UNIVERSIDADE DO VALE DO RIO DOS SINOS — UNISINOS
UNIDADE ACADÊMICA DE PESQUISA E PÓS-GRADUAÇÃO
PROGRAMA DE PÓS-GRADUAÇÃO EM CIÊNCIAS CONTÁBEIS
NÍVEL DOUTORADO

DAVI SOUZA SIMON

IMPAIRMENT LOSSES AND DEBT CHARACTERISTICS: A STUDY IN MULTIPLE COUNTRIES UNDER IFRS REPORTING

PORTO ALEGRE
2020

Davi Souza Simon

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Tese apresentada como requisito parcial para obtenção do grau de Doutor em Ciências Contábeis pelo Programa de Pós-Graduação em Ciências Contábeis da Universidade do Vale do Rio dos Sinos — UNISINOS

Orientadora:
Prof[a]. Dr[a]. Clea Beatriz Macagnan

Porto Alegre
2020

S594i

Souza Simon, Davi

Impairment losses and debt characteristics: a study in multiple countries under IFRS reporting / Davi Souza Simon — 2020.

145 f.: il.; 30 cm.

Tese (doutorado) — Universidade do Vale do Rio dos Sinos, Programa de Pós-Graduação em Ciências Contábeis, Porto Alegre, 2020.

"Orientadora: Profª. Drª. Clea Beatriz Macagnan."

1 . Dívida. 2. Impairment. 3. Conservadorismo Contábil. I. Título.

CDU 657

Dados Internacionais de Catalogação na publicação (CIP)

(Bibliotecário responsável: Josiane Liebl Miranda — CRB 14: 1023)

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Acknowledgements

To my beloved wife, Mariana, for accompanying me, side by side, throughout my academic training and in the best part of my life. Being able to discuss this thesis with you, from start to finish, was invaluable.

To my mother, Marinice, whose academic and personal trajectory is my main inspiration and reference.

To my father, Valdir (*in memorian*), for awakening my interest in accounting when I was very young, leading to a sequence of decisions that determined my path until this moment.

To my brother, Mathias, and my grandmother Evany for their unconditional love.

To my in-laws, Carmencita and Reginaldo and my sisters-in-law and younger sisters, Madalena and Karen, for their constant encouragement.

To my advisor, Professor Dr. Clea Beatriz Macagnan, for the lessons that went far beyond academic research. Her commitment to research and science and her strategic vision are examples to be pursued.

To Professor Dr. Dr. h.c. Alfred Wagenhofer, for having received me during the visiting period at Karl-Franzens-University Graz, for his availability for the scientific debate, and for his significant contribution to the accounting literature and fierld. Your class and kindness are inspiring.

To Professor Dr. Tiago Wickstrom Alves for econometrics and microeconomics classes, which formed the toolbox with which I conduct scientific research.

To Prof. Dr. João Zani for guidance during my master's degree, and for the classes at the Doctoral level. His systemic vision and his focus on economic frictions are a fundamental part of my training.

To Professors Dr. Dr. Georg Schneider, Dr. David Windisch, and Dr. Felix Niggemann. Spending time with you at Karl-Franzens-University Graz was inspiring in many ways.

To the members of my Project approval committee, professors Rodrigo Verdi, PhD, Dr. Francisco Antônio Zanini, and Dr. André Luis Korzenowski. The suggestions made by you were fundamental to the development of this research.

To professors Dr. Cristiano Machado Costa, Dr. Roberto Frota Decourt, and Dr. Daniel Francisco Vancin, for their constant availability throughout the doctoral course.

To my brothers in arms, Alexandre, Antônio, Luiz Fernando, Milton, and Rogério. My trajectory in accounting is marked by working with you.

To my dear friends Kika and Felipe, for the pleasant company and inexhaustible disposition to discuss any topic, however controversial or complex.

To my friend Jorge, for being directly responsible for my relationship with international accounting, for the invaluable English lessons, and for the long-term thinking.

To colleagues during my visiting year at Karl-Franzens-University Graz, especially Matthias Müllner, Thomas Müllner, Robert Eder, and Peter Habiger, for their hospitality in Graz, and for the interaction of unparalleled quality we had. You are all brilliant.

To my colleagues at Unisinos, especially Fernando, Taciana and Redvânia, Gabriel, Thobias, Letícia, Clari, Tadeu, and Angela. The last four years have been much more pleasant and productive thanks to your company.

To all, my sincere thanks!

RESUMO

Proposição/objetivos: Esta tese investiga a associação entre as características do endividamento e a probabilidade de reconhecimento de *impairment* por firmas que sofreram choques econômicos. Essas características do endividamento são o nível da dívida, o tipo de credor, a razão entre a dívida de curto e longo prazo e o valor da dívida líquida emitida no período.

Design/metodologia/abordagem: A partir de uma ampla amostra de firmas listadas no mercado de ações em 16 países que adotam o padrão IFRS, prováveis choques econômicos foram identificados por meio de uma combinação de índices *book-to-market* persistentemente altos, retornos sobre ativos baixos e F-Scores baixo. Por meio de regressões logísticas, analisou-se se as características do endividamento estão associadas à probabilidade de registrar uma redução no valor recuperável (*impairment*).

Resultados: As constatações indicam que a probabilidade de reconhecer um *impairment* contábil aumenta quando a firma tem dívida negociada em mercado e também quando o endividamento aumenta, embora em algumas especificações esse aumento ocorra a taxas decrescentes. Os resultados também mostram que a razão entre a dívida de curto e longo prazo e o valor da dívida líquida emitida no período não têm uma associação consistentemente significativa com o reconhecimento de *impairment*, embora a teoria preveja que essas variáveis afetem a probabilidade de reserva de *impairment*.

Originalidade/contribuição: Este estudo contribui para a literatura sobre impairment e conservadorismo condicional, mostrando que a diferença nos níveis de assimetria de informações entre a firma e seus credores, medida sob a forma de nível de dívida e tipo de credor, influencia a demanda por conservadorismo contábil.

Palavras-chave: Dívida. Impairment. Conservadorismo Contábil.

ABSTRACT

Purpose: This thesis investigates the association between debt characteristics and the probability of impairment recognition for firms that have been through economic shocks. These debt characteristics are debt level, type of creditor, the ratio of short-term debt to total debt, and the amount of net debt issued in the period.

Design/methodology/approach: From a broad sample of IFRS reporting stock-listed firms from 16 countries, I identified likely economic shocks through a combination of persistently high book-to-market ratios, low returns on assets and low F-Scores. Through logistic regressions, I analyzed whether the firm's debt characteristics are associated with the firm's probability of recognizing impairment losses.

Findings: Results suggest that the probability of recognizing impairment losses increases when the firm has exchange-traded debt, and it also increases when leverage increases, even though in some specifications it increases at decreasing rates. Results also show that the ratio of short-term debt to total debt and the amount of net debt issued in the period do not have a consistently significant association with impairment recognition, even though theory predicts these variables should affect the probability of recognizing impairment losses.

Originality/value: This study contributes to the impairment and conditional conservatism literature by showing that the difference in levels of asymmetry of information between the firm and its creditors influence the demand for conditional accounting conservatism.

Keywords: Debt. Impairment. Accounting Conservatism.

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1 INTRODUCTION

This thesis studies the accounting recognition of losses in the recoverable value of the firms' net assets given the previous occurrence of losses of these net assets' economic value. The accounting recognition of losses in the recoverable value of the firms' net assets is commonly called accounting impairment. The accounting impairment is a mechanism regulated by IAS 36 (IASB-International Accounting Standards Board, 2004), whereby the value of the firm's assets is adjusted downwards in the financial statements, in proportion to the losses of the firm's economic value. These losses of economic value can also be called economic impairments.

Prior empirical research (RAMANNA; WATTS, 2012; AMIRASLANI; IATRIDIS; POPE, 2013; BINI; PENMAN, 2013; ANDRÉ; FILIP; PAUGAM, 2015; OLER, 2015) shows evidence that a significant percentage of firms do not recognize accounting impairments adequately and promptly in their financial statements. On the other hand, regulators and class entities (CVM, 2018; European Accounting Association, 2019) show concern regarding the proper application of the IAS 36 impairment rules. The inadequate application of the impairment rules is a problem that affects firms, independent auditors, regulatory and supervisory bodies, and the capital markets themselves (BINI; PENMAN, 2013).

This thesis focus on the relationship between a firm's debt and the probability of recognizing an economic impairment in the financial statements of the firm [1]. The focus on debt stems from the fact that the financial statements are an informational source that promotes the mitigation of information asymmetry between the firm and its potential and actual creditors. Information about losses in the firm's assets economic value is important to potential creditors, before granting credit, as it allows the potential creditor to assess the firm's creditworthiness in advance. This information is also crucial for actual creditors, after granting credit, as any losses may directly affect the expectation of recovery of the granted credit, in the case of execution of contractual guarantees.

The following section presents the contextualization of the research problem, culminating in the formulation of the research question.

[1] in this thesis, debt means loans and financing that the firm obtains from creditors. The firm's operating accounts payable that make up its operating liabilities, such as obligations to suppliers, employees, and taxes, are excluded from the concept of debt.

1.1 Contextualization and problem definition

Firms can obtain capital from third parties using resources offered by creditors of direct or indirect relationships (FLOROU; KOSI, 2015). Indirect relationship creditors are those who acquire corporate exchange-traded debt securities issued by the firm (ARMSTRONG; GUAY; WEBER, 2010). On the other hand, direct creditors, mostly banks, are suppliers of capital that deal directly with the firm.

The level of information asymmetry between firms and creditors of direct relationship can be mitigated by mechanisms other than accounting information, such as meetings between managers and creditor representatives, information demands that allow the creditor of direct relationship to analyze the quality of the information presented by the firm, as well as exercising influence on the board of directors of the firm (SHIVAKUMAR, 2013; FLOROU; KOSI, 2015). These possibilities provide the direct lender with better conditions of access to information that are not available to indirect lenders (SHIVAKUMAR, 2013).

Also, direct lenders such as banks have reduced monitoring costs due to economies of scale. They have systems that facilitate access to and organization of information. Such systems are used for a more significant number of financing operations, accompanying several debtors, thus lowering the costs by creating dilution. Direct lenders also benefit from having a team of specialized professionals who monitor the situation of several debtors. That condition enables direct relationship creditors to perform a more sophisticated analysis of the information provided by the firm, and also to have advantages in debt renegotiation, in comparison with indirect creditors (FLOROU; KOSI, 2015).

The availability of private communication channels and the ease of direct monitoring between creditors of direct relationship and firms reduce the importance that these creditors give to the information disclosed in financial statements compared to the importance given by indirect relationship creditors who participate in the debt market (FLOROU; KOSI, 2015; SHIVAKUMAR, 2013; PENALVA; WAGENHOFER, 2019). In this perspective, the incentives the creditor has to monitor the firm would be affected by the access to non-accounting information and the by the cost-benefit ratio of this monitoring.

In contrast to creditors of direct relationship, creditors who operate in debt markets are more dispersed, have less access to non-accounting information, and have a lower propensity for investing in information gathering and monitoring. This lower propensity stems from the costs associated with monitoring and from the free-rider problems, resulting from the existence of several parties interested in the behavior of firms with exchange-traded debt. Some creditors will not invest in monitoring in order to benefit from the fact that other creditors

will incur monitoring costs.

As a consequence of monitoring costs and of free-rider problems, exchange-traded debt issuance contracts tend to be more standardized, depending heavily on the accounting information published by the firm (FLOROU; KOSI, 2015). Thus, creditors of indirect relationships with the firm are more dependent on the accounting representation of the firm's economic situation, being more sensitive to the firm's practices concerning the recognition of impairment losses.

Furthermore, potential or actual creditors may have distinct demands for accounting information. Distinct demands are a response to different levels of information asymmetry concerning the firm (FLOROU; KOSI, 2015). These different levels of asymmetry lead to different economic problems, such as adverse selection and moral hazard. Adverse selection problems can happen in the case of pre-contractual relationships in which the creditor has trouble identifying the quality of firms seeking credit. Moral hazard problems can happen in the case of post-contractual relationships, in which the lender has is unable to perfectly monitor the behavior of the firm.

The extant accounting literature suggests that the IAS 36 impairment rule aims to mitigate information asymmetry between firms and creditors, by bringing accounting information closer to the firm's economic reality, conditional on the existence of negative economic information. This rule constitutes the most important mechanism of conditional conservatism in the structure of IFRS (LAWRENCE; SLOAN; SUN, 2012; ANDRÉ; FILIP; PAUGAM, 2015).

The IAS 36 impairment rule is a conditional conservatism mechanism, as it causes the reduction of the firm's assets carrying amount under adverse economic circumstances, but not to be increased when there are favorable economic circumstances. It is worth noting that conditional conservatism is not an accounting principle in the strict sense, nor it is an explicit part of the conceptual framework for the preparation and disclosure of an accounting-financial report (IASB-International Accounting Standards Board, 2010). However, conditional conservatism is a consistent behavioral trend among accountants, in order to recognize the economic impact of negative news on the value of the firm's assets more promptly than the impact of positive economic news (BASU, 1997). This trend occurs even though both kinds of news may affect the economic value of assets symmetrically (PENALVA; WAGENHOFER, 2019).

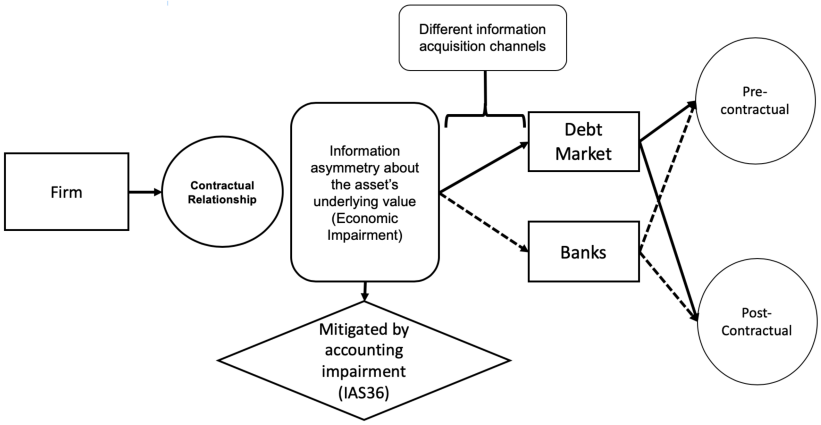
The IAS 36 impairment rule states that reductions in expectations of future cash flows underlying the firm's assets must be promptly recognized in the financial statements of the firm (ANDRÉ; FILIP; PAUGAM, 2015). The adequate and timely application of IAS 36 impairment accounting rules can be interpreted as a response from the firm to the problems of

adverse selection and moral hazard in debt contracts. As these problems are more relevant between the firm and the creditors with whom the firm has an indirect relationship, the application of impairment rules will likely be carried out in a more appropriate and timely manner by firms that obtain financing from indirect relationship creditors.

The possibility of a multidimensional relationship between debt and the probability of recognizing economic impairments through accounting impairments is suggested by the extant analytical literature but has not yet been studied by the empirical literature on the subject. Debt can be analyzed according to its characteristics, such as the debt amount relative to firm size, the direct or indirect relationship between the firm and the creditor, and the maturity of the debt. Nonetheless, the reviewed empirical studies on impairment losses consider debt only as a one-dimensional and linear factor, revealing the research gap that this thesis explores.

Therefore, the following research question identifies the problem of this thesis: Can debt characteristics explain the probability of recognition of economic losses through accounting impairments?

Figure 1: Theoretical Framework of the Thesis



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1.2 Research Objective

This research has the following general objective:

- To analyze whether debt characteristics can explain the probability of recognition of economic losses through accounting impairments.

1.3 Justification and Relevance of the Study

Debt markets play a pivotal role in the level of conditional conservatism presented by firms (BALL; ROBIN; SADKA, 2008). The empirical evidence reported by Ball, Robin and Sadka (2008) is consistent with the results of the analytical model of Nagar, Rajan and Ray (2018), which explains conditional conservatism as a result of demand from capital providers (including shareholders and creditors) for information about the firms' future states. In support of Ball, Robin and Sadka (2008), the model presented by Nagar, Rajan and Ray (2018) considers that the demand for information on the firm's state is greater in contexts where the level of information asymmetry between the parties is higher, what frequently happens in the exchange-traded debt markets.

Despite the results of Ball, Robin and Sadka (2008), Nagar, Rajan and Ray (2018), Armstrong, Guay and Weber (2010) and Florou and Kosi (2015), which conclude that debt affects firms' level of conditional conservatism, research that empirically analyzes factors that determine the recognition of impairment losses do not go further on analyzing the role of debt in the probability of impairment recognition (RIEDL, 2004; KHAN; WATTS, 2009; RAMANNA; WATTS, 2012; BALL; KOTHARI; NIKOLAEV, 2013a; ANDRÉ; FILIP; PAUGAM, 2015; BANKER; BASU; BYZALOV, 2017; GUNN; KHURANA; STEIN, 2018; KHURANA; WANG, 2019). In these studies, debt is treated as a one-dimensional and continuous control variable. Debt is not considered differently depending on the levels of information asymmetry between the firm and creditors, as well as on the direct or indirect relationship between the parties involved in the financing contract. The importance of this research gap is reinforced by the studies of Mora and Walker (2015) and Penalva and Wagenhofer (2019). Both studies highlight the importance of research on improving the accounting rules associated with conditional conservatism, which includes the impairment rules. These studies suggest that improving the identification of conditional conservatism and its causes is an important issue that deserves careful exploration (PENALVA; WAGENHOFER, 2019). The importance of this issue justifies this research as it differs from the previous literature because it considers debt in a more comprehensive role .

The adequacy of the application of the impairment rules of IAS 36 in the financial statements is a matter of concern by regulatory bodies and entities of the accounting class (European Security Markets Authority, 2013; CVM, 2018). In the European context, in which the adoption of IFRS took place in 2005 (DASKE et al., 2008), impairment was the primary key audit matter - KAM - in European publicly traded firms' financial statements in 2017 (Euro-

pean Accounting Association, 2019) [2]. This importance reveals that it is a complex issue for which the auditors believe that there is a need for broad discussion in their reports. Thus, the results can contribute to policymakers and accounting standard setters. A better understanding of the relationship between accounting impairments and the characteristics of the firm's debt can contribute to the development of more efficient rules and a better accounting representation of the firms'economic phenomena, as well as contribute to auditors, who must ensure the adequacy of the financial statements of the firms they audit.

Quality financial statements, prepared with transparency and a resulting in a reliable representation of the firm's underlying economic phenomena, imply a reduction in information asymmetry, enabling greater efficiency of investment decisions (LEUZ; WYSOCKI, 2016). Therefore, this thesis's relevance lies in its contribution to a broader understanding of how IAS 36's is applied by firms in several jurisdictions. Such broader understanding can contribute to standard setters and regulatory bodies in the continuous process of improving IFRS.

1.4 Limitations

There are many possible approaches to study the relationship between debt characteristics and the recognition of impairment losses. The main limitations of this thesis are presented in this section. The research was carried out by considering only publicly traded firms that present their financial statements in IFRS. Other accounting standards were not considered, nor were privately held firms, for which the characteristics of debt may also significantly affect the probability of recognizing impairment losses.

It is plausible to assume that independent auditors can play a relevant role in the likelihood that auditees will recognize impairment losses. Glaum, Landsman and Wyrwa (2018) use the variable BIG 4 in their study on impairment loss recognition in order to distinguish firms audited by the world's four largest audit firms (EY, PwC, KPMG, and Deloitte). The authors emphasize the existing ambiguity of the theoretical expectation about the role of the auditor in the recognition of impairment losses. Their empirical results do not support the significance of the variable as a predictor of impairment losses. Accordingly, the results of Bond, Govendir and Wells (2016) are similar to those of Glaum, Landsman and Wyrwa (2018), as they reinforce that being audited by a BIG 4 firm apparently does not affect impairments.

Additionally, André, Filip and Paugam (2015) measure accounting quality as the recognition of impairment losses when the market expects such losses. According to their results, accounting quality is more strongly derived from the country's regulatory and enforcement en-

[2] It is essential to remember that 2017 was the first year of mandatory disclosure of KAMs.

vironment, and not necessarily from the independent auditor. Although partially captured in this thesis by the country fixed-effects, the relationship among the institutional environment, the auditors and the firm could be deeper explored in a detailed analysis of the characteristics of the auditor. Such analysis, however, should go beyond the fact that the auditor is BIG 4 or not, considering that the quality of the audit, which could result in timely impairments, can be decomposed into several relevant factors (LOBO et al., 2017).

