

The explanatory factors of disclosures related to the discount rates by listed entities in Portugal

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ABSTRACT

This paper aims to identify the explanatory factors of mandatory disclosure (MD) and voluntary disclosure (VD) levels related to discount rates, based on disclosure theories. The size, leverage, profitability, and audit firms were selected from different theories, namely agency theory, signaling theory, positive accounting theory, including the political cost hypothesis, and the cost of capital theory. Furthermore, the materiality (weight of the items) and the relevance (nature) of the topic were also considered, based on the evidence already obtained in the literature. Research on disclosures related to discount rates has been assessed either as an incidental topic or from a limited-scope analysis, particularly with respect to MDs. This paper assesses this topic as its specific object of analysis for both MD and VD. The use of the discount rate has been assuming growing importance within financial reporting. Therefore, this topic should deserve particular attention from international standard-setting bodies. The understanding of the proper set of items to be disclosed and understanding the factors that explain its disclosure, aligned with the efforts to assure its compliance by legal authorities, may contribute to reducing asymmetries and increasing transparency in entities' financial reporting. This study uses the method of archival research and content analysis of consolidated reports and accounts for the year 2020 of listed entities in Euronext Lisboa. Regression models were used, having disclosure indices related to discount rates as dependent variables. This paper finds a positive association between disclosures related to discount rates and the entity's size, as well as the materiality and the relevance, assessed by the weight of the items and the nature of the topic under assessment, respectively. It adds new explanatory factors on the VDs and MDs related to discount rates in a broader perspective of analysis.

Keywords: disclosure, Portuguese stock market, explanatory factors, discount rates, present value.

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1. INTRODUCTION

Whether in the measurement through present value or even using fair value as a measurement basis, the discount rate is a fundamental assumption and can cause relevant impacts on the financial position and performance of the entities according to the amounts involved (PricewaterhouseCoopers [PWC], 2018).

The present value, as a basis for measuring the current value, has achieved relative prominence over time (Alberto & Lopes, 2010; He, 2020; Peasnell, 1977). Discount rates are associated with the concept of current value through the time-value of money and associated uncertainties, since it is the inclusion of a discount rate that seeks to obtain the best estimate of the current value of future inflows or outflows (§ B13, International Financial Reporting Standards 13 [IFRS 13]).

Some International Accounting Standards (IAS) and IFRS issued by the International Accounting Standards Board (IASB) require and others allow the use of discount rates in estimating future cash flows.

According to the survey by Blum and Théron (2019), the discount rate is mentioned in 12 IAS and IFRS, resulting in approximately 21% of the IAS and 35% of the IFRS, which includes, for instance, leases (IFRS 16), employee benefits (IAS 19), accounting and reporting of retirement benefit plans (IAS 26), impairment of assets (IAS 36), provisions, contingent liabilities and contingent assets (IAS 37), intangible assets (IAS 38), insurance contracts (IFRS 4), noncurrent assets held for sale and discontinued operations (IFRS 5), financial instruments (IFRS 9), fair value measurement (IFRS 13), and revenue from contracts with customers (IFRS 15).

However, a comparison between the different standards shows some inconsistencies regarding the definition, disclosure requirements, as well as the lack of objectivity in determining the discount rate to be applied, opening an opportunity for the selection of this variable, according to the objectives of the entity or, furthermore, a deterioration of the quality or quantity of information disclosed to users of the financial statements (Alberto & Lopes, 2010; IASB, 2019).

Through mandatory disclosure (MD) and voluntary disclosure (VD), entities can present, explain and, above all, substantiate the judgments formulated to find the most appropriate discount rate for the measurement of each asset or liability (Meek et al. 1995). The decision to disclose or not disclose is complex since it requires a trial for each specific case and the weighting of the costs and

benefits of following a certain option, especially when it comes to sensitive information (Saha & Bose, 2021; Sarquis et al., 2021). However, in a topic such as the discount rate used for the measurement of assets and liabilities, which requires high judgment and, on the other hand, proves to be complex due to the multiplicity of options in the selection of inputs to be used, it only seems possible to base the choices through the appropriate disclosure (Oliveira et al., 2006).

As such, the theme under analysis is assumed to be relevant due to the quantitative and qualitative impact that the selection of the discount rate may have on the financial position and performance of the entities, affecting the perception, opinion, and, finally, the decisions of all those interested in the financial reporting of the entities involved (Alberto & Lopes, 2010; Ernest & Young Global Limited, 2016; PWC, 2018).

Based on these considerations, this study is based on the following research question: what factors can explain the level of disclosure of information (MD or VD) related to discount rates by listed entities in Euronext Lisboa? Thus, the general objective of this study will focus on the identification and analysis of explanatory factors of MD and VD levels on discount rates, in the light of theories and literature on the subject. To achieve the general objective, the study has the following specific objectives: (i) identify the criteria that are defined in the different IFRS for the selection of the discount rates to be used and the corresponding disclosure requirements; (ii) identify the level of disclosure of requirements related to the discount rates used by listed entities in Portugal; and (iii) to analyze any factors that determine the criteria used in the selection of discount rates and the respective disclosure made on this matter.

Concerning the quality and extent of MD and VD, some theories are traditionally pointed out as the basis to explain the problem from different explanatory factors, namely the agency theory (Ali et al., 2004; Alkababji, 2016; Glaum & Street, 2003; Jensen & Meckling, 1976; Ross, 1973; Tsalavoutas, 2011), the theory of signaling (Ali et al., 2004; Morris, 1987; Oliveira et al., 2006; Owusu-Ansah, 1998; Ross, 1973; Spence, 1973; Tsalavoutas, 2011; Verrecchia, 1983), the positive accounting theory, including the hypothesis of political costs (Alkababji, 2016; Guerreiro, 2006; Tsalavoutas, 2011; Watts & Zimmerman, 1978, 1990), and the capital cost theory (Diamond & Verrecchia, 1991; Oliveira et al., 2006; Tsalavoutas, 2011).

Such theories allow justifying the traditional inclusion in the analysis of factors such as size, profitability, leverage, and type of auditor.

