Impact of debt and taxes on earnings persistence of Portuguese SMEs

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Abstract

Purpose – We analyze how debt burden and income taxes affect the earnings quality of Portuguese SMEs, using earnings persistence as a proxy for earnings quality. More specifically, we intend to find out whether the high indebtedness of these firms causes a greater tax effect than debt effect.

Theoretical framework – While credit banks represent the main source of financing for SMEs, they tend to reduce their earnings in order to avoid taxes. However, this activity can be costly for their development, given that banking institutions demand earnings persistence to reduce the risk of default, in accordance with contract theory.

Design/methodology/approach – We collect data for 140 Portuguese SMEs over the period from 2015 to 2021 to run panel data regressions.

Findings – Debt and earnings persistence are negatively related, so this relationship tends to degrade earnings quality, which is inconsistent with capturing bank confidence. Furthermore, debt maintains the negative effect with income taxes in the model. However, in this combination, income taxes become significant to explain the negative influence on earnings persistence, which is consistent with tax avoidance. Finally, we control for firm size, which is positively associated with earnings persistence. Overall, taking together the determinants of debt, income tax and size, Portuguese SMEs do not have persistent earnings.

Practical & social implications of research – This study may be useful for several stakeholders of Portuguese SMEs, namely tax authorities, creditors, managers and academics, as it shows that debt and especially taxes have a negative impact on the earnings persistence, which signals a decrease in the quality of financial reporting.

Originality/value – In the most leveraged Portuguese SMEs, debt is not a governance mechanism to control managers' decisions, as more debt reduces earnings persistence, meaning that managers are not sensitive to capturing creditors' confidence. In addition, the tax effect is more relevant than the debt effect for earnings persistence. Faced with interest rate rigidity, managers exploit the discretionary nature of tax decisions.

Keywords: SMEs, earnings persistence, debt, income taxes.

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Revista Brasileira de Gestão de Negócios

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1 Introduction

Accounting standards rely on flexibility in preparing financial reports in order to disclose the true and fair view of each firm. However, Kvaal and Nobes (2010) argue that accounting standards based on principles rather than rules may lead to different interpretations of financial information. In addition, the use of both fair value and estimates may lead to financial statement volatility and thus increase the potential for managerial discretion (Ball, 2006).

Given that accounting earnings are a fundamental source of information for decision making (Francis et al., 2004), entities with high earnings quality and good economic performance tend to promote efficient resource allocation (Healy & Wahlen, 1999). Therefore, it is important to investigate the factors that may affect managers' decisions regarding the financial statements to be prepared. Indeed, managers may not defend the interests of owners, so it is fundamental to regulate their performance, as agency theory shows. Several studies analyze the incentives that drive discretion. In particular, debt covenants are analyzed in studies on accounting choices, as reported by Fields et al. (2001).

In this context, information quality indicators are essential to increase transparency and gain the trust of stakeholders. However, as the quality of results is not directly observable, the literature has developed several indicators that allow the perception of earning management activities (Dechow et al., 2010; Schipper & Vincent, 2003).

In the specific case of SMEs, which have a large presence in most economies, they have an incentive to reduce tax payments, but they also have very high levels of indebtedness. Thus, while entities report lower earnings in order to pay less tax, they have an incentive to increase earnings in order to obtain additional bank financing at a reasonable cost, as mentioned by Khuong et al. (2022). This helped to motivate our research.

Previous literature highlights the effect of earnings quality for stakeholders. For example, Cerqueira and Pereira (2020) mention that shareholders and creditors demand high quality financial information. In the same sense, Francis et al. (2004) point out that earnings persistence is a desirable attribute and contributes to reducing the cost of debt. Therefore, given that earnings persistence is a measure of earnings quality, we propose that creditors will tend to value sustainable earnings because they reduce the risk of default. In this sense, the objective of this paper is to investigate the impact of debt and taxes on the earnings persistence of Portuguese SMEs in the period from 2015 to 2020.

