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Administrative Sciences

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Suggested Citation: Dias, Catarina Gonçalves; Paiva, Inna Sousa; Carvalho, Luísa Cagica (2024) : Board member remuneration and earnings management: The case of Portugal, Administrative Sciences, ISSN 2076-3387, MDPI, Basel, Vol. 14, Iss. 1, pp. 1-20, <https://doi.org/10.3390/admsci14010020>

This Version is available at:

<https://hdl.handle.net/10419/320843>

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Article

Board Member Remuneration and Earnings Management: The Case of Portugal

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Abstract: This study draws on agency theory and evaluates the effect of the remuneration structures of board members on earnings management, proxied by discretionary accruals. To achieve the objective, this study uses a multiple regression model and a hand-collected dataset of Portuguese-listed firms from 2015 to 2019. This study suggests that fixed board remuneration is associated with lower levels of earnings management, as opposed to variable remuneration of board members, which is strongly associated with a higher level of earnings management. The findings based on this study provide useful information to investors and regulators in evaluating the effect of board compensation structure on earnings management. Additionally, this study expands the corporate governance literature by examining an under-researched mechanism to address the agency problem.

Keywords: agency theory; earnings management; Portugal; remuneration structure; board of directors



Citation: Dias, Catarina Gonçalves, Inna Choban de Sousa Paiva, and Luísa Cagica Carvalho. 2024. Board Member Remuneration and Earnings Management: The Case of Portugal. *Administrative Sciences* 14: 20.

<https://doi.org/10.3390/admsci14010020>

admsci14010020

Received: 7 October 2023

Revised: 16 January 2024

Accepted: 18 January 2024

Published: 22 January 2024



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1. Introduction

Due to the pervasive occurrence of financial scandals, pressure from stakeholders and regulators on the quality and transparency of financial information is motivated by the general assumption that earnings management affects the ability of accounting information presented in financial statements (Obermann and Velte 2018). In line with agency theory (Jensen and Meckling 1976), managers are driven to manage earnings opportunistically to enhance firm equity value and drive executive remuneration (Safari et al. 2016).

Most of the previous literature indicates that the use of remuneration to encourage the performance of board members may lead to opportunistic practices among board members to increase their compensation, especially when the remuneration policy includes variable values or bonuses (Haverkate 2020; Duarte 2015; González-Sánchez et al. 2021). Some authors claim that due to the position and power of board members in firms, managers can influence their compensation through incomes that are indexed to the results and objectives achieved (Bebchuk et al. 2002; Riotto 2008). Moreover, several financial scandals have been reported, showing the fragility of financial reporting (Lisboa 2016; Marques et al. 2011; Alves et al. 2016; Alves 2023).

The literature presents several opinions regarding the impact that the structure and value of remuneration have on earnings management practices (Pecha 2018; Almadi and Lazic 2016; Obermann and Velte 2018). Although several studies on remuneration suggest that companies with higher bonuses have a higher level of discretionary accruals (Pecha 2018; Almadi and Lazic 2016) and that incorporation of remuneration based on results causes greater earnings management (Dikolli et al. 2020), there is also evidence of lower levels of earnings management in firms with remuneration indexed to the firm's results (Gul et al. 2003). The controversial evidence in previous studies suggests that a better

understanding of the relationship between the structure of management remuneration and earnings manipulation is needed.

This paper aims to fill gaps in the academic literature, draws on agency theory, and evaluates the effect of the remuneration structures of board members on earnings management, proxied by discretionary accruals. Hence, the key research question is: Is there an association between the structure of executive remuneration in Portuguese-listed firms?

This study examines the influence of executive remuneration structure on earnings management. This study uses a multiple regression model and a hand-collected dataset of Portuguese-listed firms from 2015 and 2019, resulting in a sample of 165 observations. The Portuguese institutional setting provides an interesting scenario to study executive remuneration and earnings management. Firstly, unlike other European countries, where a majority of firms separate CEO and Chairman positions, Portuguese-listed firms present a higher level of combined structure boards (Alves 2023). Although CEO duality is considered an impediment to good corporate governance, it remains a common practice in Portuguese firms. Consequently, an examination of executive remuneration and earnings management is valuable. Secondly, Portugal uses a civil-law legal system, which is characterized by weak investor protection and no litigation risk for directors (La Porta et al. 1998). Finally, compared to common-law countries' systems, which are strongly capital market-based, the Portuguese financial system is bank-based, which can influence earnings management (Ball et al. 2000; Burgstahler et al. 2006).

In line with the findings presented in previous studies (Safari et al. 2016; Hassen 2014; Harvey et al. 2020), the results show that the higher the fixed remuneration paid to managers, the lower the level of earnings management. Regarding variable remuneration, when the manager's remuneration has a variable component, the level of earnings management increases (Alhadab and Al-Own 2017; Gong et al. 2019; Qu et al. 2020; Sadiq et al. 2019; Pecha 2018).

This paper makes some contributions to the existing literature. For the Portuguese context, this study intends to provide a basis for the formulation and decision-making of shareholders or responsible bodies on the composition of remunerations, thus being able to make the decision that best suits their objectives and characteristics (Lisboa 2016; Marques et al. 2011). At an institutional level, this work aims to assist the competent bodies in formulating regulations and recommendations, to improve the quality of financial reporting and avoid abusive situations. At the academic level, this study aims to contribute to the analysis of the impact of remuneration on the development of national entities and the cause-effect relationship between this factor and the quality of financial reporting (Alves 2023).

Apart from this introduction, this study is organized as follows. Section 2 summarizes the literature review on remuneration policy and earnings management and develops hypotheses. Section 3 reports the methodology and Section 4 reports the results. Finally, Section 5 summarizes and concludes this study.

2. Literature Review and Hypotheses

2.1. Overview

The structure and form of CEO remuneration have been the subject of several studies over the last decades; however, the conclusions obtained on the subject were varied, as this topic is considered controversial (Crocì et al. 2012). Duarte (2015) proposes a structure that subdivides the remunerations paid into three categories: fixed, variable, and benefits. The first encompasses amounts that are paid on a regular basis both in periodicity and amount (base salary, holiday, and Christmas bonus, among others). The second can include the amounts that are normally associated with other periods and result from performance (short term) or results (long term). These may also be attributed on an individual or collective basis. Finally, unlike the first two categories analyzed, benefits do not represent any monetary transfer between the employer and the employee (pension plans, health insurance, and family support are some examples).

