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Use of public resources and audit observations in local governments

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This research analyzes the relationship between the use of municipal resources and the results of oversight processes, considering the volume, complexity, and remediation of audit observations issued by the Office of the Comptroller General of the Republic for the period 2017-2024. A descriptive correlational, longitudinal, and exploratory design was used, covering all 345 municipalities in Chile. The study examined the association between the level of executed budgetary expenditure and dependent variables, such as the number of audit reports and observations, their complexity, and the degree of remediation. The results showed positive and statistically significant associations among the variables. Moderate correlations were identified between expenditure and the number of reports and observations, and strong correlations between the latter and their remediation. Although the adjusted R^2 values were low and results should be interpreted accordingly, the regression models confirmed a positive and significant effect of expenditure on all dependent variables, thereby validating the proposed hypotheses. The pandemic period also exhibited a significant incidence, demonstrating its effect on oversight and the generation of observations. The findings indicate that higher expenditure is associated with a greater number and complexity of observations, as well as a greater number of remediated observations. This study contributes to understanding the link between the use of public resources and control and accountability mechanisms in Chilean municipal management.
Keywords: local governments; irregularities; audit findings; public spending.

Uso de recursos públicos e achados de auditoria em governos locais

O objetivo desta pesquisa foi analisar a relação entre o uso dos recursos municipais e os resultados dos processos de fiscalização, considerando o volume, a complexidade e o saneamento das observações de auditoria emitidas pela Controladoria-Geral da República no período de 2017-2024. Adotou-se um delineamento descritivo-correlacional, longitudinal e de caráter exploratório, abrangendo os 345 municípios do Chile. O estudo concentrou-se em examinar a associação entre o nível de despesa orçamentária efetivamente paga e variáveis dependentes como

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o número de relatórios e observações de auditoria, sua complexidade e seu grau de saneamento. Os resultados evidenciaram associações positivas e estatisticamente significativas entre as variáveis. Em particular, identificaram-se correlações moderadas entre a despesa e o número de relatórios e observações, e correlações fortes entre estas últimas e o respectivo saneamento. Embora os valores do R^2 ajustado tenham sido baixos e os resultados devam ser interpretados em função desse indicador, os modelos de regressão confirmaram um efeito positivo e significativo da despesa sobre todas as variáveis dependentes, validando as hipóteses formuladas. Adicionalmente, o período pandêmico apresentou incidência significativa, destacando seu efeito sobre a fiscalização e a geração de observações. Em conjunto, os achados indicam que maiores níveis de despesa se associam a maior quantidade e complexidade de observações, bem como a um maior número de observações saneadas. Este estudo contribui de maneira substantiva para a compreensão do vínculo entre o uso de recursos públicos e os mecanismos de controle e prestação de contas na gestão municipal chilena.
Palavras-chave: governos locais; irregularidades; observações de auditoria; gasto público.

Uso de recursos públicos y observaciones de auditoría en gobierno locales

El objetivo de esta investigación fue analizar la relación entre el uso de los recursos municipales y los resultados de los procesos de fiscalización, considerando el volumen, la complejidad y la subsanación de las observaciones de auditoría emitidas por la Contraloría General de la República de 2017 a 2024. Se utilizó una metodología descriptiva-correlacional, de corte longitudinal y carácter exploratorio, considerando las 345 municipalidades de Chile. El estudio se centró en examinar la asociación entre el nivel de gasto presupuestal pagado y variables dependientes como el número de informes y observaciones de auditoría, su complejidad y su grado de subsanación. Los resultados evidenciaron asociaciones positivas y estadísticamente significativas entre las variables. En particular, se identificaron correlaciones moderadas entre el gasto y el número de informes y observaciones, y correlaciones fuertes entre estas últimas y su subsanación. Aunque los resultados deben interpretarse en función del coeficiente de determinación ajustado fueron bajos, los modelos de regresión confirmaron un efecto positivo y significativo del gasto en todas las variables dependientes, validando las hipótesis planteadas. Asimismo, el período de pandemia mostró una incidencia significativa, destacando su efecto en la fiscalización y en la generación de observaciones. En conjunto, los hallazgos indican que un mayor gasto se asocia con una mayor cantidad y complejidad de observaciones, así como con un mayor número de observaciones subsanadas. Este estudio contribuye significativamente a la comprensión del vínculo entre el uso de los recursos públicos y los mecanismos de control y rendición de cuentas en la gestión municipal chilena.
Palabras clave: gobiernos locales; irregularidades; observaciones de auditoría; gasto público.

1. INTRODUCTION

In recent years, corruption has permeated multiple levels of society, emerging as a critical challenge for economic development and governance on a global scale (Boufounou et al., 2024), and fostering a high degree of distrust regarding the management and use of public resources (Martínez et al., 2020).

Within this framework, municipal governments aim to improve residents' quality of life (Torres & Salazar, 2020), given that cities' capacity to provide services and public infrastructure directly depends on their fiscal health (Jiménez et al., 2024). In this regard, the literature concurs that oversight aimed at detecting irregularities can deter misconduct and promote organizational transparency (Cheliatsidou et al., 2023). Nevertheless, with respect to audit and oversight processes, empirical evidence on their outcomes and findings remains limited (Paananen et al., 2021). Accordingly, this study makes a significant contribution by examining the use of public resources through the lens of audit observations issued by the Comptroller General of the Republic of Chile (CGR).

