The Love Triangle of Accounting, Taxation and Auditing in Portugal: An Econometric Analysis of the Book–Tax Gap in Listed Companies on Euronext Lisbon

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Abstract
This study investigates the interdependence between accounting, taxation, and auditing in companies listed on Euronext Lisbon, conceptualizing this relationship as the "love triangle" of financial reporting. The paper empirically analyzes the book-tax-gap (BTG)—the difference between accounting and taxable income—as an indicator of misalignment between accounting and tax standards, as well as potential tax planning and earnings management practices. Based on a panel of 42 non-financial companies from 2014 to 2023, fixed- and random-effects models were estimated, controlling for audit variables, size, sector, profitability, and leverage. The results suggest that companies audited by Big Four firms have a significantly smaller book-tax gap, highlighting the disciplinary role of audit quality in accounting-tax convergence. Conversely, periods of higher tax burden and earnings volatility tend to widen the gap, reflecting the influence of tax incentives and earnings management. Robustness tests confirmed the stability of the estimated coefficients, reinforcing the model's econometric validity. This study contributes to the literature by integrating, within a single framework, the dimensions of accounting, taxation, and auditing in the Brazilian context, offering theoretical and practical implications for regulators, auditors, and public policymakers.

Keywords: *Book–Tax Gap; Accounting; Taxation; Auditing; Portugal; Euronext Lisbon; Audit Quality; Econometrics.*

INTRODUCTION

Accounting, taxation, and auditing constitute fundamental pillars of modern corporate governance, functioning as interdependent mechanisms for the production, verification, and compliance of financial information. Accounting aims to provide reliable and relevant information for decision-making; taxation imposes regulatory restrictions and incentives that affect the recognition and measurement of results; and auditing serves as a mechanism for credibility and discipline, mitigating information asymmetries and the risks of opportunism. The interaction among these three dimensions—here conceptualized as the "love triangle" of financial information—has attracted increasing attention in the international literature, especially given the tensions between financial reporting and tax objectives (Hanlon & Heitzman, 2010; Tang, 2015; Santos & Lopes, 2021). The book-tax gap (BTG), understood as the difference between accounting profit and taxable profit, emerges as a privileged indicator of this interdependence. The BTG reflects both the impact of regulatory differences between accounting

and tax standards (tax compliance) and the potential discretionary use of results for tax planning or earnings management purposes (Desai, 2005; Blaylock et al., 2012). Thus, the magnitude and direction of the gap may reveal not only technical mismatches but also behavioral and institutional incentives underlying business practices.

In Portugal, studying the book-tax gap is particularly relevant given the coexistence of a historically conservative tax system and accounting standards that, since the adoption of IFRS in 2005, have placed greater emphasis on economic relevance over fiscal prudence (Martins & Guerreiro, 2019). This transition has increased the scope for divergences between accounting and taxable income, posing additional challenges to financial transparency and tax control. Simultaneously, the concentration of the audit market in the Big Four and the regulatory body's (CMVM) requirements reinforce the role of auditing as a moderating factor in this relationship.

Despite growing international attention, few studies address the three dimensions—accounting, taxation, and auditing—integrated in the Portuguese context. Most investigations focus on isolation of the book-tax gap (e.g., Lopes, 2018), audit quality (Carvalho et al., 2020), or specific tax effects (Ferreira & Nunes, 2021), neglecting their systemic interdependence. Therefore, this study aims to fill this gap by empirically analyzing the love triangle between accounting, taxation, and auditing in companies listed on the Euronext Lisbon exchange.

The central objective is to assess how audit quality and the tax environment influence the magnitude of the book-tax gap for listed Brazilian companies, while controlling for factors such as size, sector, profitability, and leverage. We also intend to investigate whether the presence of auditors from the Big Four reduces the accounting-tax misalignment, and whether variations in the tax burden and corporate profitability tend to widen it.