Our empirical evidence shows that debt is significantly and negatively associated with earnings persistence. Thus, when debt increases, earnings persistence tends to be lower, which is inconsistent with the need to respond to creditors' demand to reduce default risk. This result deserves the attention of managers, investors, creditors and regulators from the perspective of the level of indebtedness of Portuguese SMEs, which is a contribution of the study. The result can be explained by the level of indebtedness of the sample firms and their exposure to the lack of liquidity in the markets during the Covid-19 pandemic. In the case of SMEs, income tax, analyzed together with debt, it has a significant negative effect on earnings persistence, in line with Hanlon (2005) and Blaylock et al. (2012), according to whom entities have less earnings persistence to avoid paying taxes. Moreover, our results suggest that the tax effect is more relevant than the debt effect for earnings persistence. This may be explained by the relatively small size of Portuguese SMEs, their high average debt and the huge weight of taxes. Furthermore, we find evidence that size positively affects earnings persistence, which may be due to these entities being subject to different economic and social pressures.

The insignificant number of scientific papers on the Portuguese market, the high representativeness of SMEs in the national economy and the high average debt level of the sample, on the one hand, and the evidence that firm size affects earnings persistence, on the other hand, justify the choice of this sample.

This paper is useful for researchers and various economic agents, namely, firm managers, bank decision makers and academics. On the one hand, it shows that earnings persistence is an indicator of the quality of accounting results, and on the other hand, it highlights the possibility that earnings persistence is a mechanism to control the activity of managers in order to gain the confidence of creditors. Moreover, the results of the paper may contribute to the responsible alignment of managers with stakeholders' expectations, especially since Portuguese SMEs have high levels of indebtedness. Finally, the tax administration may also benefit by knowing the impact of tax policy on earnings persistence and, thus, on earnings quality.

2 Literature review

2.1 Earnings quality

Financial statements (FS) disclose useful information for various users to make their economic decisions (Dechow, 1994; Schipper & Vincent, 2003).

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The usefulness of financial information depends on its quality. In practical terms, earnings and metrics derived from these are used for debt contracts and managers' compensation (Penman & Zhang, 2002). Therefore, it is in the interest of all parties that FS exhibit high quality. In fact, entities with both good performance and high earnings quality contribute to an efficient allocation of resources (Healy & Wahlen, 1999).

Dechow and Schrand (2004) argue that quality is the ability of earnings to reasonably reflect the firm's current performance. However, given that earnings quality is not directly measurable, several estimates and approximations have been developed in the literature (Dechow et al., 2010; Schipper & Vincent, 2003). Indeed, Dechow et al. (2010) argue that estimates of earnings quality provide additional information about firm performance that is crucial in the decision-making process. Additionally, Dimitropoulos et al. (2013) point to the fundamental role of earnings quality, especially in controversial times, which underpins financial markets and allows investors to make more efficient and less risky decisions.

In general terms, the closer earnings are to future cash flows, the higher their quality. Hence, earnings management practices, which occur when managers use privileged information to mislead stakeholders about the true performance of the firm, tend to reduce earnings quality because they are no longer complete and transparent and may mislead users (Healy & Wahlen, 1999). Francis et al. (2004) divide measures of information quality into two groups: those based on accounting and those based on capital markets. The first includes parameters such as accruals, predictability, persistence, and smoothness, and the second includes conservatism, timeliness, and value relevance. The most used estimates of earnings quality in the literature are income smoothing, conservatism, more timely recognition of losses relative to gains, discretionary accruals, and earnings persistence (Dechow et al., 2010; Cerqueira & Pereira, 2019).

This paper focuses on the quality of earnings reported by accounting, considering the ability of entities to maintain earnings, through an analysis of their persistence. This measure indicates the extent to which current earnings persist and are repeated in the future, and thus it is used as a measure of earnings quality. Therefore, it is expected that higher levels of earnings persistence allow a more accurate estimate of the current and future performance of the firm (Dechow et al., 2010).

In this context, persistence is interpreted as a measure of expected future cash flows. Its usefulness derives from the positive correlation between earnings persistence and stock returns (Schipper & Vincent, 2003). Consistently, Francis et al. (2004) point out that earnings persistence is a desirable characteristic that depends on firm performance. This does not prevent earnings from being volatile over time, as long as this volatility is directly related to changes in the firm's future performance.

In addition, earnings have two components, namely accruals and cash flows. Sloan (1996) observed that the performance of the accruals component is less persistent than the performance attributed to the cash flows component. The author also shows that stock prices act as if investors fix earnings and have serious difficulties in decomposing earnings into their different components.