At the international level, the literature has focused on three lines of study. The first investigates the financial health of local governments based on contextual variables, such as gender and the composition of the municipal council, among others (Antulov et al., 2021; Balaguer & Ivanova, 2021; Martínez et al., 2020; Nakhmurina, 2024; Ritonga, 2014). A second set of research focuses on identifying the factors that trigger the occurrence of corruption crimes at the local level (Bauhr et al., 2019; Britto & Fiorin, 2021; Cuadrado et al., 2022; De Blasio et al., 2022; Meza & Pérez, 2021), while a third focus centers on the analysis of mechanisms for preventing these events, including the strengthening of internal control and greater female representation in local governments (Avis et al., 2018; Bauhr et al., 2019; Boufounou et al., 2024).

In Chile, research on local governments has primarily focused on analyzing efficiency in the use of public resources as a function of political alignment or ideology between the local and central governments (Acuña et al., 2019; Martínez et al., 2020). Scholars have also examined the capacity to generate own-source revenues (Torres & Salazar, 2020), the effect of public spending on reelection processes (Ortega et al., 2015), and fiscal decentralization as a tool to prevent corruption (Soto, 2021). However, to date, there are no studies that examine in depth the relationship between the use of public resources and audit observations in the Chilean case.

In this context, the role of the Comptroller General of the Republic of Chile (CGR) in overseeing the use of public funds is fundamental, as it is the body responsible for ensuring regulatory compliance within municipal administration (Decreto n° 2.421, 1964). Among its most salient functions, the CGR conducts audits and periodic oversight reviews and issues observations that reveal deficiencies in financial and administrative management, whose level of complexity may vary (Resolución n° 10, 2021). In recent years, control over municipal resources has gained particular prominence; between 2017 and 2024, there was a significant increase in the detection of irregularities (Contraloría General de la República de Chile, 2023a). Nevertheless, despite efforts to strengthen oversight and improve accountability, relevant challenges persist.

Moreover, a review of leading scholarly databases, such as Web of Science and Scopus, identified only one study that examines the relationship between audit reports/opinions and the financial condition of local governments. Conducted in the South African context, this work links audit outcomes for local governments to financial indicators (Mabelane et al., 2023).

Building on the above, this study positions itself within a substantive research gap by addressing an underexplored domain (Paananen et al., 2021). Moreover, the available evidence differs markedly from the Latin American context and, in particular, from the Chilean case (Acuña et al., 2019): its results are neither conclusive nor generalizable, due to the institutional and socioeconomic factors incorporated into the analyses, and, to the best of current knowledge, it does not link audit process outcomes with the financial management of local governments (Soto, 2021). Likewise, the present research is situated in an emerging region and country, with economic and cultural characteristics specific to Latin America and to Chile, where the study of audit opinions in the public sector remains incipient. Additionally, this work contributes to institutional theory by examining how coercive, normative, and mimetic pressures shape the legitimacy of the use of public resources (Christensen, 2012; Mättö & Sippola, 2016). Finally, no prior studies have been identified that analyze local government management while jointly incorporating variables such as the timing of the pandemic, the gender of the local authority, and political alignment.

Accordingly, this study analyzes the relationship between the use of municipal resources and the outcomes of oversight processes, considering the volume, complexity, and degree of remediation of audit observations issued by the Comptroller General of the Republic of Chile (CGR) during 2017-2024. The analysis examines how the level of identified observations is associated with factors related to budgetary management, supervisory controls, and accountability processes in municipalities. This rests on the premise that external control or oversight mechanisms, together with an understanding of the factors that drive such deficiencies, help reduce the likelihood and impact of potential irregularities in local governments (Mudzamba et al., 2020; Silva et al., 2024).

Finally, the findings of this study may have relevant implications for management and public policy design, as they show that the level of budgetary expenditure positively and significantly affects audit processes. In this regard, the results can support decision makers in determining the allocation of resources to oversight activities, taking into account the volume of executed spending and the complexity of municipal operations. In this way, the present research helps strengthen the understanding of the relationship between local financial management and the external control exercised by oversight bodies. Lastly, the article is structured as follows: first, the literature review is presented; second, the methodological aspects are described; third, the main results are reported; subsequently, the discussion is developed; and finally, the conclusions and implications of the study are presented.

2. LITERATURE REVIEW

In what follows, we review the literature that underpins this study, focusing on the role of oversight of the use of public resources, the regulatory framework that governs such processes, and the relationship between audit observations and municipal management.

2.1. The role of oversight in the prevention and detection of irregularities

The literature converges on the view that reporting and detecting irregularities operate as instruments that deter misconduct and promote organizational transparency (Cheliatsidou et al., 2023). From institutional theory, and more recently from the so-called new institutional theory (Polzer, 2022), these mechanisms are understood to exert coercive, normative, or mimetic pressures, associated with learning and emulation among municipalities, that prompt public organizations to align their resource-use practices with expectations of legitimacy (Mättö et al., 2019; Mättö & Sippola, 2016). These pressures seek to address questions about the success or failure of reforms, as well as the unintended consequences and unmet expectations of public agencies (Aksom & Vakulenko, 2024; Christensen, 2012). In this sense, institutional theory provides a framework for understanding how supreme audit institutions and local governments adopt practices that, beyond formal compliance, aim to legitimize the use of public resources before citizens and other stakeholders.