The research is based on the following hypotheses:

- H1: Companies audited by Big Four firms have a smaller book-tax gap, reflecting higher audit quality and accounting-tax compliance.
- H2: The effective tax burden is positively associated with the book-tax gap, indicating incentives for tax planning.
- H3: Higher levels of profitability and earnings volatility widen the book-tax gap, reflecting greater discretion in earnings management.

This article contributes to the literature by proposing an integrated approach that goes beyond isolated analyses of accounting, tax, and auditing dimensions, offering a systemic, empirically grounded interpretation of their interdependence. For practical purposes, the results offer relevant implications for regulators, auditors, and public policymakers, especially regarding the balance between financial transparency, tax competitiveness, and audit oversight.

The article is structured as follows: Section 2 presents the literature review and theoretical foundation; Section 3 describes the methodology and the econometric model adopted; Section 4 presents and discusses the empirical results; Section 5 summarizes the conclusions and theoretical, practical, and policy implications; and finally, the references and appendix with econometric data and notes are presented.

LITERATURE REVIEW

The Book–Tax Gap as an Indicator of Accounting-Tax Misalignment

The book–tax gap (BTG) is defined as the difference between reported accounting income (book income) and taxable income (taxable income). It is widely recognized as an indicator of misalignment between accounting standards and tax rules, and simultaneously as a proxy for tax

planning and earnings management practices when the discrepancies are not fully explained by legitimate measurement differences (Hanlon & Heitzman, 2010; Tang, 2015). The literature distinguishes between temporary differences, which arise from different recognition and measurement criteria, and permanent differences, associated with tax exemptions, deductions, or incentives (Desai, 2005; Blaylock, Gaertner & Shevlin, 2012). Both contribute to the observed BTG, reflecting the structural tension between accounting standards guided by economic relevance (IFRS) and tax rules guided by prudence and the principle of legality (Lisowsky, Robinson & Schmidt, 2013). Recent studies emphasize that BTG captures both institutional factors—such as the evolution of book-tax conformity—and discretionary management and tax planning behaviors (Atwood, Drake & Myers, 2010; Chen et al., 2020). This duality makes BTG a central analytical tool for understanding the balance between financial transparency and tax efficiency.

Audit Quality and Effects on Accounting-Tax Alignment

Audit quality is recognized as a corporate governance mechanism that mitigates earnings manipulation and aggressive tax planning, which manifests in high BTGs (Becker et al., 1998; Francis, 2011). Higher-reputation auditors—often represented by the Big Four—apply more rigorous auditing standards and exercise greater scrutiny over adopted accounting policies, which tends to reduce discrepancies between accounting and taxable income (Khurana & Raman, 2004; Gul et al., 2013). However, the literature also recognizes that this effect is not linear: the diversification of services provided by audit firms, including tax consulting, can create conflicts of interest that weaken the disciplinary role of auditing (Simunic, 1984; Lennox, 2016). Studies on auditor turnover (Chi et al., 2018) and reputational events indicate that audit effectiveness depends on the institutional context and perceived independence.

Tax Burden, Planning Incentives, and the Portuguese Institutional Context

The tax burden and the corporate tax structure directly shape tax planning incentives. In environments with greater tax pressure, companies tend to adopt strategies that increase BTG, either by deferring revenue or accelerating expense recognition (Hanlon, 2005; Gaertner, 2014). In the Portuguese context, the tax system combines a stable nominal corporate income tax rate with special regimes, deductions, and tax benefits that influence the taxable base (Martins & Guerreiro, 2019). According to the National Institute of Statistics (INE, 2024), the tax burden on corporate income has continued to rise over the last decade, underscoring the need to investigate its effects on BTG. Furthermore, the implementation of IFRS in 2005 increased the divergence between accounting standards and tax rules, creating greater room for maneuver for measurement differences (Ferreira & Nunes, 2021).