In turn, Hanlon (2005) provides information that entities recognize losses in a timely manner in order to reduce taxes payable, and positive differences between book and tax earnings tend to increase earnings volatility and reduce their persistence. Demerjian et al. (2013) analyze earnings persistence as a proxy for earnings quality, and their results suggest that earnings persistence is greater when managers have more skills and higher ability.

2.2 Debt versus taxes and earnings management

Earnings management occurs when managers use inside information (information asymmetry between managers and outsiders) to modify the numbers expressed in certain items of FS, so that contracts based on accounting data are not breached, as argued by Healy and Wahlen (1999). In contrast, Bartov et al. (2002) and Scott (1997) mention that the management of financial information aims to maximize firm value. In this approach, firms engage in earnings management activities to avoid costs or generate benefits. In addition, earnings may be used as a regulatory mechanism, namely being useful for the definition of debt contracts, as argued by Dichev et al. (2013).

Business relationships are governed by contracts, where compliance with objectives is monitored through specific clauses (covenants), which sometimes appear in the form of financial ratios. Thus, contractual issues are expected to increase earnings management activity because the ratios are derived from accounting items that may be affected by managers' discretion (DeAngelo, 1986; Healy & Wahlen, 1999).

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One of the motivations for managers to engage in earnings management activities is related to compensation plans in which part of their compensation is defined according to the firm's performance, associated with indicators such as book income. Managers are therefore encouraged to adopt practices that improve these performance measures and, consequently, their compensation (Mulford & Comiskey, 2005). It turns out that maximizing value for managers sometimes does not coincide with maximizing value for shareholders, thus creating conflicts of interest. Agency theory argues that accounting information plays an important role in mitigating conflicts of interest between agents (managers) and principals (owners) (Jensen & Meckling, 1976).

As managers actively participate in management decisions, the contractual compensation plans are based on the achievement of certain targets imposed by the shareholders, so that the incentives for manipulation are not divergent and therefore unfavorable to either party. In the case of SMEs, this concern tends not to be verified because ownership and management are usually carried out by the same person. In this context, managers make decisions that maximize their own interests. In the remaining firms, shareholders have to develop some activities such as monitoring and giving some incentives to managers.

Positive accounting theory (PAT), proposed by Watts and Zimmerman (1978), argues that managers' compensation plans provide a strong incentive for them to develop practices that increase earnings. Other studies find empirical evidence of earnings management activities to reduce earnings (Healy, 1985). In the same vein, Ewert and Wagenhofer (2015) indicate that managers' compensation schemes, political factors, and debt clauses are incentives for decision makers to manage earnings.

In addition to conflicts between managers and shareholders, there are also conflicts with creditors. Fields et al. (2001) highlight the importance of debt contract clauses, which have been analyzed in studies related to accounting choices.

Debt contracts typically act as a safeguard for creditors. In particular, if firms fail to achieve stipulated financial ratios, they are subject to penalties (Healy & Wahlen, 1999). For example, DeFond and Jiambalvo (1994) and Sweeney (1994) analyze a group of firms that violated contractual clauses and therefore the loan agreement. These authors find that firms tend to increase earnings in the year prior to the covenant violation. These results were interpreted as evidence of earnings management. In the same vein, the results of Palumbo and Rosati (2022) for a sample of Italian SMEs suggest that despite bank monitoring, firms engage in earnings management practices in order to increase earnings. Thus, entities engage in accounting practices to avoid non-compliance with contractual clauses. This is because entities do not benefit from violating the restrictions imposed, as they run the risk of having their credit rating downgraded and hindering the allocation of future loans. Therefore, non-compliance with the clauses is expensive for firms and managers develop some accounting choices that allow them to increase assets and income or reduce liabilities and expenses, among others, thus resorting to earnings management practices that offer solutions for the maintenance and proper functioning of these contracts. Dyreng et al. (2022) find that for shareholders in firms with a high risk of covenant violation, it is better for the firms to engage in earnings management to avoid such a violation than to violate a covenant but not manage earnings.

Francis et al. (2004) argue that earnings persistence is a desirable characteristic that allows for a reduction in the cost of debt. In the same vein, Cerqueira and Pereira (2020) argue that creditors prefer more conservative information, as it is considered to be of higher quality. However, Khuong et al. (2022) argue that firms with a high debt-to-asset ratio are more likely to have funding problems, leading to lower earnings persistence.