Jensen and Murphy (1990) mention a fourth category, something the authors termed as non-monetary benefits. These authors consider that factors such as power, prestige, or public recognition are quite important compensations in the corporate environment. However, there must be a balance between this type of compensation and the value of the company, otherwise they will not be effective in motivating managers. Krauter (2009) presents a synthesis of these two approaches, which can be summarized in Figure 1.

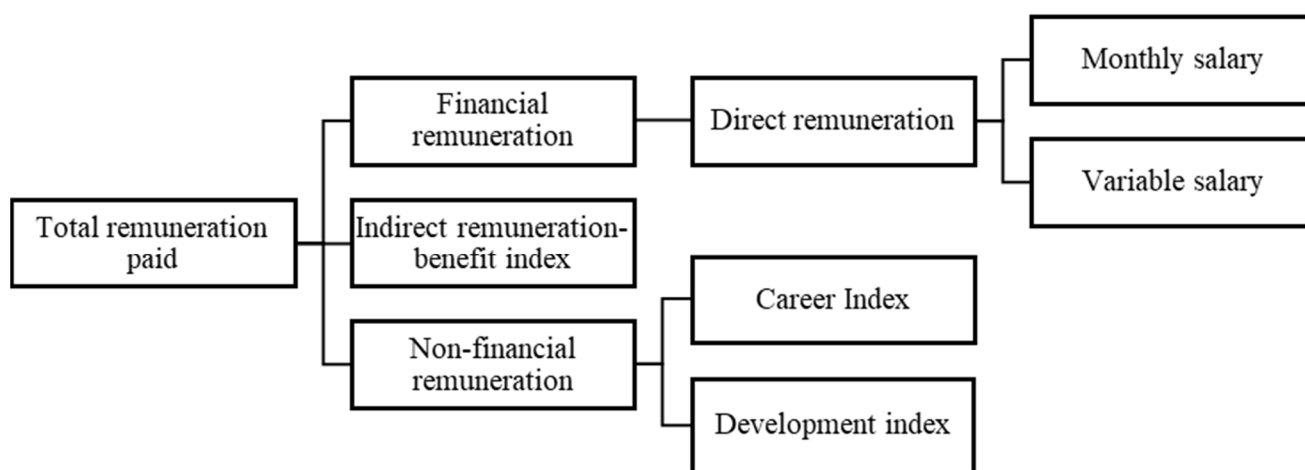


Figure 1. Executive remuneration. Source: Krauter (2009).

Krauter (2009) characterizes financial remuneration as the amount paid at the expense of the work performed (direct remuneration), and it can be characterized as monthly (fixed amount) and variable (derived from bonuses and awards). Non-financial remuneration cannot be translated into monetary terms. The career index reflects the hierarchical level occupied by the employee in the entity and the capacities for professional evolution while the development index represents the capacities acquired by the individual. Indirect remuneration is characterized by the attribution of benefits to employees which may be translated into monetary terms, however, there is no type of transaction between the parties.

Concerning variable remuneration in Portuguese companies, Duarte et al. (2006) concluded that this type of remuneration is observed at higher hierarchical levels and in managers with high-level academic degrees, and also in smaller companies or subsidiaries of foreign companies. However, the authors present factors that can be seen as alternatives to this type of remuneration, such as career progression. In turn, Borges (2017) states that the salary policy is important for the manager's motivation since it directly reflects the employees' past performance and may influence future motivation and commitment. In a study conducted with companies based in the autonomous region of the Azores, he considers that remuneration with only a fixed component negatively affects productivity and performance, and that incentives and benefits may be fundamental for the success of the organization.

About regulatory bodies, these can be external or internal. The former type are normative, being common to most sectors of activities or even directed to specific sectors. The second types are defined only by the entity that applies them and are often linked to its mission, vision, values, and objectives. One of the external bodies acting in this sense in Portugal is Comissão do Mercado de Valores Mobiliários, henceforth "CMVMC" (Securities Market Commission). Constituted in May 1991, it is responsible for "(...) supervising and regulating the markets of financial instruments, as well as the agents that operate in them promoting the protection of investors" (CMVM 2020). Cunha and Rodrigues (2018) conclude that the changes to corporate governance standards introduced in the years 2007 and 2010 led to greater disclosure of information by the entities listed on Euronext Lisbon, highlighting the role of CMVM in the process.

Each entity is free to establish its organizational structure and respective rules, always taking into consideration the legislation in force. Intending to establish remuneration, bonuses, and benefits, many companies have in their constitution a corporate body called a remuneration committee. This should be an independent body, able to ensure the impartiality of the guidelines it discloses. [Kanapathippillai et al. \(2019\)](#) consider that this corporate body has gained relevance due to the successive scandals and financial crises observed in recent years globally. Additionally, [Al-Absy et al. \(2018\)](#) consider that corporate bodies, such as the remuneration committee or nomination committee, are important corporate governance mechanisms. Considering that the remuneration committee is responsible for determining the remuneration of directors and managers with high decision-making power, it should be independent. It is possible to identify that there is a negative relationship between the level of earnings management and the number of members of this corporate body.

With the evolution of organizational structures and the dispersion of companies' capital, it is possible to observe a separation between the ownership and the control of entities. To clarify and expose the disparity of objectives between managers and shareholders, [Jensen and Meckling \(1976\)](#) suggest the agency theory. On the one hand, shareholders have as their main objective the maximization of the profitability of their investment (by rule, distribution of dividends) while managers, by presenting a greater knowledge of the business, manage the strategy and operational matters with a view to the development and growth of the business. [Panda and Leepsa \(2017\)](#) consider that the divergence between directors and shareholders is one of the biggest organizational problems, and it has been worsening mainly in companies listed on the stock exchange.

[Grinblatt and Titman \(1998\)](#) reveal that conflicts can arise for three reasons: (1) CEOs want to develop activities and policies that they consider more advantageous and interesting than shareholders do; (2) they are motivated to steer the company towards projects that emphasize their career path, to achieve personal goals; (3) in consideration of employees who perform operational tasks, the manager makes decisions based on loyalty and not on the objectives of the organization.

To solve the problem announced by the agency theory, one of the main mechanisms used is the existence of contractual incentives, that is, incentives based on managers' performance. [Jensen et al. \(2004\)](#) review the conclusions presented in the past, identifying managers' remuneration as a tool for managing conflict between shareholders and board members. However, when not used appropriately it can bring increased costs to companies and may even lead to their closure.

