasileiros. Esses resultados contribuem para o debate a respeito da atuação desses órgãos de controle. No campo da contabilidade, os resultados aqui apresentados têm potencial para impactar as normas, procedimentos de fiscalização pública e sua relação com os seus auditados, de forma a mitigar efeitos econômicos adversos.

Palavras-chave: Divulgação; Política Fiscal; Crescimento Econômico

Resumen

La divulgación de los resultados de inspecciones por parte de los organismos públicos de control tiene el potencial de causar impactos en la gestión pública. Dado que hubo una brecha en las consecuencias económicas de estos órganos de control, esta investigación utilizó el caso brasileño para verificar hasta qué punto el efecto de la divulgación de informes de inspección afecta la dinámica económica de gobiernos locales. Utilizando datos de los municipios brasileños, se estimaron modelos de panel para determinar el

impacto de los diversos tipos de divulgación de resultados de inspección pública sobre el crecimiento económico municipal. Los resultados muestran que la divulgación de informes de inspección con fallas críticas afectó negativamente la economía de municipios brasileños. Estos resultados contribuyen al debate sobre la divulgación en el trabajo de los órganos públicos de control. En el campo de la contabilidad, los resultados aquí presentados tienen el potencial de impactar las reglas y procedimientos de inspección pública y su relación con sus auditados, con el fin de mitigar los efectos económicos adversos.

Palabras clave: Divulgación; Política Fiscal; Crecimiento Económico

1 Introduction

This work aims to analyze the degree of effects of the disclosure reports made by Comptroller-General Office (hereafter CGU) on local governments' economic growth, using the case of Brazilian municipalities.

We noted that the disclosure of public audits impacts the behavior of managers and stakeholders. Gustavson & Sundström (2018) pointed out that better communication between public control bodies and citizens lowers the perception of corruption. Nor, Hudaya, & Novriyandana (2019) used data from Indonesian financial statements from local governments to test whether audit opinion affects publication on websites, finding that it had a positive impact. Oh & Lee (2022) research showed that external audits elevate public managers' perception of red tape (bureaucracy dysfunctionalities), and Avis, Ferraz, & Finan (2018) examined municipalities where local media is present and are close to other ones that were visited by CGU auditors, testing if that is related to a reduction in corruption levels. They found a 7.5% of reduction. Yet, property tax revenues increase when audit reports do not show mismanagement and decrease when they point to faults (Timmons & Garfias, 2015).

Regarding the effects of disclosure in private sector, we verify that there is a relationship between quality of audits and possible investment losses (Chen, Jiang, & Zhang, 2018); also, that the degree of corporate governance of European audit companies improves investor confidence (La Rosa, Caserio, & Bernini, 2019), as well as the disclosures provided by auditors and managers contain different information values; however, they are the same object. Moreover, the inclusion of visual elements improves the assessment of investors (Dennis, Griffin, & Zehms, 2018), and disclosure of vulnerabilities in internal controls impacts the share price (Hammersley, Myers, & Shakespeare, 2008; Espahbodi & Espahbodi, 2019), for example. These pieces of evidence are essential to show that the degree of information that we have about a company and in a broader dimension, an organization, influences the behavior of stakeholders concerning it, and impacts even their economic performance.

However, there are no studies in the researched literature on the effects of the disclosure of failures detected in CGU's inspections on the economic growth of municipalities. With this in mind, the present study seeks to explore parallels between the effects observed in the economy regarding the disclosure of relevant information and their impacts on municipal public administration, verifying whether disclosures provided by municipal inspection reports impact the economic growth of these local governments.

This matters because public audit institutions refuse to disclose their adverse effects (Cordery & Hay, 2019), and the benefits they produce must be considered by matching the potential losses they cause due to inappropriate approaches or methods. So, this research is useful for discussing how public audit bodies have worked.

For accounting, this research brings knowledge about the effects of disclosure, showing brand new potential outcomes of audit opinions linked with the economic outcomes.

2 Theoretical References

2.1 Disclosure and audit

Disclosure comprises the act or action of publicizing all information deemed relevant to the investment decision making of the economic agents involved, allowing everyone to have equal access to the same set of facts. In order to ensure adequate disclosures, institutions hire auditing companies. Besides contributing to the improvement of their internal controls, auditing companies are also responsible for analyzing and criticizing the published information. Additionally, audits also promote disclosure when they disclose material facts not published by the entity's management. Therefore, it is imperative to analyze research on this topic.