Given that Portuguese SMEs have a high level of indebtedness (cf. Table 1), we expect earnings persistence to decrease with debt. Thus, we formulate the first hypothesis:

Table 1
Descriptive statistics

	Minimum	Median	Mean	Maximum	Standard deviation
PTI	-11.0026	0.00162	0.0085	1.233	0.4144
Debt	0	0.6405	0.7263	28.4861	1.3632
Size	43,733,84	822,615.1	1,353,594	10,666,615	1,488,922
Tax	-0.0904	0.001	0.006	0.1864	0.018

Source: authors' calculations.

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H1: Debt is negatively associated with higher earnings persistence in Portuguese SMEs.

In addition, previous literature argues that tax incentives are also relevant, leading entities to reduce accounting costs by avoiding taxes through earnings management activities (Saka et al., 2019). For Portuguese SMEs, the tax administration is one of the main users of financial information. The strong link is due to the fact that income tax payable is determined based on book income (Nobes & Parker, 2008). This means that the higher the book income is, the higher the tax payable is. Therefore, the relationship between corporate income tax and earnings persistence tends to be negative. Hanlon (2005) and Blaylock et al. (2012) find empirical evidence that entities with higher taxable deferred taxes resulting from differences between book and taxable income, together with lower earnings persistence, tend to be a sign that they are engaged in earnings management activities to avoid paying taxes. For SMEs in Finland, Karjalainen et al. (2023) argue that their contribution to the previous literature consists of providing empirical evidence of dividend and tax-driven earnings management. In the case of Portuguese SMEs, Pereira et al. (2023) find empirical evidence that deductible temporary differences are an indicator of earnings management activities, given that earning persistence tends to be lower when deductible temporary differences increase. In the same vein, Sousa et al. (2019) find that tax remains an incentive for Portuguese and Spanish SMEs to engage in earnings management practices because the calculation of taxable income is based on accounting income. Therefore, we expect a decrease in earnings persistence and we propose the following hypothesis:

H2. Corporate income tax is negatively associated with earnings persistence in Portuguese SMEs.

Furthermore, as both debt and income taxes are expected to have a negative impact on earnings persistence, we examine whether they still have the same effect on earnings persistence when considered together. Dichev et al. (2013) argue that earnings may be useful for the definition of debt contracts if these contracts are used as a regulatory mechanism to avoid earnings management activities, namely to avoid taxes. Therefore, these two effects may have a different influence on earnings persistence. Considering the relatively small size of Portuguese SMEs, their high average debt and the huge weight of taxes, then these entities support high levels of interest and focus on avoiding more tax burden.

Faced with interest rate rigidity, managers exploit the discretionary nature of tax decisions. Therefore, we propose the following hypothesis:

H3: Debt and taxes show a negative relationship with earnings persistence, but the former is lower than the latter in Portuguese SMEs when both effects are included.

2.3 Other incentives

We also control for the association between firm size and earnings persistence based on prior literature. Thus, entities manage earnings to avoid the political costs mentioned by PAT. Specifically, entities adopt accounting policies that hide earnings for the period. According to Mulford and Comiskey (2005), large firms have more incentives to engage in earnings management practices that provide them with a certain degree of invisibility. Within the scope of these incentives, Jones (1991) analyzed a set of firms that could benefit from import protection. In this case, managers make accounting choices in order to reduce earnings, signaling difficulty in dealing with external competition to consequently pressure the government to protect domestic firms. In contrast, Bradshaw et al. (2004) mention that larger firms are under greater scrutiny and pressure because they have a greater number of stakeholders, requiring greater control of their earnings and, therefore, their financial reporting exhibits higher quality. We thus expect a positive relationship between firm size and earnings persistence.

3 Empirical research design

3.1 Sample selection

In this study, we collect data available in the SABI database for Portuguese firms. We use the criteria established in Decree-Law No. 98/2015, of June 2, for the definition of SMEs. Therefore, we include entities whose total balance sheet is between €350,000 and €20,000,000 for the period from 2015 to 2021. In addition, we exclude firms from the financial sector from banking and insurance due to their specific regulations. However, given that the model we estimate contains a lagged variable, in 2021 we only consider values for income before taxes. After the selection procedures, we are left with 140 SMEs, with 840 firm-year observations (see Appendix A - Supplementary Material). In addition, the econometric procedure we follow does not require the firms considered to have information on all variables and in all years, given that we use unbalanced data.