[Pepper and Gore \(2015\)](#) state that the agency theory presents several deficiencies concerning the organization's performance, agent behavior, and executive directors' remuneration, presenting a new theory: behavioral agency theory. This new approach to the agency theory, about incentives for managers, clarifies that these should be adapted to each entity, focused on the definition of objectives and performance levels and on rewarding the goals achieved. Thus, [Panda and Leepsa \(2017\)](#) concluded that inadequate compensation may lead to the manager using his decision-making ability for his benefit. The authors consider that a systematic review of compensation and its suitability for each manager can motivate managers to improve organizational performance and maximize investor returns. [Maas and Rosendaal \(2016\)](#) conclude that most entities tend to use financial indicators to measure the performance of the organization to calculate the remuneration for their managers. The authors advocate the introduction of non-financial indicators to measure organizational performance and thereby indicate the appropriate level of manager's remuneration.

The remuneration policy of Portuguese-listed companies holds significant relevance in the realm of corporate governance and financial management. This policy dictates how executives and key personnel are compensated, encompassing not only fixed salaries but also variable components, such as bonuses, stock options, and other performance-based incentives. The existing legal framework is covered in numerous provisions of the Por-

tuguese Companies Code, the Portuguese Securities Code, and several recommendation documents and regulations issued by the CMVM.

Portugal uses the French civil-law legal system, which is characterized by weak investor protection and almost no litigation risk for directors (La Porta et al. 1998). Distinct from other European countries, such as the UK and Germany, where a majority of firms separate CEO and chairman positions, Portuguese-listed firms present a higher level of combined structure boards (Alves 2023). While CEO duality is considered an impediment to good corporate governance, it remains a common practice in Portuguese firms. Therefore, these differences make it relevant to analyze Portugal, not only to expand international evidence but also to compare the results of the previous studies on executive pay and earnings management (Alves 2023; Alves et al. 2016).

2.2. Earnings Management and Remuneration Policy: Hypothesis Development

To overcome the limitation identified by the agency theory (Jensen and Meckling 1976), shareholders resort to indexing remunerations to the results of the period or previous periods through the deferral of remunerations. This mechanism tends to reward the manager for the objectives achieved. According to Ball et al. (2000), in countries where tax and accounting practices are closely related (code law), as is the case in Portugal, managers have greater flexibility and freedom in decision-making, causing changes in results by changing operational, financial, and investment decisions.

Healy (1985) was one of the first to observe a positive relationship between incentives paid to managers and the value of discretionary accruals, showing earnings management practices that negatively influenced the quality of financial reporting. The author also identified that there was a voluntary change in accounting practices when there was a change in the variable remuneration of the manager (bonus) but only when this was binding. In turn, Balsam (1998) states that there is a positive correlation between the remuneration paid to managers and the level of discretionary accruals observed. The author states that the manager himself manages to increase his remuneration by using positive discretionary accruals, whilst the use of negative discretionary accruals has less impact on remuneration. de Andrés et al. (2018) corroborate the analysis carried out by Coffee (2004), also listing other cases, such as WorldCom, Fannie Mae, and General Electric, which criticized excessive remuneration and poor structuring of the same.

However, due to the economic and financial crisis, managers' remunerations are no longer pointed out as one of the main factors in the fall in financial markets. The US Financial Crisis Inquiry Commission (2011) names excessive indebtedness, high-risk investment, and lack of transparency in economic transactions as causes of the crisis. According to previous literature, it is possible to observe evidence between remuneration among members of the board of directors of a company and the earnings management, and consequently, the quality of financial reporting. Table 1 presents the summary of the main studies, methodology, and conclusions drawn.

Table 1. Literature review on the board remuneration and earnings management.

Authors	Methodology	Data/Sample	Objective	Main/Conclusions
Dikolli et al. (2020)	Multiple linear regression analysis. Earnings management model based on accruals.	17726 North American companies 2020	Investigation of the co-option of the CFO and the remuneration of the CEO.	The positive relationship between the co-option of the CFO and the incorporation of remuneration is based on results as well as on earnings management.

Table 1. Cont.

Authors	Methodology	Data/Sample	Objective	Main/Conclusions
Fredriksson et al. (2020)	Multiple linear regression analysis. Earnings management model based on accruals.	940 Swedish companies 2007–2016	Determining the correlation between management remuneration and audit quality.	The positive relationship between the value of remuneration and the quality of auditing and, consequently, of financial reporting.
Blanes et al. (2020)	Multiple linear regression analysis. Earnings management model based on accruals.	121 Spanish companies 1998–2018	Determining the relationship between CEO income and the quality of financial reporting (discretionary accruals).	The positive relationship between the value of remuneration and the level of earnings management was observed.
Lee and Hwang (2019)	Multiple linear regression analysis. Earnings management model based on accruals.	82 South Korean companies	Determination between the percentage of variable remuneration and the level of earnings management.	The positive relationship between the existence of a higher percentage of variable remuneration and the level of earnings management.
Pecha (2018)	Multiple linear regression analysis. Earnings management model based on accruals.	2978 British companies 2006–2012	Relationship between management bonuses and the level of earnings management.	The positive relationship between the value of management bonuses and the level of earnings management.
Almadi and Lazic (2016)	Multiple linear regression analysis. Earnings management model based on accruals.	3000 Australian and British companies	Relationship between fixed remuneration and the level of earnings management.	The positive relationship between the base remuneration paid and the level of earnings management.
Safari et al. (2016)	Multiple linear regression analysis. Earnings management model based on accruals.	107 Australian companies 2009–2010	Determining the relationship between the remuneration structure and the existence of discretionary accruals.	The negative relationship between the differentiation of remuneration between executive and non-executive members and the level of earnings management.
Hassen (2014)	Multiple linear regression analysis. Earnings management model based on accruals.	80 French companies 2007–2010	Investigate the correlation between the total amount of remuneration and the earnings management.	The negative relationship between the amount of remuneration and the level of earnings management was observed.
Kang et al. (2013)	Multiple linear regression analysis. Earnings management model based on accruals.	766 Australian companies 2001–2003	Relationship between the existence of a remuneration committee and the earnings management.	The negative relationship between the existence of this entity and the observation of discretionary accruals.
Kam (2010)	Multiple linear regression analysis. Earnings management model based on accruals.	772 European companies 1999–2009	Relationship between the existence of variable remuneration and the level of earnings management.	The positive relationship between the existence of variable remuneration and the level of earnings management.

Table 1. Cont.