This thesis did not take into consideration the endogenous or exogenous financial constraints that a firm is subjected to. These financial constraints can result from financial and operational difficulties of the firm itself or from externalities, such as financial crises and contraction phases of economic cycles. Firms can respond differently to the loss of economic value of their assets, depending on these factors.

The role of the firm's governance structure was also not considered in depth in this thesis. The composition of the governance bodies of the firm, including the board of directors, audit committee, as well as the exchange of key executives of the firm, such as CEO and CFO, were not considered. Even though the general governance environment of the firm could be partially captured in this thesis through the country fixed-effects, an in-depth an in-depth study of the role of the supervision exercised by governance bodies would contribute to the literature on impairment rules.

The thesis relied on indirect measures of information asymmetry between the firm and the creditors. Information asymmetry was considered to be more significant for indirectly related creditors, to grow with the level of debt (potentially at decreasing rates), and to be affected by the proportion of short-term debt over total debt. Therefore, this thesis did not use direct measures of asymmetry of information that could result in increased demand for accounting information. Such direct measures could better capture information asymmetries between the firm and the creditors, hence improving the identification of the effects of debt on accounting conservatism.

Likewise, this thesis did not use explicit information on covenants, contractual commitments contained in debt contracts, which might affect the firm's level of conditional conservatism, including its impairment practices (NIKOLAEV; LENT, 2005; BEATTY; WEBER; YU, 2008). Issues associated with the creditors' priority for their debt claims in the event of bankruptcy were not considered. The identification of contractual commitments and priority is not usual in the literature dealing with accounting impairments, especially in multi-national contexts, where the availability of detailed information about covenants and priority in case of bankruptcy tends to be limited.

1.5 Thesis structure

This thesis is structured in six chapters. This introductory chapter presents the theme, the contextualization and problem definition, the research objective, the justification and relevance of the study, and the research's limitations.

Chapter two presents a review of the theoretical and empirical literature that this thesis is based on. Following this thesis's theoretical framework, the literature review starts with the relationship between the firm and the creditors. Subsequently, there is a section about the problem of information asymmetry. Then, there is a section on the role of IAS 36, followed by a brief review of the literature on impairment determinants. Finally, there is a section on the formulation of research hypotheses.

Chapter three presents the methodological procedures of this research, including the choice and justification of the dependent variable and of the explanatory variables, as well as the specification of the econometric models. Finally, the population and sample are discussed, as well as data collection procedures.

Chapter four presents the analysis of the empirical results. This analysis is complemented by the description of robustness tests performed in order to achieve the objective of the thesis.

Chapter five presents the discussion of the results establishing a dialogue with the extant literature.

In chapter six, final remarks and recommendations for future research are presented.

2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

In the first section, the contractual relationship between the firm and creditors is analyzed, highlighting the type of contract and the integral parts. Therefore, potential and actual creditors are considered, as well as creditors of direct (such as banks) and indirect relationships (debt market participants) with the firm. In the second section, the review is about information asymmetry as an economic problem, which underlies the emergence of the adoption of conditional accounting conservatism, in a more specific way: the application of the IAS 36 impairment standard as a mitigating mechanism. In the third section, the empirical literature on losses due to impairment is reviewed. Finally, the last section presents the development of this thesis's hypotheses.

2.1 Contractual relationship between firm and creditors

Firms can finance their projects and operations through equity, in the form of capital increases or retained earnings. Financed can also be obtained by employing debt capital, using bank credit, or the public debt negotiation market. To obtain debt capital, the firm signs contracts with the creditors. These contracts regulate the relationship between creditor and firm, ideally mitigating potential conflicts of interest (PENALVA; WAGENHOFER, 2019).

In major world economies, firms use more third-party capital than selling shares as a source of financing, whether third-party capital is obtained directly, through bank credit, or indirectly, through the debt market (RAJAN; ZINGALES, 1998; FLOROU; KOSI, 2015). The average size of the debt market in European countries between 2000 and 2011, consisting of bank debt and exchange-traded debt, was three times the size of the stock market. This ratio between the debt market and the stock market of European markets is comparable to that verified in the North American market (FLOROU; KOSI, 2015).

Concerning the proportion between the use of bank credit or credit negotiated in the corporate debt public negotiation market, Gorton and Winton (2003) present historical evidence of the preponderance of bank credit over credit obtained in public debt markets. The example brought by the authors shows that the financing obtained through bank credit was substantially higher than that obtained through the public debt negotiation markets, between 1970 and 1985, in the following countries: Italy, Japan, United Kingdom, United United States of America, Germany, France, Finland, and Canada (GORTON; WINTON, 2003). Mora and Walker (2015) point out that the primary market for public negotiation of corporate debt has been historically the North American market. However, the authors report that markets for

public negotiation of corporate debt are growing around the world in size and importance, especially in the European Union. This growth may be a response to the bank credit system's weaknesses, evidenced by the global financial crisis of 2008 (MORA; WALKER, 2015).

It is worth noting that the monitoring and renegotiation capacity that direct creditors have with the firm is superior to the creditors in the market for corporate debt. These aspects could lead to a strict dominance of bank loans as a source of corporate finance (GORTON; WINTON, 2003). However, in the relationship between direct creditors and the firm, the firm may have incentives to invest in risky projects, which do not happen or are weaker in the relationship between the firm and indirectly related creditors, which operate in the market for public negotiation of corporate debt (GORTON; WINTON, 2003).

Direct lenders can obtain information related to the project that is not fully known to the firm, extracting gains from informational superiority, in the form of interest rates higher than the rate sufficient for the financed project. Firms have an incentive to invest resources taken from direct creditors in riskier projects ex-post, for example, to cover the higher interest rates charged by banks with informational advantage (DARROUGH; DENG, 2019). Any renegotiations allow the firm to obtain advantages, appropriating part of the project's wealth (DARROUGH; DENG, 2019).

When debt is taken from indirect creditors who acquire debt securities issued on the market for public negotiation of corporate debt, renegotiation is unlikely or impossible. The firm's incentive to invest in risky projects is mitigated because it cannot capture an advantage in debt renegotiation. Consequently, public debt contracts achieve a higher degree of contractual efficiency concerning the incentive to invest in risky projects (GORTON; WINTON, 2003).

In a seminal analytical study on debt markets, Rajan (1992) distinguishes the bank credit market and the market for public negotiation of corporate debt according to the ability of each type of creditor associated with these markets to obtain information about the debtor. This perspective is similar to that adopted in Ali and Hwang (2000). Creditors in a direct relationship with the firm can obtain private information about the debtor and the financed project. That may happen at any time in the period leading up to the credit operation and during its term. Debt renegotiations are facilitated, as these direct creditors have accessible channels of communication with the debtor. Rajan (1992) concludes that the situation involving corporate debt traded on the market is strikingly different because creditors participating in these markets receive only public information through financial statements. In the same vein, renegotiating contracts with creditors that participate in the corporate debt negotiation market is difficult because these indirectly related creditors are dispersed. Also, the renegotiation suffers from asymmetric information and free-rider problems(RAJAN, 1992). The difficulty of renegoti-

ation discourages indirect creditors from investing in activities to obtain private information (NIKOLAEV, 2018).

When developing his analytical model, Rajan (1992) chose to differentiate between three main types of debt contracts, in order to characterize in general the relations between creditors and debtors. The first type is the short-term contract between the firm and the direct lender (bank). In this contract, the direct creditor requires the principal's payment only after obtaining information on the state of nature of the financed project. Consequently, the direct lender can prevent the firm from continuing a project with negative net present value, demanding the immediate settlement of the loan (RAJAN, 1992). The second type of contract, established between a firm and a direct lender, is a long-term one. In this type of contract, the direct lender can only request full payment of the loan when the project is completed.

Finally, the third type of contract is a long-term contract, established between a firm and indirect creditors, participants of the market for negotiation of corporate debt. In this type of contract, the creditor has no direct control over the decision about the project's continuation. Despite this, the firm has a greater incentive in this type of contract to exert efforts, compared to contracts with direct creditors (RAJAN, 1992), given that it is not possible for the firm to extract benefits from a renegotiation with creditors with an indirect relationship.

The main conclusion of the study of Rajan (1992) is that the firm's choice between obtaining credit in a direct relationship or in the market for negotiation of corporate debt, through an indirect relationship, is made considering a balance between costs and benefits (RAJAN, 1992). Direct creditors may monitor the firm and have more interference in their investment decisions, but this possibility alters the wealth division between these creditors and the firm, distorting the firm's incentives. The firm may, therefore, prefer to obtain credit through indirect relations, maintaining greater control over its investment decisions. Dhaliwal, Khurana and Pereira (2011) consider that firms may prefer direct lenders when the costs associated with public disclosure of information are substantial.

Contractual relations between firms and direct and indirect creditors are also affected by the parties' context. In this regard, there are significant differences in the financial systems of each country (ALI; HWANG, 2000). In the research of Ali and Hwang (2000), several countries are classified in terms of financial systems oriented towards banks (e.g., Germany) or capital markets (e.g., the United States of America). The results show that in bank-oriented systems, there is a proximity of communication between the bank and the firm. In these systems, banks have direct access to the firm's information, reducing the demand for information in published financial statements.

In countries with systems oriented to the capital markets, however, there is a large number

of actual and potential creditors who do not have direct access to the information of the firms, which makes creditors dependent on the accounting information for their decision making, monitoring and evaluation of debt securities (ALI; HWANG, 2000).

In the same vein, the research of Leuz and Verrecchia (2000) analyzed several countries according to their institutional characteristics, such as protection for investors, the legal system, dependence on external financing, and rules to mitigate negotiations in conditions of favoritism with related parties. Based on common characteristics, Leuz (2010) identified the presence of three clusters evidenced in the Table 1.

Table 1: Leuz Identified Clusters (2010)

Cluster 1	Cluster 2	Cluster 3
Australia	Austria	Argentina
Canada	Belgium	Brazil
Hong Kong	Chile	Colombia
Israel	Denmark	Ecuador
Malaysia	Finland	Egypt
Singapore	France	Indonesia
The United Kingdom	Germany	Jordan
The United States	Greece	Kenya
	India	Mexico
	Ireland	Nigeria
	Italy	Pakistan
	Japan	Peru
	South Korea	Philippines
	Netherlands	Sri Lanka
	New Zealand	Thailand
	Norway	Peru
	Portugal	Uruguay
	South Africa	Venezuela
	Spain	Zimbabwe
	Sweden	
	Switzerland	
	Taiwan	

Source: reproduced from Leuz (2010).

The first cluster is composed of economies with a strong orientation towards the capital markets, characterized by stock markets, low concentration of ownership, protection of the rights of outsiders (including creditors), non-controlling shareholders and other stakeholders, high disclosure, and vigorous enforcement. In these countries, firms seek funds in publicly traded stock or debt securities markets (LEUZ, 2010).

The countries grouped in the second and third clusters have characteristics of insider economies, in which the public markets for trading in stocks and debt securities are small. There is also a high concentration of ownership in these countries, weak protection for investors, and low levels of disclosure. The differences between the second and third cluster countries are in the strength of their legal system. Third cluster countries have weak investor protection and legal systems (LEUZ, 2010). In the second and third cluster countries, firms establish direct and strong relationships with banks and rely more on bank financing than on issuing equity or debt instruments (LEUZ, 2010). In this insider economy system, the most important parties (controlling shareholders, board members, administrators, and banks) have privileged access to information about the firm through the relationship developed with it. Therefore, information is accessed through private information channels, instead of obtained through public disclosure (LEUZ, 2010).

The contractual indebtedness relationships between firms and their potential and actual creditors depend on the economic incentives of each party, especially concerning monitoring, renegotiation, and investment in risky projects (asset substitution). These incentives relate to the level of information asymmetry between the parties, discussed in the following section.

2.2 Information Asymmetry

Information asymmetry is present when there are different levels of access to information between the parties involved in a particular transaction or contractual relationship (AKERLOF, 1970). Guay and Verrecchia (2017) stated that information asymmetry is a central problem in the relationship between creditors and the firm. This asymmetry may arise from the cost of obtaining information that was not disclosed by the firm's management in the firm's financial statements, as well as from the economic incentives to obtain information that the parties have in a contractual relationship (ARROW, 1973; STIGLITZ, 2000). For some creditors, there may not be benefits that outweigh the cost of obtaining information about the debtor, which could occur when the debt is minimal, or the creditor has no operational structure to carry out the necessary investigation to obtain the information, for example. The firm

may also have incentives to expropriate creditors' wealth, such as the firm's potential interest in preventing or delaying the transfer of control rights to the creditor (PENALVA; WAGENHOFER, 2019). The transfer of control rights occurs when the debtors incur severe breaches of the provisions of the debt contract, including the deterioration of the firm's economic situation (e.g., bankrupt state). In these cases, the firm can hide the increase in the risk of default that would be noticeable from its financial statements (PENALVA; WAGENHOFER, 2019). The firm may delay recognition of bad news in accounting with the expectation that bad news will be offset by positive results in the future, resulting from higher-risk projects. That would result in further damages for the creditors (WATTS, 2003; LI, 2015).

The economic incentives that potential and actual creditors have to invest in obtaining information are affected by the fact that the information is a commodity with unique economic characteristics. According to Arrow (1972), there are two salient characteristics of information that make it different from other commodities: the indivisibility of its use and the difficulty of its appropriation.

Arrow (1973) highlights that the cost of obtaining information does not depend on the scale of its application and its use, but only on the efforts required to obtain it. An example, in the context of the capital markets, would be the case of an investment analyst who follows two firms, one small and with few shares outstanding and the other large, with thousands of individual shareholders. The cost of conducting research is not affected by the scale of application, that is, the fact that information about the larger firm will benefit thousands of shareholders does not affect the cost of obtaining the information. Due to the inherent complexities of the two firms in the example, obtaining information about the smaller firm may be more costly for the analyst than obtaining information about the larger firm.

Concerning the difficulties of appropriating information, Arrow (1973) emphasizes that the information is not appropriable due to the difficulty of capturing the economic value by those who first obtain the information. If information can be produced or obtained privately, its producers must be able to profit from its use, which in general can be obtained through legislation that protects intellectual property (DEMSETZ, 1969).

The very use of the information, revealed by actions taken by its holder, can reveal the information to other participants in a given market (ARROW, 1972). This problem can be more intense when a creditor seeks information about the state of a firm. The use of this information can benefit other creditors of the firm without incurring high costs, which reduces the incentives to invest in the acquisition of information.

Information about the firm's state can increase the likelihood that the investor will make sound investment decisions. However, individuals may have different incentives for the acqui-

sition of information. These incentives depend on the variation in the conditions of appropriation of the benefits that information can bring. They also depend on scale effects associated with the indivisibility of the information (ARROW, 1973).

Stiglitz (2000) states that considering the role of information asymmetry in markets allows for better explanations for economic and social phenomena that would be difficult to understand under neoclassical economic models. This statement is applicable to the relationships between firms and potential or actual creditors since the existence of information asymmetries in this relationship means that firms may be affected by the problem of adverse selection (STIGLITZ; WEISS, 1981; GÖX; WAGENHOFER, 2009; BALAKRISHNAN; WATTS; ZUO, 2016) or moral risk (JENSEN; MECKLING, 1976; TIROLE; HOLMSTROM, 1997).

In the case of pre-contractual relationships, characterized when the firm seeks to obtain resources from potential creditors, the existence of information asymmetry leads to problems of adverse selection (AKERLOF, 1970). Adverse selection problems occur when an economic agent that is a potential party to a contract has difficulty or inability to correctly identify the economically relevant characteristics of the other contracting party (AKERLOF, 1970). That occurs, for example, when the potential creditor has difficulty in identifying the characteristics of the future debtor. If a given market has two types of credit borrowers, good and bad ones, the difficulty of identifying the correct type on the part of the creditor means that he has to make his decisions based on his statistical expectation about the type of borrower. Depending on the proportion of good to bad borrowers, the interest charged by the creditor to the average borrower may be higher than that of the appropriate interest rate for good borrowers. Considering the analytical model of Akerlof (1970), good debt borrowers withdraw from the market, leaving only bad borrowers. That would result in further interest rate hikes and the potential market stall (STIGLITZ; WEISS, 1981). This situation is reflected in the inefficiency of resource allocation, as the best borrowers will have the same cost of capital offered as bad payers. On the other hand, the potential creditor's access to information on the firm's ability to pay will enable the creditor to demand a lower capital cost from third parties.

In the case of post-contractual relations, characterized after obtaining credit, the asymmetry of information between the firm and actual creditors leads to moral hazard problems. These problems result from two main factors: the difficulty of monitoring the debtor's behavior after contracting the debt and the existence of economic incentives for the debtor to behave in order to maximize his utility at the cost of reducing the creditor's utility (ARROW, 1963). This problem of unobservable behavior is similar to what occurs in the health insurance market, explored by Arrow (1963). The difficulty in monitoring the debtor's behavior allows for the emergence of a conflict of interest. Such a conflict may occur when the debtor has an incentive

to act in a manner that does not serve the creditor's interests. As an example, the debtor agrees with the creditor when granting the credit that will use the funds obtained for the purchase of machinery and equipment, but after receiving the credit, invests the corresponding money in research and development of products with a high level of uncertainty. In this case, the debtor's behavior creates a loss for the creditor, who will have an increase in his risk of recovering the borrowed capital. The difficulty in monitoring the debtor's behavior in the context of credit agreements may result from limitations in the quantity and quality of channels available for obtaining information.

The information asymmetry between the firm and the indirectly related creditors occurs because the firm has informational superiority in relation to the creditors. This superiority considers that these creditors are informed about the firm primarily through accounting information (FLOROU; KOSI, 2015). Hence, the quantity and quality of information disclosed by the firm to creditors through its accounting information influence the level of information asymmetry. Ball, Robin and Sadka (2008) state that much information about the firm's state is not readily incorporated into the financial statements. Some information would only be accessible when the capital provider actively carries out investigative and monitoring activities. Indirect creditors, who only gain access to information about the firm's financial status through publicly available information, may have greater difficulty obtaining relevant and sufficient information for the adequate monitoring of the debtor's behavior compared to direct relationship creditors. with the firm (FLOROU; KOSI, 2015).

Analytical models of information disclosure assume that there is incomplete disclosure of information by the firm. This incomplete disclosure is explained by the existence of disclosure costs, the compensation structure of the firm's managers, and the cost of handling information. (VERRECCHIA, 1983; DYE, 1986; JUNG; KWON, 1988; FISCHER; VERRECCHIA, 2004). Verrecchia (1983) shows that the withholding of information by the firm can be explained by the existence of proprietary costs associated with disclosure, including direct costs of preparing and disseminating the information, but also costs associated with actions that can be taken by competitors of the firm in response to the information disclosed. These disclosure costs create noise by increasing the range of information that would not be disclosed by the firm and also include positive information about the state of the firm. As investors are unable to interpret non-disclosure unambiguously, they cannot price the firm to the extent that the firm would rationally disclose the information.

After the study of Verrecchia (1983), the analytical literature showed that incomplete disclosure of information might also incur due to the uncertainty about whether the firm's managers hold private and superior information to information disclosed to the market (DYE,

1986; JUNG; KWON, 1988), or the existence of low costs of biasing accounting information, such as the absence of penalties or reputational losses for managers who manipulate financial statements (FISCHER; VERRECCHIA, 2004). However, the role of proprietary costs can be ambiguous. The firm may incur proprietary costs even if it does not disclose information, as its competitors may take adverse actions to the firm based on the information conveyed by the act of not disclosing information (WAGENHOFER, 1990). Disclosure of information may also enable the firm to avoid proprietary costs, particularly if the information disclosed detains a competitor from taking action against the firm (WAGENHOFER, 1990).

Direct relationship creditors can mitigate the asymmetries of information with the firm by obtaining information in addition to that available in the firm's financial statements. That is because direct lenders have access to more and better channels of communication with the firm (FLOROU; KOSI, 2015). When lending is direct, there is still an advantage for larger creditors to acquire information when compared to smaller creditors. The creditor's larger size reflects a reduction in the cost of obtaining information so that the information creates economies of scale. In other words, the information needed to assess payment risks is not directly affected by the size of the contracted debt, but rather by the cost of efforts to obtain information, in line with Arrow (1972)'s argument. There are potential economies of scale associated with the monitoring of the debtor by creditors who have higher loans. That is because the information is less costly per unit of debt for creditors with a direct relationship with the firm, who usually hold a larger share of the debt of a particular firm.