3.2 Model and variables description

To test the hypotheses, we used an econometric model, which was estimated using panel data. As panel data consist of observations for the same firms over time, it is not possible to ensure that the observations are independently distributed. The execution of the Hausman test, with the acceptance of the null hypothesis, suggested the inclusion of random effects in the panel data estimation.

The panel data model with random effects for individuals can be represented by the regression (Equation 1):

$$y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + b_i + \grave{o}_{it} \qquad (1)$$

where b_i are values of a random variable with a normal distribution and zero mean, independent of errors $\grave{o}_{it}$.

We analyze the effect of debt on earnings persistence. For this purpose, and based on the literature review carried out, we estimate the econometric regression (Equation 2):

$$PTI_{i,t+1} = \beta_0 + \beta_1 PTI_{i,t} + \beta_2 Debt_{i,t} + \beta_3 Debt_{i,t} \times PTI_{i,t} + b_i + \varepsilon_{i,t+1} \qquad (2)$$

where i,t is firm i in year t;
PTI is pre-tax book income scaled by total assets;
Debt is total liabilities scaled by total assets;
ε_{t+1} are the residuals.

Given earnings persistence, the coefficient associated with earnings in the current year (β_1) should be positive, meaning that when earnings before tax in the current year increases, earnings before tax in the following year tend to increase too (Dechow et al., 2010). The coefficient that allows us to analyze whether debt increases earnings persistence is β_3. If this coefficient is statistically significant and has a negative sign, it allows us to validate our first hypothesis, which is consistent with higher earnings persistence when debt increases because creditors value the ability of firms to maintain earnings. Therefore, earnings persistence is considered an indicator of their quality, which is taken into account by creditors. In fact, creditors are concerned both with compliance with contractual ratios and with the feasibility/quality of that information. Thus, the total earnings persistence is given by the sum of the coefficients β_1 and β_3. This operating procedure between estimates follows André et al. (2015). Regarding β_2, we expect a negative sign, because the higher the debt is, the higher the financing charges tend to be and, thus, the lower the earnings in the following period. This is all the more expected given the high average debt of Portuguese SMEs.

To test the second hypothesis, we estimate the regression (Equation 3):

$$PTI_{i,t+1} = \beta_0 + \beta_1 PTI_{i,t} + \beta_2 Tax_{i,t} + \beta_3 Tax_{i,t} \times PTI_{i,t} + b_i + \varepsilon_{i,t+1} \qquad (3)$$

where Tax refers to the ratio between the entity's income tax and its total assets, and PTI is the pre-tax income scaled by total assets.

To support the second hypothesis, the coefficient β_3 is expected to have a significant and negative sign, based on the predicted effect of income taxes on the earnings persistence, consistent with the goal of reducing tax burden. In addition, firms exhibit earnings persistence if $\beta_1 > \beta_3$ with $(\beta_1 + \beta_3) > 0$.

To test the third hypothesis mentioned, we use the regression (Equation 4):

$$PTI_{i,t+1} = \beta_0 + \beta_1 PTI_{i,t} + \beta_2 Debt_{i,t} + \beta_3 Debt_{i,t} \times PTI_{i,t} + \beta_4 Tax_{i,t} + \beta_5 Tax_{i,t} \times PTI_{i,t} + b_i + \varepsilon_{i,t+1} \qquad (4)$$

Within this regression, we analyze the coefficients β_3 and β_5, which indicate the incremental impact of debt and tax, respectively. If both coefficients are statistically significant and $|\beta_5| > |\beta_3|$, then the impact of tax is greater than that of debt and the third hypothesis is confirmed.

Finally, we analyze whether the effect of debt/taxes on earnings persistence remains relevant and negative when these determinants, including firm size, are considered together. This procedure allows us to test the robustness of the results.