Authors	Methodology	Data/Sample	Objective	Main/Conclusions
Cheng and Warfield (2005)	Multiple linear regression analysis. Earnings management model based on accruals.	9472 North American companies	Relationship between the indexation of bonuses to the stock market price and equity participation and the level of discretionary accruals observed.	The positive relationship between the observation of discretionary accruals and the indexation of wages to the share price; The positive relationship between capital held by managers and earnings management.
Gul et al. (2003)	Multiple linear regression analysis. Earnings management model based on accruals.	648 Australian companies	Relationship between the indexation of remuneration to financial results and the level of discretionary accruals observed.	The negative relationship between the observation of discretionary accruals and the value of remuneration indexed to financial results.

Safari et al. (2016), in a study of 214 companies listed on the Australian Stock Exchange, present findings on the relationship between the structuring of remuneration of board members and the quality of financial reporting presented. The study concludes that there is a positive correlation between compliance with the principles presented by ASX-Australian Securities Exchange and the quality of financial reporting. Consequently, the authors state that there is a negative correlation between the remuneration paid to board members and the value of discretionary accruals. Barontini et al. (2017) corroborates these findings, highlighting the positive correlation between compliance with best practices regarding compensation and the remuneration paid to CEOs of companies in the FTSE Developed Europe Index.

When analyzing French companies, a negative relationship was observed between total managerial compensation and the observed level of accruals. Hassen (2014) states that these findings are due to the alignment of managers' and shareholders' objectives. When there is adequate compensation, managers tend to reduce risky behaviors and take actions that can be considered opportunistic. Thus, the manager's ultimate goal is to maintain a good relationship with his shareholders and the retention of his position in the organization. Harvey et al. (2020), in an analysis of British companies, state that the remuneration of the members of the executive board of directors is not a sufficient condition to ensure the correct accountability of managers to the stakeholders of the sample entities. Thus, Collinson et al. (2014) point out that sometimes the stakeholders' interests may be neglected for the benefit of the organization managers; for instance, to increase manager remuneration.

With regard to non-executive members, such a correlation no longer occurs, because often the remuneration of these managers is not indexed to the objectives achieved by the organization (Goh and Gupta 2016). The authors also argue for a negative relationship between the quality of financial reporting and the period between the presentation of results and the payment of remuneration. This conclusion is in line with the recommendations presented by the CMVM in 2018, which advocates that remuneration referring to bonuses and awards should be deferred for no less than three years (Recommendation nº 3—Remuneration of members of the board of directors).

Xu and Chang (2017) and Ferreira (2019) argue that to obtain rewards based on the results achieved, managers may adopt earnings management mechanisms. Thus, it is important to understand whether they use earnings management practices to increase their own income. Blanes et al. (2020) analyze the relationship between several characteristics and indicators of Spanish companies and the remuneration paid to CEOs, concluding that there is a positive relationship between the financial performance of the entity and the

remuneration paid; that is, the higher the remuneration paid to the manager, the higher the performance of the entity. Hence, from the agency theory perspective and under the CMVMC's recommendation, we expect that fixed remuneration of board members can decrease the likelihood of opportunistic earnings management:

Hypothesis 1. *There is a significantly negative relationship between fixed compensation of board members and the level of earnings management.*

Jensen and Murphy (1990) consider that it is not about the amount paid to board managers, but rather how this is structured. Several studies claim that CEOs incur “opportunistic” earnings management practices to (1) maximize earnings-based compensation (Balsam 1998; Das et al. 2011; Healy et al. 1987) and (2) increase the stock market price and in turn the compensation based on it (Beneish and Vargus 2002; Sloan 1996; Cheng and Warfield 2005). In addition, Cheng and Warfield (2005) conclude that there is a higher level of discretionary accruals in companies where the manager's variable remuneration is based on the entity's share price.

From the perspective of the auditor, the structure of the manager's remuneration is important in determining the audit risk (Qu et al. 2020). When remuneration is based on the results presented by the entity, it is possible to observe a positive relationship between the manager's remuneration and the audit costs. This is because the auditor considers that there is a high risk of earnings management. However, when remuneration is based on indicators such as market value, we can observe a negative relationship.

Sadiq et al. (2019) state that there is a positive correlation between earnings management practices and bonus payments to board members with political influence. Pecha (2018) shows the existence of earnings management practices to maximize the organization's performance in companies that award annual bonuses. Additionally, Kam (2010) considers that the existence of variable remuneration is a contributing factor in earnings management. Lee and Hwang (2019) further state that it is not only the existence of variable remuneration that contributes to the inconsistency of earnings management but also its percentage in the total remuneration. In other words, the higher the percentage of variable remuneration in the total remuneration paid to the manager, the greater the earnings management observed. Therefore, given the above discussion, we test the following hypothesis:

Hypothesis 2. *There is a significantly positive relationship between the variable remuneration paid to board members and the level of earnings management.*

3. Method

3.1. Data and Sample

The initial sample included all firms whose stocks are listed in the main market, Euronext Lisbon, at the end of the period 2015 to 2019. Using the Wordscope Database, we analyzed the companies that were listed without interruption during the presented period. Financial and insurance companies were excluded. To obtain information regarding the remuneration of the members of the board of directors, hand-collected datasets from the Annual Report and Corporate Governance Report were sourced online at www.cmvm.pt, accessed on 1 January 2024. In the end, a total of 165 observations were obtained for the 33 selected firms. Table 2 characterizes the sample according to the SIC-Standard Industrial Classification.

Table 2. Classification of the sample by industry.

SIC Code	Number of Firms	Percentage
Construction	3	10%
Manufacturing	13	39%
Transport and communications	7	21%
Retail	4	12%
Services	6	20%
Total for one year	33	100%

It should be noted that the panel of variables was constructed because the same companies were observed over five years, totaling 165 observations. The sample is very diverse in terms of sectors of activity, with manufacturing (SIC Code 20–39) being the sector with the greatest weight in the total sample (39 percent). The second most represented sector is transport and communications (SIC Code 40–49), with 21 percent of the total sample, and in the third place, services (SIC Code 70–89), with 20 percent of the total sample.

3.2. Dependent Variable—Accruals

Accruals methods have become increasingly prevalent in econometric analysis for testing earnings management in recent years (Alves 2023; Dikolli et al. 2020; Fredriksson et al. 2020; Blanes et al. 2020). We used discretionary accruals because they offered interpretations that were more intuitive and consistent with the theoretical concept of earnings. The theory is to focus on the accruals element of accounting numbers. Essentially, accruals represent non-cash flow elements of the accounts and are often manipulated by management. Total accruals are estimated as the difference between reported accounting earnings and cash flow from operation. These accruals are then divided into normal and discretionary accruals. Managers can alter the discretionary (Gul et al. 2003; Fredriksson et al. 2020), our proxy of earnings management was the absolute values of discretionary accruals (Earnings Management—EM). We followed Kothari et al. (2005) and Kasznik's (1999) extension of the cross-sectional Jones (1991) model to compute the discretionary current accruals.