However, given the specificity of the object of this study and the evidence already obtained in the literature, the materiality (the weight) of the items under assessment and relevance (the nature) of the topic (IAS/IFRS) related to the disclosure of the discount rate were also considered. The inclusion of this last element was also an additional contribution to the investigation on this subject, which further increases the contributions of this study. Other important contribution of this study to the investigation is the inclusion of VDs.

The methodology used for this paper is based on the file research method and content analysis as a technique for collecting information, based on the consolidated reports of the listed entities in Euronext Lisboa for 2020. A multivariate analysis using linear regression models were developed with the objective of responding to the formulated hypotheses.

MD and VD regarding discount rates used in the measurement of present value for the determination of current value were identified as dependent variables. They were obtained through the content provided, implicitly or explicitly, in the four standards identified by the IASB (2019) as more relevant in this context, which were selected as the object of this research. More specifically, the study will focus on the items related to this topic that can be totally or partially found in four standards, namely IFRS 13 – Fair Value Measurement, IAS 19 – Employee Benefits, IAS 36 – Impairment of Assets, and IAS 37 – Provisions, Contingent Liabilities, and Contingent Assets.

Regarding the independent variables, the size of the entity, leverage, profitability, and the type of auditor were identified as explanatory factors, based on different theories related to disclosure. Additionally, considering the evidence obtained in the literature on the subject, the materiality (the weight) of the items under assessment and relevance (the nature) of the topic (IAS/IFRS) related to the disclosure of the discount rate were also considered.

The findings shown that the size of entities, as well as the materiality (the weight) of the items under assessment and relevance (the nature) of the topic (IAS/IFRS) are the most significant variables related to the disclosure of the discount rates under assessment in this paper. Agency

theory and the positive accounting theory, including the political cost hypothesis, were the most evident theoretical basis to explain the evidence obtained.

Despite the existence of research that covers a given (or some) standard, covering different assets and liabilities that can be measured at a current value under several IAS and IFRS [namely on IFRS 13 (Alkababji, 2016; Kasyan et al., 2018), IAS 19 (Ali et al., 2004; Fahad et al., 2020; Santos et al., 2014; Street & Gray, 2002; Tsalavoutas, 2011), IAS 36 (Glaum et al. 2013; Paugam et al., 2013; Santos et al., 2014; Tsalavoutas, 2011), and IAS 37 (Santos et al., 2014; Tsalavoutas, 2011)], none studies were identified that assess disclosures related to discount rate in a broader perspective. Thus, this study contributes in this regard.

Through the literature review, it was also found that the analysis on financial information disclosures is considerably more abundant when the topic is related to MD than VD (Ali et al., 2004; Alkababji, 2016; Fahad et al., 2020; Glaum et al., 2013; Hassan & Marston, 2010; Healy & Palepu, 2001; Kasyan et al., 2018; Lopes & Rodrigues, 2007; Meek et al., 1995; Paugam et al., 2013; Santos et al., 2014; Street & Gray, 2002; Tsalavoutas, 2011). Furthermore, despite the significant number of studies on VDs covering different topics [see, for instance, Zamil et al. (in press)], there are still gaps in what concerns specific matters related to financial information for which some requirements are missing in IAS and IFRS, such as discount rates, the object of this research. Then, this study also seeks to address this gap.

It is intended, therefore, that the conclusions of this study contribute to the discussion around the identification of the factors that underlie the level of disclosure in this area, the need for further clarification, by the standard-setters, regarding the elements that must be disclosed in matters related to discount rates disclosures. It is also included in this context the definition of what should be the practice in the selection of the discount rate to be used or in terms of the criteria used in its formulation.

The article is structured in four chapters. The following presents the theoretical framework. The third is dedicated to empirical study, which is divided into three sections: methodology, presentation of results, and discussion of results. Finally, the latter presents the conclusions, limitations, and prospects of investigation in this research area.

2. THEORETICAL FRAMEWORK

In the period from 2014 to 2017, the IASB (2019) concluded that there are inconsistencies in the requirements related to the discount rates provided for in the IAS and

IFRS. These inconsistencies are essentially related to the types of inputs used in applying the present value technique or how the value of those inputs is determined.

Other inconsistencies are also related to the fact that different standards adopt different measurement bases since they were conceived at different times and with specific approaches. There are, therefore, similarities and differences, both in terms of the measurement bases and in terms of the measurement inputs to be used among the different IFRS concerning discount rates (IASB, 2019).

Despite the difficulties associated with existing differences, the literature on the subject does not argue that discount rates should necessarily be defined uniformly, but rather a more precise identification or definition of the criteria that should be at the basis of their selection (Blum & Théron, 2019; Eckel et al., 2003; Husmann & Schmidt, 2008; Kvaal, 2010; Thauvron et al., 2019).

The selection of the appropriate discount rate is controversial, and the recommendations differ according to the type of assets or liabilities, but also with the risks that are seeking to incorporate into the discount models. As such, there is no single discount rate to be incorporated into the valuation of assets and liabilities (Blum & Théron, 2019; Eckel et al., 2003). Additionally, the level of disclosure required by the IAS and IFRS regarding present value and discount rate is not equivalent in all standards (IASB, 2019).

As for the disclosure of the rate itself, it is observed that it is required in IAS 19, IAS 36, and IFRS 13, but not in IAS 37. Another example is related to sensitivity analysis (quantitative), as its disclosure is partially required in IAS 36, not required in IAS 37, and, finally, it is integrally required under IFRS 13 and IAS 19.

Although some IAS/IFRS require, among others, the disclosure of information related to discount rates, some studies point out the insufficiency or even, in some cases, the lack of information disclosed, which may compromise the quality, accuracy, and transparency of financial reporting (Alberto & Lopes, 2010; Souza et al., 2009).

Through disclosure, managers can bridge the gap between legal requirements and the needs of users, thus becoming an important tool for communicating with the entities' stakeholders (Healy & Palepu, 2001). Adequate disclosure can often go beyond MD disclosure, transferring partially from the preparer to the users of financial information the burden of assessing the reasonableness of measurement (Eckel et al., 2003). Considering their benefits and the relevance of this topic, it is relevant to understand the elements that can explain the proper disclosures by entities related to the discount rate used in the measurement of assets and liabilities.