Then, the estimated regression is (Equation 5):

$$PTI_{i,t+1} = \beta_0 + \beta_1 PTI_{i,t} + \beta_2 Debt_{i,t} + \beta_3 Debt_{i,t} \times PTI_{i,t} + \beta_4 Tax_{i,t} + \beta_5 Tax_{i,t} \times PTI_{i,t} + \beta_6 Size_{i,t} + \beta_7 Size_{i,t} \times PTI_{i,t} + b_i + \varepsilon_{i,t+1} \qquad (5)$$

The variables were defined in the previous regressions and the expected signs will remain identical to those mentioned above if the results are robust. Thus, the incremental effect of debt will be given by β_3, the incremental effect of taxes by β_5 and the incremental effect of size by β_7. Thus, the joint effect on persistence will be given by $\beta_1 + \beta_3 + \beta_5 + \beta_7$, and if this sum is positive, then the firms have persistent earnings.

4 Results and discussion

4.1 Descriptive statistics

Table 1 contains the descriptive statistics of the variables analyzed in this study, namely the minimum and maximum values, median, mean and standard deviation.

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The variable PTI is 0.0085 on average for the period considered. This means that, on average, Portuguese SMEs have a positive pre-tax book income, which represents approximately 1% of the firms' total assets. Note that the dispersion in this item is high. The debt variable, which refers to the weight of total liabilities in the entity's assets, is on average 72.63%. With this statistical data, it is worth noting that the main source of financing for Portuguese SMEs is creditors, more specifically bank credit. Regarding the size variable, the average of total assets is €1,353,594. As this variable exhibits a high dispersion, the logarithm of total assets will be used to estimate the regressions. It should also be noted that although the size of medium-sized entities has a maximum limit of €20 million in the balance sheet total, under the terms of Decree-Law 98/2015, the maximum value of the sample is just over half, that is, €10,666,615. Regarding taxes, on average, the income tax of these entities is less than 1% of their total assets, but the standard deviation is large, showing a large spread between firms that pay more and firms that pay less.

4.2 Regression results

The first test we carried out concerns the effect of debt on earnings persistence for Portuguese SMEs. Based on the reviewed literature, it is expected that the higher the debt, the lower the level of pre-tax earnings in the following year. Therefore, regarding the impact on earnings persistence, we expect it to be significant and negative, in the sense that the greater the indebtedness, the more difficulties entities have in obtaining funds from creditors, which in turn increases their financial costs and reduces earnings in the following period.

Table 2 documents the estimation results of the first and second regressions. In the first regression, we test the impact of debt on earnings persistence. The F-statistic is 128.2457 and the p-value is 0.000, meaning that, for any significance level used, at least one estimated coefficient is statistically different from zero. Regarding the model quality, given by the adjusted R^2, it appears that the independent variables explain 31.82% of the variation that occurred in the dependent variable. The estimated coefficients β_1, β_2 and β_3 are statistically significant at the 1% level in the first regression. The positivity of the estimated β_1 is the first sign of earnings persistence in Portuguese SMEs, indicating that higher earnings in the previous period have a positive effect on earnings in the current period, according to Dechow et al. (2010). The estimate of the coefficient β_3 is negative, consistent with the expected sign, which shows that an increase in debt tends to reduce earnings persistence. This result is not consistent with Francis et al. (2004) and Dichev et al. (2013), but it is in line with Khuong et al. (2022). Therefore, we find evidence to support our first hypothesis.

For Portuguese SMEs, the results suggest that higher levels of debt tend to reduce earnings persistence (Equation 2). This may be due to the costs generated by the average level of debt, which is higher than 72% of total assets. As total earnings persistence is given by $\beta_1 + \beta_3$, but since $|\beta_3| > |\beta_1|$, where $\beta_3 < 0$, this combination leads to a decrease in earnings persistence.

In the case of tax (Equation 3), the coefficient β_3, which indicates the impact on earnings persistence, is not statistically significant, although the sign tends to reflect that tax reduces earnings persistence. Therefore, the evidence we find does not allow us to support our second hypothesis.