The studies conducted by Espahbodi & Espahbodi (2019) and Hammersley et al. (2008) explore market reactions around disclosure in private companies. The former analyzes the impact of United States regulations around mandatory information disclosure in audits of internal controls of small businesses. The authors showed that there was a negative cumulative abnormal return of these companies when compared to medium and large firms and concluded that shareholders negatively assess the absence of relevant information, regardless of the size of the company. The second study measures the effects of material

weakness disclosure on companies' internal controls and stock price. From a sample of 377 disclosures, the authors econometrically isolated the effects of other disclosures to focus on the issue of internal controls. It was found that the effects of material weaknesses are significant when they interact with the severity of the weakness. It was also found a set of studies that involve the assessment of the market in relation to auditors' independence (Ashbaugh, LaFond, & Mayhew, 2003; Chen et al., 2018; Francis & Ke, 2006; Frankel, Johnson, & Nelson, 2001). All these show that the market observes information besides disclosure, such as quality with the independence of their assessments.

Additionally, it is worth mentioning other works that focus on the impacts of audit opinion. Dennis et al. (2018) found that the value the market gives to the opinion of managers and auditors is different, and when auditors use visual resources in their reports, there is a greater guarantee of protecting stock prices of audited firms. Managers are encouraged to promote greater transparency in their disclosures to mitigate the effects of audit disclosures. Also, the degree of corporate governance of European audit firms improves investors' confidence (La Rosa et al., 2019). Geiger & Kumas (2018) showed that the change of auditors' opinion influences the position of institutional investors, causing them to price this change and increase stock sales. These studies show that auditors' opinion is influential in the market and, ultimately, for the economy of each company. Since managers have conflicting interests with investors, auditors evaluate, test, and qualify the information provided by managers to avoid principal-agent problems.

Also, because this study focuses on public administration, it is important to verify whether there is an effect on the public sector parallel to that observed in the private sector. In order to produce a good scientific hypothesis, it is better to also examine the effects of the disclosure of auditors in the public sector.

Nogueira & Jorge (2017) argues that the existence of audit opinion that comes from internal controls makes financial statements more useful for public managers and politicians. Adi & Gusti (2020) showed that audit opinions do not significantly affect elements of local government transparency. Nor et al. (2019) evidenced a positive impact of audit opinion on the publication of Indonesian financial statements on websites. Koval, Nazarova, Hordopolov, Kopotiienko, Miniailo, & Diachenko (2019) discuss the role of public audits in the investor's confidence in the economic security of the State relating to disclosure of audit opinion on supporting public institutions.

We found that there is a line of research that looks over the effects of disclosure on corruption. External audits elevate public managers' perception of red tape (Oh & Lee, 2022), and red tape implies in corruption and low private investment (Bhattacharya & Mukherjee, 2020; Zhao, Wang, Ning, Ju, & Mu, 2022). Municipalities closer to others that have local media and were previously visited by CGU auditors experienced a 7.5% reduction in corruption levels (Avis et al., 2018), pinpointing the disclosure effects amplified by media vehicles. Gustavson & Sundström (2018) study showed that better communication between public control bodies and citizens lowers the perception of corruption. Lewis & Hendrawan (2019) found that without public audit opinion disclosure, levels of corruption increase in Indonesian local governments. In this line, Vargas & Schlutz (2016) reported that financial disclosure regulation reduces corruption levels between countries. It's worth remembering that Mauro (1995) stated that corruption lowers economic growth. So, public disclosure made by auditors, even in an indirect way, can affect economy.

Another set of papers focuses on the impacts of disclosing critical failures on CGU reports. The study conducted by Zamboni & Litschig (2018) shows that local authorities reduce deviations in acquisitions in response to increased audit risk. Hence, the potential disclosure of findings has a behavioral effect. Ferraz & Finan (2011) and Ferraz & Finan (2008) found an effect on municipal voters' behavior: there were fewer reports of critical failures in municipalities where mayors could be re-elected, which shows that disclosure also impacts the political environment. The Timmons and Garfias (2015) study found evidence that revenues from the Urban Property Tax in Brazil (IPTU) rises with audit reports that have no disclosures of weaknesses and serious management failures, and falls when revealed corruption increases.

However, we did not identify impacts on municipal economies, especially on their economic growth. But, just like in the private sector, disclosure in public administration may lead to economic consequences that need to be analyzed.

In light of this exposure, this work aims to accomplish this task, and the following hypothesis is stipulated:

Hypothesis H₁: The disclosure promoted by inspection reports of public auditors in municipalities impacts their economic growth.

2.2 Fiscal factors and municipal economic growth

In order to isolate the effects of disclosure on municipal economic growth, it is necessary to study and analyze the primary factors that influence it. Thus, this section describes fiscal policies and their impacts on municipal economic growth, as well as fiscal adjustment and budget deficits which are two of the factors related to growth.

After Solow (1956) and Swan (1956) published their works on investment-based economic growth models, Barro (1990) extended the same models. He added government fiscal policies, naming them as "endogenous growth models", given the existence of internal budgetary components to the GDP movement.