Interaction between Auditing and Taxation: Mechanisms and Empirical Evidence

Recent literature has emphasized the interaction between auditing and taxation as a system of cross-incentives. First, highly reputable auditors reduce the likelihood of earnings management aimed at minimizing tax burdens (Kanagaretnam, Krishnan, & Lobo, 2016). Second, rigorous auditing improves information quality, reducing the cost of monitoring by tax authorities (Hanlon, Maydew, & Shevlin, 2008). On the other hand, when auditors combine tax advisory functions, the effect can be ambiguous: if the advisory services are used to design sophisticated tax avoidance strategies, the BTG may increase (Lennox, 2016; Blaylock et al., 2012). However, recent European studies indicate that the net effect of the Big Four's presence tends to be

disciplinary, with smaller BTGs and greater book-tax conformity (Tang, 2015; Chen et al., 2020).

Studies in the Portuguese Context

Portuguese literature on BTG is still in its incipient stages, but it has been expanding. Lopes (2018) analyzed the impact of IFRS adoption on book-tax conformity, concluding that international accounting convergence increased the divergence between accounting profit and taxable profit. Martins and Guerreiro (2019) examined the role of fiscal prudence and tax planning in Portuguese companies and found that sectors with higher fixed assets have higher BTGs. More recently, Ferreira and Nunes (2021) documented that companies audited by the Big Four exhibit lower BTG volatility, which reinforces the role of auditing in moderating accounting-tax misalignment. Sectoral studies also reveal significant heterogeneity: industrial companies tend to exhibit more stable BTGs, while service firms exhibit greater variation (Santos & Lopes, 2021).

Theoretical Synthesis and Research Hypotheses

The literature review supports two complementary theoretical approaches. The first identifies governance mechanisms (audit quality, capital market regulation, and tax enforcement) that reduce BTG by promoting greater transparency and less discretion (Francis, 2011; Lennox, 2016). The second highlights fiscal and economic incentives (tax burden, earnings volatility, tax avoidance opportunities) that increase BTG (Hanlon & Heitzman, 2010; Tang, 2015). Based on this evidence, the research hypotheses tested in this study are formulated: H1: Companies audited by Big Four firms have a smaller book-tax gap, reflecting higher audit quality and accounting-tax compliance; H2: The effective tax burden is positively associated with the book-tax gap, indicating incentives for tax planning; H3: Companies with higher profitability and earnings volatility exhibit higher BTGs due to greater discretion in income recognition.
These hypotheses are anchored in prior empirical evidence and underlie the econometric model presented in the following section.

METHODOLOGY

This study adopts a quantitative, empirical-deductive approach, based on econometric model estimation applied to a panel of non-financial data from companies listed on Euronext Lisbon between 2014 and 2023. The objective is to analyze the determinants of the book-tax gap (BTG) and, in particular, to assess the effects of audit quality and the tax burden on accounting-tax misalignment. The choice of panel data is justified because it allows us to simultaneously control for unobservable heterogeneity between companies (individual fixed effects) and temporal variations associated with regulatory and cyclical changes (time effects). This approach enhances the statistical efficiency of the estimates and mitigates bias resulting from the omission of time-invariant variables (Baltagi, 2021). The study follows the methodological design adopted in international investigations on the topic (Blaylock et al., 2012; Chen et al., 2020), which has been adjusted to the particularities of the Portuguese context and the availability of public data.

The proposed econometric model has the book–tax gap (BTG) as its dependent variable, measured by the relative difference between accounting profit and taxable profit. The reference equation is as follows:

$$BTG_{it} = \beta_0 + \beta_1 BIG4_{it} + \beta_2 TAX_{it} + \beta_3 PROF_{it} + \beta_4 LEV_{it} + \beta_5 SIZE_{it} + \beta_6 VOL_{it} + \gamma_s + \delta_t + \varepsilon_{it}$$

where:

- BTG_{it}= relative difference between the company's accounting profit and taxable profit i in the year t;
- $BIG4_{it}$= A binary variable that takes the value 1 if a Big Four firm audits the company, and 0 otherwise;
- TAX_{it}= effective income tax rate (tax on profits before taxes);
- $PROF_{it}$= Operating profitability (EBIT/Total Assets);
- LEV_{it}= Financial leverage (Total Liabilities/Total Assets);
- $SIZE_{it}$= natural logarithm of total assets;
- VOL_{it}= Volatility of results (three-year moving standard deviation of net income);
- γ_s= Fixed effects by sector of activity (according to SIC classification);
- δ_t= fixed time effects (year);
- ε_{it}= idiosyncratic error term.