The perspective of Watts (2003) that accounting conservatism in debt contracts is explained by its usefulness indicates that conservative accounting mitigates the moral hazard problem between the firm and the creditor. That is because conditional conservatism can restrict the opportunistic (optimistic) behavior that managers could adopt in preparing the firm's financial statements, for example, to avoid or delay the violation of contractual clauses based on accounting numbers (WATTS, 2003). An example illustrating the problem of opportunistic behavior happens when a particular firm acquires a patent for a drug, for a substantial amount, corresponding to 50% of its total assets. This firm obtains financing through debt, corresponding to 40% of its total assets. After the issue, the drug becomes obsolete due to a new cheaper drug, launched by a competing firm. The creditor's interest is that the borrower recognizes the effect of adverse economic news on his accounting as soon as possible. Based on this information, the creditor could take steps to mitigate its expected loss concerning the credit transaction. The debtor has the option of postponing the recognition of bad news so that, before any action by the creditor, he can invest in a risky project that, if it works, results in profit for the debtor. If it goes wrong, it results in a total loss of the creditor, who will not receive

any value for the offered credit.

Armstrong, Guay and Weber (2010) state that understanding the role of accounting information in reducing information asymmetry depends on a better understanding between the interaction of accounting information, its properties (including conditional conservatism) and the informational demands presented by the contracting parties. An example of a study dealing with this relationship is Khan and Watts (2009), which presents evidence that increases in the level of asymmetric information lead to increases in the measure of conditional conservatism constructed by the authors, based on event studies conducted by the authors.

Another study that analyzes the interaction between accounting information and the informational demands of parties in a contractual relationship is that of Nagar, Rajan and Ray (2018). These authors present innovation to the conditional conservatism literature, through the construction of a mathematical model to deal with this accounting behavior. In their model, conditional conservatism appears as a response to the level of information asymmetry or even the level of mutual trust between the parties to a contractual game. This response is affected not only by explicit contractual provisions adopted but also by the relationship and the intensity of communication between the parties. The Nagar, Rajan and Ray (2018) model offers an explanation for previous empirical evidence, such as reported by Lafond (2008) and Khan and Watts (2009), in the sense that conservative accounting reporting is more prevalent in public companies with more significant information asymmetry.

In practical terms, the information asymmetry between the firm and creditors can be mitigated through higher quality accounting information. When accounting recognizes more quickly the effect of news with a negative impact on the value of the firm, which would occur when IAS 36 is applied, there is a mitigation of the moral hazard problem associated with the asymmetry of information. The application of the IAS 36 impairment rule restricts the opportunistic (optimistic) behavior that managers could adopt in the preparation of the firm's financial statements to, for example, avoid or delay the violation of contractual clauses based on accounting numbers (WATTS, 2003). In these cases, the application of IAS 36 reduces the monitoring costs borne by creditors, decreasing contract costs, and increasing the firm's value due to a reduction in the cost of capital (GUAY; VERRECCHIA, 2017).

Timely application of the IAS 36 impairment rule can also mitigate the adverse selection problem that occurs in pre-contractual relationships between the firm and potential creditors. The timely recognition of losses due to impairment reduces the uncertainties that potential creditors have about the quality of the firm seeking credit, including its financial status and the value of assets that can be pledged as credit guarantee (GÖX; WAGENHOFER, 2009). In this case, a lower cost of capital and a greater probability of obtaining credit are expected (LEUZ;

VERRECCHIA, 2000; GÖX; WAGENHOFER, 2009).

2.3 Role of IAS 36 impairment rules

Before highlighting the empirical literature on the recognition of losses due to impairment, it is necessary to conceptualize this mechanism, instituted by IAS 36, as part of what the literature defines as conditional accounting conservatism. In a broad sense, conservatism is one of the main characteristics of accounting systems, preceding the creation of limited liability, accounting standards, auditing, regulation of financial markets, separation of ownership and control, and the possibility of litigation (PENALVA; WAGENHOFER, 2019).

Watts (2003) defines accounting conservatism as the asymmetry in the verifiability requirements required for the recognition of profits and losses. Economically adverse events for the firm are recognized quickly in the income for the year, with small verifiability requirements. The same does not happen with economically favorable events. For these, accounting standards usually establish rules that lead to a more significant time lag between the event and its accounting recognition. Recognition of the impact of negative news on the value of the firm's assets depends on receiving the news. As a consequence, the timing of news recognition in accounting is conditional on the content of the news received (PENALVA; WAGENHOFER, 2019).

The definition given by Watts (2003) for accounting conservatism is similar to the interpretation of Basu (1997), in the sense that conservatism represents the tendency for accountants to demand a greater degree of evidence for the accounting recognition of good news, than the degree required for recognizing bad news. Therefore, profits reported by firms tend to reflect negative economic results quicker than positive economic results, resulting in asymmetric timing of profits and losses. Conservatism also considers the fact that accountants typically recognize the capitalized value of negative economic phenomena in the form of losses. Thus, bad news is recognized more quickly, but is less persistent, affecting the result of the reporting period, but having no effect on subsequent profits (BASU, 1997).

The case of assets and liabilities arising from lawsuits (treated in IAS 37 - Provisions, Contingent Liabilities, and Contingent Assets) illustrates the asymmetry between the recognition of negative and positive economic news. According to the rules of IAS 37, it is sufficient that a given liability from a lawsuit is probable for its recognition in financial statements. However, in the opposite situation, for recognizing an asset in the balance sheet, the gain in the lawsuit must be virtually certain, and it is not enough that the gain is only probable.

Other examples of conditional conservatism in the context of IFRS are the impairment of

goodwill and the impairment of long-lived assets (IAS 36 - Impairment of Assets), as well as the measurement of inventories according to the lowest value, between the historical cost value and the market value (IAS 2 - Inventories) (PENALVA; WAGENHOFER, 2019). In these examples, accounting rules require that negative information about future cash flows that the firm expects to incur are considered in advance in the accounting measurement of its assets and liabilities. In the particular case of IAS 36, when the economic losses in the value of the firm's assets are sufficiently large, to the point of indicating that these assets have an economic value below their book value, an accounting impairment should be recorded immediately.

With a different perspective, Beaver and Ryan (2005) separate accounting conservatism into two facets. The first is unconditional conservatism, which causes the value of equity to be reported consistently for less than its economic value. The adoption of historical cost as a basis for measuring property, plant, and equipment exemplifies unconditional conservatism, in comparison with the adoption of an aggressive accounting model, which adopts a rule of historical cost or market value, whichever is the greater. In general, balance sheets do not include the future value of the firm's growth opportunities as an asset, which would cause the economic value of the firms to be greater than the value reported by accounting (MORA; WALKER, 2015).

The immediate recognition as an expense of some assets developed internally by the firm, such as research and development and advertising (PENALVA; WAGENHOFER, 2019), also exemplifies unconditional conservatism. Hence, unconditional conservatism is independent of any news about economic phenomena that affect the firm (ANDRÉ; FILIP; PAUGAM, 2015). Even if research and development and advertising expenses create intangible assets that can generate future benefits for the firm, they are not recognized in its financial statements.

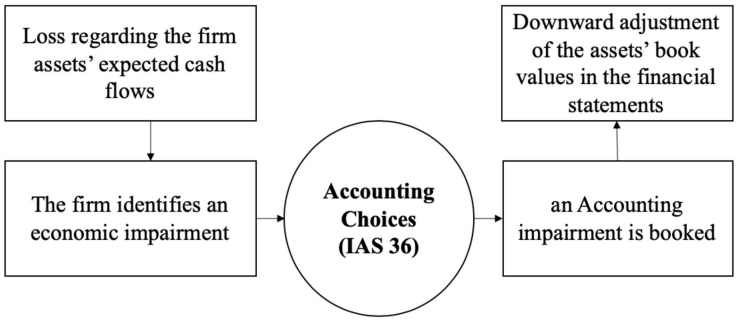
The IAS 36 impairment rule falls under the second side of conservatism, conditional conservatism. Under this form of conservatism, the equity value of firms is reduced under sufficiently adverse economic circumstances. However, it is not increased when there are positive economic circumstances, with conservative behavior depending on the type (good or bad) of news about the firm (BEAVER; RYAN, 2005). This construct allows a relationship between the behavior of accounting reports and the economic profit observed through stock returns (BALL; KOTHARI; NIKOLAEV, 2013b).

Under IAS 36, firms must continuously monitor the recoverable amount of their assets. If there are signs of loss of economic value of the firm's assets, IAS 36 requires the firm to perform a formal impairment test. In the impairment test, the firm verifies whether the book value of its assets can be recovered financially, through cash generated from their sale or through continued use (IASB-International Accounting Standards Board, 2004).

Therefore, the impairment test verifies whether the firm's assets have sufficient economic value to justify the assets' book value. If the test indicates a loss of the assets' economic capacity (economic impairment), IAS 36 determines that the value of the assets must be adjusted downwards, recognizing the loss of capacity that occurred in the form of an accounting expense (impairment). In other words, the financial statements (balance sheet and income statement for the year) must record the economic loss that decreased the asset's value to mitigate the information asymmetry between the firm and its respective stakeholders, including creditors, which are the focus of this research.

Figure 2 illustrates this mechanism. It is worth noting that the firm's assets' intrinsic value stems from the expectations of generating future economic benefits that are underlying the assets, materialized in the form of cash flows (MODIGLIANI; MILLER, 1958; COCHRANE, 2009; DAMODARAN, 2012).

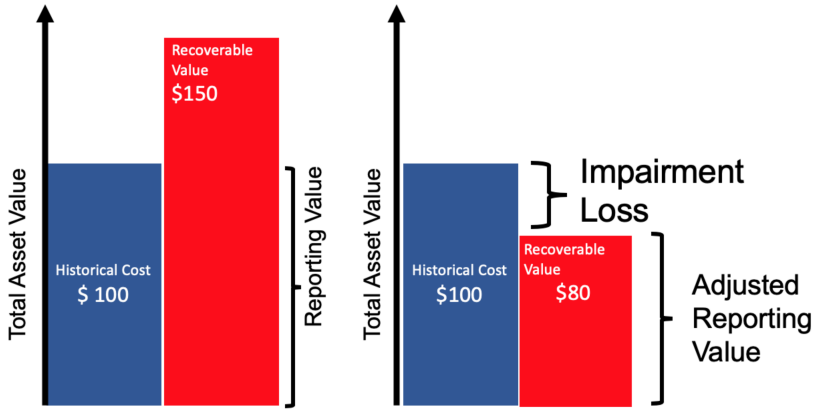
Figure 2: Scheme for recognition of accounting impairment



Source: prepared by the author

Figure 3 presents two situations, which illustrate the behavior of conditional conservatism resulting from the application of the impairment rule of IAS 36. In the situation presented, the left side of Figure 2, there is no loss when comparing the historical cost and the recoverable value (economic value) of the firm's assets. In this case, the value of the assets reported in the balance sheet is limited to the historical cost value already recorded. In the situation shown on the right side of Figure 3, the economic value of the firm's assets has decreased compared to its historical cost, showing the occurrence of a loss of value. The firm must recognize this loss promptly and in full in its financial statements, through the recording of an impairment expense, in line with the mechanism illustrated by Figure 2.

Figure 3: Illustration of impairment loss



Source: prepared by the author

In cases where there is an economic appreciation of the value of the assets, the firm does not recognize gain immediately in its financial statements. These gains will only be incorporated into accounting in the future when considered to be effectively earned. Conversely, losses must be recognized in advance as soon as they become expected. As a result, the accounting system incorporates gains and losses regarding the economic value of the assets into the firm's financial statements asymmetrically (PENALVA; WAGENHOFER, 2019).

In summary, the IAS 36 impairment rule aims to make the loss of economic capacity recognized promptly in the financial statements, causing economic impairments to be recognized in accounting through the recording of losses, that is, accounting impairments. These rules result in a "lower of cost or market" reporting mechanism, that is, the amount recorded in the balance sheet must be the lower of the asset's recovery value and the acquisition cost net of accumulated depreciation. As a consequence of this mechanism, the net asset values contained in the firm's balance sheet must represent the lower limits of the firm's economic value (JIANG; YANG, 2017).

The Conceptual Framework for Financial Reporting (IASB-International Accounting Standards Board, 2010) of the IFRS is referred to in this thesis as the Conceptual Framework. The Conceptual Framework defines the fundamental qualitative characteristics of useful accounting information. Faithful representation of the firm's economic situation is one of these characteristics. For the accounting information to be useful for its users, the Conceptual Framework determines that the accounting reports, when representing economic phenomena, must

present information with completeness and neutrality, with the lowest possible level of error, thus achieving a reliable representation of reality underlying (IASB-International Accounting Standards Board, 2010). One of the standards that seek to ensure that reliable representation is achieved, particularly in cases where the firm's economic situation deteriorates, is IAS 36 - Impairment of assets (IASB-International Accounting Standards Board, 2004), which deals with losses in the recoverable amount of assets.

It is worth mentioning that the version of the Conceptual Framework of the IFRS, adopted from 2010, explicitly eliminated conservatism of the list of qualitative characteristics of accounting information (ANDRÉ; FILIP; PAUGAM, 2015; PENALVA; WAGENHOFER, 2019). The exclusion of conservatism arose from the understanding that conservatism is not compatible with the neutrality of financial statements. Therefore, its maintenance would not be consistent with the objective of maximizing the faithful representation of the economic phenomena that accounting aims to portray (ANDRÉ; FILIP; PAUGAM, 2015).

The new version of the Conceptual Framework, applicable for financial statements after January 1, 2020 (IASB, 2018), reintroduced the concept of prudence, which is related to conservatism (PENALVA; WAGENHOFER, 2019), with the following definition given by paragraph 2.16: "prudence is the exercise of caution when making judgments under conditions of uncertainty" (IASB, 2018). That document explains, in paragraph 2.17, that prudence does not imply unconditional conservatism, as this conservatism is not a qualitative characteristic of useful financial statements (IASB, 2018).

The explicit exclusion of conservatism from the Conceptual Framework adopted in 2010 did not lead to the suppression of all conservative practices, and there is still many standards that demand conservative accounting behavior. André, Filip and Paugam (2015) highlight that the conservatism eliminated from the Conceptual Framework is only that of the unconditional type, following the typology proposed by (BEAVER; RYAN, 2005), which separates accounting conservatism between conditional and unconditional. The literature reports examples of accounting standards under IFRS that include conditional conservatism mechanisms (ANDRÉ; FILIP; PAUGAM, 2015; BARKER; MCGEACHIN, 2015; PENALVA; WAGENHOFER, 2019). Among these examples, one can highlight: (i) the asymmetric treatment that leads to the recognition of probable liabilities, but requires virtual certainty for the recognition of contingent assets (IAS 37); (ii) the adoption of the historical cost criterion or realization value, whichever is the lower, for inventories (IAS 2); and (iii) the impairment rules for financial assets and long useful lives (IAS 39 and IAS 36).

Although these standards are in line with conditional conservatism, the literature reports (CAPKUN; COLLINS, 2018; LAI; LU; SHAN, 2013; ANDRÉ; FILIP; PAUGAM, 2015)

predominant evidence of a reduction in conditional accounting conservatism after the adoption of IFRS in 2005, within the European Union. Capkun and Collins (2018) report a reduction in asymmetric timeliness concerning negative news in European firms that have adopted IFRS. Lai, Lu and Shan (2013) show similar results, with a reduction in conditional conservatism in Australian firms after the adoption of IFRS in 2005. André, Filip and Paugam (2015) also document a decline in the level of conditional conservatism, after the adoption of IFRS by European firms. However, the authors point out that this decline is influenced by the level of quality of the audit environments and enforcement of accounting standards.

According to André, Filip and Paugam (2015), conditional conservatism is embedded in the standards established by IFRS. In that sense, the authors claim that empirical results that show less conditionally conservative financial statements under IFRS result from an incorrect application of the rules and low levels of enforcement. However, Guermazi and Khamoussi (2018) conducted a study in which they identified an increase in conditional conservatism in Europe, following the adoption of IFRS. The authors report that effect when controlling for the level of differences between the local accounting standards that were replaced and the IFRS. This result is contrary to the evidence reported by Capkun and Collins (2018); Lai, Lu and Shan (2013); André, Filip and Paugam (2015).

Penalva and Wagenhofer (2019) reinforce that most of the empirical studies on conditional conservatism use the models of Basu (1997) and Khan and Watts (2009) as a proxy to identify conservatism. However, the recent criticisms offered by the literature (JARVA; LOF, 2018; BREUER; WINDISCH, 2019; HEMMER; LABRO, 2019) suggest that the analysis of accounting impairment may be a better way to identify conditional conservatism. Therefore, the ambiguous results mentioned above may result from the form of identification adopted in the research design.

Penalva and Wagenhofer (2019) state that in debt contracts, creditors demand that negative information about the firm's performance be reported in their respective financial statements immediately and in advance compared to positive information. An impairment loss occurs when the expectation of generating future economic benefits from an asset or set of assets is decreased, and the carrying amount of the asset is no longer fully recoverable, as provided for in IAS 36 (IASB-International Accounting Standards Board, 2004).

This early recognition of decreased future benefits is important for creditors because information asymmetry between the firm and the creditor is particularly important concerning situations that negatively affect the firm's financial situation (PENALVA; WAGENHOFER, 2019). When the firm's cash flows at the end of the financed project exceed the value of the contracted credit and the respective interest, which results in a positive performance of the

firm, the excess flows do not affect the creditor, who will have guaranteed his payment of capital and interest (PENALVA; WAGENHOFER, 2019). In the opposite situation, when the returns of the financed project are less than the value of the contracted credit and the respective interest, the firm protects itself through the limited liability of its shareholders and the creditors receive less than the amount due to them contractually (PENALVA; WAGENHOFER, 2019).

An economic impairment recognized at the time required by IAS 36 (when the loss becomes expected) leads to a faithful representation of the economic phenomena underlying the financial statements of the firm (FRANCIS; HANNA; VINCENT, 1996; RAMANNA; WATTS, 2012; RIEDL, 2004; STENHEIM; MADSEN, 2016), which contributes to the quality of accounting information. The reduction of information asymmetry between the firm and potential and actual creditors, provided by accounting information that represents reality in a reliable manner, can bring economic benefits to the firm (WATTS, 2003; GÖX; WAGENHOFER, 2009; PENALVA; WAGENHOFER, 2019).

The reduction of uncertainties about the prospects of the firm that is provided by financial statements prepared with conditional conservatism (SOHN, 2012; JUNG et al., 2017; GUAY; VERRECCHIA, 2017) may lead to lower estimation risks, regarding the prospects of the firm (EASLEY; O'HARA, 2004; FLOROU; KOSI, 2015), to reduction in transaction costs, including the cost of capital (NIKOLAEV; LENT, 2005; LI, 2015) and greater capacity to raise funds (VERRECCHIA, 2001; LAMBERT; LEUZ; VERRECCHIA, 2007; GÖX; WAGENHOFER, 2009). All of these components can affect the investment policy of firms (SHROFF, 2017), contributing to market efficiency (CRAWLEY, 2015; DO; NABAR, 2019).

The following section presents the literature review on the IAS 36 impairment rules.

2.4 Empirical literature on accounting impairment

Empirical research that analyzes firms' behavior concerning the recording of impairment losses shows that a significant percentage of firms do not recognize accounting impairments in an appropriate and timely manner in their financial statements (RAMANNA; WATTS, 2012; AMIRASLANI; IATRIDIS; POPE, 2013; BINI; PENMAN, 2013; ANDRÉ; FILIP; PAUGAM, 2015; OLER, 2015; BOND; GOVENDIR; WELLS, 2016).

Delaying or avoiding the recognition of an impairment loss may be a way of postponing the transfer of control rights to creditors that would result from the breach of covenants established in the debt agreement (PENALVA; WAGENHOFER, 2019). Chalmers and Godfrey (2006) and Filip, Jeanjean and Paugam (2015) report the existence of additional reasons for

managers to avoid or delay the recognition of losses due to impairment, such as executive compensation schemes and the existence of political costs. In contrast, large and profitable firms tend to prefer accounting rules that result in smaller profits, decreasing their visibility and the consequent attracting attention from regulatory and supervisory bodies (ZHANG; CAHAN, 2010; HODDER; HOPKINS, 2014).

Disclosure of information about impairment required by IAS 36 is a type of mandatory disclosure that should force companies to disclose verifiable information based on transactions and events, such as cash flows, profits, the value of assets (MAZZI et al., 2017). This information should help stabilize financial markets, mitigating asset price bubbles, and subsequent market crashes. The disclosure of mandatory information could limit asymmetric information among market participants, creating an anchor of value for investors (LEUZ; WYSOCKI, 2016). Such disclosure, though mandatory, depends on enforcement, as managers may be reluctant to disclose adverse information to the firm because of the costs associated with disclosure (DYE, 1986).