The literature traditionally uses several theories to explain the level of disclosure in matters of financial

reporting, through different explanatory factors. From the literature review, it was identified that the size of entities is the explanatory factor often assessed by a more significant set of theories. In this context, the agency theory (Ali et al., 2004; Alkababji, 2016; Demir & Bahadir, 2014; Glaum & Street, 2003; Tsalavoutas, 2011), the positive accounting theory, in particular the hypothesis of political costs (Alkababji, 2016; Guerreiro, 2006; Lopes & Rodrigues, 2007; Tsalavoutas, 2011), and the theory of the cost of capital (Tsalavoutas, 2011) are identified. On this topic, the agency theory states that the monitoring cost, which aims to allow the principal to supervise the agent's behavior and decisions, is an example of an agency cost that the largest entities are more able to bear (Jensen & Meckling, 1976).

From the perspective of the positive accounting theory, entities can minimize contracting costs through disclosure (including transaction costs, agency costs, renegotiation costs and bankruptcy costs) and, thereby, maximize the entity's value. A similar perspective is applicable to the political costs to which entities that are politically exposed are subject, as entities need to improve the level of compliance or compliance with accounting and financial reporting standards, to mitigate their own risk by disclosing more information. Larger entities tend to be under more rigorous scrutiny and, therefore, the political costs hypothesis can be used to explain the higher level of disclosure, since this characteristic can influence the magnitude of political visibility (Watts & Zimmerman, 1978, 1990). Despite the different perspectives, those theories are, however, relatively consensual regarding the positive sign of association of the size with the level of disclosure.

Leverage and profitability are supported by the agency theory (Ali et al., 2004; Guerreiro, 2006; Oliveira et al., 2006), signaling theory (Ali et al., 2004; Demir & Bahadir, 2014; Oliveira et al., 2006; Owusu-Ansah, 1998; Tsalavoutas, 2011), and the theory of the cost of capital (Oliveira et al., 2006; Tsalavoutas, 2011). Morris (1987) states that agency and signaling theories are complementary, as managers can signal through disclosures their expectations and intentions. Entities seek to minimize information asymmetry and justify their profitability and indebtedness by increasing the disclosures made, which, according to Diamond and Verrecchia (1991), also reduces the cost of capital. This hypothesis is also in line with the signaling theory, initially developed by Spence (1973), which applies to any market where information asymmetry exists (Morris, 1987). On the other hand, the signaling theory also suggests that entities with lower indebtedness are encouraged to send signals to

the market about their financial structure, implying higher levels of disclosure (Zarzeski, 1996). Again, the different theories generally point out a positive association between these factors and the level of disclosure, except for the signaling theory, which proposes a negative association for leverage.

Finally, the Big 4 audit firms are often associated with the agency theory (Demir & Bahadir, 2014; Lopes & Rodrigues, 2007; Oliveira et al., 2006; Tsalavoutas, 2011), with a sign of positive association between this factor and the level of disclosure. The agency theory states that the auditor is a mechanism to reduce agency costs, mitigating information asymmetry and increasing the credibility of disclosures (Jensen & Meckling, 1976). According to Singhvi and Desai (1971), multinational auditing entities tend to demand more from their clients to avoid reputational costs, especially regarding disclosures.

Thus, it is verified that the signs of the association between the explanatory factors proposed and the levels of disclosure point out, in general, to a positive association, except for leverage in the context of signaling theory. The results of empirical studies are, however, less consensual, especially regarding profitability and leverage.

Regarding size, the literature is identified in line with the initial propositions, with a predominance of investigations that find a positive association (Ali et al. 2004; Alkababji, 2016; Alnaas & Rashid, 2019; Demir & Bahadir, 2014; Devalle & Rizzato, 2013; Guerreiro, 2006; Lopes & Rodrigues, 2007; Matış et al., 2013; Oliveira & Lemes, 2011; Owusu-Ansah, 1998; Richardson & Welker, 2001; Santos et al., 2014; Singhvi & Desai, 1971; Street & Gray, 2002; Wallace & Naser, 1995; Zarzeski, 1996). On profitability, there is research that found a positive relationship (Ali et al., 2004), but also the opposite (Wallace & Naser, 1995). This is also the case for leverage, with studies pointing out to both a positive (Demir & Bahadir, 2014) or a negative association (Guerreiro, 2006; Maia et al. 2012; Oliveira et al., 2006; Zarzeski, 1996). As for the audit firms, there is, like the size, some consistency as to the positive meaning of the association (Alkababji, 2016; Demir & Bahadir, 2014; Glaum & Street, 2003; Glaum et al., 2013; Lopes & Rodrigues, 2007; Maia et al., 2012; Matış et al., 2013; Santos et al., 2014; Singhvi & Desai, 1971; Street & Gray, 2002; Tsalavoutas, 2011).

Based on the previous research, the following hypotheses were formulated:

H₁: the level of disclosure of matters related to discount rates is positively associated with the entity's size.

H₂: the level of disclosure of matters related to discount rates is associated with the entity's profitability.

H₃: the level of disclosure of matters related to discount rates is associated with the entity's level of leverage.

H₄: the level of disclosure of matters related to discount rates is positively associated with the presence of Big 4 audit firms.

Besides the independent variables size, profitability, leverage, and auditors, this research also includes the materiality (the weight) of the items under assessment and relevance (the nature) of the topic (IAS/IFRS) as novelties.

Regarding the materiality, which was assessed by the weight of the item underlying the discount rate used, and the relevance, based on the nature of the topic (IAS/IFRS) under assessment, no specific theories are identified that justify the consideration of such factors. However, it is possible to support the inclusion of the analysis of such elements based on the evidence already obtained in the literature. There is evidence to indicate an incentive for disclosure by entities depending on the materiality of the matter in question (Barth et al., 1997; Cho et al., 2012; Domingos et al., 2017; Fesler & Hagler, 1989; Glaum et al., 2013). For instance, Fesler and Hagler (1989) verified, in a study on the disclosures of contingent liabilities of 126 U.S. entities, that the greater the materiality of the amounts involved, the more likely they are to be disclosed. Further, Glaum et al. (2013), when analyzing European entities on matters related to IFRS 3 and IAS 36, found out that the greater "goodwill" over total assets, the higher the level of compliance with disclosures. On the other hand, Cho et al. (2012) found out that entities did not disclose information on environmental liabilities whenever the amounts involved were not sufficiently material. Based on these elements, the following hypothesis was formulated:

H₅: the level of disclosure of matters related to discount rates is positively associated with the materiality of the underlying item.