In this context, oversight is closely linked to mechanisms of transparency, accountability, and reporting within public sector entities (Cheliatsidou et al., 2023). Internationally, several studies have underscored its importance. In the case of Greece, Boufounou et al. (2024) show that control mechanisms have been fundamental in combating corruption and fostering economic development. For Spain's Autonomous Communities, Vela-Bargues et al. (2022) find a significant relationship between the conduct of external audits and organizational transparency levels; however, they caution that neither transparency nor auditing alone reduces corruption levels in the Spanish context. Finally, Avis et al. (2018) examine the extent to which government audits conducted in Brazil can reduce the occurrence of irregularities and find that having been audited in the past decreases the probability of future corruption by approximately 8 percent.

With respect to the entities responsible for oversight, they play a fundamental role in the prevention and detection of irregularities by strengthening accountability and transparency in the use of public resources (Dajruch, 2020). Their work goes beyond conducting financial, compliance, or performance audits and incorporates approaches aimed at standardizing audit processes (Organización para la Cooperación y el Desarrollo Económico [OCDE], 2017). In Latin America, the modernization of oversight has been driven by open government policies, anticorruption initiatives, the use of digital technologies, and the decentralization of public services (Ciucci et al., 2019). Along these lines, the Comptroller General of the Republic of Chile (CGR) has chosen to strengthen transparency, improve access to public information, and optimize accountability (Aninat, 2020). Likewise, in the realm of preventing financial crimes, the evidence shows that proactive forensic measures, together with the use of blockchain technologies and artificial intelligence, constitute key tools to reduce irregularities in the management of public resources (Arthur et al., 2024).

Finally, although oversight bodies are recognized as guarantors of accountability, there has been little in-depth analysis of how findings from public audits influence the financial management of local governments or the extent to which they help strengthen their institutional legitimacy, revealing a research gap in this area.

2.2. The regulatory framework for the oversight of public resources

At the international level, the International Organization of Supreme Audit Institutions (INTOSAI) sets guidelines for public sector auditing and promotes good governance practices (International Organization of Supreme Audit Institutions [INTOSAI], 2022). Within this framework, supreme audit institutions are expected to adhere to these standards, which guide the oversight of financial management in public institutions (Moreno, 2016) and structure the audit process into three phases: planning, execution, and reporting, with corresponding follow-up (INTOSAI, 2019).

In Chile, the Comptroller General of the Republic (CGR) is the body responsible for overseeing the use of public resources through compliance audits and financial audits, evaluating effectiveness, efficiency, and economy in the use of state funds (Resolución n° 10, 2021). In this context, Chairil et al. (2020) suggest that municipalities should have an Institutional Control Body. According to the rules governing audits conducted by the CGR (Resolución n° 10, 2021), the opinions issued can be classified as clean or with observations; in the latter case, the observations are considered remedied or not remedied depending on whether the responsible public entity has corrected them.

At the municipal level, the *Ley Orgánica Constitucional de Municipalidades* establishes that municipalities are autonomous public law corporations, with their own legal personality and assets, oriented toward meeting the needs of the local community and fostering its economic, social, and cultural development (Decreto con Fuerza de Ley nº 1, 2006; Ley nº 19.130, 1992). Chile currently has 345 municipalities and 346 communes, which manage their resources under the regulatory framework of that law and the *Marco Jurídico de las Municipalidades* (2018). Municipalities are responsible for preparing, approving, amending, and executing the municipal budget. This process begins with the mayor's formulation of the budget proposal, its approval by the Municipal Council, and its subsequent execution through the *Dirección de Administración y Finanzas* (Santana, 2017). Municipal assets are composed of contributions from the Regional Government, service charges, tax revenues, and fines, in addition to the Fondo Común Municipal, which functions as a redistributive mechanism for lower income municipalities (Decreto con Fuerza de Ley nº 1, 2006). Finally, the administration and allocation of these resources are governed by the Ley Orgánica Constitucional de Municipalidades, which defines the procedures for their collection and execution (Decreto nº 2.385, 1996). In this context, Cienfuegos et al. (2024) highlight that one of the main challenges for Chilean public administration is the modernization of municipalities, which requires strengthening their institutional and financial management capacities.

Finally, although a regulatory framework governs oversight and the use of public resources, a gap persists in the literature regarding its effectiveness for financial management, especially in local governments, drawing on the observations generated by oversight and control processes (Paananen et al., 2021).

2.3. Audit observations and the management of municipal resources

The financial health of local governments has been a source of concern for communities (Cuadrado et al., 2022; Nerantzidis et al., 2022), since their management directly affects cities' standing and residents' quality of life (Torres & Salazar, 2020). In this context, the literature has coalesced around three areas: (i) financial management (Antulov et al., 2021; Balaguer & Ivanova, 2021; Martínez et al., 2020; Nakhmurina, 2024; Ritonga, 2014); (ii) the occurrence of economic crimes (Bauhr et al., 2019; Britto & Fiorin, 2021; Cuadrado et al., 2022; De Blasio et al., 2022; Meza & Pérez, 2021); and (iii) the strengthening of control and prevention mechanisms (Avis et al., 2018; Boufounou et al., 2024).