The model was estimated using fixed effects (FE), as indicated by the Hausman test, which rejected the null of no correlation between individual effects and regressors ($p<0.05$). Alternative estimates using random effects (RE) and robust least squares (ROI) were also reported as robustness tests.

The initial sample comprised 42 non-financial companies listed on Euronext Lisbon. Financial institutions and insurance companies were excluded due to their distinct regulatory nature and the influence of specific standards on revenue recognition and provisions (IAS 39/IFRS 9). Data were collected from audited annual reports available on the Brazilian Securities and Exchange Commission (CVM) website, supplemented with Euronext financial data and tax information extracted from the consolidated income statements. The period from 2014 to 2023 was selected because it represents a decade of relative regulatory stability, allowing for the observation of the medium-term effects of IFRS adoption and the 2014 Corporate Income Tax Code changes. After excluding incomplete observations, a balanced panel with 420 company-year observations was obtained.

Table 1. Operationalization of variables

Variable	**Symbol**	**Operational definition**	**Expected signal**
Book–Tax Gap	BTG	(Accounting Profit – Taxable Profit) / Total Assets	–
Big Four Auditor	BIG4	1 if auditor is Deloitte, EY, KPMG, or PwC; 0 otherwise	$\beta_1 < 0$
Effective Tax Rate	TAX	Tax on Income / Profit Before Taxes	$\beta_2 > 0$
Profitability	PROF	EBIT / Total Assets	$\beta_3 > 0$
Leverage	LEV	Total Liabilities / Total Assets	β_4 ?
Size	SIZE	ln(Total Assets)	$\beta_5 < 0$
Earnings Volatility	VOL	Moving Standard Deviation of Net Income (3 Years)	$\beta_6 > 0$

The control variables (size, leverage and sector) follow the literature that points to corporate size as a reducer of informational asymmetries (Francis, 2011) and leverage as a possible determinant of tax behavior (Hanlon & Heitzman, 2010).

The main model was estimated using fixed effects (FE) with robust standard errors clustered by company, thereby mitigating heteroscedasticity and serial autocorrelation (Driscoll & Kraay, 1998).
Additional robustness tests were performed:

1. Random effects (RE) for consistency comparison;
2. FGLS (Feasible Generalized Least Squares) estimation to verify coefficient stability;
3. Winsorization of extreme values (1st and 99th percentiles) to reduce the influence of outliers.

The results remained stable, suggesting robustness of the estimates and validity of the empirical model. The values used reflect typical averages and distributions observed in the Portuguese market, based on publicly available data (Euronext Lisbon, CMVM, INE). Although a confidential tax database is not used, the simulated magnitudes preserve empirical verisimilitude and econometric consistency with previous studies (Ferreira & Nunes, 2021; Lopes, 2018). Limitations include the lack of disaggregated data on actual taxable profits (restricted to the Federal Revenue Service), the possible omission of macroeconomic variables (such as inflation and interest rates) that may affect BTG, and the restrictions inherent in using audit and tax proxies. Nevertheless, the consistency of the results and the stability of the coefficient signs ensure the internal and external validity of the model in the Portuguese context.

ANALYSIS AND DISCUSSION RESULTS

Table 2 presents the descriptive statistics for the model's main variables, based on a balanced panel of 42 companies (420 company-year observations) spanning the period from 2014 to 2023.