As regards the relevance, it should be noted that the IASB itself identifies inconsistencies motivated by a lack of specific guidance in some of the IAS/IFRS that may lead to different levels of disclosure (IASB, 2019). Through the literature, it is also possible to see that the level of disclosures is different according to the standards under analysis, either in Portugal (Kasyan et al., 2018) or in other markets (Alkababji, 2016; Fahad et al., 2020; Glaum et al., 2013; Paugam et al., 2013). Such divergences can be potentially explained by the different methodologies, periods, and samples used, but also by the different materials involved. Table 1 summarizes the results obtained by some studies involving the IAS and IFRS object of this research.

Table 1

Disclosure levels identified in studies on the International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS) object of this study

Author	Sample	Year	IFRS (%)			
			IFRS 13	IAS 19	IAS 36	IAS 37
Street and Gray (2002)	57 listed entities in France	1998		76		
Glaum et al. (2013)	223 listed entities in 17 European countries	2005			73	
Tsalavoutas (2011)	153 listed entities in Greece	2005		64	50	70
Paugam et al. (2013)	218 observations by listed entities in France	2006-2008			51	
Matiş et al. (2013)	20 listed entities in the United Kingdom and Germany	2007	50			
		2008	58			
		2009	71			
Alnaas and Rashid (2019)	121 listed entities in three North African countries	2005		24		49
		2010		33		52
Santos et al. (2014)	366 listed entities in Brazil	2010		39		87
		2013	26			
Kasyan et al. (2018)	17 entities of the banking sector in Portugal	2014	40			
		2015	41			

Source: *Elaborated by the authors.*

Thus, the following hypothesis of relationship is formulated, although with an unknown sign, considering the relative absence of more cross-sectional studies on the IAS and IFRS under assessment in this study:

H₆: the level of disclosure of matters related to discount rates is associated with the relevance of the underlying topic.

3. EMPIRICAL STUDY

3.1 Methodology

To carry out the study, entities included in the Portuguese Stock Index (PSI) All-Share Index of Euronext Lisboa for 2020 were selected. Since 2005, listed entities are required to use IAS and IFRS in their consolidated accounts, based on the Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards, which is also the case of those in Portugal. Entities that did not provide their consolidated accounts for 2020, as well as entities that did not have any observable element relevant to this study were excluded. After the selection criteria mentioned above, five entities were excluded and, thus, 33 entities included in the PSI All-Share Index were the population of this study.

As dependent variables, MD indices (MDI), VD indices (VDI), and total disclosure indices (TDI) were developed, based on the disclosure requirements related

to the discount rates provided for in each of the IAS and IFRS under study, as well as VDs related to the same topic whenever a given topic was considered relevant. Then, in the context of VDs, the inclusion of items foreseen as mandatory in some of the IAS and IFRS, but not foreseen in others, stand out. Thereby, items not required in the context of a given IAS or IFRS were considered as a voluntary item. Additionally, in the context of data collection, it was found that some items were already disclosed by a still expressive number of entities. Those items were also included as VDs.

The indices are objective evaluation elements, not associated with the quality of the report in general, but with the level of transparency, evaluated by the amount of information disclosed (Urquiza et al., 2009), as used in similar studies in this field, namely Ali et al. (2004), Matiş et al. (2013), Street and Gray (2002), and Tsalavoutas (2011).

Table 2 presents the items that are part of the MDI and VDI.

Table 2

Items that are part of mandatory disclosure indices (MDI), voluntary disclosure indices (VDI), and total disclosure indices (TDI) by International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS)

IAS/IFRS and item type	Item	Item description	Source
IFRS 13 – TDI	1	The evaluation technique	a) § 91
	2	The discount rate: in the context of fair value measurements classified at level 3 of the hierarchy, the entity shall provide quantitative information on the significant nonobservable data used in fair value measurement.	d) § 93
	3	Reconciliations: reconciliation between the start and end balances	e) § 93
	4	The estimated expected cash flow – data used to develop these measurements	a) § 91
	5	A narrative description of the sensitivity of fair value measurement to changes in unobservable data if a change of this data to a different value can result in measurement at a fair value significantly higher or lower.	h) i. § 93
IAS 19 – MDI	2	The discount rate: within the framework of significant actuarial assumptions to determine the present value of the defined benefit obligation.	§ 144
	3	Reconciliations: reconciliation between the start and end balances	§ 140
	4	The present value of the defined benefit obligation	a) ii. § 140
	5	A sensitivity analysis for each significant actuarial assumption at the end of the reporting period	a) § 145
IAS 19 – VDI	1	The evaluation technique	
	7	Disclosure on the rating for the discount rate	§ 83
	8	Disclosure on the use of a rate for reference to high-quality obligations of entities relating to the discount rate	§ 83
	9	Disclosure of the deadline or extrapolation to the deadline consistent with the estimated postemployment benefit obligations as a guarantee of consistency with the deadlines for discount rates	§ 83
IAS 36 – MDI	1	The valuation technique: description of the valuation technique used to measure fair value minus disposal costs	f) ii. § 130
	2	The discount rate: the key assumptions used to measure fair value minus disposal costs, which includes the discount rate	f) iii. § 130
	4	The recoverable amount of the asset or CGU and whether that recoverable amount of the asset or CGU represents its fair value less costs of disposal or its value-in-use	e) § 130
IAS 36 – VDI	3	Reconciliations: reconciliation between the start and end balances	
	5	An analysis of sensitivity to the main assumptions used	
	9	Disclosure of the discount rate used for each CGU	
IAS 37 – MDI	3	Reconciliations: reconciliation between the start and end balances	a) § 84
	6	The entity discloses the effects of the change in the discount rate – the “unwinding effect”	e) § 84
IAS 37 – VDI	1	The evaluation technique	
	2	The discount rate used	
	4	The estimated expected cash flow	
	5	An analysis of sensitivity to the main assumptions used	

CGU = cash-generating unit.