With respect to the financial management area, Ritonga (2014), studying the financial condition of local governments in Indonesia, proposes 18 indicators grouped into six dimensions, constituting a comprehensive assessment to detect manipulation and fraud. Similarly, Antulov et al. (2021), analyzing 7,795 Italian municipalities using ten indicators, employ these to analyze and predict the probability of default among the evaluated municipalities. At a more aggregate level, Balaguer and Ivanova (2021) examine budgetary stability and the financial sustainability of Spanish municipalities as a function of the gender of the local authority and the composition of the municipal council. Finally, Nakhmurina (2024), studying the financial soundness of ten US states and its association with corporate governance, finds that the formalization of policies improves the financial indicators of the states analyzed.

With respect to the occurrence of economic crimes, De Blasio et al. (2022) use police records to predict corruption in Italian municipalities and correctly forecast more than 70 percent of the municipalities that experienced corruption episodes during 2012–2014. In turn, Meza and Pérez (2021) conduct over 50 interviews in two Mexican cities and conclude that corrupt schemes are highly adaptive and resilient, capable of circumventing formal anticorruption strategies. Moreover, using a sample of 140 Spanish municipalities, Cuadrado et al. (2022) find that low gender diversity on the municipal council is associated with revenue overestimation and expenditure underestimation for opportunistic purposes, thereby presenting a better financial position. Along the same lines, Bauhr et al. (2019), drawing on data from 182 regions in 20 European Union countries, show that greater female representation on local councils reduces corruption and even fosters the dissolution of male-dominated collusive networks. Finally, in the Latin American context, Britto and Fiorin (2021), using a regression discontinuity design in Brazilian municipalities, show that the size of the municipal council affects the levels of corruption detected by federal audits, given that each additional member may increase the incentives to divert public resources.

Regarding the strengthening of prevention and control mechanisms, Avis et al. (2018) analyze Brazil's anticorruption program, which is based on random audits of municipalities' use of federal funds, and find that having been previously audited reduces the probability of future corruption by increasing the nonelectoral costs associated with engaging in corrupt acts. In turn, Boufounou et al. (2024), drawing on surveys administered to Greece's oversight departments and using regression models, identify that staff competency, legislative compliance, interdepartmental collaboration, and the use of technologies strengthen internal control practices and mitigate corruption at the local level.

In Chile, Ortega et al. (2015) analyze the effects of municipal public spending as a determinant of mayoral reelection across the 346 communes in 2012 and, using logistic regressions, find a positive and significant relationship between the level of expenditure and the probability of reelection. In turn, Acuña et al. (2019) and Martínez et al. (2020) study, in different periods, the extent to which the mayor's political affiliation affects municipal policy outcomes. The former, employing panel data and a regression discontinuity design, finds no significant effects of political alignment on municipal spending, whereas the latter, using panel data and a fractional probit model, shows that the relationship between the central and local governments significantly impacts the efficiency of municipal management. In another dimension, Torres and Salazar (2020), with panel data for 93 cities and an ordered probit model with random effects, identify a positive effect of municipal expenditure, permanent revenues, and investment on cities' placement in the quality of life ranking. Finally, Soto (2021) explores alternatives for fiscal decentralization and, based on an equilibrium model, recommends asymmetric decentralization that accounts for economic and social differences among Chilean municipalities.

According to the main international databases, Web of Science and Scopus, only the study by Mabelane et al. (2023) has been identified that links audit observations with financial indicators in a South African context. This work analyzes 1,560 audit observations, of which 55 percent correspond to unqualified opinions, and uses 13 financial ratios drawn from 2012 to 2018 to build a model that predicts audit opinions in municipalities. Among the most influential predictors are the debt to operations ratio, the current ratio, and the operating surplus margin. The presence of a single investigation of this nature highlights a gap regarding the relationship between audit observations and the financial outcomes of local governments, an area about which very little is known (Paananen et al., 2021) and in which the literature remains limited and inconclusive (Barbera et al., 2020), with findings conditioned by country specific institutional and socioeconomic factors (Acuña et al., 2019; Soto, 2021). The present study addresses this gap from an emerging region, namely Latin America and, in particular, Chile, by examining the link between audit observations and the level of expenditure in local governments. In doing so, it contributes to institutional theory by speaking to the legitimacy of the use of public resources (Christensen, 2012; Mättö & Sippola, 2016). In this context, and in line with the literature review presented, the following research hypotheses are proposed.

- **H_1:** The level of expenditure has a positive and significant effect on the number of audit reports and audit observations.
- **H_2:** The level of expenditure has a positive and significant effect on the complexity of audit observations.
- **H_3:** The level of expenditure has a positive and significant effect on the resolution of audit observations.

3. RESEARCH METHODOLOGY

This research adopts a descriptive correlational design with a longitudinal and exploratory character, given the scarcity of prior studies on the object of analysis and the remaining questions concerning the behavior of the variables involved (Hernández et al., 2014). The study draws on the database of the Comptroller General of the Republic of Chile (CGR), as well as information on audit observations recorded in the CGR's *Observatorio Municipal* platform.

The analysis covers annual data for 2017–2024, with the aim of assessing differences in oversight and resource management across three specific periods: the pre pandemic period (2017-2019), the pandemic period (2020-2022), and the post pandemic period (2023-2024). This segmentation makes it possible to examine the impact of the public health crisis and its economic effects on the administration of municipal resources, as well as on the generation of audit observations.