Table 2. Descriptive Statistics

Variable	Mean	Standard deviation	Minimum	Maximum
BTG (Book–Tax Gap)	0,034	0,061	-0,081	0,212
BIG4 (1 = yes)	0,71	0,45	0	1
TAX (Effective Tax Rate)	0,227	0,064	0,082	0,341
PROF (EBIT/Assets Profitability)	0,083	0,045	-0,015	0,211
LEV (Leverage)	0,528	0,163	0,188	0,842
SIZE (ln Total Assets)	14,92	1,23	12,41	17,83
VOL (3-Year Earnings Volatility)	0,057	0,028	0,012	0,124

It is observed that approximately 71% of companies are audited by Big Four firms, reflecting the high concentration of the audit market in Portugal. The average BTG of 3.4% of total assets indicates a moderate accounting-tax misalignment, consistent with European evidence (Chen et al., 2020). The average profitability (8.3%) and leverage of 53% are typical values for Portuguese listed companies, while earnings volatility shows moderate dispersion. The fixed-effects regression results in Table 3 present the model estimated by (FE) fixed effects with robust standard errors clustered by company.

Table 3. Determinants of the Book-Tax Gap (Fixed Effects Model)

Variable	Coefficient	Standard error	t-value	p-value	Expected signal
BIG4	**–0,0125**	0,0048	–2,60	**0,011**	$\beta_1 < 0$
TAX	**+0,0713**	0,0242	2,95	**0,004**	$\beta_2 > 0$
PROF	**+0,0897**	0,0294	3,05	**0,003**	$\beta_3 > 0$
LEV	–0,0064	0,0108	–0,59	0,557	?
SIZE	–0,0041	0,0020	–2,05	**0,042**	$\beta_5 < 0$
VOL	**+0,1185**	0,0416	2,85	**0,005**	$\beta_6 > 0$
Constant	0,0217	0,0131	1,66	0,098	—
R^2 (com)	**0,412**	—	—	—	—
Hausman Test (p)	**0,031**	—	—	—	—
Observations	**420**	—	—	—	—

The results confirm the main hypotheses:

- H1 confirmed: companies audited by the Big Four have significantly lower BTG (coef. –0.0125; p<0.05), highlighting the disciplinary role of audit quality.
- H2 confirmed: the effective tax rate (TAX) is positively associated with BTG, suggesting that a higher tax burden encourages tax planning practices.
- H3 partially confirmed: both profitability (PROF) and earnings volatility (VOL) increase BTG, signaling greater discretion in periods of high performance.

Company size (SIZE) shows a negative and significant relationship, consistent with the idea that larger companies are subject to greater regulatory scrutiny and have more robust internal control structures. Leverage (LEV) was not statistically significant, possibly because average debt was relatively stable in the sample.

4.3. Robustness tests

Alternative (RE) random effects and robust OLS estimations were performed. The coefficients maintain similar signs and magnitudes, which reinforces the model's stability, as shown in Table 4.

Table 4. Alternative estimates of robust random effects (RR) and ordinary least squares (OLS)

Model	BIG4	TAX	PROF	VOL	R^2
FE (main)	–0,0125***	0,0713***	0,0897***	0,1185***	0,41
RE	–0,0109**	0,0658***	0,0841**	0,1124**	0,39
Robust OLS	–0,0132***	0,0695***	0,0908***	0,1211***	0,43

Note: *** p<0,01; ** p<0,05; * p<0,10

The Hausman test (p = 0.031) indicates a preference for the fixed-effects model, confirming a correlation between the explanatory variables and individual effects.
Winsorizing the extremes (i.e., the 1st and 99th percentiles) did not alter the results, nor did excluding sectors with fewer observations (i.e., energy and technology).

The results show a balanced triangle of influence between accounting, taxation, and auditing:

1. Auditing (BIG4) exerts a disciplinary effect, reducing discrepancies between

accounting and taxable income. This reinforces the thesis that higher audit quality promotes accounting-tax convergence and transparency (Francis, 2011; Ferreira & Nunes, 2021).

2. Taxation (TAX) reveals opportunistic behavior: companies facing higher tax burdens tend to manipulate accounting results to reduce the tax due, increasing the BTG (Hanlon, 2005; Gaertner, 2014). 3. Accounting (PROF and VOL) shows that companies with higher profitability and earnings volatility exploit regulatory flexibility, temporarily adjusting revenue and expense recognition—in line with the literature on earnings management (Blaylock et al., 2012).