Also, the defense of government action as an inducer of productivity in the private sector was included in several other studies (Aschauer, 1989; Ram, 1986; Rebelo, 1991; Romer, 1986). From this, other authors studied how the composition of government revenues and expenses could explain or be related to the economic growth of these entities. Thus, Kneller et al. (1999) used the studies carried out by Mendoza, Milesi-Ferretti, & Asea (1997) to classify taxes and fees into “distortionary” and “non-distortionary”, and Devarajan et al. (1996) to classify expenditure into “productive” and “unproductive”. Based on the OECD countries, the empirical results showed that non-distortionary taxes and productive expenditures (according to the authors’ classification) provided positive variation in the GDP rate. Barro (1991) studied developed and developing countries and found that education expenditure, added to private sector investments, contributed to economic growth.

However, such studies have countries as observational units. Therefore, it is crucial to verify what takes place in local governments. Glaeser et al. (1995) found that local spending has a positive relationship with income. Quigley (1998) states that productive diversity in cities also has a positive relationship with income. Chen & Feng (2000) found that education spending is beneficial to the growth of local Chinese governments. In addition, fiscal decentralization contributes positively to local growth (limi, 2005; Stansel, 2005). Hasan et al. (2009) demonstrated that the protection of property rights is also positive for local economic growth.

In relation to Brazilian local governments, it appears that investments contribute to growth (Rodrigues & Teixeira, 2010); spending on public services, such as health, education, and assistance, is positive for the municipalities (Bogoni, Hein, & Beuren, 2011; Degenhart, Vogt, & Zonatto, 2016).

Besides studies related to economic growth based on endogenous components, it is necessary to highlight research on the internal dynamics of these components, which are also at a federative level of local governments (Bessho & Ogawa, 2015; Buettner, 2009; Buettner & Wildasin, 2006; Solé-Ollé & Sorribas-Navarro, 2008). These studies are essential as a source of evidence for the adjustments in the deficit components made by municipal managers. They show the need to adapt to the dynamic shocks of each component, showing that managers also adjust these according to external shocks and that these components converge in a balance in the long term.

Thus, there is a theoretical connection with the effects of disclosure discussed in the previous section, for the disclosure of inspection reports is an example of such external shocks. Several studies in the private sector showed that auditors’ performances shape managers’ behavior in the item “manipulation of earnings” (Chen, Lin, & Zhou, 2005; Francis, Maydew, & Sparks, 1999; Gerayli, Yanesari, & Ma’atoofti, 2011; Krishnan, 2003). Furthermore, government audit reports have an important impact on public sector accountability (Reichborn-Kjennerud, 2013). In other words, additional disclosures promoted by audits do influence management behavior.

3 Methodology and Empirical Analysis

To test our formulated hypothesis presented in Section 2.1, we examined the Brazilian routine of federal inspections on municipalities because of the federal government’s obligatory transfers to the local level, considering that Brazilian laws determine this commitment. In this sense, it is important, first, to illustrate how these routines are operationalized.

3.1 Brief description of how CGU works

The Brazilian Comptroller-General Office (CGU), through the Federal Internal Control Secretariat (SFC), performs two basic types of control actions: audits and inspections. The former aims to evaluate public management, detecting failures and causes, as well as proposing improvements in its management processes. In other words, it seeks to promote the effectiveness and efficiency of public management. Since CGU cannot intervene in the management of other governmental entities, only federal entities suffer audits. The latter aims to verify whether the objects of government programs do exist, correspond to the established specifications, meet the needs for which they were defined, and are consistent with the conditions and characteristics intended. Hence, inspections have a more “police-like” character when compared to audits, and they characterize auditors as “watchdogs.” They are usually carried out by other federal entities, such as municipalities. Therefore, the object of this study is the inspection of disclosures.

Inspection records were made in an information system called “Novo Ativa”¹ (CGU has a new information system called e-Aud, which appended Novo Ativa records by data migration). When inspection teams finish conducting inspections and have inspection findings in hand, duly supported by evidence recorded in working papers, they start feeding the records that compose the reports. These records were classified into some categories. One of them refers to the severity of findings, a typology adequately explored in this study. It can be classified into three labels: formal failures (non-compliance with legal formalities); medium failures (management problems without losses, deviations, and damages); and critical failures (serious deficiencies in the internal controls of a municipality, point out losses, deviations, and losses). It’s also important to point out that this classification was taken only until 2016. Since then, CGU has

stopped to disclose these labels in reports, which makes the data from 2002 until 2016 the most comprehensive data available. This research considers these classifications made by CGU staff as a variable of interest, not relying upon self-made classifications that are present in some parts of related literature (Brollo, 2008; Ferraz & Finan, 2008; Ferraz & Finan, 2011; Mondo, 2016).

When reading the reports written by the interested agents (Public Prosecutor, parliamentarians, citizens, market, and other stakeholders), they are faced with the texts and with the classifications of failures found. This information is called disclosure, i.e., additional information on municipal management promoted by inspection reports.