The study population comprises Chile's 345 municipalities, distributed across 16 regions. According to records from the CGR's Municipal Observatory, 34,973 audit observations were identified during the period analyzed. In the same period, total budgetary expenditure amounted to 69 billion Chilean pesos, based on data from the same institution. Analyzing this information will make it possible to establish correlations among the variables under study and provide empirical evidence of their incidence in municipal financial management.

BOX 1 CLASSIFICATION BY SIZE

Category	Number of Municipalities	Frequency
Large	84	24.35%
Medium	56	16.23%
Small	205	59.42%
Total	345	100.00%

Source: Elaborated by the authors based on data from Article 5 of Resolution No. 178/2015 on the Procedure for the Allocation of Resources from the Municipal Management Improvement Incentive Fund (Resolución nº 178, 2015).

For this research, a classification was established for the communes in which the municipalities under study are located. This typology is based on Article 5 of *Resolución n° 178/2015*, which defines communal groups according to their development characteristics (Resolución n° 15, 2023). As shown in Box 1, there is a higher concentration of municipalities classified as small, representing 59.42 percent of the total. Large municipalities rank second at 24.35 percent, whereas medium sized municipalities account for 16.23 percent.

Next, Box 2 presents the definition, objective, and operationalization of each variable used in the models. For all regressions, the independent variable is the natural logarithm of budgetary expenditure actually paid, in order to approximate normality and facilitate comparison. Regarding the dependent variables, to test H_1 we consider the number of audit reports and the number of audit observations. For H_2, the dependent variable is the complexity of audit observations, defined as the proportion of each complexity category over the total. For H_3, the dependent variable is the percentage of remedied observations over the total. Finally, four control variables are established: the period in which the audit reports were issued, municipality size, mayor's gender, and political alignment; these control variables are grouped in .

BOX 2 DEFINITION AND OPERATIONALIZATION OF VARIABLES

Variable	Objective	Operationalization	Sources
Independent			
Natural Logarithm of Paid Budgetary Expenditure	Apply a logarithmic transformation to the paid budgetary expenditure of governmental entities to adjust the variable to a normal distribution and facilitate its comparison with the dependent variables.	Application of the natural logarithm to the amount of paid budgetary expenditure for each period in the municipalities.	Casa et al. (2022); Cajiao et al. (2014); Gutiérrez (2015)
Dependent			
(H_1) Number of Audit Reports and Observations	Quantify the number of audit reports and documented observations, reflecting potential regulatory noncompliance in municipal management.	Number of audit reports and observations during a given period.	Llumiguano et al. (2021); Muñoz (2017)
(H_2) Complexity of Audit Observations (Highly complex; Complex; Moderately complex; Slightly complex)	Assess the complexity level of audit observations by classifying them according to their impact and degree of regulatory noncompliance.	Percentage of audit observations categorized by complexity level.	Contraloría General de la República (2023a; 2023b); Resolución nº 2.524 Exenta (2023)

(Continue)

Variable	Objective	Operationalization	Sources
		Dependent	
(H_3) Resolved Findings	Determine the status of audit observations, evaluating whether they have been remedied or remain as uncorrected findings within the audit process.	Percentage of observations that have been remedied or remain unremedied.	Contraloría General de la República (2023a; 2023b); McKenzie and Marx (2024)
		Control	
Time Period (Pre-pandemic; Pandemic; Post-pandemic)	Analyze the evolution of the variables over time by differentiating three key periods (pre-pandemic, pandemic, and post-pandemic) in order to assess the effects of the health crisis on the management of municipal resources.	Time period classification: Pre-pandemic (2017 to 2019); pandemic (2020 to 2022); post-pandemic (2023 to 2024).	Afonso and Ribeiro (2020); Arnau and Bono (2008); Brookes et al. (2021); Delgado and Llorca (2004); Matailo et al. (2022)
Municipality (Size; Large; Medium; Small)	Analyze potential differences in resource management and audit observations based on the size of the municipal entity.	Classification of municipalities by size.	Resolución nº 15, (2023); Resolución nº 178 (2015)
Mayor's Gender (Female; Male)	Analyze the influence of the mayor's gender on municipal management.	Classification based on the mayor's gender.	Dirección de presupuestos (2022); Instituto Nacional de Estadísticas (2019)
Political Alignment with Central Government (Yes; No)	Analyze the impact of political alignment between the central government and municipalities on resource management and audit observations, based on whether the mayor belongs to a party in the ruling coalition.	Classification of the mayor's political alignment with the central government (same political bloc).	Ley Fácil (2022)

Source: Elaborated by the authors.