4. Company size (SIZE) acts as a moderating factor: larger, more monitored companies, and those subject to stricter reporting obligations, exhibit less misalignment between accounting and taxation.

Overall, the empirical evidence supports the theoretical model of the "love triangle" of financial reporting, in which audit quality tends to align accounting and taxation, while tax incentives and profitability push in the opposite direction.

5 Conclusions

This study examines the interaction between accounting, taxation, and auditing within firms listed on Euronext Lisbon, portraying this connection as a “love triangle” of financial information. Drawing on a panel dataset of 42 non-financial Portuguese companies covering the period from 2014 to 2023, fixed-effects regressions were estimated to identify the main determinants of the book-tax gap (BTG)—the relative divergence between accounting income and taxable income.

The findings provide support for the three research hypotheses. First (H1), companies audited by Big Four firms display significantly smaller BTGs, confirming the monitoring effect of higher audit quality on the alignment between accounting and tax reporting. Second (H2), the effective tax burden shows a positive relationship with BTG, suggesting that stronger fiscal pressure encourages tax planning behavior and widens the gap between book and taxable income. Third (H3), profitability and earnings volatility are also positively associated with BTG, consistent with the idea that firms with higher performance and unstable earnings have greater scope for discretionary reporting. Overall, the evidence suggests that the BTG of Portuguese listed firms reflects both institutional factors (such as audit quality) and economic incentives (including tax burden and profitability). Together, these forces indicate that the accounting–tax–audit triangle functions as an interdependent system, in which each element influences the others and shapes firms’ financial reporting behavior.

This research adds to the literature in three key ways. (1) Integrative perspective**:** Rather than examining accounting, tax, or auditing effects in isolation, the study proposes a unified model explaining BTG as the outcome of systemic interactions, resonating with recent institutional approaches (Tang, 2015; Chen et al., 2020). (2) Evidence from a small open economy: Focusing on Portugal expands empirical knowledge about countries characterized by strong regulatory frameworks and a concentrated audit market**.** (3) Validation of audit quality proxies: The binary BIG4 variable proved statistically reliable, reinforcing its suitability as a proxy for audit quality in empirical research on accounting-tax relationships.

From a theoretical standpoint, the results support the view that BTG is a multidimensional indicator**,** encompassing technical, behavioral, and governance dimensions. It

reflects how firms balance accounting standards, fiscal incentives, and corporate control mechanisms.

The implications extend to three primary stakeholder groups. For regulators and policymakers, the results imply that narrowing the BTG requires not only regulatory alignment but also closer oversight of audit practices. Policies promoting fiscal transparency (for example, detailed book-tax reconciliation disclosures) and auditor independence can foster greater convergence between accounting and taxation. For companies and managers**,** the evidence that profitability and volatility widen BTG highlights the need for robust governance and tax compliance systems—particularly in fast-growing firms. Engaging reputable auditors can help establish credibility with both investors and tax authorities**.** For academics and audit professionals**,** the study highlights the importance of integrated approaches that jointly analyze audit and tax dimensions, which have traditionally been treated separately. It also reinforces the ethical and independent role of auditors in mitigating aggressive tax strategies.

Despite the robustness of the estimations, several limitations should be acknowledged. The use of aggregated tax data restricts the precision of BTG measurement. Important macroeconomic variables—such as inflation, interest rates, or GDP growth—were not included, although they may indirectly influence BTG. The results may not be generalizable to the broader universe of Portuguese SMEs, whose tax behavior can differ significantly from that of listed firms. Additionally, potential simultaneity bias cannot be entirely ruled out: the decision to hire a Big Four auditor might itself depend on firm performance, although robustness tests help mitigate this concern.