The flexibility of accounting standards partly explains the fact that the firm's managers can hide or delay the recognition of economic losses. Paugam, Astolfi and Ramond (2015) argue that American (SFAS 141R, SFAS 142, SFAS 144) and international (IFRS 3, IAS 36) accounting standards offer significant scope for managers to manage results and affect asset value estimates in your care. Knauer and Wöhrmann (2016) report the absence of significant differences between capital market reactions to the recognition of losses due to impairment under US GAAP and IFRS.

Among the reviewed articles, the recent articles from Bond, Govendir and Wells (2016), Glaum, Landsman and Wyrwa (2018), Gunn, Khurana and Stein (2018), and Ayres et al. (2019) focus on the empirical identification of determinants of impairment losses. In the following paragraphs, the main results reported in the referred studies are presented, with emphasis on the contribution that these results bring to the present thesis.

Bond, Govendir and Wells (2016) studied a sample Australian firms, including 5,842 firm-year observations between 2000 and 2012. The authors report that in 1,764 of their firm-year observations (30.2%), firms reported at least one economic impairment indicator (e.g., book-to-market greater than one). However, only in 475 of the total observations (8.1%), an accounting impairment was recognized. The authors also emphasized that the average size of the losses as an immaterial value.

In the sample analyzed by Bond, Govendir and Wells (2016), the recognition of several losses due to impairments seems to have been postponed, requiring the presence of a significant catalyst event for the recognition of the loss to take place finally. This fact led the

authors to suggest an expansion of the disclosure rules on impairment tests, especially when market indicators contradict the firms' decision not to recognize these losses. The need for a catalyst event pointed out by Bond, Govendir and Wells (2016) is related to the empirical study of Banker, Basu and Byzalov (2014), which shows that the recognition of accounting impairments is triggered by extreme negative news.

Bond, Govendir and Wells (2016) bring the illustrative example of Qantas Limited, an Australian airline. Qantas had a market value substantially lower than its book value for five years, and in some these years, the difference was greater than 50%. This situation persisted between 2009 and 2013, suggesting the existence of a significant unrecognized economic impairment. In 2014 alone, the company recorded an impairment loss in the amount of 2.947 billion Australian dollars. Bond, Govendir and Wells (2016) also point out that during this long period, Qantas management provided insufficient information to support the decision not to recognize losses due to impairment, limiting itself to declaring that it complied with accounting standards.

More recently, the study of Glaum, Landsman and Wyrwa (2018) investigates the determinants of the accounting recognition of impairments related to the goodwill of firms in 21 countries that adopt IFRS. The authors' analysis was conducted through logistic regression, with a dummy variable that assumes a value of 1 as the dependent variable when the firm recognized an accounting impairment of its goodwill and zero in the other cases.

The main results presented by Glaum, Landsman and Wyrwa (2018) are in the sense that the impairment of goodwill is more likely when firms have negative economic performance in the period and also in the immediately preceding period. This relationship with the previous period's negative performance, measured by the lagged stock returns in a period, suggests that some losses due to impairment are not recorded promptly.

Glaum, Landsman and Wyrwa (2018) innovated by considering the role of enforcement on firms and audits in the timeliness of accounting impairments records and on incentives measured at the firm level. The authors use a public enforcement indicator on the financial statements and audits developed by Brown, Pott and Wömpener (2014). For countries in which the level of enforcement is high, Glaum, Landsman and Wyrwa (2018) find a stronger relationship between negative stock returns in the period and losses recorded by impairment, revealing greater timeliness, which is reinforced by the lack of a relationship with lagged returns.

For firms in countries with weak enforcement, Glaum, Landsman and Wyrwa (2018) report a smaller statistical relationship between accounting impairments with period returns, and a weak relationship with lagged returns, suggesting that there is a delay in records of economic

losses. According to the authors, this relationship with lagged returns in countries with weak enforcement can be explained by greater discretion on the part of administrators to manage results for their benefit, delaying the recognition of losses (GLAUM; LANDSMAN; WYRWA, 2018).

Regardless of the country's level of enforcement, the results reported by Glaum, Landsman and Wyrwa (2018) show that goodwill impairment registration decisions are affected by incentives for managers and firms. Among these incentives, Glaum, Landsman and Wyrwa (2018) emphasize: (i) the preference of firms for smoothed results, which encourages them to recognize goodwill impairment losses in years in which their results are high; and (ii) management's reputational incentives, who prefer to avoid liability for an impairment.

Gunn, Khurana and Stein (2018) report that firms recorded impairments in a more timely manner during the 2008 financial crisis when their financial statements in the five years before the crisis were more conservative. This relationship was even more intense for firms with strong corporate governance, audited by auditors specialized in the sector in which the firm operates and with more leverage. According to the authors, their results are consistent with the view that firms recognize impairments to disclose private information as part of a commitment to a conditionally conservative accounting reporting strategy.

The results of Gunn, Khurana and Stein (2018) also show that firms that presented conditionally conservative financial statements before and during the 2008 financial crisis were able to obtain more debt financing during the crisis. Its publicly traded debt securities suffered fewer liquidity declines. These results are consistent with the theoretical predictions of Göx and Wagenhofer (2009), in the sense that the search for financing should lead firms to be more likely to recognize impairments before obtaining financing.

When analyzing the relationship between information asymmetry and losses due to impairment, Ayres et al. (2019) report that the presence of a more significant number of market analysts covering the firm increases the likelihood that the firm's managers will recognize impairments when the market expects them. That is because more coverage by analysts improves the information environment (monitoring ex-ante). Also, more coverage by analysts increases the likelihood that the firm will suffer negative consequences when it does not recognize an impairment that is expected by the market (AYRES et al., 2019).

In addition to the results of studies that analyze impairment losses' determinants, there are interesting papers dealing with the economic consequences of adequately applying the impairment rule of IAS 36. Considering that one of the functions of financial statements is to restrict the actions of managers for the benefit of shareholders (WATTS; ZIMMERMAN, 1978), greater transparency in accounting information can reduce the information asymmetry be-

tween insiders and outsiders, increasing the firm value. If the IFRS increases the transparency of accounting information, including increases achieved through the impairment rules, they should have a positive effect on the value of the firm (HORTON; SERAFEIM, 2010). Thas is the main economic consequence that the reviewed literature treats as expected from the application of IAS 36.

Disclosing information with the potential to reduce investor uncertainty about the firm's valuation parameters would reduce its cost of capital. Information on impairment tests may provide the market with details of cash flow projections, management estimates of the firm's discount rates, analysis of cash-generating units, as well as long-term growth assumptions. This information could help investors to evaluate the firm as a whole (PAUGAM; RAMOND, 2015). The revised literature reports that losses due to impairment related to long-lived tangible assets are associated with decreases in the firm's future cash flows. That suggests that managers do use this channel to communicate adverse situations to the market (GORDON; HSU, 2018).

Paugam and Ramond (2015) analyzed the economic consequences of the disclosure of information and the accounting recognition of impairment losses. The theoretical basis adopted by the authors was the information risk theory (BARRY; BROWN, 1985; EASLEY; HVIDKJAER; O'HARA, 2002; EASLEY; O'HARA, 2004; LAMBERT; LEUZ; VERRECCHIA, 2007). The information risk theory postulates that investors demand a higher rate of return when the uncertainty regarding the firm valuation parameters is greater, characterizing the estimation risk. The quantity and quality of accounting information affects asset prices, which can be managed by firms by reducing their cost of capital based on choices, such as accounting policies, analyst coverage, and market microstructure (EASLEY; HVIDKJAER; O'HARA, 2002) .

From a sample of French firms listed between 2006 and 2009, Paugam and Ramond (2015) report a negative association between disclosures about impairment tests and firms' cost of capital, provided that such disclosures contain forward-looking information and are specific to the firm. However, this capital cost reduction ratio does not occur concerning firms that, despite disclosing detailed information about their tests, avoid recognizing impairments (PAUGAM; RAMOND, 2015).

The results of Paugam and Ramond (2015) reinforce the logic that the disclosure of information required by accounting standards allows users of financial statements to obtain information on accounting practices and private information available to the firm (MAZZI et al., 2017). These results suggest that, at least in circumstances in which the accounting information contributes to prospective information about the firm's state, the markets give importance

to the firms' impairment practices.

In the reviewed articles, the role of debt in the probability of recognizing impairment losses is considered unidimensional. In other words, the extant literature treats debt as a variable with a directly proportional relationship with the probability of recognizing impairment losses. The revised literature does not consider the possibility of a non-linear relationship between debt and impairments, nor does it consider that attributes of debt such as the maturity and type of creditor could influence the accounting for impairment losses.

The same occurs with papers in which the focus is on conditional conservatism, and not specifically on impairment losses (RIEDL, 2004; KHAN; WATTS, 2009; BALL; KOTHARI; NIKOLAEV, 2013b; ANDRÉ; FILIP; PAUGAM, 2015; BANKER; BASU; BYZALOV, 2017; KHURANA; WANG, 2019). Due to this gap, the next section deals with the suggestion that the relationship between debt and impairment is more complicated than it would be possible to capture from econometric models that specify a linear relationship between impairments and debt.

The behavior adopted by firms in applying the impairment rule of IAS 36 can be interpreted as a response to the demand for conditionally conservative accounting information. The level of this demand stems from the existence of information asymmetry between the firm and creditors. This demand would be more significant when the firm is present in debt markets, in line with evidence reported in the literature that debt markets shape the degree of conditional conservatism(BALL; ROBIN; SADKA, 2008; JIANG; YANG, 2017; LAFOND, 2008; PENALVA; WAGENHOFER, 2019). This demand could be less when the firm's financing is obtained primarily through creditors with a direct relationship with the firm, who can replace accounting information with obtaining private information (FLOROU; KOSI, 2015).

The difference in the demand for conditionally conservative accounting information depends on the existence of significant differences in the information asymmetry levels expected in the relationships between firms and potential and actual creditors. These differences in the level of information asymmetry are prominent in the relationships between (i) a firm and direct relationship creditors; and (b) firm and indirectly related creditors, in a public debt market, as is the case with individual investors who acquire corporate bonds (FLOROU; KOSI, 2015). Bondholders usually have weak incentives to invest in acquiring information and monitoring borrowers. As the number of bonds of a given firm owned by a typical investor is a small fraction of the total bonds issued by the firm, that investor would individually have a very high cost to monitor the firm. Still, there would be typical investors who would wait for the monitoring efforts carried out by a creditor with a more significant number of bonds, leading to the aforementioned free-rider problems (FLOROU; KOSI, 2015).

Direct creditors, like banks, usually have the necessary skills and incentives to acquire and examine information in addition to those contained in the financial statements. These incentives include economies of scale that result from the size of the bank and the multiplicity of borrowers that the bank serves. These elements enable the bank to develop better expertise in the performance of the monitoring function, at a relative cost (per unit of debt granted) substantially lower than what would be attainable by a typical individual investor (FLOROU; KOSI, 2015).

With better ability to identify borrowers' characteristics, direct lenders also hope to attract lower-risk borrowers, on average, than would be possible if the adverse selection problem were not mitigated (STIGLITZ; WEISS, 1981). Direct creditors have even greater ease of interacting privately with debtors over time, so their contracts tend to rely less on accounting information than market debt contracts (FLOROU; KOSI, 2015). Differences in information asymmetry between the firm and its various creditors may affect the likelihood of properly applying the IAS 36 impairment rule.

The benefits expected from the application of the IAS 36 impairment rule are related to the expected utility from conditional conservatism. The accounting literature considers conditional conservatism to be useful for the firm, whereas unconditional conservatism is undesirable. That is because conditional conservatism causes the firm's accounting to provide new information in a more timely manner to the underlying economic events, provided these events are adverse. Unconditional conservatism is non-informative, as it does not reflect changes in economic circumstances associated with the firm's assets in financial statements (PENALVA; WAGENHOFER, 2019).

In this line, the empirical literature reviewed allows us to infer that unconditional conservatism has no relevant role in debt contracts (BALL; ROBIN; SADKA, 2008; SUNDER; SUNDER; ZHANG, 2018; PENALVA; WAGENHOFER, 2019). The firms' adoption of conditional accounting conservatism is expected, as it can result in benefits in terms of reducing the cost of capital (LI, 2015; SUNDER; SUNDER; ZHANG, 2018), and increasing the chances of obtaining financing (GÖX; WAGENHOFER, 2009).

Guay and Verrecchia (2017) analytically explain that firms committed to conditionally conservative accounting reporting have a higher market value. This commitment is evidenced when the firm applies IAS 36 impairment rules promptly. The higher market value obtained with conservative behavior would be a function of the firm's incentives. Administrators with remuneration sensitive to the firm's market price have incentives to disclose positive news and retain negative news (GUAY; VERRECCHIA, 2017).

When there are disclosure costs and uncertainties regarding the firm's level of informa-

tional superiority in relation to creditors, they react to the incentives that managers have to disclose positive news and retain negative news, demanding higher interest rates and reducing the firm's value (VERRECCHIA, 1983; KOTHARI; SHU; WYSOCKI, 2009). Conversely, the behavior of reporting negative results in advance, complemented by the voluntary disclosure of good news, reduces uncertainties regarding the firm's financial situation (GUAY; VERRECCHIA, 2017). The reduction of uncertainty concerning the firm's market value would reflect in reduction in its cost of capital (EASLEY; O'HARA, 2004; GUAY; VERRECCHIA, 2017).

Penalva and Wagenhofer (2019) question whether firms could establish a credible commitment to conditionally conservative accounting, including a commitment always to recognize an impairment loss when it becomes known. This credible commitment would be a condition for the firm to enjoy the benefits of conditional conservatism. According to the authors, the literature presents four main arguments supporting the idea that this compromise would be possible.

The first argument presented by Penalva and Wagenhofer (2019) is that a consistently conservative report has a positive effect on the reputation of the firm and the managers, causing the market to perceive less information asymmetry concerning the firm (NIKOLAEV, 2010). The second argument focuses on the increased litigation risk suffered by the independent auditors of non-conservative firms, which would encourage these firms to apply more efforts and charge higher fees to audit firms of this type (NIKOLAEV, 2010; DEFOND; LIM; ZANG, 2016). The third argument is that the boards of directors demand conservative reporting by the firm, due to the board's reputational incentives (GARCÍA LARA; GARCÍA OSMA; PENALVA, 2009; ARMSTRONG; GUAY; WEBER, 2010).

Finally, Penalva and Wagenhofer (2019) argue that the historical tradition of accounting conservatism, even before the existence of regulation, shows that firms can commit to conditional conservatism.

The firm's commitment to conservative reporting can be reinforced by the presence of independent members on the board of directors, by hiring independent auditors recognized for their high quality. It can also be achieved by the firm's active encouragement of increased monitoring by shareholders and creditors, and, finally, with the induction of an increase of coverage by analysts (GUAY; VERRECCHIA, 2017; PENALVA; WAGENHOFER, 2019).

These mechanisms would allow the identification ex-ante of the firm's commitment to a conservative accounting system. In other words, these mechanisms would mitigate the problem of adverse selection, insofar as they create a differential of confidence with the potential creditor. These same mechanisms that reveal a firm commitment to conservatism also affect

the ex-post relationship between the firm and creditors. That is because the commitment to accounting conservatism practices mitigates the discretion that the firm would have in reporting its results (KHAN; WATTS, 2009).

In the next section, the literature review ends with the development of the hypotheses of this research. This development was carried out based on the objective of the present thesis, as well as the results and recommendations verified in the reviewed literature.

2.5 Hypotheses

In order to identify a potential explanation for the problem of inadequate or insufficient recognition of impairment losses, the main factors that explain the level of conditional conservatism of firms were searched in the literature that addresses conditional conservatism. In this regard, the empirical study of Ball, Robin and Sadka (2008) points out that the level of conditional conservatism presented by the firm is a response to the demand for conservative information presented by creditors. The results of Ball, Robin and Sadka (2008), taken together with the subsequent study by Florou and Kosi (2015), suggest that the incentives for recognizing accounting impairments will be positively related to the level of information asymmetry between the firm and its creditors. It should be noted that both Ball, Robin and Sadka (2008) and Florou and Kosi (2015) did not focus on the act of recognizing accounting impairments.

The role of debt in the probability of recognizing losses in the recoverable value of the firm's net assets through accounting impairment is considered in a unidimensional way in the reviewed articles. The extant impairment literature considers debt as a variable that is directly and proportionally related to the probability of recognition of accounting impairment. Although debt is the primary determinant of conditional conservatism in firms (BALL; ROBIN; SADKA, 2008), the revised empirical literature on determinants of impairment losses does not consider the possibility of a non-linear relationship between debt and the probability of impairments. The revised empirical literature also does not consider that debt attributes such as maturity and type of creditor can influence the accounting for impairment losses. The same applies to articles where the focus is on conditional conservatism, without studying impairment losses (RIEDL, 2004; KHAN; WATTS, 2009; BALL; KOTHARI; NIKOLAEV, 2013b; ANDRÉ; FILIP; PAUGAM, 2015; BANKER; BASU; BYZALOV, 2017; KHURANA; WANG, 2019).

Before delving into the impact the type of creditor has on the probability of recognition of accounting impairments, it is about the importance of impairment for creditors in general. The expectation that incentives for the recognition of accounting impairments are positively related

to the information asymmetry level between the firm and its creditors is based on the assumption that negative news is more important for creditors than for other investors. That is because the investments made by actual creditors, in the form of debt granted, are more sensitive to adverse economic news than to positive news (GÖX; WAGENHOFER, 2009; FLOROU; KOSI, 2015; PENALVA; WAGENHOFER, 2019). Creditors do not directly participate in the firm's profits. The maximum result that can flow to creditors is the payment of principal and interest contracted. On the other hand, news that positively affects the firm, implying future profits, does not necessarily affect the firm's ability to pay principal and interest.

Often the firm's assets are used as collateral for the firm's debts, and, in the absence of collateral, creditors receive their share in a bankruptcy proceeding with proceeds from the sale of assets (WATTS, 2003; ARMSTRONG; GUAY; WEBER, 2010). Consequently, the risk to creditors increases when the firm presents overestimated the book value of its assets, as these assets may not be sufficient to satisfy the debt. Additionally, the anticipation of bad news can accelerate the transfer of control rights over the assets to creditors, minimize their losses, increasing the likelihood of recovering the principal borrowed (KHURANA; WANG, 2015; DEMERJIAN, 2017; WANG; XIE; XIN, 2018).

The importance of negative information for creditors is also evidenced by the results of DeFond and Zhang (2014), which report that prices of debt securities (bonds) traded on the market react more quickly to bad news about the firm than react when good news is released. The speed of reaction of debt markets to negative news is faster than the speed of reaction of stock markets to the same news (DEFOND; ZHANG, 2014).

If firms do not adopt accounting behavior with conditional conservatism, creditors tend to protect themselves from potential information asymmetry by charging higher interest rates. In this sense, there is empirical evidence that the cost of capital in debt contracts is negatively related to conditional conservatism. That effect is more substantial for firms with high credit risk.

The correct application of the IAS 36 impairment rule has, as one of its effects, the generation of accounting information beneficial to creditors. With the application of this rule, the firm adjusts the value of its assets downwards as soon as it is possible to identify that the assets' value has suffered an economic loss. Therefore, this conditional conservatism mechanism reduces the information asymmetry between the firm and creditors regarding the economic value of assets through higher quality accounting information (FLOROU; KOSI, 2015; LEUZ; WYSOCKI, 2016).

Despite the importance of the IAS 36 impairment rule for creditors in general, this importance may not be homogeneous for all creditors of the firm. The studies of Armstrong,

Guay and Weber (2010) and Florou and Kosi (2015) highlight that different creditors have different levels of information asymmetry concerning the firm. Indirect relationship creditors, who participate in the debt market, have increased difficulty in obtaining information about the firm's financial status, depending on the accounting information as the primary source of information (FLOROU; KOSI, 2015). These creditors are more sensitive to the level of conditional conservatism in the firm's financial statements. Direct lenders are better able to (i) obtain private information from borrowers; (ii) investing time and resources in producing information about these creditors and in monitoring their activities and (iii) renegotiating the debt after the initial contracting (FLOROU; KOSI, 2015). As a consequence, direct creditors may place less importance on the information presented in financial statements, compared to the level of importance given by other debt providers (FLOROU; KOSI, 2015). This reduced importance that direct creditors give to accounting information is suggested by the results of Florou and Kosi (2015), which report the absence of significant changes in the levels of cost of capital on bank loans in response to the firm's level of conditional conservatism.