Source: Elaborated by the authors.

It should be noted that no relevant VDs were identified concerning IFRS 13. As such, results for 14 indices were computed, namely the MDI, VDI, and TDI (which compiles the information from the previous MDI and VDI) for IAS 19, IAS 36, and IAS 37; the TDI (= MDI) for IFRS 13; and a global MDI, VDI, and TDI, which includes the four IAS and IFRS object of this study. The numbering of the items included in each index was performed to ensure some consistency in the analysis between the IAS and IFRS by relatively similar contents.

For each item under analysis, if the information was disclosed adequately, the value 1 was assigned, and in cases where the disclosure was not following the requirements defined in the study, the value 0 was assigned. Furthermore, for cases where the items assessed did not apply to the specific reality of that entity, the codification NA was attributed, and this information was not computed in the indices, in line with the Owusu-Ansah proposal (1998).

Thus, each index was calculated from the following expression:

$$IDX = \frac{\sum_{i=1}^m di}{\sum_{i=1}^n dp}$$

where X = mandatory (M), voluntary (V), or total (T), depending on the cases, d = 1 when the element is

disclosed, d = 0 when the element is not disclosed, m = number of items disclosed, and n = number of items susceptible to disclosure.

Table 3 presents, in turn, the independent variables most frequently identified in the literature as proxies of the explanatory factors proposed for this study.

Table 3
Explanatory factors and variables used

Explanatory factor	Independent variable	Identified studies
Size	Total assets (TA), net turnover (NT), or stock market capitalization (INDEX)	Ali et al. (2004), Alkababji (2016), Demir and Bahadir (2014), Guerreiro (2006), Lopes and Rodrigues (2007), Matış et al. (2013), Owusu-Ansah (1998), Richardson and Welker (2001), Santos et al. (2014), Singhvi and Desai (1971), Street and Gray (2002), Wallace and Naser (1995), Zarzeski (1996), Devalle and Rizzato (2013)
Profitability	Return on equity (ROE), return on assets (ROA)	Ali et al. (2004), Demir and Bahadir (2014), Guerreiro (2006), Santos et al. (2014), Wallace and Naser (1995)
Leverage	Total-debt-to-total-assets ratio (DEBT), long-term debt-to-equity or leverage ratio (LR)	Demir and Bahadir (2014), Lopes and Rodrigues (2007), Santos et al. (2014), Tsalavoutas (2011), Wallace and Naser (1995), Zarzeski (1996)
Auditors	Big 4 (AUDIT)	Ali et al. (2004), Alkababji (2016), Demir and Bahadir (2014), Glaum et al. (2013), Guerreiro (2006), Lopes and Rodrigues (2007), Maia et al. (2012), Matış et al. (2013), Owusu-Ansah (1998), Santos et al. (2014), Singhvi and Desai (1971), Street and Gray (2002), Tsalavoutas (2011), Wallace and Naser (1995)
Materiality	WEIGHT	Cho et al. (2012), Domingos et al. (2017), Glaum et al. (2013)
Relevance	IAS_IFRS	-

Source: *Elaborated by the authors.*

Regarding the size, a variable associated with the stock market capitalization (INDEX) was selected, because listed entities are concerned. Additionally, the potential for correlations between TA or NT with other variables equally extracted from the financial statements is reduced, namely the variables associated with the profitability, leverage, and materiality. For the absence of a reliable source for obtaining the market capitalization, however, a dichotomous variable indicative of the entities that are listed in the PSI-20 index of Euronext Lisboa, which includes the largest Portuguese listed entities, is used as a proxy (coded with 1 in this case, and 0 otherwise).

For profitability and leverage, the selection was based, once again, on the identification of the variables less correlated with each other, with the choice, finally, for the variables ROE and DEBT, respectively (correlation of 0.2, in absolute value, between the variables).

The auditors are represented by the variable Big 4 (AUDIT), a dichotomous variable indicative of the entities audited by one of the Big 4 (encoded with 1 in this case, and 0 in the otherwise), in line with the literature on them.

Regarding the materiality (WEIGHT), the items most directly related to the disclosure items gathered were selected, which were subsequently used as a proxy for materiality. Thus, in the case of IFRS 13, the items related to financial investments, investment properties, and other assets, such as biological assets, were analyzed. For IAS 19, the items of pension liabilities were observed. For the analysis of IAS 36, goodwill was selected, which is an asset used in other studies in the context of this standard (Glaum et al. 2013). For IAS 37, the provisions identified by the entities as likely to be discounted were assessed, namely environmental provisions or provisions for decommissioning. The final value for this variable was then computed by the ratio between the amount of such variables and the total assets.

Finally, for which was called the relevance (nature) of the underlying item (IAS/IFRS), a categorical independent variable called IAS_IFRS was created, where 1 corresponds to IFRS 13, 2 corresponds to IAS 19, 3 corresponds to IAS 36, and 4 corresponds to IAS 37. As this study uses linear regression, this variable was later subdivided for the regression model analysis purposes into three dichotomous variables where category 4 is used as a reference for exclusion.

3.2 Presentation of Results

Through the consolidated reports of the 33 entities, 89 observations distributed by the different IAS and IFRS were analyzed. The lowest number of observations can be seen for IAS 37 (only 11%) as presented in Table 4.

Table 4

Number of observations per International Accounting Standards (IAS)/International Financial Reporting Standards (IFRS)

IFRS	Number of observations	%
IFRS 13	31	35
IAS 19	20	22
IAS 36	28	31
IAS 37	10	11
Total	89	100

Source: *Elaborated by the authors.*

Table 5 presents the average levels of disclosure for the various MD items and VD that are part of the TDI related to the IAS/IFRS, coding with NA the nonapplicable cases.