As for studies that use CGU's data to quantify and explain corruption, the following caveat is worth mentioning: information collection bias. Firstly, the teams do not perform the same procedures or use the same criteria for sampling, which makes comparisons of quantitative corruption between municipalities doubtful, and such comparisons occur in several studies on this subject Brollo & Troiano (2016); Ferraz & Finan (2011); Ferraz et al. (2012); Mondo (2016); Timmons & Garfias (2015); Zamboni & Litschig (2018). Furthermore, the number of reports found, which are the primary measures for assessing corruption used by the aforementioned authors, change according to each auditor's writing style, given that reports often report two serious failures related to the same object (e.g., same bidding). Secondly, the definitions of corruption is changed from author to author in an arbitrary (and often non-transparent) way, making the results of each survey unparalleled. Also, CGU is an administrative body and has no legal or normative force to charge anyone with corruption crimes, unlike the Federal Police (PF), which has the means to detect and characterize bribes and deviations and has the consent of the Judiciary to do so.

For all these reasons, we decided to focus on the aspects of disclosure, in which the effects analyzed center only on aspects related to the municipal administrative structure, without attempting to quantify complex concepts, such as corruption.

3.2 Data

We obtained the data for this research from the records of three government agencies: IBGE, STN, and CGU. IBGE data contain information on the economic growth of municipalities per year. STN data provide information on municipal financial execution per year, as well. The data also include expenses incurred by the Legislative, Judiciary and Executive branches of each entity. Such public bodies maintain active repositories for consultation and extraction². Therefore, the STN data provide the necessary information for the representation of the municipal fiscal policy, and the IBGE data contribute to the information on economic growth.

These data are available for a wide period. However, only the period from 2002 to 2016 was used, since STN data before 2002 would imply an improper accounting between productive and unproductive expenses, as some functional portfolios were joint (e.g., Education and Culture), and despite IBGE and STN data being available until 2019, as already explained, CGU data imposes limitations on recent data available provided by STN and IBGE. Thus, financial data refer to year-end balances and expenses paid. Also, they have undergone adjustments and treatments set out in Table 1.

The financial records were brought to the values for the 2016 period as this is the last year of the available base. We excluded outliers and linear interpolation data because STN technicians gave information about the existence of errors and inaccuracies in the data declared by municipal administrations. We inserted the financial data in relation to the GDP of each municipality. Therefore, expenses and taxes are represented by the proportion of their GDP. The dependent variable was transformed according to the formula in the last line of Table 1 to reflect its growth rate.

Table 1
Summary of treatment of STN and IBGE data

Treatment	STN data	IBGE data
Deflation by the IPCA, brought to present values in 2016	Yes	Yes
Exclusion of outliers by the Inter Quartile Range (IQR) method	Yes	No
Linear interpolation of the series, by municipality	Yes	No
Division by municipal GDP	Yes	No
Calculation of the Growth Rate by the formula $GR = (Y_t/Y_{t-1} - 1) * 100$	No	Yes

Source: Elaborated by the authors.

Moreover, expenditures included in the STN bases were classified as "productive" and "unproductive", and taxes/fees as "distortionary" and "non-distortionary", as proposed by Kneller et al. (1999). Table 2 shows the accounting classifications for the approximation of this proposal. In relation to

disclosure, we obtained the data from CGU's Novo Ativa system, which records audit findings and inspections carried out by the agency's auditors. The data are grouped by year and municipality for the same periods of the STN and IBGE records. Then, they are summarized by the number of work orders³ per municipality group/year. Then, data were filtered so that only the inspections in municipalities, related to the Random Audits Anti-Corruption Program (PFSP) and Municipality-Facing Auditing Program (FEF)⁴, remained.

Inspections resulting from demands from other Brazilian control bodies, such as MPF, PF, and the Judiciary, were not included, for the CGU does not disclose the respective reports. As for the interpretation of CGU's data, an important caveat is in order: what is under analysis is the disclosure of detected failures and not their real quantity, since part of them will always remain uncovered. CGU could never measure this parameter correctly, since it does not audit all municipalities, and it does not do so for all periods covered in the scope of this study. Furthermore, CGU's auditors do not have the tools or the operational capacity to detect all failures in municipal public management. Finally, failures disclosed in inspection reports are the result of collective interpretations by the teams and supervisors of the control staff. However, there is no means to standardize the understanding of what a failure is, whether medium or critical. The variables represent an average understanding of what constitutes a medium or critical management failure.