Because of the explanatory hypotheses of Armstrong, Guay and Weber (2010) and Florou and Kosi (2015) for the relationship between leverage and conditional conservatism, debt should be related to the probability of recognition of economic losses through impairment expenses, in a perspective that is not merely one-dimensional. It would not be appropriate to conclude that more debt always leads to a greater propensity for impairments to be recognized, in a linear fashion. This conclusion would be inappropriate because the researched literature on conditional conservatism leads to the hypothesis that the probability of recognizing losses will be less or even non-existent when debt is primarily obtained from creditors with whom the firm maintains a direct relationship. It will be higher when indirectly related creditors predominantly provide the firm's debt (ARMSTRONG; GUAY; WEBER, 2010; FLOROU; KOSI, 2015).

In summary, from the theories presented in the reviewed literature (ARMSTRONG; GUAY; WEBER, 2010; FLOROU; KOSI, 2015; NAGAR; RAJAN; RAY, 2018; PENALVA; WAGENHOFER, 2019), it is expected that the relationship between debt and the propensity to register impairments will be influenced by different levels of demand for conditional accounting conservatism, due to different levels and types of debt. The existence of debt obtained from creditors in an indirect relationship, with exchange-traded debt, leads to the assumption that the debt issuing firm will be subject to a greater demand for conservative accounting information (FLOROU; KOSI, 2015). In the example presented by Armstrong, Guay and Weber (2010), the essential difference between direct creditors and investors in the debt market, who buy securities like bonds, is that the former have access to information not available to the

public, and the latter are informed mainly through the firm's financial statements. Armstrong, Guay and Weber (2010) claim that firms that decide to go into debt recognize the institutional differences between the various potential debt providers and that these differences give rise to different demands for accounting information. As a consequence, the first hypothesis of this thesis is established:

Hypothesis 1. *The existence of exchange-traded debt is positively related to the probability of recognizing economic losses through accounting impairments.*

As mentioned, the empirical literature considers indebtedness a variable with a direct relation proportional to the probability of registering impairments (RAMANNA; WATTS, 2012; BOND; GOVENDIR; WELLS, 2016; GLAUM; LANDSMAN; WYRWA, 2018; GUNN; KHURANA; STEIN, 2018; AYRES et al., 2019). This relationship may not be linear due to two main aspects.

The first argument considers that a larger amount of debt subjects creditors to a greater risk of default, accompanied by more information asymmetry (DE FRANCO; VASVARI; WITTENBERG-MOERMAN, 2009). The greater the risk of default, the greater the value the creditor will attach to information about the firm's financial status. That is because information asymmetry increases the uncertainty inherent in the firm's ability to pay commitments, with the creditor or even with potential creditors. In the case of indirect relationship creditors, who depend on accounting information as a means of mitigating information asymmetry, this issue is expected to be more relevant (DE FRANCO; VASVARI; WITTENBERG-MOERMAN, 2009).

In situations of a high risk of default, which occurs when indebtedness becomes excessive or incompatible with the future cash generation of the firm, the accounting information prepared with conditional conservatism, as would be the case of a firm that recognizes impairment losses, can accelerate the transfer of control rights to creditors, reducing the risk of expropriation of wealth by shareholders (WATTS, 2003; PENALVA; WAGENHOFER, 2019). In the same sense, Beyer and Guttman (2012) consider the aggregation of signals, which occurs when different firm's assets have different signals (positive or negative), showing that conservatism is in these cases is beneficial when the amount of debt is high because it favors liquidation efficiency. A liquidation is more efficient as accelerating the transfer of control rights increases the chance that creditors will be able to preserve the value of the firm's assets before the firm is entirely unable to repay the debt (DONOVAN; FRANKEL; MARTIN, 2015).

The second argument in favor of non-linearity depends on the hypothesis derived from Diamond (1991) that the financial statements would be a monitoring mechanism applied by cred-

itors when the borrower's credit risk is classified as median (middle tier). In some instances, even if the creditor is a bank, there may be greater demand for accounting information.

According to Minnis and Sutherland (2017), who empirically tested the predictions of the Diamond (1991) model, the underlying theoretical argument is that low-risk customers do not need monitoring because they have strong financial incentives to maintain low credit risk. For borrowers with high credit risk, monitoring is also not useful, as these borrowers have less to lose by hiding information, so that monitoring does not create strong incentives for the firm to behave appropriately. Debt borrowers who fall into the intermediary group will invest in risky projects if not monitored. However, these borrowers have a sufficient reputation for their behavior to be affected by the incentives provided by bank monitoring.

Minnis and Sutherland (2017), with a sample of private transactions between banks and customers, suggest that banks request financial statements from their customers less frequently for creditors with higher and lower credit risk (higher and lower quintiles of the distribution of credit spreads). However, the authors emphasize the difficulty of generalizing their results, considering the characteristics of the sample, which includes only small and medium-sized firms. This type of firm may be subject to economic forces other than those suffered by publicly traded firms.

In summary, a non-linear relationship between debt and the probability of accounting for economic losses through accounting impairments is expected, as increases in debt can create greater demand for accounting information, mitigating asymmetric information. This increase, however, can occur at decreasing rates, as for firms with very high leverage, additional monitoring may not create sufficiently strong incentives for the firm to adopt the IAS 36 impairment rule properly.

Therefore, the second hypothesis of this thesis is established:

Hypothesis 2. *The firm's debt level is related non-linearly to the probability of recognizing economic losses through accounting impairments.*

In the case of firms that have most of their debt from short-term financing, the constant renegotiations and scrutiny to which firms are subject would serve as a substitute for conditional conservatism (KHURANA; WANG, 2015). That is because short-term debt subjects management to more frequent monitoring when renewing debt (KHURANA; WANG, 2015).

Therefore, there could be no significant incentives for firms with predominantly short-term debt to present conditionally conservative financial statements. Therefore, the probability of recognizing losses by impairment of these firms would be less. Thus, the third hypothesis of this thesis is established:

Hypothesis 3. *The proportion of the firm's short-term to total debt is negatively related to the probability of recognizing economic losses through accounting impairments.*

As for the current borrowing factors and the firm's temporal stage in the debt borrowing cycle, the discussion of the analytical results of Göx and Wagenhofer (2009) and Gigler et al. (2009) is relevant. There are relevant arguments in the sense that the firm's behavior concerning financial reporting, as a response to the demand for conservative information, may not be uniform over time. According to Penalva and Wagenhofer (2019), the apparent contradiction between both analytical models stems from the particularities of each models' settings. The main difference between the analytical models in question refers to the analyzed moment. The model of Göx and Wagenhofer (2009) analyzes a firm that seeks to obtain capital from third parties. In the model of Gigler et al. (2009), the analysis falls on the costs of recognition of accounting impairment, and especially of the situations in which this impairment is unduly recognized, for firms that are already indebted.

Göx and Wagenhofer (2009) show that the ex-ante adoption of an accounting system that guarantees the recognition of losses by impairment is the optimal policy to be adopted by firms seeking financing under the form of debt. According to the Göx and Wagenhofer (2009) model, the firm benefits from committing itself to the adoption of an accounting system that offers conditionally conservative information about the collateral value for its creditors. Hence, there are benefits to be appropriated by the firm that recognizes impairment losses when economic losses occur.

Göx and Wagenhofer (2009) state that this type of accounting system reports the lower limit of the assets' expected value, resolving the uncertainty about the value of the assets that would exist for the financier if the accounting system adopted a historical cost system without impairment rules. The conservative system is preferable to a fair value model that allows positive revaluations of assets, which would make book values more volatile and less informative (GÖX; WAGENHOFER, 2009). An accounting system that adopts strict impairment rules increases the chances of obtaining financing when the firm has good quality assets that the firm can pledge as collateral (GÖX; WAGENHOFER, 2009).

In a different context, after the firm has obtained debt, Gigler et al. (2009) analyze the rules of impairment, concluding that conservative practices reduce contractual efficiency since they do not favor the minimization of the cost resulting from false alarms. False alarms occur when a project is settled in advance because the accounting system sends a false signal, which can be an accounting impairment or other accounting record that reduces the value of the project's assets.

The analysis of Gigler et al. (2009) concludes that an optimal accounting system should

not have as its primary objective the reduction of the cost of capital, a common objective in the previous literature (PENALVA; WAGENHOFER, 2019). The model of Gigler et al. (2009) innovated by showing that the objective should be the minimization of errors in the execution of the contracts, adopting a perspective of evaluating the total welfare of both parties of the debt contract. These errors include the false alarms described in the previous paragraph and the errors that occur when the creditor does not terminate the project when it should have done it. Analytically, Gigler et al. (2009) show that minimizing the cost of false alarms is the most critical objective for minimizing the losses associated with contracts. Thus, creditors and debtors benefit ex-ante from a non-conservative accounting system.

Penalva and Wagenhofer (2019) emphasize that the analytical model of Gigler et al. (2009) means that after contracting the debt, the lender will prefer conservative accounting practices. That is because a conservative system maximizes the expected return from the loan, which is in line with the prevailing literature results. However, in a competitive credit market, the creditor's benefits would be lost ex-ante in the negotiation of the debt contract, causing the creditor to be indifferent ex-ante to conservative accounting, and causing the debtor to benefit from the non-conservative system (PENALVA; WAGENHOFER, 2019).

The analytical model of Gigler et al. (2009) was later extended by several authors. Li (2013), for example, considered the cost of renegotiation after obtaining an accounting signal, showing that in cases where the cost of renegotiating contracts is low, a conservative system is preferable for projects with a low probability of high returns. Caskey and Hughes (2012) analyzed the selection between several projects after receiving the loan, leading to the risk of the firm choosing a project that transfers wealth from creditors to shareholders. The authors show that there is an economic trade-off between mitigating the risk of investments that harm creditors and optimizing the efficiency of the project's settlement. In the Caskey and Hughes (2012) model, conservatism leads to excessive abandonment of projects and high false alarm costs, similarly to Gigler et al. (2009). However, in the Caskey and Hughes (2012) model, the addition of multiple projects makes conservatism valuable as abandonment costs fall disproportionately with lower quality projects, making conservatism a useful mechanism to prevent managers from choosing these projects.

Penalva and Wagenhofer (2019) reaffirm the analytical strength of the model of Gigler et al. (2009), but reinforces that the subsequent analytical literature brings situations such as renegotiation and other agency problems that make conditional conservatism an optimal behavior. According to Penalva and Wagenhofer (2019), conditional conservatism is sensitive to specific conditions that can be studied by empirical literature. As a consequence, it is expected that the probability of accounting for economic losses will also be sensitive to the

firm's specific conditions, particularly regarding the attributes of its debt.

In summary, the problems that occur after contracting debt can lead the firm to avoid recognizing impairment (GIGLER et al., 2009; GRAHAM; HARVEY; RAJGOPAL, 2005; LI; XU, 2018). However, before contracting the debt, conservative practices, represented by the recognition of impairment, are preferable (GÖX; WAGENHOFER, 2009; WATTS, 2003). Thus, the fourth hypothesis of this thesis regarding the level of current debt issuance is established:

Hypothesis 4. *The issuance of debt in the current period is positively associated with the probability of recognizing economic losses through accounting impairments.*

The hypotheses are presented together in the Table 2. The hypotheses are accompanied by the expected sign of their associated coefficients in the econometric model described in section 3.2.

Table 2: Hypotheses

Hypothesis	Description	Predicted Sign
H1	The existence of exchange traded-debt is positively related to the probability of recognizing economic losses through accounting impairments.	positive
H2	The firm's debt level is related non-linearly to the probability of recognizing economic losses through accounting impairments.	positive and negative
H3	The proportion of the firm's short-term debt to total debt is negatively related to the probability of recognizing economic losses through accounting impairments.	negative
H4	The issuance of debt in the current period is positively associated with the probability of recognizing economic losses through accounting impairments.	positive

Source: prepared by the author.

In the next section, the research design used to test the set of hypotheses developed in this thesis is detailed.

3 METHODOLOGICAL PROCEDURES

This chapter begins with the presentation of the description of the samples considered and the data collection procedures. Subsequently, the econometric models adopted to test the hypotheses developed in section 2.5 are presented. In the sequence, sections describe the dependent variable, the variables of interest, and the control variables.

3.1 Samples and Data collection

This thesis considers accounting impairment in the form of IAS 36 rules, in a context after the mandatory adoption, in 2005, of international accounting standards - International Financial Reporting Standards (IFRS) in the European Union. That adoption demanded a significant change in accounting practices (CHRISTENSEN; NIKOLAEV, 2013). The adoption of IFRS was followed, from 2005, by several countries, developed and emerging, such as Australia, Hong Kong, New Zealand, and South Africa. IFRS was later adopted by countries such as Brazil, Canada, and South Korea. The convergence process for international accounting standards resulted in the adoption of IFRS by more than 100 jurisdictions (DASKE et al., 2008; BALL, 2016). In this change, the accounting rules of several countries, shaped by the institutional characteristics of each country and marked by great diversity, were replaced by a unified set of rules and principles (ANDRÉ; FILIP; PAUGAM, 2015).

The selection of the sample is based on the criteria adopted by Glaum, Landsman and Wyrwa (2018). Initially, all firms with observations in the Thomson Reuters Eikon were considered for inclusion in the sample [1]. Firms listed on stock exchanges in countries requiring IFRS financial statements from 2011 to 2018 were selected. The use of 2011 as a starting point stems from the fact that the sample from this calendar year onwards is substantially increased. That happened due to IFRS adoption by Brazil, whose full adoption of the IFRS occurred from 2010, as well as Canada and South Korea, which adopted the standard in 2011.

The initial sample included 122,454 firm-year observations from non-financial firms. In Glaum, Landsman and Wyrwa (2018), financial firms are analyzed separately from non-financial firms, due to differences in the reasons that may lead financial and non-financial firms to record losses due to impairment, considering that financial firms have concerns about

[1] Thomson Reuters Eikon is the database from which the variables used in this thesis were collected, including the stocks database and the corporate bonds database. Concerning the corporate bonds database, I considered firms that issued debt directly. However, I also included issues made by controlled firms. I also considered debt issues in which the firm in the sample appears as the primary guarantor, as in these types of debt issuance, the firm in the sample is of importance to the indirect lender.

the maintenance of regulatory capital. There are also fundamental differences in the capital structure and balance sheet structure between financial and non-financial firms. As the focus of this thesis is on the impact of debt characteristics on the probability of recognizing impairment losses, the sample excludes firms that are part of the financial and insurance sector (according to the NAICS nomenclature). These financial firms have a large part of their net assets comprised of financial instruments valued at fair value, subject to specific rules of impairment outside of the scope of IAS 36.

Firms with reports for less than one calendar year were excluded from the sample, along with and observations with missing data. Firms with a market capitalization smaller than 20 million euros, negative equity, or domiciled in countries with less than 100 firm-year observations were also excluded. The minimum limit of observations by country was adopted to make it possible to carry out analyzes by country, as well as to make it possible to compute variables at the country and segment level in each calendar year considered. In order to consider the effects arising from fiscal-year end dates other than the calendar year, the (MURPHY, 2013) criterion was adopted. By this criterion, observations from firms with a fiscal year ending after May 31 of year t are considered in year t, and observations from firms that end the fiscal-year until May 31, are considered in year t-1. As a result of the described selection process, the sample included 36,579 observations for which there are complete data for all independent variables, referring to 7,069 unique firms. Among these total observations, the firm recognized an impairment in 13,550 observations, corresponding to 37.04% of the total observations. In addition to that, 4,338 unique firms recognized a loss due to impairment at least once during the sample period.

After the initial selection of the sample, additional criteria were adopted in order to achieve the main objective of this thesis, which is to analyze the relationship between the characteristics of debt and the probability of accounting recognition of economic losses, through accounting impairments. Following the logic adopted in Ramanna and Watts (2012), the sample comprises firms in which an economic loss has occurred, and the ex-ante probability of recognizing an accounting loss would be greater. After identifying these firms, they are considered for estimating the parameters of econometric models that aim to capture the effect of different levels of asymmetry between firm and creditors on the firm's probability of recognizing or not the economic loss, through accounting impairments.

The extant literature presents two important indicators that an economic loss has occurred, which can be observed directly by funders. These external indicators are: the book-to-market ratio (RAMANNA; WATTS, 2012), from now on referred to as BTM, and the existence of return on assets (ROA) less than any reasonable estimate of the cost of capital. The BTM

ratio is explicitly included in IAS 36 as a loss indicator to be monitored by firms. A low ROA suggests that the firm's economic fundamentals are substantially deteriorated. The return the firm obtains from its assets is not sufficient to repay the capital invested in the company's assets firm (HEALY, 2016). In addition to these indicators, the criterion proposed by Barth, Israeli and Sridharan (2019) is added, which combines the BTM analysis with the F-Score indicator proposed by Piotroski (2000), to identify firms with deteriorated financial health firms.

The following subsections provide details of the selection criteria for the three samples considered.

3.1.1 BTM Criterion

The BTM ratio is used as an indicator of impairment in the influential Ramanna and Watts (2012) study. Ramanna and Watts (2012) analyze a sample of US firms for which there is an indication that the market expects a loss to the firm's goodwill to have occurred. In 69% of their sample's observations, the firm did not recognize the economic loss in its financial statements. A positive association was found between non-recognition and factors related to agency problems, such as the CEO's remuneration, the CEO's concerns about his reputation, and the covenants' violation (RAMANNA; WATTS, 2012).

Measuring a book-to-market indicator greater than one shows that the book value of the firm's net assets (the firm's net worth, also called book value) is greater than the value that the market assigns to these net assets. Under the premise of market efficiency, stock market prices aggregate investors' opinions on the future cash flows of the firm (FAMA, 1970; DAMODARAN, 2012; KOLLER; GOEDHART; WESSELS, 2015). Thus, the market value below the book value of the assets suggests that the investors' aggregate opinion in the stock market is unfavorable to the prospects of the firm (BARTH; ISRAELI; SRIDHARAN, 2019).

According to Ramanna and Watts (2012)'s perspective, the persistence of a book value higher than the market value of the firm's shares is an indicator that the observed book value of the firm's net assets contradicts the lower bound between historical cost or market value. This situation potentially signals an unrecognized economic impairment, although this impairment is expected by the markets (DANIELSON; PRESS, 2003; RAMANNA; WATTS, 2012; OLER, 2015).

Analyzing a sample of firms from 2008 to 2010, Bini and Penman (2013) report that the percentage of European firms reporting a BTM ratio greater than one was 30.9% in 2008, 17.1% in 2009, and 16.4% in 2010. This result points to a persistence of the book-to-market ratio greater than one (BINI; PENMAN, 2013). That persistence is contrary to the recommen-

dations of IAS 36, as a high BTM ratio suggests that there may be problems in accounting for the firm's assets. This possibility is supported by the opinion of European Security Markets Authority (2013), by regulators and regulators in Germany and the United Kingdom (CAPKUN; COLLINS, 2018) and by reports issued by audit firms and consultants (ANDRÉ; FILIP; PAUGAM, 2015).

In summary, the potential occurrence of losses in the economic capacity of a firm's assets (economic impairment) can be identified in extreme cases where the book-to-market ratio persists at a level higher than one. Firms that present this ratio for periods longer than two years are considered in the literature as firms with unrecognized economic losses (RAMANNA; WATTS, 2012; ABUGHAZALEH; AL-HARES; ROBERTS, 2011; LAWRENCE; SLOAN; SUN, 2012; JARVA, 2014; OLER, 2015; BOND; GOVENDIR; WELLS, 2016; MAZZI et al., 2017; SIMON; MACAGNAN, 2019).

The use of the BTM ratio as an identification strategy is justified by the fact that this ratio is used by IAS 36 as one of the examples of external impairment indicators, together with technological changes, interest rates, and market changes. These factors are beyond the direct control of firms and may indicate lower future cash flows or higher discount rates (KNAUER; WÖHRMANN, 2016). Riedl (2004) also points out that the existence of positive differences between a firm's book value and market value is a buffer that can absorb losses in some cash-generating units. The situation of the BTM ratio greater than one indicates that the cash-generating unit aggregation buffer has already been consumed, and the firm has a potential economic impairment.

However, as pointed out by Barth, Israeli and Sridharan (2019), a BTM ratio greater than one may be due to two main phenomena, namely, overvalued assets or underestimated market value. The empirical evidence reported by Barth, Israeli and Sridharan (2019) suggest that the second case is a more likely explanation for the number of firms with BTM ratio greater than one in the US market. In the sample analyzed by the authors, 28% of the 118,268 observations (8,654 unique American firms between 1962 and 2016) have a BTM ratio greater than one.