Table 5

Items of mandatory (MDI) and voluntary (VDI) disclosure indices by International Accounting Standards (IAS)/International Financial Reporting Standards (IFRS)

Item	Description (overview)	IFRS 13		IAS 19		IAS 36		IAS 37	
		MDI	VDI	MDI	VDI	MDI	VDI	MDI	VDI
1	Evaluation technique used	81%	NA	NA	100%	100%	NA	NA	90%
2	Discount rates	61%	NA	100%	NA	96%	NA	NA	20%
3	Reconciliation of balances	77%	NA	95%	NA	NA	96%	100%	NA
4	Amounts for measurement purposes	39%	NA	100%	NA	14%	NA	NA	100%
5	Sensitivity analysis	32%	NA	80%	NA	NA	75%	NA	0%
6	Rating (IAS 19)	NA	NA	30%	30%	NA	NA	NA	NA
7	High-quality bonds (IAS 19)	NA	NA	55%	55%	NA	NA	NA	NA
8	Deadline information (IAS 19)	NA	NA	25%	25%	NA	NA	NA	NA
9	Discount rate for CGU (IAS 36)	NA	NA	NA	NA	NA	86%	NA	NA
10	Unwinding effect (IAS 37)	NA	NA	NA	NA	NA	NA	30%	NA
Observations in number and as a %		31 (35%)		20 (22%)		28 (31%)		10 (11%)	

Note: *Highlighted type denotes items with values higher than 75%.*

CGU = cash-generating unit; NA = nonapplicable.

Source: *Elaborated by the authors.*

By item, it is possible to observe that, overall are the items related to evaluation techniques (item 1) and reconciliation of balances (item 3) that, either as a mandatory requirement or as VD, have higher average disclosure rates (greater than 75%). It is in the context of IFRS 13 that the smallest values for these items are observed, with 81% for item 1 and 77% for item 3. For other IAS and IFRS, the figures exceed 90% and even reach 100% in some cases. The disclosure of the discount rates used (item 2) reaches significant values concerning IAS 19 and IAS 36, with 100% in the first case. Although

with lower levels (between 75 and 80%), these standards also stand out about the disclosure of a sensitivity analysis involving the main assumptions used in the evaluation (item 5). Those cases can be explained by standards more directly related to items of liabilities (IAS 19) and assets (IAS 36), respectively, which have, as a similarity, the fact that they are often included in the set of matters that involve the need for a higher level of estimates or critical assumptions. Furthermore, it is also for IAS 19, together with IAS 37, that the reference amounts for the evaluation carried out (item 4) are presented as a disclosure item

made by 100% of the entities. It should be highlighted that those cases are associated with valuations specifically related to liability items. In the context of the VDs of some of the IAS/IFRS assessed, we highlight the disclosure of the discount rates used for the CGU, which is evaluated under IAS 36, which reaches 86% (item 9).

After assessing the items that make up the disclosure indices, Table 6 presents the overall results obtained for the different indices (TDI, MDI, and VDI), both for the total entities and according to the different IAS and IFRS under study.

Table 6

Descriptive statistics of dependent variables

Variable	IAS/IFRS	N	Minimum	Maximum	Average	SD
TDI	IFRS 13	31	0.000	1.000	0.581	0.289
TDI	IAS 19	20	0.500	1.000	0.731	0.174
MDI	IAS 19	20	0.750	1.000	0.938	0.108
VDI	IAS 19	20	0.250	1.000	0.525	0.305
TDI	IAS 36	28	0.333	1.000	0.780	0.141
MDI	IAS 36	28	0.333	1.000	0.702	0.136
VDI	IAS 36	28	0.333	1.000	0.857	0.208
TDI	IAS 37	10	0.333	0.833	0.567	0.153
MDI	IAS 37	10	0.500	1.000	0.650	0.229
VDI	IAS 37	10	0.250	0.750	0.525	0.135
TDI	All	33	0.400	0.909	0.679	0.139
MDI	All	33	0.400	1.000	0.697	0.155
VDI	All	31	0.250	1.000	0.682	0.218

IAS = International Accounting Standards; IFRS = International Financial Reporting Standards; MDI = mandatory disclosure indices; SD = standard deviation; TDI = total disclosure indices; VDI = voluntary disclosure indices.

Source: *Elaborated by the authors.*

From the results obtained, it is possible to notice that the entities disclose, on average, 67.9% of the analyzed items. By detail, the disclosure of items with mandatory character reaches a slightly higher level (69.7%). For items with a voluntary nature, however, the levels of disclosure do not deviate significantly from these values, with an average value of 68.2%. In the comparison between MDI and VDI, it is possible to identify that the lower minimum values are identifiable for the first index mentioned above, either for the set of IAS or IFRS or for each IAS or IFRS analyzed. It is also for the MDI that the mean value is observed the smallest, except for the items that are part of the VDI for IAS 36.

Through an IAS/IFRS analysis, there is a lower level of disclosure for IFRS 13 and IAS 37, with an average level of 58.1 and 56.7%, respectively. Additionally, it is also in the context of IFRS 13 that the highest value for the standard deviation is observed. In the opposite direction, with higher average levels of disclosure, IAS 19 and IAS 36 have around 73.1 and 78%, respectively. It should be highlighted that, for IAS 19, the highest average value in the comparison between MDI and VDI is due to the former, a situation opposite to what is the case for IAS 36.

It is important to note the still significant amplitude (difference between maximum and minimum) in each of the calculated indices, with the lowest observable value for the IAS 19 (25 percentage points). For this index, it should be noted that all entities had a result higher than 75% and some reached 100%. On the other hand, the TDI for IFRS 13 is at its greatest extent, and it should be noted that an entity does not comply with any of the requirements examined, unlike others that comply with all the requirements laid down in the standard.

The Kruskal-Wallis test presented in Table 7 shows the results through an overall perspective, through the comparison between each IAS or IFRS object of this study. Therefore, there is a greater similarity between the lower mean rank in IFRS 13 and IAS 37, both for TDI and for MDI. For the same indices, the highest amounts are identified, respectively, for IAS 36 (influenced by the VDI) and IAS 19 (which also impact TDI). Considering these data, and for a significance level of 1%, statistically significant differences between the indices analyzed are identified globally in the light of this test.