Table 2

Theoretical aggregation of functional classifications

Theoretical classification	Functional classification	Brazilian functions and budgetary classifications
Distortionary taxes	Taxation on revenue and profit	Not applicable
	Social security contributions	Social contributions
	Labor and income taxes	Not applicable
	Property taxes	IPTU
Non-distortionary taxes	Taxes on goods and services	ISSQN
Other tax revenues	Other revenues	Difference between revenues totals and those already pointed out
Productive expenditures	General expenditures for public services	Sanitation, Labor
	Defense	Public security expenditures*
	Educational expenses	Education
	Health expenses	Health
	Housing expenses	Housing
	Transport and communication expenditures	Transport, Communications
Unproductive expenditures	Social Security and social assistance	Pension expenditures, Assistance
	Recreation	Leisure, Sports expenses
	Expenses with economic services	Commerce, Industry, Agriculture
Other expenditures	Other expenditures (not classified)	Difference between total expenditures and those already pointed out

Notes: The classifications in the last column are those present in the classifications provided by the budget manuals of the Brazilian government regarding revenues and functional classifications of expenses.

* Public security expenditures are included since they contribute to the preservation of property rights (Barro, 1990).

Source: Elaborated by the authors, adapted from Kneller et al. (1999).

3.3 Variables description

From the data treatments presented in Section 3.2, and according to the classifications proposed in Table 2, variables were designated to represent them. The IBGE data on the variation of GDP (Δ_{GDP}) appears as the model-dependent variable. The summary of the data can be found in Table 3.

The variable Value Added from Private Sector (VAP) was obtained by adding the GDP for agricultural, service/trade and industrial production⁵ divided by the total municipal GDP. The variable Δ_{pop} was encoded taking the percentage changes⁶ in the local population, as done with the dependent variable (same calculation formula).

The quantities of medium and critical failures were coded by their effective count, grouped by respective municipality and year. Additionally, a dummy variable (Visit) was coded to indicate whether a specific municipality was inspected in the respective year, labeling 1 (one) when the municipality suffered inspection process and 0 (zero) when not, i. e., the mean value of 0.075 indicates that this is the proportion of municipal inspections taken by CGU along the period of the study.

Table 3
Summary of variables used in this research

Variable	n	Mean	Std.Err.	Min.	Max.	CV
ΔGDP	81,952	6.144	28.527	-120.830	5,760.227	4.643
Transfers (%GDP)	81,952	18.255	15.440	-613.547	2,774.547	0.846
Productive expenditures (%GDP)	81,952	10.839	8.546	-170.670	1,544.487	0.788
Unproductive expenditures (%GDP)	81,952	1.807	2.175	-90.624	458.561	1.204
Other expenditures (%GDP)	81,952	5.664	4.727	-221.814	843.074	0.835
Distortionary taxes (%GDP)	81,952	0.280	0.655	-4.021	91.837	2.337
Non-distortionary taxes (%GDP)	81,952	0.354	1.784	-123.288	393.983	5.032
Other taxes (%GDP)	81,952	0.161	0.530	-91.705	25.676	3.288
Δpop	81,952	0.935	4.725	-76.675	274.517	5.051
VAP	81,952	79.240	25.671	-4,668.957	1,069.012	0.324
Qty. medium failures	81,952	2.573	22.700	0.000	896.000	8.821
Qty. critical failures	81,952	0.440	5.612	0.000	416.000	12.745
Visit (<i>dummy</i>)	81,952	0.075	0.264	0.000	1.000	3.503

Source: Elaborated by the authors.

3.4 Model specifications

Based on the databases presented in the previous subsection, we propose an analysis model of municipal economic growth. This analysis model is measured by the variation of its local GDP, which is explained by the effects of disclosure and fiscal policies. Panel estimation techniques are better suited to the structure of these data. Furthermore, it is necessary to carry out tests to verify the best and most reliable specifications, in order to avoid the disclosure of biased and inefficient estimates.

Thus, we performed Dickey-Fuller augmented tests for panel data as proposed by Choi (2001) and Demetrescu, Hassler, & Tarcolea (2006) for the variable GDP. All tests indicated the series was stationary. Chow tests were also carried out to verify the homogeneity of the coefficients between the panel's observational units (municipalities), which failed to reject the null hypothesis, indicating that pooling data is feasible.

The test proposed by Hausman (1978) indicated that fixed effects models are more appropriate. The Breusch & Pagan (1980) tests indicated heteroscedasticity of the residuals. In order to circumvent this model assumption that was not observed, covariance matrices were calculated using the method proposed by White (1980). Based on the theoretical elaborations and the configuration of the collected data, the following equation is defined:

$$\Delta GDP_{it} = \alpha + \sum_{j=1}^m \beta_j X1_{it} + \sum_{k=1}^n \beta_k X2_{it-1} + \sum_{l=1}^o \beta_l X3_{it-1} + u_{it} \quad (1)$$

Where:

X1 is a matrix of control covariates,
 X2 is a matrix of fiscal covariates, and
 X3 is the matrix of disclosure covariates.