Table 2
Effect of debt on earnings persistence

	Expected sign	Equation 2	Equation 3
β_0		0.0771 (10.0826)	0.01206 (1.7505)
β_1	+	0.9818*** (12.2848)	-0.0028 (-0.0873)
β_2	-	-0.1006*** (-11.3333)	1.0827*** (3.1992)
β_3	-	-1.3157*** (-12.3330)	-0.5590 (-0.3441)
Number of observations:		819	747
F-statistic		128.2457; p-value = 0.000	3.300; p-value = 0.002
$R^2 ajusted$:		0.3182	0.0092

$$PTI_{i,t+1} = \beta_0 + \beta_1 PTI_{i,t} + \beta_2 Debt_{i,t} + \beta_3 Debt_{i,t} \times PTI_{i,t} + \varepsilon_{i,t+1} \quad \text{Equation 2}$$
$$PTI_{i,t+1} = \beta_0 + \beta_1 PTI_{i,t} + \beta_2 Tax_{i,t} + \beta_3 Tax_{i,t} \times PTI_{i,t} + \varepsilon_{i,t+1} \quad \text{Equation 3}$$

***Represent statistical significance at the 1% level.
Source: authors' calculations.

To further develop this study, we examine whether the tax effect on earnings persistence is greater than the debt effect, including both simultaneously in the regression. The estimated results are reported in Table 3 (Equation 4). The F-statistic indicates that at each level of significance, at least one of the estimated coefficients is statistically different from zero and the quality of fit is 35.21%.

In this estimation, the coefficient β_3 remains negative and statistically significant at the 1% level. Regarding the coefficient β_5, which allows the relationship between income tax and earnings persistence to be estimated, it becomes statistically significant at the 1% level, supporting our second hypothesis, in which entities engage in earnings management activities in order to reduce income taxes (Pereira et al., 2023; Karjalainen et al., 2023; Saka et al., 2019; Blaylock et al., 2012; Hanlon, 2005).

However, given that all coefficients are significant and $|\beta_3 + \beta_5| > \beta_1$ (with β_3 and β_5 negative), Portuguese SMEs do not have persistent earnings due to the high level of indebtedness and income tax. Even so, our results show that debt is a robust factor to reduce earnings persistence, but when considered together with tax, the latter has a greater effect $(|\beta_5| > |\beta_3|)$. This evidence is consistent with what was expected, confirming our third hypothesis.

Finally, we analyze the relationship between debt, taxes and earnings persistence by considering them together with firm size in Table 3 (Equation 5). The F-statistic shows that for each level of significance, at least one of the estimated coefficients is statistically different from zero, with a quality of fit of 35.66%.

The weight of debt in assets (β_3) remains significant at the 1% level and negative, as expected (Khuong et al., 2022), to explain the earnings persistence after including income tax and size in the model. The same occurs with the effect of tax (Pereira et al., 2023; Karjalainen et al., 2023; Saka et al., 2019; Blaylock et al., 2012; Hanlon, 2005). Therefore, greater indebtedness/tax tends to reduce persistence by reducing current year earnings due to high financing costs.

Regarding size, it is statistically significant at the 5% level to explain earnings persistence (β_7). It has a positive sign, as expected, because larger firms tend to have higher earnings persistence, resulting from the need to meet the expectations of a substantial number of stakeholders monitoring their activities (Bradshaw et al., 2004).

Considering that $\beta_3 < 0$ and $\beta_5 < 0$, and that $\beta_1 > 0$ and $\beta_7 > 0$ with $|\beta_3 + \beta_5| > |\beta_1 + \beta_7|$, we find evidence that Portuguese SMEs do not have persistent earnings when debt, income tax and size are considered together.

5 Conclusions

In this study, we analyze the effect of both debt and income tax on earnings persistence for Portuguese SMEs in the period from 2015 to 2021.

Although earnings quality is not directly observable, we use earnings persistence as a proxy for earnings quality and propose this indicator as a regulatory mechanism for managerial activity. Indeed, by increasing earnings persistence, entities disclose a financial signal of information quality to outsiders, which allows them to gain creditors' confidence.