Barth, Israeli and Sridharan (2019) also highlight that BTM ratios greater than one occur in substantial proportions in all of the economic segments and periods analyzed. In the sample analyzed by the authors, there are fewer cases in segments that traditionally depend on unrecognized intangible assets and more cases in years of recession. Therefore, the usage of the BTM ratio as the only strategy to identify firms that have suffered significant economic losses may lead to biased conclusions. It is necessary to adopt complementary identification strategies. These strategies are presented in the next subsections

3.1.2 ROA Criterion

The second strategy for identifying firms with potential unrecognized economic loss is based on comparing the firm's ROA (Return on Assets) with reasonable costs of capital. Firms whose ROA has been less than the cost of capital over the past two years can be treated as firms in which there is a potentially unrecognized economic loss regarding the value of their assets. Christensen and Nikolaev (2013) deal with the relationship between ROA and the recognition of the recoverable value of assets, noting that ROA better reflects economic performance when assets are valued at their value in use, considering that this assessment of fair value makes it difficult for management to maintain unproductive assets.

The identification strategy through ROA analysis follows the study of Healy (2016), which presents a historical analysis of the purchase of America Online (AOL) by Time Warner. This transaction resulted in a merged company, AOL TW, in a transaction whose particularities generated the accounting recognition of $ 127 billion in goodwill. A few years after the transaction, several impairment losses were recognized by AOL TW. Analysis by Healy (2016) shows that the recognition of accounting impairment resulted in the realization of $ 99 billion of the goodwill initially recognized.

Healy (2016) analyzed the timing and reasonableness of losses due to impairment recognized by AOL TW. If the recorded losses represent an unbiased estimate of the economic loss suffered by goodwill, Healy (2016) theorizes that the firm should generate returns on its assets that are at least equal to its cost of capital. The analysis carried out by Healy (2016) from 2002 to 2008 shows that the resulting firm had an average of 3% pa of ROA. Healy (2016) states that this average level of ROA is consistently lower than any reasonable capital cost for the firm. This situation is even worse considering that Time Warner's acquirer, America Online, would potentially have intangible assets not recognized in its financial statements before the acquisition. That would make the ROA adjusted to recognize these intangible assets originating in America Online even lower than the empirically verified average.

Healy (2016) considers that, if the firm recognized losses due to impairment promptly, it would be able to generate returns on assets consistent with its cost of capital. The identification strategy used by Healy (2016) could be adapted to consider that firms with a ROA below reasonable estimates of their cost of capital are strong candidates to be more likely to have unrecognized economic losses. As it is possible that a low ROA firm still has a substantial surplus of market value over book value of its net assets, the buffer advocated by Riedl (2004), this criterion is used in conjunction with the BTM criterion. Firms that have a BTM ratio greater than one for at least two years (RAMANNA; WATTS, 2012) and also ROA, before

recording losses due to impairment, below the risk-free rate (HEALY, 2016) are considered under the Roa criterion. The percentage of 4% pa was adopted as a proxy for the risk-free rate, approximating the historical rates of return of T-bills and T-Bonds issued by the US government between 1928 and 2019 Damodaran (2012). Firms that meet the BTM criterion and also presented ROA (before recording losses due to impairment) in the first quartile of the statistical distribution of ROA, adjusted by segment, country, and year, were also included in the sample.

3.1.3 F-Score Criterion

More recently, in criticism of the use of the high book-to-market ratio as a proxy for the lack of accounting conservatism, Barth, Israeli and Sridharan (2019) used the F-score indicator proposed by Piotroski (2000) as an indicator of financial performance and health of firms. Barth, Israeli and Sridharan (2019) point to the fact that US firms with high book-to-market generally have a high F-score as an indicator that the financial situation of firms with high book-to-market is not necessarily bad.

The Piotroski (2000)'s F-Score consists of the sum of seven binary signals, which take on the value 1 when: (i) the cash flow from operations is greater than the operating profit; (ii) cash flow from operations is greater than zero; (iii) the firm did not issue shares; (iv) ROA is greater than zero; (v) the variation in ROA for the period compared to the previous year is positive; (vi) there is a reduction in the proportion of long-term debt to total assets; (vii) there is a positive variation in the current liquidity indicator (current assets divided by current liabilities); (viii) there is a positive change in gross margin (revenue minus revenue costs divided by total assets), and (ix) there is a positive change in the turnover of assets (revenues divided by total assets). According to the author, firms with a higher F-Score indicator have a higher level of financial health.

The original study by Piotroski (2000) reports that firms with a high book-to-market ratio can be divided, using the F-Score, between firms with high or deteriorating financial health. The results presented by the author indicate that the returns that can be obtained by investors by adopting a high book-to-market firm acquisition strategy can be substantially increased, concentrating on firms with high financial health (high F-Score).

3.1.4 Criteria summary

Depending on the criteria described in the previous subsections, the samples adopted have the following criteria:

- BTM criterion: firms that have the BTM ratio greater than one for two consecutive periods are included
- ROA criterion: firms that have met the BTM criterion, and have a low ROA. A low ROA is one that either belongs to the lower quartile by sector, country and year; or is below the long-term return on US government-issued bonds, which are a standard proxy for the risk-free rate (DAMODARAN, 2012), of approximately 4% aa.
- F-Score Criterion: includes firms that cumulatively met the BTM criterion for two consecutive periods and have an F-Score belonging to the lower quartile by sector, country, and year.

ROA and F-Score were not considered in isolation, as firms with a low ROA or F-Score could still have the buffer of excess market value mentioned by Riedl (2004). In this case, firms with a low ROA or F-Score could still have sufficient market value to recover their net assets, even if their momentary financial health was not ideal. For that reason, ROA and F-Score were only considered in combination with the BTM criterion initially proposed by Ramanna and Watts (2012).

3.2 Econometric Models

The hypotheses of the present thesis are tested through two econometric models, presented in Equation (3.1) and Equation (3.2). The models adopt the same variables with one exception. In the Equation (3.1) model, the DummyExchangeTradedDebt variable is considered, and in Equation (3.2), the LogExchangeTradedDebt variable is used. Both variables are related to the hypothesis H1 of the present thesis, in the sense that the existence of debt traded in an exchange, with indirect creditors, positively affects the probability of recognizing losses by impairment in the firm's financial statements.

The substitution of the variable DummyExchangeTradedDebt in Equation (3.1), by the variable LogExchangeTradedDebt in Equation (3.2) is performed to verify if the level of exchange-traded debt affects its probability of booking impairments. Substituting a dummy variable for a log variable tests not for a change in the intercept effect of exchange-traded debt,

but for the slope coefficient of the probability of booking an impairment regarding the level of debt negotiated. As the variable LogExchangeTradedDebt is measured on a logarithmic scale, no relevant correlation is expected with the variable debt, which is measured in the form of a ratio between the book value of loans and financing and the firm's market capitalization, as defined in Table 4. The aforementioned econometric models presented below, with the variables of interest defined and related to the hypotheses of this thesis in Table 4, of section 3.4, and control variables presented in Table 5, of section 3.5.

$$\begin{aligned} &P(Impairment) = \beta_0 + \beta_1 DummyExchangeTradedDebt_i + \beta_2 Debt_i + \\ &\beta_3 DebtxDebt_i + \beta_4 ShortTerm_i + \\ &\beta_5 NetDebtIssued_i + \sum_{k=1}^{13} \{\gamma_k Controls_i\} + \mu_i \end{aligned} \tag{3.1}$$

$$\begin{aligned} &P(Impairment) = \beta_0 + \beta_1 LogExchangeTradedDebt_i + \beta_2 Debt_i + \\ &\beta_3 DebtxDebt_i + \beta_4 ShortTerm_i + \\ &\beta_5 NetDebtIssued_i + \sum_{k=1}^{13} \{\gamma_k Controles_i\} + \mu_i \end{aligned} \tag{3.2}$$

The estimation of Equation (3.1) and Equation (3.2) models is performed with a logistic regression, adequate to model this type of dichotomous variable, representing probabilities.

Fixed-effects models were not used as some independent variables are invariant over time for many of the firms in the sample, so the effect of these variables is not estimated by fixed-effects models. These models also suffer from inconsistency in the presence of heteroscedasticity, a common phenomenon in the cross country studies [2]. Random-effect models are also not used as the main specification since this alternative would not control for omitted variables. Results with estimation by random effects are contained in section A.6, and are qualitatively similar to the main results.

Thus, the type of econometric model proposed by Glaum, Landsman and Wyrwa (2018) was followed, considering that the sample consists of the combination of several firms in various periods. Model parameters were estimated with dummy variables to recognize year, country, and sector fixed effects, with standard errors grouped at the firm level. Jarva and

[2]Discussion posted by Jeffrey Wooldridge, available at https://www.statalist.org/forums/forum/general-stata-discussion/general/70609 -fixed-effects-logit-standard-errors, accessed on May 23 2020

Lof (2018) also recommend the adoption of logistic regressions, given that they are not sensitive to the mechanical asymmetries between gains and returns of shares. Thus, these models constitute a more robust form for the analysis of conditional conservatism.

Mechanical asymmetries can occur regardless of the firms' accounting system, as the profits of the period respond more strongly to adverse shocks than positive shocks of profitability, due to adjustment costs that affect the result of the period as costs associated with the drastic reductions in production. These adjustment costs amplify the adverse effects on profits caused by productivity shocks (BREUER; WINDISCH, 2019). According to recent studies by Breuer and Windisch (2019) and Hemmer and Labro (2019), this type of mechanical asymmetry causes conservatism models such as Basu (1997) and Khan and Watts (2009) to detect the existence of conditional conservatism even when there is no functioning accounting system. Due to the problems identified by Breuer and Windisch (2019) and Hemmer and Labro (2019), logistic regression is considered a suitable form for studies on conditional accounting conservatism, which includes studies that focus on recording losses due to impairment (JARVA; LOF, 2018).

3.3 Dependent Variable

Given the objectives of this thesis, the dependent variable is an observed variable, which indicates an impairment loss, an accounting record of recognition of the economic loss in the value of the firm's assets. The dependent variable, called P(Impairment), is computed as a dummy variable. It assumes a value of 0 when the firm did not record an impairment loss, or a value of 1 when the firm recognized the loss.

Table 3: Dependent Variable

Dependent Variable	Definition
$P(Impairment)$	Dummy variable that assumes a value of 0 when the firm did not record an impairment loss, or a value of 1 when the firm recognized an impairment loss.

Source: Prepared by the author

3.4 Variables of Interest

Table 4 presents the variables of interest, their construction, and the expected sign. Table 4 also presents the relation between the variables of interest and the hypotheses H1 to H4.

Table 4: Variables of Interest

Hypothesis	Signal	Independent Variables	Definition
H1	positive	$DummyExchangeTradedDebt$	Dummy variable that assumes value 1 when the firm has exchange-traded debt and 0 otherwise.
H1	positive	$LogExchangeTradedDebt$	Natural logarithm of the firm's exchange-traded debt.
H2	positive and negative	$Debt$	Debt-to-market capitalization of the firm.
H3	negative	$ShortTerm$	Short-term debt divided by total debt.
H4	positive	$NetDebtIssued$	Net debt issued by the firm divided by firm market capitalization if issuance is positive, and 0 otherwise

Source: Prepared by the author

The parameters of Equation (3.1) and Equation (3.2)'s models are estimated considering the measurement of the debt construct using the debt-to-market capitalization ratio. Adopting this financial leverage measure, replacing the usual debt-to-equity ratio, has the main objective of eliminating the possible measurement problems affecting the firm's assets in the calculation of relative debt levels. These problems can occur when the firm has many intangible assets developed internally that cannot be recognized in accounting (such as goodwill, trademarks, customer portfolios, and others). They can also happen when the firm should have recognized an impairment loss when its assets are impaired but did not book such loss. In both cases, the debt-to-equity ratio would present comparability problems when used to measure a firm's debt at any given time.

The DummyExchangeTradedDebt variable allows for a direct test of the H1 hypothesis. This hypothesis considers that exchange-traded debt is positively related to the probability

of recognizing economic losses through accounting impairments. Thus, the β_1 coefficient is expected to have a positive sign.

Considering the theoretical expectation that debt affects the variable P(Impairment) non-linearly, the Equation (3.1) includes the term Debt x Debt. If statistically significant, this term can represent increasing or decreasing marginal responses of the P(Impairment) variable to changes in the firm's debt. Thus, the variables Debt and Debt x Debt are associated with hypothesis H2, which predicts that the firm's debt level is related non-linearly to the probability of recognizing economic losses through accounting impairments. The β_2 coefficient, associated with the variable Debt, is expected to be positive, and the β_3 coefficient, associated with the variable Debt x Debt is expected to be negative. Thus, the probability of recognition impairment losses is expected to be increasing on Debt, but at decreasing rates.

Khurana and Wang (2015) theorize that short-term debt can play a role similar to accounting conservatism concerning the mitigation of agency costs, given that short-term debt subjects managers to more frequent monitoring. The authors report evidence that confirms the hypothesis that firms with higher levels of short-term debt have less conservative accounting. In their results, conservatism is more significant for firms in financial difficulty, where the ex-ante severity of agency costs debt is higher than in firms with better financial health. Thus, in Equation (3.1) and Equation (3.2), the explanatory variable ShortTerm is used, which represents the effect of the firm's proportion of short-term to total debt. The ShortTerm variable is associated with hypothesis H3, which states that the proportion of the firm's short-term debt to total debt is negatively related to the probability of recognizing economic losses through accounting impairments. Therefore, the expected coefficient for β_4 is negative.

Equation (3.1) and Equation (3.2) also include the explanatory variable NetDebtIssued, capturing the amount of debt raised in the period. That variable aims to separate the effect of the debt level from the firm's loans in the current calendar year. The Göx and Wagenhofer (2009) model suggests that firms seeking credit would have the accounting recognition accounting impairments as an optimizing strategy, by increasing the likelihood of good projects being financed, by reducing uncertainty about the value of the assets that can be pledged as part of the financing agreement. Therefore, the variable NetDebtIssued is associated with hypothesis H4, which predicts that the issuance of debt in the current period is positively associated with the probability of recognizing economic losses through accounting impairments. Thus, β_4 is expected to have a positive sign.

3.5 Control Variables

The control variables of the model were selected from the reviewed literature, considering factors associated with the occurrence of economic losses and their untimely recognition by accounting. These variables are shown in Table 5.

Glaum, Landsman and Wyrwa (2018)'s study presents a set of control variables, also adopted in this thesis, which the previous literature suggests is related to the probability of recording impairment losses. These variables include:

- $SMOOTH$, which considers the incentives of managers to book impairment losses in periods when profit before the impairment loss is abnormally high, smoothing the profits reported to the market, reducing the likelihood of future impairment losses (RIEDL, 2004; GLAUM; LANDSMAN; WYRWA, 2018);

- $BATH$, which considers the management's incentives to book impairment losses in periods when profit before the impairment loss is abnormally low, considering that the impairment loss will be attenuated by the losses that the firm would report to the market before the impairment, also reducing the likelihood of future impairments (RIEDL, 2004; GLAUM; LANDSMAN; WYRWA, 2018);

- $Return52Weeks$, which considers the economic returns, captured in the returns of the firm's shares in the previous 52 weeks, and which may affect the likelihood of loss recognition (GLAUM; LANDSMAN; WYRWA, 2018). This variable is also included with one lag, in order to capture any postponement in the accounting recognition of losses anticipated by the market;

- ADJ_ROA, defined as the return on the firm's assets before the recognition of the impairment, above the average return by sector and country, in order to capture how much the firm's returns are lower than contemporary returns of its peers (FRANCIS; HANNA; VINCENT, 1996);

- BTM, defined as the book-to-market ratio before recording impairment losses, to capture the severity of the economic loss indicated by the BTM ratio (RAMANNA; WATTS, 2012) ;

- $Risk$, defined as the standard deviation of the monthly returns on the firm's shares, to capture the firm's specific risks (GLAUM; LANDSMAN; WYRWA, 2018);

- $Size$, represented by the natural logarithm of the firm's total assets before the recognition of impairment losses (GLAUM; LANDSMAN; WYRWA, 2018);

- $NumberOfAnalists$, defined as the number of analysts covering the firm in the period. This variable captures the quality of the information environment in which the firm operates. Firms covered by a more significant number of analysts are subject to increased pressure to prepare quality financial statements; (GLAUM; LANDSMAN; WYRWA, 2018);

IAS 36 allows impairment losses of assets with defined useful lives to be reversed if the circumstances that led to the loss change, to the extent that the loss is no longer probable. This possibility does not apply to losses associated with goodwill, which, by definition, have an indefinite useful life. The works of Trottier (2013) and Rennekamp, Rupar and Seybert (2015) provide evidence that management's behavior about impairment losses is affected by behavioral aspects. The reversal restriction makes it less likely to record a loss due to impairment related to goodwill, suggesting the adoption of a control variable that considers the level of goodwill divided by the firm's total assets.

The Göx and Wagenhofer (2009) study presents the testable prediction that firms with high proportions of intangible assets would have conservative practices of impairment. Thus, the firm's proportions of fixed and intangible assets over total assets are also adopted as control variables.

Table 5: Control Variables

Variable	Definition	Reference
SMOOTH	equal to 1 if the profits before impairment loss recognition in the year are positive and the change in profits before impairment losses in the year is above the median of the change in profits before losses of firms with positive profits and 0 otherwise.	Riedl (2004)
BATH	equal to 1 if the profits before impairment loss recognition in the year are negative and the change in profits before impairment losses in the year is below the median of the change in profits before losses of firms with negative profits and 0 otherwise.	Riedl (2004)
Return52Weeks	firm's stock returns in the 52 weeks of the calendar year	Glaum, Landsman and Wyrwa (2018)
ADJ_ROA	Difference between the firm's ROA and the average ROA of companies in the same industry, country and year	Glaum, Landsman and Wyrwa (2018)
BTM	Book-to-Market ratio before the recognition of impairment losses	Ramanna and Watts (2018)
Risk	Standard deviation of the firm's monthly stock returns	Glaum, Landsman and Wyrwa (2018)
NumberofAnalysts	number of analysts covering the firm	Glaum, Landsman e Wyrwa (2018)
Goodwill	book value of the firm's goodwill divided by total assets before impairments.	Trottier (2013); Rennekamp et al (2015)
Intangibles	book value of the firm's intangible assets (except goodwill) divided by total assets before impairments.	Göx and Wagenhofer (2009)
FixedAssets	book value of the firm's fixed assets divided by total assets before impairments	Göx and Wagenhofer (2009)
Payout	dividends paid by the firm divided by prior year's profits	Szczesny and Valentincic (2013)
FreeFloat	- percentage of the firm's stocks available for investors in the stock market	Glaum, Landsman and Wyrwa (2018)
SIZE	Log of the firm's total assets before impairments	Glaum, Landsman and Wyrwa (2018)

Source: Prepared by the author

4 RESULTS

This chapter is divided into three sections. The first section presents the results with the sample of firms with the BTM ratio greater than one for periods of two years. The second section presents the results with the sample of firms that have the BTM ratio greater than one for periods of two years and also have low ROA. Finally, the third section presents the results with the sample of firms that have a BTM ratio greater than one for periods of two years and also present a low F-Score indicator.

4.1 BTM Criterion

Table 6 presents descriptive statistics for the sample of firms that match the BTM criterion.

Table 6: Descriptive Statistics - firms that met the BTM criterion

Number of observations = 9,542	mean	standard deviation	min	max
Debt	.8765421	.9216354	0	4.945222
LogExchangeTradedDebt	2.734716	6.56578	0	24.71526
ShortTerm	.5106032	.3635079	0	1
NetDebtIssued	.0746122	.1649891	0	2.477875
BTM	1.765448	.8186656	1.000095	11.98692
ADJ_ROA	-.4195937	4.330168	-200.8309	95.01394
Return52Weeks	.0626898	.3587211	-.8738761	7.666667
NumberofAnalysts	2.250681	5.47832	0	44
Risk	.0991621	.0659864	0	1.106209
Float	.4890518	.2372535	.0012548	1
Payout	.0251994	.0422979	0	1.585951
Goodwill	.0267419	.0804743	0	.8128738
Intangibles	.0277371	.0742663	0	.9803123
FixedAssets	.2976294	.2300615	0	1.004623
Size	19.50169	1.609354	9.772968	26.79059

The variables Debt, BTM, and NetDebtIssued were winsorized at the 99% percentile due to the presence of extreme values resulting from small denominators. The other variables have values within reasonable ranges. The sample selected under this criterion comprises 9,542 observations, out of 36,579 for which complete data are available for all independent variables. That shows a BTM ratio greater than one for periods of two years occurring in approximately 25% of the observations that could be considered in the sample. Table 7 presents the sample of observations in the BTM Criterion, divided by country and by impairment recognition.