Total accruals can be presented by the following algebraic representation:

$$TA_{i,t} = NDA_{i,t} + DA_{i,t} \quad (1)$$

In which:

TA_t = Total Accruals in firm i , year t ;

NDA_t = Non-discretionary accruals in firm i , year t ;

DA_t = Discretionary accruals in firm i , year t .

First, we compute total accruals ($TA_{i,t}$) as the change in non-cash current assets minus the change in operating current liabilities and depreciation and amortization expense, i.e.,

$$TA_{i,t} = \left(\Delta (\text{Current assets}_{i,t} - \text{Cash}_{i,t}) - \Delta (\text{Current liabilities}_{i,t} - \text{Short term debt}_{i,t}) - \text{Depreciation}_{i,t} \right) \quad (2)$$

The value of discretionary accruals is calculated by the difference between the observed value and the value estimated by the model. If this difference is significant, it is more likely that we are dealing with earnings management.

To estimate the Kasznik (1999) model, we regress $TA_{i,t}$ on the following variables: the change in revenues net of the change in receivables ($\Delta REV_{i,t} - \Delta REC_{i,t}$); gross property, plant and equipment ($PPE_{i,t}$), and cash flow from operations ($CFO_{i,t}$) to estimate Kasznik (1999) model, as demonstrated in Equation (3). To estimate the Kothari et al. (2005) model, we then regress $TA_{i,t}$ on the change in revenues net of the change in re-

ceivables ($\Delta REV_{i,t} - \Delta REC_{i,t}$), gross property, plant and equipment ($PPE_{i,t}$) and return of assets ($ROA_{i,t}$), according Equation (4). The book values of total assets of the previous period ($Total\ assets_{i,t-1}$) are used as deflator to reduce heteroscedasticity.

Kaszniak's (1999) model can be represented by the following algebraic expression:

$$\frac{TA_{i,t}}{Total\ assets_{i,t-1}} = \hat{\alpha}_0 + \hat{\alpha}_1 \frac{1}{Total\ assets_{i,t-1}} + \hat{\alpha}_2 \frac{(\Delta REV_{i,t} - \Delta REC_{i,t})}{Total\ assets_{i,t-1}} + \hat{\alpha}_3 \frac{PPE_{i,t}}{Total\ assets_{i,t-1}} + \hat{\alpha}_4 \frac{CFO_{i,t}}{Total\ assets_{i,t-1}} + \varepsilon_{i,t} \quad (3)$$

The Kothari et al. (2005) model can be represented by the following algebraic expression:

$$\frac{TA_{i,t}}{Total\ assets_{i,t-1}} = \hat{\alpha}_0 + \hat{\alpha}_1 \frac{1}{Total\ assets_{i,t-1}} + \hat{\alpha}_2 \frac{(\Delta REV_{i,t} - \Delta REC_{i,t})}{Total\ assets_{i,t-1}} + \hat{\alpha}_3 \frac{PPE_{i,t}}{Total\ assets_{i,t-1}} + \hat{\alpha}_4 ROA_{i,t} + \varepsilon_{i,t} \quad (4)$$

Equations (3) and (4) are estimated for each industry level and fiscal year combination. The non-discretionary accruals are the prediction values from Equations (3) and (4), while discretionary accruals are the residuals. Thus, the higher the value of discretionary accruals, the greater the likelihood of earnings management. According to previous studies, discretionary accruals are evaluated by its module and not by its absolute value, since the aim of analyzing the practice of earnings management is to verify its existence, and its sign is not important (Klein 2002). We take the absolute value of the residuals as our proxy for earnings management.

3.3. Independent and Control Variables

Our set of independent variables covers two main aspects to be tested in this work: the effect of fixed (FR) and variable remuneration (VR) on the level of earnings management. The value of the fixed remuneration paid to members of the board of directors (FR) is presented in the form of a logarithm due to its relationship with the number of managers that this body may have—payment of a higher remuneration may occur because of a higher number of elements in this corporate body, and not because the remuneration of these elements is higher. By logarithmising this variable, the model satisfies the assumptions of homoscedasticity and non-correlation (Das et al. 2011; Marroco 2018). The value of the variable remuneration paid to members of the board of directors (FR) is presented as a dummy variable that assumes the value of one when the company presents variable remuneration, and zero otherwise (Ryan and Wiggins 2001).

Several control variables are introduced to isolate other factors that may influence managers' accounting choices. We control for effect audit by a Big 4 (AUD) that represents audit quality. The Big 4 are the four largest international accounting firms: Deloitte, EY, KPMG, and PwC. Accounting literature suggests that audit quality is negatively related to earnings management (Safari et al. 2016; Niza 2017), which means that firms audited by the Big 4 have lower incentives to manage earnings. It becomes relevant to include as a control variable the existence of a remuneration committee (RC) in the structure of the entities under analysis. Kang et al. (2013) present a positive relationship between the existence of a remuneration regulator within companies and the level of discretionary accruals. Thus, the study of these authors shows that when this corporate body exists in the governance structure, earnings management decreases. We also control for firm size (SIZE) with the natural logarithm of the total assets of each firm. Several studies consider that the size of the entity is negatively correlated with earnings management, which means that the larger the company, the lower the level of earnings management (Siekelova et al. 2020). To evaluate the capacity that a certain entity has to generate results, the return that it presents in relation to its total assets is analyzed. To this end, the ROA—Return on Assets indicator is used. Lakhal (2015) considers that the greater the financial performance of a company, the greater the tendency to manage its earnings so as to interfere in the preparation of future plans or investments. With regard to the composition of the board of directors, the exis-

tence of elements without management functions, that is, non-executive managers (NEM), has shown some impact on earnings management. Ferreira (2019) concluded that, in Portuguese companies, there is a negative relationship between the number of non-executive managers and the level of discretionary accruals presented. This means that when these managers exist on the board of directors, the quality of financial reporting tends to increase. Finally, to control for variations over time and across industries, we also include year and industry effects. Table 3 presents the definitions of our independent and control variables used in this study.

Table 3. Definition of independent variables.