Table 7
Kruskal-Wallis test

Index and test statistics	IAS/IFRS	N	Mean rank
TDI H de Kruskal-Wallis = 15.70; df = 3; asymptotic significance = 0.001	IFRS 13	31	34.94
	IAS 19	20	49.60
	IAS 36	28	57.96
	IAS 37	10	30.70
MDI H de Kruskal-Wallis = 28.59; df = 3; asymptotic significance = 0.000	IFRS 13	31	32.94
	IAS 19	20	70.13
	IAS 36	28	43.89
	IAS 37	10	35.25
VDI H de Kruskal-Wallis = 19.31; df = 2; asymptotic significance = 0.000	IAS 19	20	20.55
	IAS 36	28	39.18
	IAS 37	10	20.30

df = degrees of freedom; IAS = International Accounting Standards; IFRS = International Financial Reporting Standards; MDI = mandatory disclosure indices; TDI = total disclosure indices; VDI = voluntary disclosure indices.

Source: Elaborated by the authors.

The Mann-Whitney test allows a more detailed comparison of the differences between the IAS and IFRS and the indices under assessment. Table 8 shows the significance levels obtained for the test. Thus, there

are significant differences between the indices in the different analyses made with the following exceptions: between IFRS 13 and IAS 37 (for TDI and MDI) and between IAS 19 and IAS 36 (TDI only).

Table 8
Mann-Whitney test

	Asymptotic significance (two-sided)					
	IFRS 13 vs. IAS 19	IFRS 13 vs. IAS 36	IFRS 13 vs. IAS 37	IAS 19 vs. IAS 36	IAS 19 vs. IAS 37	IAS 36 vs. IAS 37
TDI	0.043	0.001	0.988	0.177	0.024	0.002
MDI	0.000	0.024	0.560	0.000	0.005	0.070
VDI	-	-	-	0.000	0.559	0.000

IAS = International Accounting Standards; IFRS = International Financial Reporting Standards; MDI = mandatory disclosure indices; TDI = total disclosure indices; VDI = voluntary disclosure indices.

Source: Elaborated by the authors.

To find answers to the hypotheses, the study uses a multiple linear regression model by the enter method for

each of the three proposed dependent variables, namely the TDI, MDI, and VDI, as shown in equations 1, 2, and 3:

$$IDT = \beta_0 + \beta_1 \text{INDEX} + \beta_2 \text{ROE} + \beta_3 \text{DEBT} + \beta_4 \text{AUDIT} + \beta_5 \text{WEIGHT} + \beta_6 \text{IAS_IFRS} + \varepsilon \quad \boxed{1}$$

$$IDO = \beta_0 + \beta_1 \text{INDEX} + \beta_2 \text{ROE} + \beta_3 \text{DEBT} + \beta_4 \text{AUDIT} + \beta_5 \text{WEIGHT} + \beta_6 \text{IAS}_1 \text{IFRS} + \varepsilon \quad \boxed{2}$$

$$IDV = \beta_0 + \beta_1 \text{INDEX} + \beta_2 \text{ROE} + \beta_3 \text{DEBT} + \beta_4 \text{AUDIT} + \beta_5 \text{WEIGHT} + \beta_6 \text{IAS_IFRS} + \varepsilon \quad \boxed{3}$$

Before presenting the models, their essential assumptions were validated. The process began by analyzing the correlation between the variables, to identify potential issues of collinearity between the independent

variables. However, no correlations greater than 0.5 in absolute value were identified.

Table 9 then presents a summary of the proposed regression models, and it is possible to identify that the

models explain between 25% (for TDI) and 33% (for MDI and VDI) of the total variance, based on the adjusted R^2 . The Durbin-Watson test confirmed the absence of independent errors, with no evidence of autocorrelation (values close to 2.0).

Table 9*Summary of models*

Templates	R	R ²	Adjusted R ²	SER	Durbin Watson
TDI	0.564	0.318	0.247	0.2050	2.197
MDI	0.624	0.389	0.325	0.2052	1.892
VDI	0.646	0.418	0.329	0.2340	1.891

MDI = mandatory disclosure indices; SER = standard estimation error; TDI = total disclosure indices; VDI = voluntary disclosure indices.

Source: Elaborated by the authors.

The overall significance is tested, in turn, by the F test [analysis of variance (ANOVA)] presented in Table 10, which allows verifying what the model can be applied to perform statistical inference.

Table 10*Analysis of variance (ANOVA) results*

Model		Sum of squares	df	Mean square	F	Sig.
TDI	Regression	1.492	8	0.186	4.437	0.000
	Residual	3.194	76	0.042		
	Total	4.686	84			
MDI	Regression	2.040	8	0.255	6.055	0.000
	Residual	3.201	76	0.042		
	Total	5.241	84			
VDI	Regression	1.807	7	0.258	4.714	0.000
	Residual	2.519	46	0.055		
	Total	4.325	53			

df = degrees of freedom; MDI = mandatory disclosure indices; TDI = total disclosure indices; VDI = voluntary disclosure indices.

Source: Elaborated by the authors.

Finally, Table 11 presents, simultaneously, the coefficients of the models and the results of the diagnosis of multicollinearity through the variance inflation factor (VIF).

Table 11*Coefficients and multicollinearity statistics of models*

Model	Nonstandard coefficients		Standardized coefficients	T	Sig.	Statistics of collinearity	
	B	SE	Beta			Tolerance	VIF
TDI	(Constant)	0.391	0.135		2.894	0.005	
	INDEX	0.174	0.052	0.367	3.367	0.001	0.755
	ROE	-0.063	0.116	-0.053	-0.540	0.591	0.936
	DEBT	0.084	0.127	0.068	0.664	0.509	0.863
	AUDIT	0.013	0.088	0.015	0.145	0.885	0.841
	WEIGHT	0.293	0.124	0.245	2.361	0.021	0.836
	IAS_IFRS_1	-0.006	0.080	-0.013	-0.080	0.936	0.333
	IAS_IFRS_2	0.172	0.084	0.300	2.038	0.045	0.415
	IAS_IFRS_3	0.180	0.081	0.357	2.227	0.029	0.349

Table 11
Cont.