It was considered that the fiscal variables only produce economic effects in the year following their execution since that is when economic agents become aware of their balances and values. This happens in the vast majority of Brazilian municipalities where financial transparency is still precarious (Michener, Contreras, & Niskier, 2018; Raupp & de Pinho, 2016); and the few sources of information come from financial reports defined and mandated by law, which are only available in the following year.

The use of lagged variables in regression is also present in other studies (Acemoglu, Moscona, & Robinson, 2016; Blinder & Watson, 2016; Nunn & Qian, 2014). Additionally, and for similar reasons, the disclosure variables, components of the X3 matrix, were also lagged in one year. As explained in Section 3.1, decision making by federal managers is not immediate, nor the preparation of consolidated reports. Therefore, the effects of measures taken at the federal level and possible market reaction to the disclosures can only become definite in the following year.

4 Results and Discussion

Table 4 shows the results of the first analysis of the research, related to the impacts of disclosure promoted by CGU's municipal inspection reports. The coefficients showed that the effects of disclosure are statistically significant. However, only the disclosure of critical failures has effects on economic growth, as we

can see in both models. The statistically insignificant coefficient for the variable *Visit* in the pooled model indicates indifference regarding the audit opinion. Thus, the linear hypothesis that $H_0: \beta_{\text{medium failures}} = \beta_{\text{critical failures}} = \beta_{\text{visit}} = 0$ through a Wald test was made. The F statistic of the test presented a value of 3.68 for 3 degrees of freedom, causing a p-value of 0.01216. This incurs and enforces the acceptance of the hypothesis proposed in Section 2.1 as true because these coefficients are significantly different from 0 (zero).

The results suggest that the economic agents and stakeholders in charge of the managing of the municipalities do not appreciate the disclosure of deviations, losses, and misuse of public resources in the municipality of interest, for it a fact that produces negative effects even in the short term. This may be due to the confounding between these deviations and corruption by these stakeholders, causing the rise of corruption perception, lowering investors' confidence (Koval et al., 2019), and consequently, prejudicating the economy (Mauro, 1995). It's important to assert that critical failures do not imply corruption by CGU's definitions, but this orientation is not free from misinterpretation. Another hypothesis of these negative economic growth effects caused by critical failures disclosure comes from Oh & Lee (2022) research on red tape perception. Since external audits imply more perception of red tape by public employees, maybe it also raises other stakeholders' perceptions, also implying corruption and low private investment (Bhattacharya & Mukherjee, 2020; Zhao et al., 2022).

These findings are corroborated by Timmons and Garfias (2015) study. Taking fiscal contract theory as background, when citizens perceive mismanagement acts disclosure on CGU inspection reports, they refuse to pay taxes (IPTU in this case).

Table 4

Pooled and fixed effects regression models for the dependent variable Δ_{GDP} and effects of disclosure of CGU's inspection reports

	Models	
	Pooled	Fixed effects
Constant	-8.805 (7.013)	-
Distortionary taxes _{t-1}	-2.604 (1.924)	-0.559 (1.605)
Non-distortionary taxes _{t-1}	5.286 (1.881)**	-0.224 (0.418)
Other taxes _{t-1}	0.957 (1.553)	0.110 (1.367)
Transfers _{t-1}	-1.360 (0.383)***	0.250 (0.094)**
Productive expenditures _{t-1}	1.736 (0.438)***	1.614 (0.120)***
Unproductive expenditures _{t-1}	5.258 (1.737)**	1.838 (0.249)***
Other expenditures _{t-1}	1.559 (0.433)***	1.658 (0.115)***
Δpop	0.319 (0.036)***	0.247 (0.030)***
VAP	0.005 (0.079)	-0.013 (0.060)
Qty. medium failures _{t-1}	0.009 (0.008)	0.002 (0.006)
Qty. critical failures _{t-1}	-0.046 (0.016)**	-0.041 (0.015)**
Visit (<i>dummy</i>) _{t-1}	0.676 (0.749)	1.469 (0.704)*
R ²	0.384	0.517
Adj. R ²	0.384	0.480
Num. obs.	76,453	76,453
Chow test	F= 0.74477	p-value= ~1,000
Hausman test	$\chi^2 = 11638$, df= 12	p-value= ~0,000

*** p < 0.001; ** p < 0.01; * p < 0.05

Source: Elaborated by the authors.

Notes: Standard errors in parentheses, with covariance matrices calculated by the method proposed by White (1980).

Table 4 shows that distortionary taxes don't have significant effects on economic growth, but expenditures do. And, without taxes to fund expenditures, mayors can't sustain growth. Looking for private sector references, this coefficient agrees with the studies that appoint to the impacts of disclosing management problems (Hammersley et al., 2008; Geiger & Kumas, 2018).