Variable	Name	Definition	Expression/Calculation Formula	Bibliography
$FR_{i,t}$	Fixed Remuneration	Logarithm Fixed Remuneration paid	$FR_{i,t} = \text{Log} \left(\frac{\text{Fixed Remuneration Paid}}{\text{Total Assets}} \right)$	Fredriksson et al. (2020); DeAngelo (1981); Lommers (2019)
$VR_{i,t}$	Variable Remuneration	Dummy variable	$VR_{i,t}$ = Dummy variable that assumes the value of 1 when company i in year t presents variable remuneration and 0 otherwise	Ryan and Wiggins (2001)
$RC_{i,t}$	Remuneration Committee	Dummy variable	$RC_{i,t}$ = Dummy variable that takes the value of 1 when company i in t has remuneration commission, and 0 otherwise	Daily et al. (1998); Haverkate (2020)
$Aud_{i,t}$	Audit by a Big4	Dummy variable where 1 if audited by a Big4 firm	$Aud_{i,t}$ = Dummy variable that assumes the value of 1 when company i in year t is audited by a Big4 (The Big 4 are the four largest international accounting firms: Deloitte, EY, KPMG, and PwC), and 0 otherwise	Abdullah and Ismail (2016); Damak (2018); Sadiq et al. (2019); Ferreira (2019)
$LnTA_{i,t}$	Total Assets	Logarithm Total Assets	$LnTA_{i,t} = \text{Ln} (\text{Total Assets})$	Dias (2015); Almadi and Lazic (2016); Safari et al. (2016); da Palma (2019)
$ROA_{i,t}$	ROA	Return on Assets	$ROA_{i,t} = \frac{\text{Net Profit}_{i,t}}{\text{Total Assets}_{i,t}}$	Jaiswall and Bhattacharyya (2016); Borodovska (2016); Niza (2017)
$NEM_{i,t}$	Non-Executive Managers	Nº of non-executive managers	Number of non-executive managers	Ferreira (2019); Haverkate (2020)
$Ind_{i,t}$	Industry	Dummy variable	$Ind_{i,t}$ = Dummy variable that takes the value of 1 if the observation is industry, and 0 otherwise	Kabir et al. (2018); Haverkate (2020); Ferreira (2019)
$Year_i$	Year	Dummy variable	$Year_{i,t}$ = Dummy variable that takes the value of 1 if the observation is from the year, and 0 otherwise	Arun et al. (2015); Benkel et al. (2006); Ferreira (2019)

3.4. Empirical Model

To test H1 and H2, the impact of fixed and variable remuneration on earnings management, we estimate the following regression:

$$|EM|_{i,t} = \alpha_0 + \alpha_1 FR_{i,t} + \alpha_2 VR_{i,t} + \alpha_3 RC_{i,t} + \alpha_4 Aud_{i,t} + \alpha_5 LnTA_{i,t} + \alpha_6 ROA_{i,t} + \alpha_7 NEM_{i,t} + \alpha_8 YEAR_{i,t} + \alpha_9 Ind_{i,t} + \varepsilon_{i,t} \quad (5)$$

where subscript i denotes individual firms and subscript t represents the year period. The coefficients $\alpha_{(0-9),t}$ are parameters to be estimated, while $\varepsilon_{i,t}$ is a disturbance term. In terms of interpretation and analysis of the model, the positive relationship means that the higher one of the remunerations presented, the greater the earnings management of the entity under analysis in a given year, and vice versa. It should be noted that the amount of earnings management $EM_{i,t}$ is presented in absolute terms.

4. Results and Discussion

4.1. Descriptive Statistics

Table 4 demonstrates the descriptive statistics of the dependent variable, earnings management, according to the estimation of the Kasznik (1999) model and the Kothari et al. (2005) model.

Table 4. Descriptive statistics of the dependent variable.

Model	N	Mean	Std. Dev.	Minimum	Median	Maximum
Kasznik (1999) model	165	0.068	0.092	0.000	0.036	0.474
Kothari et al. (2005) model	165	0.070	0.090	0.001	0.419	0.492

It is possible to observe that the absolute values of discretionary accruals are similar among the various models under analysis. The mean value of the earnings management proxy is between 0.068 and 0.070, being congruent with the literature regarding earnings management (Grilo 2014; Lisboa 2016; de Sousa 2017; Ferreira 2019; Hassen 2014; Al-Absy et al. 2018).

Table 5 demonstrates the descriptive statistics on the independent variables to be applied in the model, thus presenting a better characterization of the sample.

Table 5. Descriptive statistics of the independent variables.

Variable	N	Mean	Std. Dev.	Percentile 25	Median	Percentile 75
$FR_{i,t}$	165	0.358	2.426	−1.423	0.579	1.939
$VR_{i,t}$	165	0.394	0.490	0.000	0.000	1.000
$Aud_{i,t}$	165	0.670	0.471	0.000	1.000	1.000
$RC_{i,t}$	165	0.710	0.456	0.000	1.000	1.000
$LnTA_{i,t}$	165	13.138	2.172	11.931	12.951	14.869
$ROA_{i,t}$	165	0.041	0.062	0.011	0.041	0.068
$NEM_{i,t}$	165	4.010	4.161	0.000	3.000	7.000

The fixed remuneration (FR) presented by the board of directors is, on average, 1.2 million euros, resulting in an average remuneration of 143 thousand euros per manager. Regarding the existence of variable remuneration (VR), it can be observed that not all entities present these items in their financial reporting. Only 40% of the Euronex listed entities state that they have paid their directors variable remuneration (VR). The average amount of variable remuneration paid to each board of directors (when this exists) is 1.3 million euros, resulting in variable remuneration per manager of 115 thousand euros.

As for the audit performed (Aud), 67% of the entities in the sample are audited by one of the Big 4, showing that entities seek to demonstrate the quality of their financial reporting, since there is a positive correlation between the quality of financial reporting and the audit performed by these multinationals (Gaio et al. 2020). The remuneration committee (RC) can be observed in the organizational structure of 71% of the entities, which is the percentage of entities that follow the recommendation issued by the CMVM. The average ROA of the entities in the sample is 4%, with around 50% of these presenting a higher value. It is relevant to point out that not all the entities analyzed showed profits in the periods under study, with the minimum value observed being -10% . It is also possible to verify through the values presented that the sample is quite dispersed in what concerns ROA (maximum = 17.3% ; minimum = -10% ; standard deviation = 0.062). These values are congruent with the results presented previously (Jaiswall and Bhattacharyya 2016; Borodovska 2016; Niza 2017).