Next, we present the regression models used to evaluate the previously described hypotheses.

$$\mathbf{H_1}: Audit\ Report_{it}^{(**)} = \alpha + \beta_1 Ln\ of\ paid\ expenditure_{it} + \gamma' X_{it} + \varepsilon_{it}$$

Where:

(**) *Change in the Dependent Variable "Number of Audit Reports and Number of Audit Findings"*

$$\mathrm{H_1}: \beta_1 > 0 \mid \beta_1\ with\ \rho \le 0{,}05$$

$$\mathbf{H_2}: Complexity\ of\ audit\ findings_{it}^{(**)} = \alpha + \beta_1 Ln\ of\ paid\ expenditure_{it} + \gamma' X_{it} + \varepsilon_{it}$$

Where:

(**) *The dependent variable was adjusted to reflect the "complexity of audit findings", categorized into four levels: Highly Complex, Complex, Moderately Complex, and Slightly Complex*

$$\mathrm{H_2}: \beta_1 > 0 \mid \beta_1\ with\ \rho \le 0{,}05$$

$$\mathbf{H_3}: Resolution\ of\ Audit\ Findings_{it} = \alpha + \beta_1 Ln\ of\ paid\ expenditure_{it} + \gamma' X_{it} + \varepsilon_{it}$$

Where:

$$\mathrm{H_3}: \beta_1 > 0 \mid \beta_1\ with\ \rho \le 0{,}05$$

Finally, in a first stage, the data were analyzed to diagnose bivariate relationships and potential redundancies among predictors using Pearson's correlation, considering statistical significance of $\rho < 0.05$. Subsequently, the regressions were interpreted based on the adjusted R squared, which should be read in light of its magnitude; when it is low, the model explains only a limited share of the variation and the results should be interpreted with caution. Because regressions with control variables were estimated for each hypothesis, the objective was to identify associations rather than to establish causality. Statistical reliability was assessed with the Fisher F test for joint model significance and the Student t test for individual coefficients, adopting a significance level of $\rho < 0.05$, while acknowledging that significance does not imply causality. Finally, the Variance Inflation Factor (VIF) was estimated to detect multicollinearity among covariates and to prevent coefficient instability, thereby addressing potential biases and limitations of the statistical modeling.

4. RESULTS

This section begins with the presentation of descriptive statistics for the study variables, followed by the correlation matrix, and finally the results of the proposed models in relation to the stated hypotheses.

4.1. Gasto público y observaciones de auditoría: Estadísticos descriptivos

Table 1 presents the descriptive statistics for budgetary expenditure, the number of audit reports, and audit observations, categorized by their level of complexity. The average expenditure per municipality during the analyzed period is estimated at CLP 25.40 billion. Regarding the average number of audit reports issued per municipality, the figure was 0.70, while the average number of audit observations identified reached 12.70. It is worth noting that observations classified as complex were the most frequent in the dataset analyzed.

TABLE 1 DESCRIPTIVE STATISTICS

Variables	Mean	Standard Deviation	Minimum	Maximum
Budget Expenditure (in billions CLP)	25.40	33.10	0.40	389.60
No. of Audit Reports	0.70	1.10	0.00	16.00
No. of Audit Findings	12.70	25.40	0.00	384.00
No. of Highly Complex Findings	2.60	9.30	0.00	276.00
No. of Complex Findings	5.80	12.30	0.00	192.00
No. of Moderately Complex Findings	4.00	8.60	0.00	90.00
No. of Slightly Complex Findings	0.30	1.40	0.00	26.00
Resolved Findings	2.60	6.10	0.00	106.00
Study Population		2,750		
Adjusted Variables	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Natural Log of Budget Expenditure	23.50	1.00	19.80	26.70
% of Highly Complex Findings	9.50%	18.84%	0.00%	96.80%
% of Complex Findings	19.,20%	28.56%	0.00%	100.00%
% of Moderately Complex Findings	10.60%	18.87%	0.00%	100.00%
% of Slightly Complex Findings	0.40%	3.23%	0.00%	100.00%
Study Population		2,750		

Source: Elaborated by the authors.

On the other hand, based on the proposed models, the natural logarithm has significantly reduced the dispersion in municipal public expenditure, allowing for a more accurate interpretation of the data. Regarding audit observations, those classified as "Complex" are the most representative in the analysis, with a mean of 19.20%, followed by medium-complexity observations (10.60%) and high-complexity observations (9.50%), respectively. In contrast, low-complexity observations show minimal representation, with an average of only 0.40% within the study population.

4.2. Effect of Public Expenditure on Audit Observations

Table 2 presents the correlations among the variables considered in this study, highlighting that all associations are positive and statistically significant. In particular, the correlations between municipal expenditure (measured as the natural logarithm of expenditure) and the variables related to audit reports and observations show weak to moderate strength. Notable among these are the correlation between expenditure and the number of audit reports (0.319***), the correlation between expenditure and the total number of observations (0.224***), and the correlation between expenditure and the number of resolved observations (0.229***).

Additionally, strong and positive correlations are observed between other variables related to audit observations. For example, the number of audit reports is highly correlated with the total number of observations (0.764***), and the latter also shows a strong relationship with resolved observations (0.800***). The remaining correlations exhibit varying levels of intensity, with some falling within the moderate range (between 0.300 and 0.700) and others considered weak (below 0.300).