Table 7: Detailed sample by country

Country	Unrecognized Impairment	Recognized Impairment	Total
Australia	293	231	524
Brazil	159	103	262
Canada	321	228	549
France	279	174	453
Germany	95	98	193
Hong Kong	239	175	414
Israel	241	39	280
Italia	75	148	223
South Korea	1,978	1,300	3,278
Malaysia	159	496	655
Poland	129	146	275
South Africa	86	84	170
Sweden	71	19	90
Taiwan	981	429	1,410
Turkey	246	33	279
UK	325	162	487
Total	5,677	3,865	9,542

Table 8 presents the comparison between the mean values of the continuous independent variables of the observations in which the firm did not recognize (Column (1)) and did recognize (Column (2)) impairment losses within the period. As shown in column (3), subcolumn p-value, the firms of the two groups present statistically significant differences ($p < 0.05$) for all variables except ShortTerm, NetDebtIssued, and Debt. Table 9 presents Pearson's correlation analysis.

As shown in Table 9, there is a large correlation (over 65%) between the size of the firm and the number of analysts who follow the firm. For this reason, the models were estimated using only the number of analysts as an independent variable. In section A.3, results are presented with the inclusion of firm size quintiles, and the results remain qualitatively similar.

Table 10 presents the estimation of the econometric models' parameters in the sample of firms that met the BTM criterion. Columns (1) and (2) of Table 10 show, respectively, the results of the estimation of Equation (3.1 and Equation (3.2, controlling the fixed effects of the sector, country and year. In this table, the control variables defined in Table 5 are also considered.

Table 8: Difference of means - firms that met the BTM criterion

	(1)	(2)	(3)	
	Without Impairment	With Impairment	Difference (3)-(2)	
	mean	mean	b	p
Debt	0.85	0.91	-0.06	0.00
LogExchangeTradedDebt	2.17	3.56	-1.39	0.00
ShortTerm	0.51	0.52	-0.01	0.14
NetDebtIssued	0.08	0.07	0.01	0.05
BTM	1.69	1.87	-0.18	0.00
ADJ_ROA	-0.31	-0.59	0.28	0.00
Return52Weeks	0.09	0.03	0.06	0.00
NumberofAnalysts	1.34	3.60	-2.26	0.00
Risk	0.09	0.11	-0.01	0.00
Float	0.48	0.51	-0.03	0.00
Payout	0.03	0.02	0.00	0.00
Goodwill	0.02	0.03	-0.01	0.00
Intangibles	0.02	0.04	-0.01	0.00
FixedAssets	0.28	0.33	-0.06	0.00
Size	19.22	19.92	-0.70	0.00
Observations	5677	3865	9542	

Table 9: Correlation Analysis - firms that met the BTM criterion

Variables	Debt	ExchangeTradedDebt	ShortTerm	NetDebtIssued	BTM	ADJ_ROA	Return52Weeks	NumberofAnalysts	Risk	Float	Payout	Goodwill	Intangibles	FixedAssets	Size
Debt	1.00														
ExchangeTradedDebt	0.26	1.00													
ShortTerm	0.02	-0.10	1.00												
NetDebtIssued	0.20	0.02	0.01	1.00											
BTM	0.10	-0.01	0.01	0.08	1.00										
ADJ_ROA	0.00	0.01	-0.01	-0.01	-0.05	1.00									
Return52Weeks	0.13	0.04	0.00	-0.05	-0.32	0.03	1.00								
NumberofAnalysts	0.06	0.17	-0.21	-0.02	-0.04	0.01	-0.04	1.00							
Risk	0.04	0.04	0.00	0.00	0.15	-0.01	0.13	0.02	1.00						
Float	-0.08	0.05	-0.09	-0.05	-0.06	-0.01	-0.08	0.24	0.06	1.00					
Payout	-0.03	-0.00	-0.06	0.03	-0.01	0.02	-0.01	0.02	-0.13	0.01	1.00				
Goodwill	-0.01	0.08	-0.09	-0.05	-0.02	-0.02	0.01	0.15	0.00	0.08	0.02	1.00			
Intangibles	0.01	0.03	-0.07	0.00	0.01	-0.00	0.01	0.09	0.08	0.01	-0.01	0.19	1.00		
FixedAssets	0.04	0.00	-0.02	-0.01	0.14	-0.02	-0.06	0.11	0.16	0.05	-0.11	-0.16	-0.14	1.00	
Size	0.32	0.18	-0.17	0.11	0.05	0.01	-0.05	0.66	-0.13	0.12	0.08	0.09	0.09	0.05	1.00

Table 10's results indicate that exchange-traded debt, represented by the variable DummyExchangeTradedDebt, is associated with a greater probability of recognizing an impairment loss. Firms with exchange-traded debt have a 5.2618% higher probability of recognizing an impairment loss, considering the remainder variables by their average values [1]. Column (2) of Table 10 presents the results of the estimation of (Equation (3.2)). In this column, the DummyExchangeTradedDebt variable is replaced by the LogExchangeTradedDebt variable, which is the natural logarithm of the sum of exchange trade debt at the end of the calendar year under analysis. Column (2) shows results similar to column (1) in terms of sign and statistical significance, and the coefficient of the variable LogExchangeTradedDebt is positive and statistically significant.

The variable LogExchangeTradedDebt is used as an alternative to the variable DummyExchangeTradedDebt. There may be a relationship between exchange-traded debt and the probability of impairment recognizing losses beyond the effect of merely changing the model's intercept. The coefficients for the other variables considered are similar in columns (1) and (2). The predictive capabilities of the column (1) and (2) models are also similar. These results support hypothesis 1, in the sense that the existence of exchange-traded debt positively affects the probability of recognizing economic losses through accounting impairments.

Table 10 also shows that the variable Debt has a positive association with the probability of accounting for an impairment loss for firms in the sample based on the BTM criterion. This association is statistically significant in all specifications considered. However, the possible non-linear relationship between debt and the probability of accounting for an impairment loss, treated in hypothesis H2, and captured by the term Debt x Debt, is not statistically significant at least 5%. However, in all specifications, this variable has a negative sign. Most of the confidence interval of estimation of its coefficient is less than zero, which may suggest the need for a more in-depth analysis of this effect.

[1] Probability estimated using the command "margins, dydx (*) atmeans", after estimating column (1) from Table 10

Table 10: Pooled Logit Models - firms that met the BTM criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.21971*	(0.09111)		
Debt	0.26013**	(0.09935)	0.25688**	(0.09932)
Debt × Debt	-0.04528	(0.02767)	-0.04501	(0.02766)
ShortTerm	0.16721+	(0.09499)	0.16998+	(0.09499)
NetDebtIssued	-0.16350	(0.15689)	-0.16314	(0.15687)
BTM	0.10004*	(0.04567)	0.10038*	(0.04567)
ADJ_ROA	-0.01298*	(0.00634)	-0.01300*	(0.00634)
Return52Weeks	-0.36623***	(0.09169)	-0.36541***	(0.09170)
L.Return52Weeks	0.02415	(0.06495)	0.02407	(0.06496)
NumberofAnalysts	0.05082***	(0.00780)	0.04927***	(0.00792)
Risk	1.53745***	(0.44945)	1.53559***	(0.44937)
Float	0.54070***	(0.16130)	0.54013***	(0.16127)
Payout	-0.33300	(0.77864)	-0.32539	(0.77707)
Goodwill	1.49280**	(0.52744)	1.49012**	(0.52761)
Intangibles	1.36083**	(0.52313)	1.36325**	(0.52316)
FixedAssets	-0.03300	(0.19322)	-0.03371	(0.19317)
BATH==1	0.49003***	(0.06425)	0.48877***	(0.06425)
SMOOTH==1	0.53079***	(0.06594)	0.53018***	(0.06594)
LogExchangeTradedDebt			0.01392**	(0.00520)
Constant	-1.72392***	(0.49856)	-1.50335**	(0.48961)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.143		0.144	
AIC	1.11e+04		1.11e+04	
BIC	1.15e+04		1.15e+04	
coxsnell	0.176		0.176	
nagelkerke	0.238		0.238	
area	0.745		0.745	
ll	-5516.854		-5515.655	
chi2	749.915		751.034	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	66.852		66.789	
P_p1	70.789		70.763	
P_n0	64.171		64.083	
Observations	9542		9542	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix A reports robustness tests, dividing firms by debt quintiles and deciles, in order to try to capture with greater sensitivity and precision the effect of possible nonlinearities in the relationship between debt and accounting impairments. These tests suggest that debt affects the probability of accounting for an impairment loss at decreasing rates, supporting hypothesis H2.

The results presented in Table 10 do not show statistically significant evidence, at least at the 5% level, that the proportion of short-term debt to total debt, represented by the Short-Term variable, is associated with a lower probability of impairment. The evidence presented in Table 10 is also not favorable to the theoretical expectation that an increased level of Net-DebtIssued is associated with an increased probability of loss by impairment. In this sense, additional robustness tests, reported in the section A.4 show that for firms in the first debt quintile, that is, the least indebted firms within the sample, NetDebtIssued is negatively and significantly associated with the probability of recognition of accounting impairments.

The results presented in Table 10 do not explicitly show the coefficients related to the country fixed-effects. However, it is important to note that several of these fixed-effects coefficients are statistically significant. section A.5 presents analyzes by clusters of countries, following the classification presented by Leuz (2010), showing large variability in the significance of the coefficients related to hypotheses H1 to H4. Only in cluster 2, composed of continental European countries, South Korea and South Africa, there is clear statistical significance in favor of the H1 hypothesis that debt with indirectly related creditors increases the probability of recognizing impairment losses. In the same sense, the variable Debt's coefficient is statistically significant only for firms in cluster 2. For firms in cluster 1, including Australia, Canada, Hong Kong, Israel, Malaysia, and the United Kingdom, the variable NetDebitIssued, which shows a negative sign, is statistically significant. That suggests that the issuance of debt in the period is associated with a lower probability of recognition impairment losses. Finally, concerning firms in cluster 3, Brazil was the only country with sufficient observations to be included in the sample. There is no statistical significance to allow rejecting the null hypothesis corresponding to hypotheses H1 to H4.

Returning to the results reported in Table 10, most of the results related to the control variables considered are in accordance with the previous literature. The variable NumberofAnalysts is associated with a greater probability of recognizing an impairment loss, with significance at the 0.1% level. This association suggests that firms that are subject to higher demands for information are, on average, more likely to recognize impairment losses when markets expect these losses, according to the argument by (RAMANNA; WATTS, 2012).

In the sample of firms selected by the BTM criterion, the control variables BATH and

SMOOTH are also positively and significantly related to the probability of recognizing impairment losses. Firms in the earnings management situation captured by these variables are 11.73% more likely to recognize impairment than other firms in the case of the BATH variable, and 12.71% more likely than other firms in the case of the variable SMOOTH [2]. These variables represent incentives to record impairment losses, respectively, to bundle this loss with adverse results or use them to smooth good results (RIEDL, 2004; GLAUM; LANDSMAN; WYRWA, 2018).

The variable Return52Weeks has a negative and statistically significant sign. Its coefficient shows that negative stock returns increase the probability of recognition of impairment losses in the current period. However, one year lag of that variable, reported as L.Retorno52Weeks, is not statistically significant, suggesting that there is no delayed effect between stock returns and the recognition of impairment losses.

As mentioned in section 3.5, impairment losses that result in a downward adjustment in the value of goodwill cannot be reversed later, under the provisions of IAS 36. This treatment is different from what occurs with impairment losses concerning assets with a defined useful life, since IAS 36 allows those losses to be reversed in the future if the circumstances that led to the loss change, to the extent that the loss is no longer probable. Considering the evidence reported by Trottier (2013) and Rennekamp, Rupar and Seybert (2015), it is reasonable to consider that goodwill makes accounting for impairments less likely, due to a greater reluctance on the part of the managers in taking an irreversible decision.

The results reported in Table 10, however, show evidence that an increase in the proportion of goodwill on total firm assets implies an increase in the probability of recording impairment losses, maintaining the other constant variables. This result is contrary to the theoretical expectation that motivated the work of Trottier (2013) and Rennekamp, Rupar and Seybert (2015). Robustness tests presented in section A.8 and section A.9 split firms into two groups. The group considered in section A.8 is comprised of firms whose goodwill is between the first and fourth quintiles of the goodwill's statistical distribution. The group of firms in section A.9 has firms whose goodwill is the fifth quintile of the statistical distribution. For those high goodwill firms, the minimum goodwill corresponds to approximately 8% of the firm's total assets. Results presented in section A.8 and section A.9 suggest that debt-related variables have a stronger role for firms with a low goodwill balance, below 8% of total assets, when the sample consists of firms selected by the BTM criterion.

Finally, the proportion of intangible assets over the firm's total assets is positively associated with the probability of recognition of impairment losses in the results reported in Table 10.

[2] Probability estimated through the command "margins, dydx (*) atmeans"

This result is in line with the prediction of the Göx and Wagenhofer (2009) model, in the sense that firms with higher proportions of intangible assets, assets of high specificity and assets that are hard to sell, have conservative impairment practices.

4.2 ROA Criterion

The Table 11 presents a descriptive analysis of the firms that integrate the sample based on the ROA criterion. It is a sample composed of 5,801 observations. This number of observations is lower than the 9,542 observations considered in the BTM criterion. That happens because the ROA criterion is a more restrictive selection criterion compared to the BTM criterion. Under the Roa criterion, the firm must cumulatively have a BTM ratio greater than one for two periods and a low ROA.

Table 11: Descriptive Statistics - firms that met the ROA criterion

Number of observations = 5.801	mean	sd	min	max
Debt	.8891192	.9291693	0	4.945222
LogExchangeTradedDebt	2.863212	6.659271	0	24.56086
ShortTerm	.5123115	.3668805	0	1
NetDebtIssued	.0785489	.1690497	0	2.477875
BTM	1.886934	.9135903	1.000095	11.98692
ADJ_ROA	-.8651222	3.931923	-166.7023	95.01394
Return52Weeks	.0024106	.3537252	-.8738761	7.666667
NumberofAnalysts	2.194794	5.422525	0	42
Risk	.1033817	.0715121	0	1.106209
Float	.5025699	.2384306	.0012548	1
Payout	.021986	.040043	0	.7647966
Goodwill	.0228698	.071156	0	.8127281
Intangibles	.027286	.0715859	0	.9803123
FixedAssets	.3070204	.2356925	0	1.004623
Size	19.4574	1.611946	9.772968	26.69752

Table 12 presents the comparison between the mean values of the continuous independent variables of the observations in which the firm did not recognize (Column (1)) and did recognize (Column (2)) impairment losses in the sample period. As shown in column (3), subitem p, the firms of the two groups present statistically significant differences ($p < 0.05$) for all

variables except ShortTerm and NetDebtIssued. The Table 13 presents Pearson's correlation analysis for the observations that integrate the sample selected based on the ROA criterion.

Table 12: Difference of mean - firms that met the ROA criterion

	(1)	(2)	(3)	
	Without Impairment	With Impairment	Difference (3)-(2)	
	mean	mean	b	p
Debt	0.86	0.93	-0.08	0.00
LogExchangeTradedDebt	2.32	3.60	-1.28	0.00
ShortTerm	0.51	0.52	-0.01	0.47
NetDebtIssued	0.08	0.08	0.00	0.62
BTM	1.80	2.01	-0.21	0.00
ADJ_ROA	-0.77	-0.99	0.22	0.03
Return52Weeks	0.04	-0.04	0.08	0.00
NumberofAnalysts	1.25	3.48	-2.23	0.00
Risk	0.10	0.11	-0.01	0.00
Float	0.48	0.53	-0.04	0.00
Payout	0.02	0.02	0.00	0.04
Goodwill	0.02	0.03	-0.02	0.00
Intangibles	0.02	0.04	-0.02	0.00
FixedAssets	0.29	0.34	-0.05	0.00
Size	19.16	19.86	-0.70	0.00
Observations	3347	2454	5801	

Table 13: Correlation Analysis - firms that met the ROA criterion

Variables	Debt	ExchangeTradedDebt	ShortTerm	NetDebtIssued	BTM	ADJ_ROA	Return52Weeks	NumberofAnalysts	Risk	Float	Payout	Goodwill	Intangibles	FixedAssets	Size
Debt	1.00														
ExchangeTradedDebt	0.24	1.00													
ShortTerm	0.08	-0.09	1.00												
NetDebtIssued	0.17	0.01	0.03	1.00											
BTM	0.11	-0.00	-0.01	0.08	1.00										
ADJ_ROA	0.01	0.01	-0.02	-0.02	-0.02	1.00									
Return52Weeks	0.14	0.05	-0.01	-0.05	-0.31	-0.00	1.00								
NumberofAnalysts	0.05	0.18	-0.20	-0.02	-0.04	0.01	-0.03	1.00							
Risk	0.03	0.06	-0.03	-0.01	0.13	-0.01	0.11	0.02	1.00						
Float	-0.11	0.07	-0.08	-0.07	-0.08	0.00	-0.07	0.25	0.07	1.00					
Payout	-0.03	-0.00	-0.05	0.01	0.03	0.03	-0.02	0.03	-0.13	0.00	1.00				
Goodwill	-0.01	0.07	-0.08	-0.05	-0.00	-0.00	0.00	0.14	0.01	0.08	0.01	1.00			
Intangibles	-0.01	0.03	-0.06	-0.02	0.02	0.00	0.02	0.05	0.08	-0.01	-0.03	0.19	1.00		
FixedAssets	0.06	0.02	-0.06	0.01	0.13	-0.02	-0.09	0.11	0.16	0.10	-0.11	-0.14	-0.14	1.00	
Size	0.33	0.18	-0.12	0.10	0.07	0.02	-0.03	0.65	-0.14	0.09	0.11	0.09	0.06	0.05	1.00

Table 14 presents the estimation of the same models whose parameters were reported in Table 10, but with changes in the sample selection criterion. Firms included in Table 14 meet the BTM criterion, and have a low ROA. Low ROA firms are either firms that belong to the lower quartile of the ROA statistical distribution, adjusted by sector, country, and year or firms with a ROA level below the long-term return of the T-Bond issued by the US government. T-Bonds' returns are a standard proxy for the risk-free rate (DAMODARAN, 2012), of approximately 4% pa.

Although the signs referring to the DummyExchangeTradedDebt and LogExchangeTraded-Debt variables are still positive in all specifications in Table 14, there is no statistical significance of at least 5%. In the case of the LogExchangeTradedDebt variable, column (2) of Table 14 shows a positive and statistically significant coefficient at 10%, with most of the confidence interval situated in the positive interval.

According to untabulated results, if the sample's selection criteria is altered to require a BTM greater than 1 for two periods and a ROA below 4% pa (the number of observations reduces to 5,637), results remain qualitatively similar in terms of sign and statistical significance. Alternatively, the estimation considering only firms with ROA belonging to the 1st quartile of the ROA statistical distribution within the sample, adjusted by segment, country, and year, shows results in which coefficients become positive and significant for the variables DummyExchangeTradedDebt and LogExchangeTradedDebt. In this case, the number of observations reduces to 3,042. These results suggest that the identification of firms that have suffered economic losses is sensitive to the choice of a benchmark in terms of the reasonable return that the firm's net assets should generate.

In Table 14, the variable Debt has a positive coefficient, although significant only at 10%. The variable Debt x Debt is not significant for the sample considered. There is no statistical significance if the sample selection criterion is changed in the same way as described in the previous paragraph, which also occurs with the effects of NetDebtIssued, which are also not significant in any of the considered specifications. Finally, the ShortTerm variable is positively associated with the probability of recognizing an impairment loss, but this effect is significant only at 10%.

The coefficients reported in Table 14 for the models' control variables have similar signs and statistical significances compared to those reported in Table 10. That occurs even for the variable goodwill, for which, as mentioned previously, the result contradicts the theoretical expectation that goodwill could make firms less likely to recognize impairment losses.