Given the use of a linear regression model, it is necessary to verify the multicollinearity of the variables to be used, that is, their relationship, to ensure that there are no strong correlations between them. Table 6 presents the Pearson correlation matrix, this coefficient being responsible for analyzing the intensity of the relationship between the two variables.

Table 6. Pearson correlation matrix.

		$EM_{i,t}$ Kasznik	$FR_{i,t}$	$VR_{i,t}$	$Aud_{i,t}$	$RC_{i,t}$	$LnTA_{i,t}$	$ROA_{i,t}$	$NEM_{i,t}$
$EM_{i,t}$ Kasznik	Coef	1	0.128	0.000	0.026	−0.069	−0.241	−0.051	−0.117
	Sig. (bil)		0.050	0.500	0.371	0.189	0.001	0.257	0.067
$FR_{i,t}$	Coef		1	0.294 *	0.256 *	0.041	−0.894 *	−0.294 *	0.316 *
	Sig. (bil)			0.000	0.000	0.301	0.000	0.000	0.000
$VR_{i,t}$	Coef			1	0.272 *	0.380 *	−0.041	−0.063	0.543 *
	Sig. (bil)				0.000	0.000	0.301	0.209	0.000
$Aud_{i,t}$	Coef				1	0.435 *	−0.103	−0.123	0.465 *
	Sig. (bil)					0.000	0.095	0.058	0.000
$RC_{i,t}$	Coef					1	0.159	−0.013	0.361 *
	Sig. (bil)						0.021	0.432	0.000
$LnTA_{i,t}$	Coef						1	0.268 *	−0.118
	Sig. (bil)							0.000	0.066
$ROA_{i,t}$	Coef							1	−0.038
	Sig. (bil)								0.314
$NEM_{i,t}$	Coef								1
	Sig. (bil)								

Note: * indicate statistically significant for a significance level of 0.1.

The fixed remuneration variable is positively correlated with the existence of variable remuneration ($r = 0.294$; sig = 0.000), auditing being carried out by a Big 4 company ($r = 0.256$) and also the number of non-executive directors on the board of directors ($r = 0.316$; sig = 0.000). However, this same variable is negatively related to the value of assets ($r = -0.894$; sig = 0.000). About the level of earnings management, it is possible to observe a positive correlation between the EM variable and the fixed remuneration paid ($r = 0.128$; sig = 0.050). In turn, variable remuneration is positively correlated with auditing by a Big 4 company ($r = 0.272$; sig = 0.000), the existence of a remuneration committee in the organizational structure ($r = 0.380$; sig = 0.000), and the number of non-executive managers on the

board of directors. The level of earnings management (EM) does not show any type of relationship with the variable remuneration (VR) paid to members of the board of directors.

Regarding the control variables, it can be seen that the engagement of a Big 4 audit is positively correlated with the existence of a remuneration committee ($r = 0.435$; $\text{sig} = 0.000$) and the number of non-executive managers ($r = 0.465$; $\text{sig} = 0.000$). It is possible to observe a negative correlation between the level of earnings management and the value of the entity's total assets ($r = -0.241$; $\text{sig} = 0.001$). Finally, we can observe a positive relationship between the value of the entity's assets and the value of ROA ($r = 0.268$; $\text{sig} = 0.000$).

4.2. Multivariate Results

Table 7 shows the results of pooled ordinary least square (OLS) estimations of regression Equation (1) from examination of the effect of the structure of remuneration on earnings management. Regarding the fixed remuneration paid to members of the board of directors, it is possible to observe that there is a significant ($\text{sig} = 0.004$) negative relationship between the amount paid ($t = -2.939$) and the level of earnings management, and Hypothesis 1 can be verified. The higher level of fixed remuneration leads to a lower level of earnings management. This conclusion is in line with the results obtained by [Safari et al. \(2016\)](#), [Hassen \(2014\)](#) and [Harvey et al. \(2020\)](#). This leads us to conclude that, regarding fixed remuneration of board members, when better remunerated with base pay, they tend to want to retain the trust of shareholders and are less likely to undertake earnings management practices.

Table 7. Impact of board remuneration on the earnings management.

Kasznik (1999) Model		
	t	Sig.
Constant	4.481	0.000 ***
Independent Variables		
$FR_{i,t}$	−2.939	0.004 **
$VR_{i,t}$	2.613	0.072 **
Control Variables		
$Aud_{i,t}$	0.652	0.516
$RC_{i,t}$	0.294	0.769
$LnTA_{i,t}$	−3.804	0.000 ***
$ROA_{i,t}$	−0.122	0.903
$NEM_{i,t}$	−2.607	0.545 **
Ind_2	−1.155	0.250
Ind_3	−1.946	0.054 *
Ind_4	−1.331	0.260
Ind_5	−1.372	0.172
Year_2015	0.011	0.991
Year_2016	5.226	0.000 ***
Year_2017	0.872	0.384
Year_2018	0.224	0.035 *
Industry	Yes	
Year	Yes	
R^2 Adjusted	0.255	
Durbin-Watson	1.752	
N	165	

*, ** and *** indicate statistically significant for a significance level of 0.1, 0.05 and 0.001, respectively ($n = 165$).

With regard to the existence of a variable component in the remuneration paid to members of the board of directors, a positive relationship with the level of earnings management ($t = 2.613$) can be observed and can be considered significant ($\text{sig} = 0.072$), enabling verification of Hypothesis 2. The higher level of variable remuneration leads to a higher level of earnings management. Thus, this conclusion supports the results presented by Alhadab and Al-Own (2017), Gong et al. (2019), Qu et al. (2020), Sadiq et al. (2019), and Pecha (2018), who state that when it is possible to influence their remuneration at the expense of achieved goals, directors tend to undertake earnings management practices to increase their remuneration. Contrary to what was observed with fixed remunerations, when the members of the board of directors are paid salaries present a salary with a variable component, the quality of financial reporting decreases. The results are supported by the agency theory, showing that managers, when well-remunerated and with properly structured objectives, tend to present better results. However, we can also observe that managers may take advantage of this type of incentive to improve their remuneration.