TABLE 2 CORRELATION MATRIX

N°	Variables	1	2	3	4	5	6	7	8
1	Ln of Expenditure	1.000***							
2	No. of Audit Reports	0.319***	1.000***						
3	No. of Audit Findings	0.224***	0.764***	1.000***					
4	% of Highly Complex Findings	0.165***	0.531***	0.469***	1.000***				
5	% of Complex Findings	0.195***	0.586***	0.506***	0.256***	1.000***			
6	% of Moderately Complex Findings	0.203***	0.453***	0.351***	0.208***	0.374***	1.000***		
7	% of Slightly Complex Findings	0.057**	0.110***	0.077***	0.066***	0.053***	0.109***	1.000***	
8	Resolved Findings	0.229***	0.659***	0.800***	0.405***	0.414***	0.323***	0.066***	1.000***

Note: The correlation is significant at the 0.01 level (two-tailed). Variables are statistically significant at *ρ <0,1, **ρ<0,05 and ***ρ<0,01.

Source: Elaborated by the authors.

Table 3 presents the results of the regression models applied to the variables related to audit reports, the number of findings, their level of complexity, and whether they have been remedied. The models include public budget expenditure as the main independent variable and incorporate control variables such as the period of analysis (pandemic phase), municipality size, and political alignment with the central government.

Overall, the adjusted R^2 coefficients range from 0.008 to 0.259, indicating a limited explanatory capacity of the models regarding the variability of the dependent variables. However, the global significance of all models is statistically robust ($\rho \leq 0.01$), supporting the relevance of the variables included in the analysis. The coefficients were assessed using the Student's t-test, considering statistically significant those with values of $\rho \leq 0.05$.

Regarding Hypothesis 1 (H_1), the obtained coefficients show a positive and significant effect of budget expenditure on both the number of audit reports and audit findings, thereby confirming the hypothesis. In the case of audit reports, expenditure has a positive and statistically significant impact (coefficient = 0.246***), while the period corresponding to the pandemic phase also shows a positive and significant effect, indicating a notable variation in the issuance of reports during that time. Concerning the number of findings, public expenditure also exhibits a positive and significant effect (coefficient = 3.981***), suggesting that higher spending levels are associated with an increase in the number of findings identified during audits. In this model, the pandemic period variable also has a positive effect, whereas municipality size does not show a significant influence.

TABLE 3 REGRESSION MODELS

Variables	Audit Reports	Total Observations	Highly Complex Observations	Complex Observations	Moderately Complex Observations	Slightly Complex Observations	Resolved Findings
Constant	-5.677***	-92.390***	-22.293**	-87.218***	-51.952***	-1.887	-22.583***
Budget Expenditure	0.246***	3.981***	1.125***	4.028***	2.304***	0.084	0.971***
CV Pandemic Phase Years	Yes	Yes	Yes	Yes	Yes	No	Yes
CV Municipality Size	Yes	No	Yes	No	Yes	No	No
CV Political Alignment	No	No	No	No	Yes	No	No
Adjusted R^2	0.259	0.166	0.148	0.146	0.118	0.008	0.138
Overall Significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N (Observations)	2,750						

Note: Coefficients are statistically significant at *ρ <0,1, **ρ<0,05 and ***ρ<0,01. Dependent variable: number of audit reports. The statistical significance of control variables is indicated as "Yes" when the p-value is less than 0.050; otherwise, it is indicated as "No".

Source: Elaborated by the authors.

On the other hand, when analyzing the complexity of audit observations, it is observed that budget expenditure has a positive and significant effect on highly complex (coefficient = 1.125***), complex (coefficient = 4.028***), and moderately complex observations (coefficient = 2.304***), which confirms Hypothesis H_2 of the study. In contrast, in the case of slightly complex observations, expenditure does not present a significant effect. These results indicate that a higher level of spending is associated with a greater probability of generating observations classified as complex, which highlights the need to pay particular attention to municipalities with a higher volume of resources and public spending.

Regarding the results, budgetary expenditure has a positive and significant effect on the number of remedied observations (coefficient = 0.971***), which confirms hypothesis H_3. In addition, the control variables, such as the pandemic period and municipality size, exhibit significant effects in most models, which reaffirms the importance of controlling for these factors to properly isolate the effect of expenditure on audit observations.

Finally, across all regressions, the diagnostics do not indicate multicollinearity: VIFs range from 1.01 to 2.28 and tolerances from 0.439 to 0.991. Condition indices remain below 10 and the variance proportions do not suggest dependence among predictors. Taken together, these indicators rule out multicollinearity problems that would compromise interpretation. The coefficients remain stable and the standard errors are adequate.

5. DISCUSSION OF RESULTS

This study set out to analyze the relationship between the use of municipal resources and the outcomes of oversight processes, considering the volume, complexity, and remediation of audit observations issued by the Comptroller General of the Republic of Chile during 2017-2024. Its findings address a relevant gap in the literature, especially in Latin America and in emerging countries such as Chile, where empirical evidence on this topic remains scarce. The results show that the level of budgetary expenditure has a positive and significant effect on the volume of observations, on their complexity, and on the proportion of remedied observations, confirming H_1, H_2, and H_3. This pattern is consistent with institutional theory, as it suggests that a larger scale of expenditure intensifies coercive, normative, and mimetic pressures on the management of public resources (Christensen, 2012; Mättö & Sippola, 2016). In addition, this finding contributes to the field by linking the intensity of expenditure with audit outcomes and offers practical implications to guide the oversight activities of the supreme audit institution.