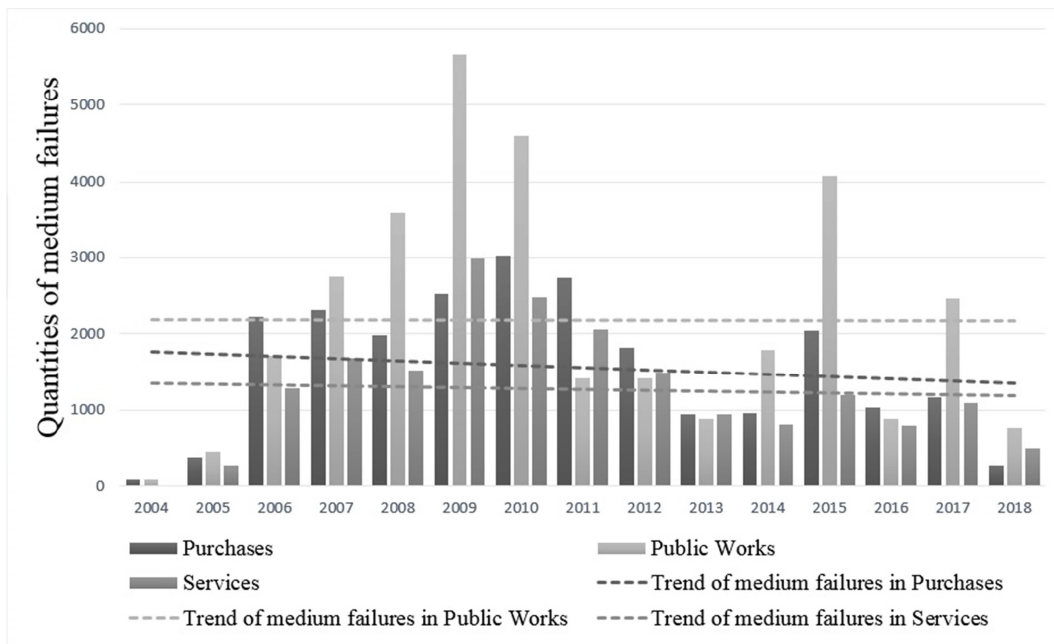
Visit effect can be explained in light of the provided information about financial management by mayors. Audit opinion has a positive impact on the publication of financial statements (Nor et al, 2019) and, since information is available, it's more useful for public managers and politicians (Nogueira & Jorge, 2017), increasing investors' confidence (Koval et al., 2019) since there some qualified information is at hand. Additionally, it's in line with research made by Avis et al. (2018), where cities closer to previously visited ones show a reduction in corruption, and, since inspection reports promote a new kind of communication with citizens, it can potentially lower corruption perception (Gustavson & Sundström, 2018).

According to the results of the model in Table 4, if a given inspection report of a municipality *i* in a period *t-1* contains a number of 25 critical failures or more, that municipality will have a 1% negative variation negative 1% of its GDP in *t* just due to this disclosure, keeping the other variables constant.

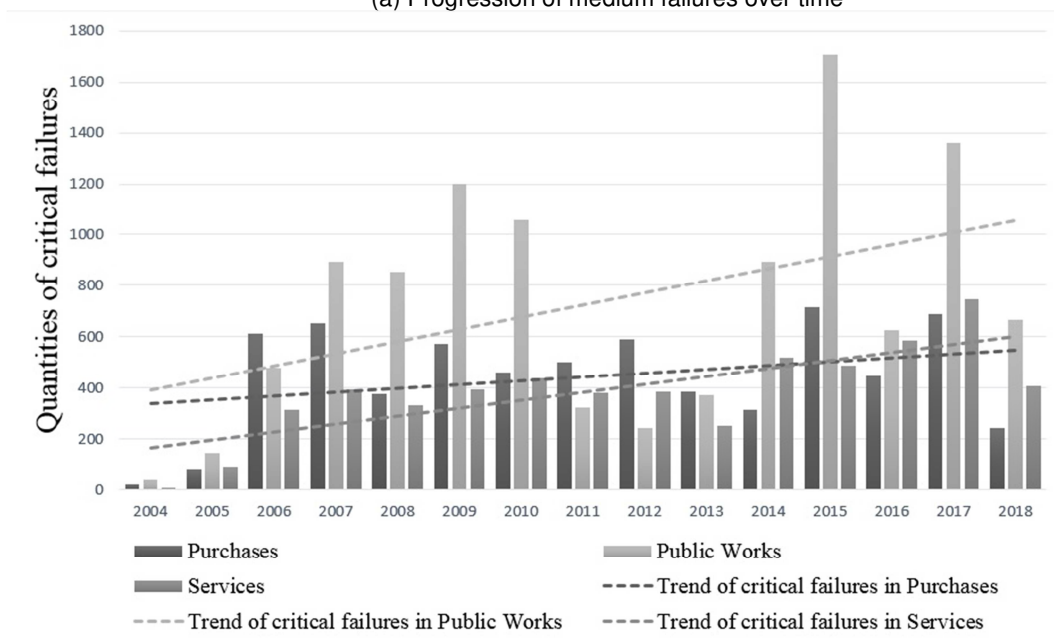
CGU's data, seen alone, show that 7.2% of the municipalities visited had 23 or more critical failures. The other coefficients of the models behave according to the theoretical predictions in Kneller et al. (1999). Thus, non-distortionary taxes imply positive average GDP growth. Expenditures also work in this direction, whereas, contrary to predictions, unproductive expenditures contribute more to growth than productive ones.