Table 3
Effect of debt, income tax and size on earnings persistence

	Expected sign	Equation 4	Equation 5
β_0		0.0641*** (7.8607)	0.0115 (0.1163)
β_1	+	1.0687*** (12.4735)	-1.9120 (-1.6440)
β_2	-	-0.0960*** (-10.4352)	-0.0952*** (-10.3909)
β_3	-	-1.5376*** (-13.1872)	-1.5677*** (-13.4307)
β_4	-	1.3344*** (4.4947)	1.3627*** (4.8690)
β_5	-	-4.2207*** (-3.1005)	-5.9563*** (-3.9365)
β_6	+		0.0039 (0.5462)
β_7			0.2127** (2.5688)
Number of observations:		747	747
F-statistic		82.0909; p-value = 0.0000	60.0716; p-value = 0.0000
$R^2 ajusted$:		0.3521	0.3566

$$PTI_{i,t+1} = \beta_0 + \beta_1 PTI_{i,t} + \beta_2 Debt_{i,t} + \beta_3 Debt_{i,t} \times PTI_{i,t} + \beta_4 Tax_{i,t} + \beta_5 Tax_{i,t} \times PTI_{i,t} + \varepsilon_{i,t+1} \text{ Equation 4}$$

$$PTI_{i,t+1} = \beta_0 + \beta_1 PTI_{i,t} + \beta_2 Debt_{i,t} + \beta_3 Debt_{i,t} \times PTI_{i,t} + \beta_4 Tax_{i,t} + \beta_5 Tax_{i,t} \times PTI_{i,t} + \beta_6 Size_{i,t} + \beta_7 Size_{i,t} \times PTI_{i,t} + \varepsilon_{i,t+1} \text{ Equation 5}$$

**Represent statistical significance at the 5% level; ***Represent statistical significance at the 1% level.
Source: authors' calculations.

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Since creditors require compliance with contractual clauses, it is fundamental that these clauses are based on true and fair financial information, i.e. on high earnings quality.

While our results show that Portuguese SMEs exhibit persistent earnings, the negative impact of debt reverses this trend. This negative effect may result from SMEs' high relative levels of debt compared to assets, which in turn imply higher costs of raising funds in the future, thus constraining earnings persistence strategies. This argument is reinforced by the reduced liquidity in financial markets during the Covid-19 pandemic, which had the greatest impact on less capitalized firms such as SMEs. As earnings persistence is a sign of earnings quality, reducing persistence may compromise the ability of firms to gain creditor confidence.

On the other hand, the effect of income taxes on earnings persistence is not statistically significant when considered separately. In addition, we analyze the effect of debt and income taxes on earnings persistence when considered together. The results confirm that both debt and tax have a significant and negative impact on earnings persistence due to high debt dependence and tax evasion practices. Moreover, our empirical evidence suggests that the tax effect is more relevant than the debt effect for earnings persistence. This may be explained by the relatively small size of Portuguese SMEs, their high average debt and the huge weight of taxes, implying that these entities support high interest rates and focus on avoiding higher tax burdens. Faced with interest rigidity, managers exploit the discretionary nature of tax decisions.

Furthermore, both impacts of debt and tax remain when we control for firm size, which is a determinant with a positive impact on earnings persistence. However, the negative effect of debt and tax outweighs the positive impact of prior period earnings and size.

Overall, this study shows that debt and taxes tend to have a negative effect on the earnings persistence of Portuguese SMEs, which may be a sign of decreasing financial reporting quality. Therefore, this study brings important insights for researchers and various economic agents, namely managers, investors, creditors and regulators, by contributing to identifying the motivations for earnings management and the level of discretion. Moreover, it also contributes to highlighting the consequences of these practices on accounting and tax earnings, which should be taken into account by government policies and stakeholders.

The main limitation of this study is the small number of SMEs due to the legal requirements in the Portuguese market. For future investigations, we suggest a broader set of entities, such as micro entities and firms from other countries, namely from the Iberian Peninsula.

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Supplementary Material

APPENDIX A. Supplementary data.

Supplementary data to this article can be found online at: Pereira, Claudia; Gomes, Luís M. P.; Lima, Armindo, 2023, "Supplementary Data - Impact of debt and taxes on earnings persistence of the Portuguese SMEs", https://doi.org/10.7910/DVN/PEHX2U.

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Open Science:
Pereira, Claudia; Gomes, Luís M. P.; Lima, Armindo, 2023, "Supplementary Data - Impact of debt and taxes on earnings persistence of the Portuguese SMEs", https://doi.org/10.7910/DVN/PEHX2U.

Conflicts of interest:
The authors have no conflict of interest to declare.

Plagiarism analysis:
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