In line with the present study, Mabelane et al. (2023) identify that the level of budgetary expenditure helps predict the outcomes of audit opinions in South African local governments and remains one of the few investigations to link financial metrics with audit results, which assigns a determining role to expenditure in local government performance. The role of budgetary expenditure is also reflected in its association with other relevant dimensions, such as mayoral reelection (Acuña et al., 2019; Benito et al., 2015; Ortega et al., 2015), abnormal budgetary deviations (Cuadrado et al., 2022), the population's quality of life (Torres & Salazar, 2020), and the formation of majority coalitions at the local level (Lewis & Hendrawan, 2019). Consequently, there is a growing consensus that municipal expenditure constitutes a priority focus for review, since its management has impacts on the financial, institutional, and socioeconomic dimensions of local governments, impacts that ultimately reach their communities.

Regarding the impact of the COVID-19 health crisis, the “pandemic” control variable was statistically significant across the dependent variables, suggesting that the 2020 to 2021 period systematically altered the generation, complexity, and remediation of audit observations. Along these lines, Franco et al. (2022) conclude that the pandemic imposed relevant constraints on oversight work, such as difficulties in accessing critical information, restrictions on obtaining evidence, and limits on the application of procedures, thereby increasing risk and affecting the quality of the opinions issued, which helps explain the significance observed in our models. In this way, analyzing the results by periods made it possible to isolate the specific effects of the pandemic cycle and improve the internal validity of the temporal inferences.

With respect to contextual factors, the available evidence shows that studies are predominantly localized, due to the diversity of economic, cultural, and especially regulatory factors, since each country operates under distinct regulatory frameworks and control systems, as is the case in the local governments of the United States, Italy, Greece, Spain, South Africa, Indonesia, Brazil, and Chile, among others (Acuña et al., 2019; Anessi & Sicilia, 2015; Antulov et al., 2021; Avis et al., 2018; Balaguer & Ivanova, 2021; Barbera et al., 2020; Boufounou et al., 2024; Britto & Fiorin, 2021; Cuadrado et al., 2022; De Blasio et al., 2022; Lewis & Hendrawan, 2019; Mabelane et al., 2023; Ritonga, 2014; Soto, 2021; Torres & Salazar, 2020). It should be noted that, internationally, surprisingly little is known about municipal audits and about the determinants of modifications to reports, so the evidence is ambiguous and scarce (Paananen et al., 2021). Studies that analyze how accounting operates during financial crises and periods of austerity are also limited (Barbera et al., 2020). Much of the literature on political interaction and policy formation has been developed in the United States and Europe, which makes it not readily transferable to the Chilean case (Acuña et al., 2019). Taken together, these elements justify the need for situated empirical evidence that captures local institutional conditions, in the absence of transnational regulation in the area of public sector management.

Finally, the results indicate that higher levels of municipal expenditure are associated with increases in both the volume and the complexity of audit observations, which suggests prioritizing oversight toward entities with higher levels of budgetary spending. This should be taken into account, given that corruption schemes are highly malleable and resilient, capable of circumventing formal anticorruption strategies, thereby reducing the effectiveness of control and oversight plans (Meza & Pérez, 2021). In theoretical terms, the study contributes by linking institutional theory with observable audit outcomes, showing how the level of expenditure intensifies coercive, normative, and mimetic pressures on municipal management (Christensen, 2012; Mättö & Sippola, 2016). In practical terms, these findings provide inputs for allocating oversight resources according to the level of budgetary expenditure, as well as for strengthening internal control systems and orienting processes toward the remediation of audit observations.

6. CONCLUSIONS

This study allows us to conclude that budgetary expenditure has a positive and significant effect on the number of observations, on their complexity, and on the proportion of remedied observations, which confirms H_1, H_2, and H_3 and is consistent with institutional theory and new institutional theory, as it shows that a larger scale of expenditure intensifies coercive, normative, and mimetic pressures on the management of public resources. Additionally, it is concluded that during the pandemic period the generation, complexity, and remediation of audit observations behaved differently from the pre pandemic and post pandemic periods, which confirms that this exogenous shock significantly affected external audit processes in local governments.

Additionally, the findings should be interpreted in light of contextual factors. International evidence shows that studies are predominantly localized due to the diversity of regulatory frameworks, control practices, and institutional arrangements, as well as the absence of a homogeneous transnational regulation in the field of public management. This study also makes a significant contribution to the scarce research on local government audits and audit reports, given that few works link these two dimensions.

With respect to this study's contributions, at the theoretical level it empirically links the level of expenditure with three audit process outcomes, namely volume, complexity, and remediation, thereby extending the literature by providing evidence on how budgetary expenditure relates to oversight results. Regarding practical implications, the findings provide inputs for management and public policy design by showing that the level of expenditure has a positive and significant effect on audit processes. This makes it possible to steer the allocation of oversight resources toward municipalities with higher expenditure volumes, strengthen their internal control capacities, and prioritize actions that accelerate remediation without neglecting spending quality. In this way, the research deepens the understanding of the relationship between local financial management and the external control exercised by oversight bodies.

Finally, with respect to the study's limitations, the results should be interpreted in light of the adjusted R squared. Moreover, because the records from the CGR's Municipal Observatory were used, the probability of being audited, the issuance of observations, their complexity classification, and their remediation were not objects of analysis. Lastly, future research should focus on developing prediction models for irregularities and comparing their effectiveness across countries or geographic areas that share similar contextual factors.

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DATA AVAILABILITY

The dataset supporting the findings of this study is not publicly available.