It should also be noted that intergovernmental transfers imply negative growth in the models, which may be due to the low administrative capacity of more than 70% of Brazilian municipalities not being able to collect enough to balance their accounts. Consequently, municipalities with low tax capacity would also have a low capacity to use their incoming transfers to convert them into GDP growth.

As mentioned before, the disclosure of critical failures negatively impacts municipal economic growth. However, there is still an additional explanation as to why critical failures cause negative impacts and are not observed in medium failures. Figure 3 shows that there is a tendency to increase the disclosure of critical failures (Figure 3 (b)), notably in public works, where the linear trend curve has a greater slope. Despite examining the scales of the ordinates' axes, evidence shows a higher number of medium failures reported, which would explain some negative impact on spending.



(a) Progression of medium failures over time



(b) Progression of critical failures over time

Figure 3 – Progression and trends of medium and critical failures, by type of object inspected

Source: Elaborated by the authors.

Thus, with a noticeable drop in the findings involving purchases, the trend of medium failures is possibly being interpreted by managers and even by the market as something without deleterious effects on

municipal management (Espahbodi & Espahbodi, 2019; Hammersley et al., 2008).

Despite the positive effects of the publicity given to these findings, the results of both models show that they are harmful to municipal economies, due to decisions made based on the findings disclosed. Moreover, because of this process, the procedures adopted end up punishing an entire population and should be reconsidered. Therefore, it is necessary to combat mismanagement and waste to preserve municipal accounts and their economic dynamics.

5 Conclusion

This study aimed to analyze the impacts of disclosure of inspection reports in municipalities. Therefore, the Brazilian case of federal inspections on local governments was examined. The concept of disclosure was measured by the quantitative of medium and critical failures disclosed by CGU. This information was collected in municipal panels and visits to each municipality between 2002 to 2016.

Also, this study sought to contribute to the investigation of effects on the economic growth of municipalities after disclosing these findings. In order to better understand how these effects work, we also considered the impacts of fiscal policies. Here, they are represented by the revenues and expenditures of each municipality.

Results showed that that medium failures do not cause economic losses. However, critical failures do, which contribute to a decrease in GDP, making our hypothesis true. Consequently, municipal economies are also affected by and suffer from the disclosure of CGU's inspection reports. These results contribute to the Disclosure Theory. It reveals that information related to bad administration and wrongdoing is causing poor economic growth and for discussions on how to properly disclosure bypass this negative effect. Also, these findings bring to debate the real necessity of supervision of public inspections since the record of a finding is a mere audit staff opinion until it takes the institution's support, and bad evidence supporting critical failures may lead a municipality to an unjust economic decrease.

The main limitation of this study is the lack of data and information on the perceptions of managers and market agents about the reports issued by CGU, which can contribute to understanding how critical failures disclosure operates in lowering economic growth. Therefore, future research in this sense is desirable, to deepen the understanding of the mechanisms that operate to negatively impact the economy of municipalities that have had critical failures disclosed. Also, another limitation relies on using Finbra and Siconfi data sources, which are declarative and do not present strong internal controls on public accounting as the federal accounting system does.

Finally, this research contributes to the debate on disclosure levels prompted by inspection reports that have been published. Also, it sheds light on failures and mismanagement notes, but for their due corrections to be made while preserving municipal economic dynamics. These measures are necessary to avoid harming taxpayers, who finance institutions to serve them.

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Data analysis: W. B. Menke

Discussion of results: W. B. Menke, I. R. Gartner

Review and approval: I. R. Gartner

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The dataset that supports the results of this study is not publicly available.

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Notes

¹The information system was shutdown in 2018, and the records migrated to e-Aud.

²Data prior to 2012 were collected from the FinBra database and those from 2013 onwards from the SICONFI database.

³Work orders are internal documents of the CGU that records: the type of work (whether audit or inspection), the scope of the work, the procedures to be performed, the government area that will be subject to the control action (health, education, infrastructure, etc.), the field period, among others. In each visit to a municipality, CGU usually issues more than one service order.

⁴Both are public programs held by CGU that choose municipalities at random for inspections.

⁵Excluding only the GDP values for the activity of the municipal Public Administration.

⁶ $\Delta_{pop} = Population_t / Population_{t-1} - 1 * 100$