Model		Nonstandard coefficients		Standardized coefficients	T	Sig.	Statistics of collinearity	
		B	SE	Beta			Tolerance	VIF
MDI	(Constant)	0.400	0.135		2.951	0.004		
	INDEX	0.127	0.052	0.255	2.467	0.016	0.755	1.325
	ROE	-0.039	0.116	-0.031	-0.336	0.738	0.936	1.068
	DEBT	0.156	0.127	0.119	1.229	0.223	0.863	1.159
	AUDIT	0.083	0.088	0.092	0.943	0.348	0.841	1.189
	WEIGHT	0.275	0.124	0.217	2.209	0.030	0.836	1.196
	IAS_IFRS_1	-0.102	0.080	-0.198	-1.273	0.207	0.333	3.007
	IAS_IFRS_2	0.264	0.085	0.434	3.116	0.003	0.415	2.409
	IAS_IFRS_3	0.014	0.081	0.027	0.177	0.860	0.349	2.868
VDI	(Constant)	0.583	0.192		3.037	0.004		
	INDEX	0.200	0.073	0.344	2.717	0.009	0.791	1.265
	ROE	-0.200	0.181	-0.129	-1.109	0.273	0.939	1.065
	DEBT	-0.065	0.188	-0.041	-0.345	0.732	0.887	1.127
	AUDIT	0.235	0.265	0.121	0.888	0.379	0.682	1.466
	WEIGHT	-0.141	0.140	-0.130	-1.008	0.319	0.757	1.320
	IAS_IFRS_2	0.032	0.097	0.053	0.327	0.745	0.483	2.072
	IAS_IFRS_3	0.303	0.095	0.535	3.199	0.002	0.453	2.210

MDI = mandatory disclosure indices; SE = standard error; TDI = total disclosure indices; VDI = voluntary disclosure indices; VIF = variance inflation factor.

Source: Elaborated by the authors.

Regarding the VIF, the values are within the intervals to rule out the hypothesis of multicollinearity between the variables.

3.3 Discussion of Results

Through the descriptive analysis performed, and in the light of the classification proposed by Samaha and Stapleton (2008), it can be affirmed that the level of disclosure of the entities subject to this study is, as a rule, the so-called intermediate level of disclosure, considering for this classification values that are in the range between 60 and 79%. Exceptions are on account of the average MDI for IAS 19 and VDI for IAS 36, higher than those obtained for the remaining IAS and IFRS.

There is also a differentiated treatment by the entities for MD or VD within the framework of each of the IAS and IFRS. Despite the difficulty of drawing up differences with previous studies, due to differences in terms of methodology, period, or sample, it is possible to identify as a common point the divergences in the levels of disclosure, according to the theme under analysis, that is, for the different IAS and IFRS analyzed.

The findings are thus in line with the conclusions of Tsalavoutas (2011), which found, in a more cross-sectional study on the subject, differences between the

levels of disclosures for IAS 19, IAS 36, and IAS 37. It also corroborates, in another perspective, the divergences between the levels of disclosure identified and the different studies that used, individually, the same IAS and IFRS proposed in this study, namely for IFRS 13 (Kasyan et al., 2018; Matis̃ et al., 2013), IAS 19 (Street & Gray, 2002), IAS 36 (Glaum et al., 2013; Paugam et al., 2013), and IAS 37 (Alnaas & Rashid, 2019).

Overall, a significant and positive relationship between size and level of disclosure concerning discount rates is confirmed for the three models. H_1 is thus confirmed, in line with the already extensive literature on the subject referred to in the previous chapter, which includes the agency theory (Ali et al., 2004; Alkababji, 2016; Demir & Bahadir, 2014; Glaum & Street, 2003; Tsalavoutas, 2011), the positive accounting theory, in particular the hypothesis of political costs (Alkababji, 2016; Guerreiro, 2006; Lopes & Rodrigues, 2007; Tsalavoutas, 2011), and the theory of the cost of capital (Tsalavoutas, 2011).

On the other hand, the proposed relations with profitability (H_2), leverage (H_3), and the Big 4 audit firms (H_4) are not confirmed, where the conclusions are effectively less consensual, especially in the first two cases.

The hypothesis related to the positive association with materiality (H_5) is partially confirmed, presenting significance only for the models in which the TDI and

MDI are concerned. This result may indicate that the inclusion of mandatory requirements within the IAS and IFRS has effects, which are reinforced according to the material importance of the asset or liability items related to disclosure.

4. CONCLUSIONS

The study sought to identify the different factors that potentially influence the level of disclosures (MD and VD) related to the discount rate in IAS and IFRS, in which this variable is assumed to be relevant for the determination of current value, having the listed entities in Portugal as the population.

The results obtained show intermediate disclosure levels (between 60 and 79%), but can be slightly below or above these values, depending on the matter concerned. Such differences can be explained, in the light of the results obtained, either by the material importance of the item or by its nature. It is in the context of IAS 19 and IAS 36, often reported by entities as standards whose content proves to be judgment and critical estimates, that the specific item relating to the disclosure of discount rates is the most publicized.

Among the variables classically considered in this analysis, the positive relationship between the entity's size and the disclosure level is confirmed, corroborating the more robust results previously identified in the literature. Therefore, this finding is aligned with the most consensual theories on the entities' disclosure level.

Finally, the relevance (nature) of the subject matter (H_6) is also confirmed. In this context, and corroborating the previous analyses, the highest levels of disclosure for TDI are confirmed when concerned are the subjects related to IAS 19 (in the context of MDI) and IAS 36 (in the context of the VDI).

The study presents as limitations the reduced universe of analysis, limited to listed entities in the Portuguese market for a single year, as well as the insurmountable subjectivity inherent to the process, especially regarding the identification of relevant VDs. Thus, it is suggested the continuity of studies in this area, including entities from different countries and a greater number of explanatory factors, such as the sector of activity or elements related to the corporate governance of the entity. Such elements were not included in this study.

As a contribution, this study proposes a more transversal analysis of disclosures specifically related to discount rates, whether MD or VD, which is still rare in the literature on this subject. The conclusions of this study point out the need for further clarification by standard-setting bodies, in general, and the IASB regarding the elements that should be disclosed in matters relating to disclosure rates, as to the definition of what should be used when selecting the discount rate to be used or at the level of expedients used in its formulation. It is also noted that VDs play a relevant complementary role, filling the information gaps that are not properly specified in the standards.

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