Regarding the control variables, the coefficients for LnTA and NEM are negative and significant, suggesting a lower level of earnings management. As for the size of the firms (LnTA), it was possible to observe a negative relationship between this variable and the level of earnings management ($t = -3.804$; $\text{sig} = 0.000$), going against the conclusions presented by Siekelova et al. (2020) and Veronica (2015). The authors believe that larger companies are subject to greater and better internal control mechanisms, thus reducing the likelihood of attempts at earnings management. The existence of a body external to the board of directors responsible for the composition of salaries, including the award of bonuses, deprives managers of the power to influence their future remuneration and the excessive indexation of this to company goals and objectives. It is possible to observe a negative relationship between the number of non-executive managers on the board of directors and the level of earnings management ($t = -0.607$; $\text{sig} = 0.545$), confirming the results presented by Ferreira (2019) and the CMVM recommendations (CMVM 2020) stating that the higher the number of non-executive managers, the lower the ability of other managers to influence results. It is also important to mention that non-executive managers, in general, do not obtain any variable remuneration, i.e., remuneration dependent on the entity's results, and they do not benefit from any earnings management. Finally, other control variables, such as AUD, RC, and ROA, have no significant influence on earnings management.

To validate the results obtained, the linear regression results through Kothari et al. (2005) model are presented (Table 8), showing that the main results remain unchanged.

Table 8. Robustness test.

Kothari et al. (2005) Model		
	t	Sig.
Constant	3.875	0.000 ***
Independent Variables		
$FR_{i,t}$	-2.259	0.025 **
$VR_{i,t}$	1.651	0.343 *
Control Variables		
$Aud_{i,t}$	-0.007	0.994
$RC_{i,t}$	1.141	0.256
$LnTA_{i,t}$	-3.935	0.002 ***
$ROA_{i,t}$	-0.439	0.661
$NEM_{i,t}$	-2.284	0.777 **
Ind_2	-1.267	0.207

Table 8. *Cont.*

Kothari et al. (2005) Model		
Ind_3	−1.874	0.063 *
Ind_4	−1.349	0.179
Ind_5	−1.367	0.174
Year_2015	0.676	0.500
Year_2016	5.367	0.000 ***
Year_2017	1.609	0.110
Year_2018	0.449	0.654
Industry	Yes	
Year	Yes	
R ² Adjusted	0.224	
Durbin-Watson	1.855	
N	165	

*, ** and *** indicate statistically significant for a significance level of 0.1, 0.05 and 0.001 respectively (n = 165).

Table 8 shows that fixed remuneration negatively influences earnings management, and that variable remuneration positively influences earnings management. We can confirm that the observed results obtained using the Kothari et al. (2005) model are very similar to those obtained using the principal Kasznik (1999) model (Table 7).

5. Conclusions

This paper analyzed the influence of executive remuneration structure on earnings management, and correspondingly its influence on the quality of financial reporting of listed companies in Portugal. The study analyzed companies listed on the Euronext Lisbon stock exchange between 2015 and 2019, and a multiple linear regression was carried out to obtain a proxy of the level of earnings management of each company. This was then compared with the value and structure of remuneration and its format through the model developed and presented herein.

The results show a negative correlation between the fixed remuneration of the members of the board of directors and the level of earnings management observed, leading to the conclusion that managers thus remunerated do not tend to undertake earnings management practices. These conclusions are congruent with those obtained by Safari et al. (2016), Hassen (2014) and Harvey et al. (2020). Regarding variable remuneration, it was possible to observe a positive relationship with the level of earnings management, demonstrating that when managers' remuneration is dependent on the results achieved, they tend to undertake earnings management practices, these findings being similar to those obtained by Alhadab and Al-Own (2017), Gong et al. (2019), Qu et al. (2020), Sadiq et al. (2019), and Pecha (2018).

Our study makes several contributions. First, our study has practical implications for regulators and practitioners who publicly debate the structure of salaries and the implications for results, growth, and agency costs, as the best practice for corporate governance. It may also help regulators in the European Union to identify the strengths and weaknesses of alternative models for the structure of salaries towards greater choice regarding board structure among member states (Alves 2023). Our study is also of importance to the Portuguese regulator (CMVM), as it provides insights into the executive remuneration structure on earnings management of the Portuguese listed firms. Therefore, the Portuguese corporate governance code should reconsider whether executive remuneration planning should be permitted in firms, as this evidence indicates that executive remuneration may be associated with higher levels of earnings management and hence poorer corporate governance. Second, our study also offers contributions at the corporate level, with the potential to help shareholders establish remuneration practices to ensure the proper functioning

of the entity without affecting the quality of the financial reporting. Third, we also contribute at the academic level by presenting an analysis of the Portuguese market, thus establishing cause–effect relationships between the elements under study, and enabling the future establishment of comparisons with other markets. The scarcity of previous literature on the subject along with the diversity of opinions and analyses on the Portuguese market make the presented study relevant (Marques et al. 2011).

For future research, it would be of interest to examine the governance mechanisms as moderators that may affect the agency costs, and consequently earnings management. CEO duality, independence of the board, and audit firms may also be used to moderate factors of listed Portuguese firms. This research could be conducted through studies over a longer period, thus allowing a larger sample, something that was not possible in this study, as information on remuneration in companies' management reports had only recently become available. In addition, the structure of the executive compensation can also include a fraction of the variable earnings in the total compensation package. According to agency theory, executives with a larger fraction of variable compensation should have their total earnings more aligned with the firm's earnings. Moreover, if listed firms have compensation schemes that are also based on stock compensation (such as stock option grants and restricted stocks), executives should also accept less excessive pay. Furthermore, small and medium-sized enterprises (SMEs) are the backbone of Europe's economy. Thus, in this vein, for future research, it would also be interesting to replicate the analyses using data from Portuguese SMEs. Finally, the model presented in this study for the Portuguese case can be applied to other similar markets at the corporate and legislative levels, thus allowing a direct comparison.

Author Contributions: Conceptualization, I.C.d.S.P., C.G.D. and L.C.C.; methodology, C.G.D. and I.C.d.S.P.; validation, I.C.d.S.P., C.G.D. and L.C.C.; formal analysis, C.G.D.; investigation, C.G.D.; resources, C.G.D. and I.C.d.S.P.; data curation, I.P., C.G.D. and L.C.C.; writing—original draft preparation, I.C.d.S.P., C.G.D. and L.C.C.; writing—review and editing, I.C.d.S.P., C.G.D. and L.C.C.; visualization, I.C.d.S.P., C.G.D. and L.C.C.; supervision, I.C.d.S.P.; project administration, I.C.d.S.P.; funding acquisition, I.C.d.S.P. and L.C.C. All authors have read and agreed to the published version of the manuscript.

Funding: Inna Paiva appreciate financial support by Fundação para a Ciência e Tecnologia, grant UIDB/00315/2020.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Dataset available on request from the authors.

Conflicts of Interest: The authors declare no conflicts of interest.

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