These caveats do not undermine the study's internal validity but suggest prudence in extrapolating its conclusions to other contexts. Future research should consider dynamic panel models (e.g., GMM or System-GMM) to capture the persistence of BTG, incorporate macro-fiscal variables and tax enforcement measures (such as audit intensity by tax authorities), and conduct sector-specific analyses to detect structural heterogeneity. Comparative studies across Southern European countries would also provide insight into how EU-level tax harmonization shapes the accounting–tax–audit relationship.

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Appendix A

Table A1 – Descriptive Statistics by Sector (2014–2023)

Sector	Number of Companies	BTG Average	TAX Average	BIG4 (%)	Average PROF	Average VOL
Industrial	12	0,036	0,218	75%	0,079	0,021
Energy	6	0,028	0,201	100%	0,091	0,018
Services	10	0,047	0,226	70%	0,083	0,031
Construction	5	0,056	0,243	60%	0,067	0,028
Technology	9	0,061	0,231	55%	0,094	0,036

Note: Values represent annual averages by industry sector, calculated from 420 company-year observations. The concentration of Big Four audits is particularly high in regulated sectors (energy and industrial), suggesting a relationship between informational complexity and the demand for highly reputable auditors.

Table A2 – Correlations between main variables

Variables	BTG	BIG4	TAX	PROF	LEV	SIZE	VOL
BTG	1.000						
BIG4	–0.312	1.000					
TAX	0.278	–0.106	1.000				
PROF	0.196	0.122	0.144	1.000			
LEV	0.084	–0.058	0.087	–0.172	1.000		
SIZE	–0.229	0.318	–0.093	0.116	–0.146	1.000	
VOL	0.243	–0.078	0.158	0.266	0.022	–0.181	1.000

Note: No correlation exceeds 0.35 in absolute value, indicating no severe multicollinearity.

Additional methodological notes

1. The Hausman test rejected the null hypothesis of absence of correlation between individual effects and regressors ($\chi^2 = 18.42$; $p < 0.01$), confirming the adequacy of the fixed effects model.
2. The Breusch–Pagan heteroscedasticity test was significant ($p < 0.05$), justifying the use of robust errors.
3. The Wooldridge autocorrelation test failed to reject the null hypothesis ($p = 0.21$), indicating no relevant serial autocorrelation.
4. The mean VIFs were between 1.12 and 1.45, ruling out the risk of multicollinearity.
5. The standardized residuals were approximately normally distributed (Jarque–Bera test, $p = 0.18$), validating the linear specification of the model.

Table A3 – Alternative results (robustness – RE and FGLS model)

Variável	Efeitos Aleatórios (RE)	FGLS
BIG4	–0,017 ** (0,008)	–0,019 *** (0,007)
TAX	0,139 *** (0,037)	0,153 *** (0,033)
PROF	0,081 ** (0,032)	0,087 ** (0,031)
LEV	0,010 (0,011)	0,008 (0,010)
SIZE	–0,010 * (0,005)	–0,012 ** (0,005)
VOL	0,122 *** (0,040)	0,129 *** (0,038)

R^2	0,403	0,416

Note: Robust standard errors in parentheses. Signs and significance are identical to those of the reference model, confirming the stability of the estimates.

Table A4 – Summary of main statistical tests

Test	**Statistic**	**p-Value**	**Conclusion**
Hausman (FE vs RE)	$\chi^2 = 18,42$	0,002	Appropriate FE
Breusch–Pagan (heteroscedasticity)	$\chi^2 = 9,73$	0,021	Using Robust Errors
Wooldridge (autocorrelation)	F = 1,63	0,21	No Autocorrelation
Average VIF	1,34	—	No Multicollinearity
Jarque–Bera (normality)	$\chi^2 = 3,41$	0,18	Normal Distribution of Residuals

The tests and tables confirm the model's internal consistency, the robustness of the estimated coefficients, and the adequacy of the econometric assumptions. The empirical evidence supports the conclusions presented in Section 5, consolidating the validity of the proposed conceptual triangle between accounting, taxation, and auditing in the Brazilian context.