Table 14: Pooled Logit Models - firms that met the ROA criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.16860	(0.10813)		
Debt	0.21685^{+}	(0.11962)	0.21369^{+}	(0.11963)
Debt × Debt	-0.03274	(0.03356)	-0.03238	(0.03357)
ShortTerm	0.20402^{+}	(0.11126)	0.20636^{+}	(0.11129)
NetDebtIssued	0.02644	(0.19039)	0.02672	(0.19034)
BTM	0.06172	(0.05115)	0.06186	(0.05114)
ADJ_ROA	-0.01213	(0.00888)	-0.01219	(0.00889)
Return52Weeks	-0.55422***	(0.13183)	-0.55372***	(0.13180)
L.Return52Weeks	-0.04775	(0.08521)	-0.04779	(0.08519)
NumberofAnalysts	0.05321***	(0.00934)	0.05191***	(0.00948)
Risk	1.65634**	(0.52921)	1.65292**	(0.52907)
Float	0.72149***	(0.19345)	0.72031***	(0.19343)
Payout	-0.44316	(0.99509)	-0.43777	(0.99325)
Goodwill	1.76224*	(0.74295)	1.76167*	(0.74291)
Intangibles	2.12686**	(0.75846)	2.12851**	(0.75832)
FixedAssets	-0.15046	(0.22219)	-0.15069	(0.22220)
BATH==1	0.42296***	(0.07590)	0.42189***	(0.07591)
SMOOTH==1	0.54567***	(0.08818)	0.54526***	(0.08819)
LogExchangeTradedDebt			0.01084^{+}	(0.00618)
Constant	-1.91051***	(0.55656)	-1.74185**	(0.54251)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.142		0.142	
AIC	6.89e+03		6.89e+03	
BIC	7.26e+03		7.26e+03	
coxsnell	0.176		0.176	
nagelkerke	0.237		0.237	
area	0.746		0.746	
ll	-3389.694		-3389.198	
chi2	505.106		506.226	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	66.351		66.437	
P_p1	73.961		74.083	
P_n0	60.771		60.831	
Observations	5801		5801	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.3 F-Score Criterion

Table 15 presents descriptive statistics for the sample of firms that match the F-Score criterion. The sample comprises 1,864 observations, a number substantially lower than the 9,542 observations considered in the BTM criterion, and the 5,801 observations considered in the ROA criterion. Nevertheless, given the more restrictive selection criteria, in which the firm must cumulatively have a BTM ratio greater than one for two periods and a low F-Score, this smaller sample is expected.

Table 15: Descriptive Statistics - firms that met the F-Score criterion

Number of observations = 1684	mean	sd	min	max
Debt	.6796665	.8185971	0	4.894282
LogExchangeTradedDebt	1.898637	5.532058	0	24.31096
ShortTerm	.5207625	.3772896	0	1
NetDebtIssued	.1364989	.2268639	0	1.977675
BTM	1.844586	.8644772	1.000188	8.682454
ADJ_ROA	-1.075165	4.891436	-126.2983	73.06296
Return52Weeks	-.0113541	.316996	-.8349057	2.513274
NumberofAnalysts	1.587446	4.826888	0	42
Risk	.0992026	.0688179	0	.8157062
Float	.4729648	.2339422	.0030537	1
Payout	.0242773	.0430043	0	.6817121
Goodwill	.0210568	.0696657	0	.6892984
Intangibles	.0268962	.073018	0	.8059458
FixedAssets	.2677614	.2234812	0	.9960268
Size	19.18773	1.531995	9.772968	26.79059

Table 16 presents the comparison between the mean values of the continuous independent variables of the observations in which the firm did not recognize (Column (1)) and did recognize (Column (2)) impairment losses in the sample period. Unlike the results in the previous sections, the results presented in column (3), subcolumn p-value, show that the firms of the two groups present differences that are not statistically significant (p> 0.05) for several variables, including the variables of interest Debt, DummyExchangeTradedDebt, ShortTerm, and NetDebtIssued.

Table 16: Difference of means - firms that met the F-Score criterion

	(1)	(2)	(3)	
	Without Impairment	With Impairment	Difference (3)-(2)	
	mean	mean	b	p
Debt	0.67	0.70	-0.03	0.38
LogExchangeTradedDebt	1.42	2.64	-1.22	0.00
ShortTerm	0.51	0.54	-0.02	0.19
NetDebtIssued	0.14	0.13	0.00	0.77
BTM	1.75	1.99	-0.23	0.00
ADJ_ROA	-0.97	-1.23	0.26	0.26
Return52Weeks	0.02	-0.06	0.07	0.00
NumberofAnalysts	0.95	2.58	-1.64	0.00
Risk	0.10	0.10	-0.01	0.02
Float	0.46	0.50	-0.04	0.00
Payout	0.03	0.02	0.01	0.00
Goodwill	0.02	0.03	-0.01	0.00
Intangibles	0.02	0.04	-0.02	0.00
FixedAssets	0.25	0.30	-0.05	0.00
Size	18.97	19.53	-0.56	0.00
Observations	1133	731	1864	

Table 17 presents Pearson's correlation analysis for the observations included in this sample.

Table 17: Correlation Analysis - firms that met the F-Score criterion

Variables	Debt	ExchangeTradedDebt	ShortTerm	NetDebtIssued	BTM	ADJ_ROA	Return52Weeks	NumberofAnalysts	Risk	Float	Payout	Goodwill	Intangibles	FixedAssets	Size
Debt	1.00														
ExchangeTradedDebt	0.24	1.00													
ShortTerm	0.05	-0.08	1.00												
NetDebtIssued	0.21	0.01	0.11	1.00											
BTM	0.12	0.05	-0.01	0.10	1.00										
ADJ_ROA	-0.00	-0.02	0.00	0.01	-0.01	1.00									
Return52Weeks	0.10	0.02	-0.05	-0.08	-0.29	-0.04	1.00								
NumberofAnalysts	0.03	0.10	-0.13	-0.02	-0.02	-0.00	-0.07	1.00							
Risk	0.07	0.02	-0.03	-0.01	0.12	-0.03	0.14	0.01	1.00						
Float	-0.05	0.01	-0.03	-0.06	-0.05	0.00	-0.09	0.16	0.02	1.00					
Payout	-0.01	0.00	-0.04	0.02	0.01	0.01	0.06	0.02	-0.12	-0.02	1.00				
Goodwill	0.01	0.06	-0.03	-0.06	0.02	-0.00	0.00	0.08	-0.01	0.07	0.02	1.00			
Intangibles	-0.02	-0.01	-0.04	0.01	0.03	0.01	-0.00	0.07	0.09	-0.01	-0.04	0.17	1.00		
FixedAssets	0.02	-0.03	-0.02	0.04	0.17	-0.03	-0.14	0.09	0.14	0.05	-0.11	-0.13	-0.10	1.00	
Size	0.28	0.13	-0.03	0.18	0.13	0.03	-0.10	0.58	-0.14	0.06	0.11	0.05	0.09	0.07	1.00

Table 18 presents results including firms that have cumulatively met the BTM criterion and have an F-Score belonging to the lower quartile by sector, country, and year, suggesting firms with a precarious financial situation. The results reported in Table 18, concerning variables related to debt, differ substantially from those reported in Table 14, in which the results did not support hypotheses H1 to H4 when the selection was based on the ROA criterion. The results of Table 18 are close to the results reported in Table 10. The DummyExchangeTraded-Debt and LogExchangeTradedDebt variables again have positive and statistically significant coefficients. These coefficients are approximately twice as large as the coefficients reported in Table 10, which were 0.21971 for DummyExchangeTradedDebt and 0.01392 for LogExchangeTradedDebt.

Debt's coefficients, reported in columns (1) and (2), are also approximately twice as large as the coefficients reported in Table 10, of 0.26013 and 0.25688. These larger coefficients may suggest that for firms in a more precarious financial situation, captured by the F-Score indicator, debt has a stronger relationship with recognizing impairment losses.

The coefficients reported in Table 18 for the variable Debt x Debt are negative and significant at the 10% level, unlike the non significant coefficients presented Table 10. This result, although not significant at the 5% level, suggests the existence of a non-linear relationship between indebtedness and the probability of accounting for impairment losses.

In results presented in section A.1, separating firms by debt quintiles and deciles (adjusted by segment, country, and year), there are statistically significant coefficients for the second to the fifth quintile (the first quintile is considered the basis of analysis). These coefficients are 0.47 for the second quintile, 0.70 for the third quintile, 0.48 for the fourth quintile, and 0.52 for the fifth quintile. Interpreting these results, the probability that the firm would recognize an impairment loss would increase as the firm increases its leverage, but this increase would occur at decreasing rates. Finally, the NetDebtIssued and ShortTerm variables do not have statistically significant coefficients.

Robustness tests presented in section A.8 and section A.9, splitting firms in the first to fourth quintiles of goodwill and firms in the fifth quint of the statistical distribution, show an interesting scenario regarding the F-Score criterion. The results suggest that exchange-traded debt and the issuance of net debt have a more substantial role for firms with a high goodwill balance, above 8% of the firm's total assets than for firms with the balance of goodwill below the fifth quintile. For high goodwill firms, the impact of having debt traded on the market increases the probability of impairment recognition by approximately 60%, against 11% in the sample with all firms under the F-Score criterion, independent of the goodwill quintile.

Table 18: Pooled Logit Models - firms that met the F-Score criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.48561*	(0.19230)		
Debt	0.49493*	(0.22984)	0.49719*	(0.22990)
Debt × Debt	-0.15645+	(0.08013)	-0.15707+	(0.08025)
ShortTerm	0.21973	(0.17126)	0.22080	(0.17119)
NetDebtIssued	-0.36898	(0.26119)	-0.36795	(0.26131)
BTM	0.12552+	(0.07572)	0.12539+	(0.07576)
ADJ_ROA	-0.00192	(0.01123)	-0.00195	(0.01124)
Return52Weeks	-0.33097	(0.21495)	-0.33269	(0.21511)
L.Return52Weeks	-0.16554	(0.16875)	-0.16481	(0.16878)
NumberofAnalysts	0.03146*	(0.01526)	0.03010+	(0.01537)
Risk	1.43186	(0.87953)	1.43038	(0.87960)
Float	1.08247***	(0.29542)	1.08455***	(0.29538)
Payout	-3.45026*	(1.46067)	-3.45000*	(1.46095)
Goodwill	1.73793+	(1.00612)	1.74652+	(1.00737)
Intangibles	1.96408*	(0.98279)	1.96654*	(0.98278)
FixedAssets	0.15978	(0.33149)	0.15449	(0.33151)
BATH==1	0.49521***	(0.12826)	0.49545***	(0.12828)
SMOOTH==1	0.61955***	(0.17875)	0.61983***	(0.17875)
LogExchangeTradedDebt			0.02738*	(0.01103)
Constant	-3.47619***	(0.78172)	-2.99263***	(0.75674)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.153		0.153	
AIC	2.22e+03		2.22e+03	
BIC	2.51e+03		2.51e+03	
coxsnell	0.185		0.185	
nagelkerke	0.251		0.251	
area	0.759		0.759	
ll	-1057.227		-1057.337	
chi2	.		.	
p	.		.	
converged	1.000		1.000	
P_corr	65.290		65.290	
P_p1	81.259		81.259	
P_n0	54.987		54.987	
Observations	1864		1864	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The issuance of net debt reduces the likelihood that the firm will recognize impairment losses, with marginal effects conditional on the other variables by their average values f -155.99% for firms in the fifth quintile of the goodwill versus -8.82% for the complete sample. These results suggest that high balances of goodwill in the case of firms with a deteriorated financial situation intensify the relationship between debt characteristics and the probability of recognizing impairment losses, notably concerning the existence of debt obtained with indirect creditors and the issuance of indebtedness in the period.

The control variables have signs similar to those reported in Table 10 and Table 14, with two relevant differences. The first refers to the goodwill's coefficient, which becomes significant only at 10%, maintaining its positive sign. The second refers to the variable Return52Weeks' coefficient, which is no longer statistically significant. This result suggests that for firms with low F-Score, indicating deteriorated financial health, the probability of impairment is not sensitive to the period's stock returns.

4.4 Additional robustness tests reported in Appendix A

In Appendix A, additional robustness tests are presented, in addition to the tests mentioned in the previous sections.

In section A.6, the models of Equation (3.1) and Equation (3.2) are reestimated for the three sample selection criteria in a panel data model with random effects. The results presented are qualitatively similar to those included in the main text concerning debt characteristics under analysis.

The section A.7 presents the estimation of the models of Equation (3.1) and Equation (3.2) with the complete sample of firms, without using the BTM, ROA, or F-Score criteria. Again, the results presented are qualitatively similar to those included in the main text, concerning debt characteristics under analysis.

The section A.10 presents an exploratory analysis of the causal effect of exchange-traded debt, obtained from indirect creditors, on the probability of recognizing impairment losses. The methodology adopted was the estimation of the average treatment effect (ATE) using inverse probability weighting (IPW), as recommended by Cunningham (2021) [3]. The method in question consists of weighting control and treatment observations in estimating the models' parameters. This weighting considers the probability of treatment, estimated through a first stage logistic model. In the context under analysis, the treatment is the exchange-

[3]Despite the publication of cited book only occurs in 2021, the full text was made available by the author at the link: https://www.scunning.com/causalinference_norap.pdf, accessed June 14, 2020

traded debt's existence. The propensity for treatment is modeled considering the variables ShortTerm, NetDebtIssued, BTM, Return52Weeks, NumberofAnalysts, Goodwill, Intangibles, BATH, SMOOTH, as well as industry and country identifiers, and with dummy variables that represent the firm's debt quintile.

Following the suggestion of Cunningham (2021), only observations with propensity scores between 0.1 and 0.9 were maintained, to mitigate the impact of extreme observations. This procedure, performed per year within the total sample of firms, allows the estimation of the average treatment effects for the treated and counterfactual observations, represented by the untreated observations. The results presented for the calendar years 2012, 2016 to 2018 are significant at 5%, and the results for 2015 are significant at 10%. These results provide additional support for Hypothesis H1, as they suggest that the presence of debt obtained with indirect creditors increases the propensity to recognize impairment losses.

Nevertheless, this IPW analysis must be considered together with the rest of the evidence presented in chapter 4, as it is exploratory. The type of propensity scoring utilized in IPW treatment effects estimation makes the control and treatment group's observations comparable only concerning the variables used to calculate the propensity score. It is impossible to guarantee that the sample is balanced when it comes to unobserved variables, which could bias the estimation of treatment effects.

In the chapter 5, the results are discussed.

5 DISCUSSION OF THE RESULTS

This chapter presents a discussion of this thesis' hypotheses in connection with results obtained with the three sample criteria. This discussion starts with the BTM criterion, followed by the ROA criterion and concluding with the F-Score criterion.

5.1 BTM Criterion

Table 19 presents a summary of the results found regarding the hypotheses proposed in section 2.5, concerning the BTM criterion.

Table 19: Summary of Results - Sample selected by the BTM criterion

Hypothesis	Description	Predicted Sign	Actual Sign
H1	The existence of exchange traded-debt is positively related to the probability of recognizing economic losses through accounting impairments.	positive	positive
H2	The firm's debt level is related non-linearly to the probability of recognizing economic losses through accounting impairments.	positive and negative	positive
H3	The proportion of the firm's short-term debt to total debt is negatively related to the probability of recognizing economic losses through accounting impairments.	negative	n.s.
H4	The issuance of debt in the current period is positively associated with the probability of recognizing economic losses through accounting impairments.	positive	n.s.

Prepared by the author Note: n.s. = not significant at least 5%

The BTM ratio greater than one for at least two years was first used by Ramanna and Watts (2012) to identify firms with impairments expected by the market. Thus, the sample under this criterion is composed of firms whose book value of net assets is higher than the market value

of their stocks. This situation indicates that the market expects that the firm's future cash flows are insufficient to recover the book value of the firm's net assets. Under these conditions, a significant economic loss has likely occurred, and it has not been recognized in the firm's financial statements.

As evidenced in Table 19, the results for hypothesis H1 suggest that the level of information asymmetry between the firm and creditors, which is higher for indirectly related creditors, differently affects the probability of recognizing impairment losses. Also, the probability of recognizing impairment losses increases in the intensity of exchange-traded debt usage, which is captured directly by the variable LogExchangeTradedDebt. This result suggests that the information asymmetry problems are, in fact, more significant between indirect relationship creditors and the firm, as stated by Armstrong, Guay and Weber (2010) and Florou and Kosi (2015). These problems grow as the exchange-traded debt grows. In response to the more significant information asymmetry, firms respond to a greater demand for conditional conservatism (NAGAR; RAJAN; RAY, 2018), recognizing impairments promptly.

The extant literature suggests that the relative amount of debt impacts creditors' demand for conditional conservatism. Hypothesis H2 considers that the firm's debt level is related to the probability of accounting recognition of economic losses through accounting impairments, which can occur in a non-linear manner. A non-linear effect happens due to differences in the cost-benefit ratio that monitoring presents to creditors, which is affected by the debt's size. Accounting information is less useful in monitoring firms at the extremes, with small or very high levels of financial leverage, according to the analytical model of Diamond (1991) and the empirical results of Minnis and Sutherland (2017).

The evidence summarized in Table 19 shows that the firm's level of debt affects the probabilities of recognizing economic losses through accounting impairments, as provided in hypothesis H2. However, the evidence that this relationship is non-linear, as expected in hypothesis H2, is not consistent. It is, therefore, not possible to reject the null hypothesis that the relationship is not non-linear.

The hypothesis H3 considers that the proportion of the firm's short-term to total debt is negatively related to the probability of recognizing economic losses through accounting impairments. This hypothesis is based on the assumption that short-term debt submits firms to constant renegotiation and close monitoring by creditors (KHURANA; WANG, 2015). The results presented in Table 10 do not allow the rejection of the null hypothesis that the proportion of short-term debt to long-term debt decreases the probability of recognizing an impairment loss. These results contradict the theoretical expectation that short-term debt would replace accounting conservatism in mitigating information asymmetries (NIKOLAEV, 2010;

KHURANA; WANG, 2015; FLOROU; KOSI, 2015). The results suggest that there may be no significant incentives for firms with predominantly short-term debt to present conditionally conservative financial statements, recognizing accounting impairments promptly.

Finally, it was not possible to reject the null hypothesis referring to hypothesis H4. This hypothesis considers that the issuance of debt in the current period is positively associated with the probability of accounting recognition of economic losses through accounting impairments. The theoretical expectation considered in formulating this hypothesis is that the need to obtain debt financing would lead firms to commit to conditionally conservative accounting behavior (GÖX; WAGENHOFER, 2009). This commitment would be useful for firms as it would mitigate the problem of adverse selection for firms that actively seek financing through debt issuance, increasing the likelihood of obtaining external financing through debt. That is because the value of the assets pledgeable assets, presented after the recognition of impairment losses, is more informative to the creditor than the historical cost of the same assets without impairment (GÖX; WAGENHOFER, 2009).

Additional analyzes focusing on firms with lower debt are presented in section A.4. For those firms, the issuance of net debt in a period is more likely to capture the adverse selection problem that occurs between creditors and firms in search of funding. In this case, the results found were not supportive of the theoretical expectation derived from Göx and Wagenhofer (2009). In the sample of low-debt firms, the net issuance of debt in the period is negatively associated with the probability of recording impairment losses.

However, the annual granularity of the data considered in this specification makes it challenging to identify the exact timing of impairment recognition and debt issuance. A firm can recognize an impairment loss in a month of the year and issue debt after that recognition, or it could issue debt in a month of the year and recognize o impairment in a later month. In the same sense, it is only possible to observe through secondary data the firms that issued debt in the period, and not the firms that tried to issue debt and failed. Hence, results concerning hypothesis H4 should be considered in conjunction with the drawbacks discussed here.

5.2 ROA Criterion

Table 20 presents a summary of the results of the hypotheses' testing regarding the sample of firms that have the BTM ratio greater than one for periods of two years and also have low ROA, meeting the ROA criterion. This sample is based on Healy (2016)'s work, which uses low ROA as an indication that impairment losses have not been recognized, or have been recognized in an insufficient amount.

Table 20: Summary of Results - Sample selected by ROA criterion

Hypothesis	Description	Predicted Sign	Actual Sign
H1	The existence of exchange traded-debt is positively related to the probability of recognizing economic losses through accounting impairments.	positive	n.s.
H2	The firm's debt level is related non-linearly to the probability of recognizing economic losses through accounting impairments.	positive and negative	n.s.
H3	The proportion of the firm's short-term debt to total debt is negatively related to the probability of recognizing economic losses through accounting impairments.	negative	n.s.
H4	The issuance of debt in the current period is positively associated with the probability of recognizing economic losses through accounting impairments.	positive	n.s.

Prepared by the author Note: n.s. = not significant at least 5%

Unlike Table 19's results, the results presented in Table 20 do not allow the rejection of null hypotheses associated with hypotheses H1 to H4. However, the variables corresponding to hypotheses H2 and H3 have coefficients that are statistically significant at 10%. Also, as mentioned in section 4.2, changing the sample selection criteria to include only firms with ROA belonging to the 1st quartile adjusted by segment, country, and year, the results are positive and significant for variables related to Hypothesis H1. These results suggest that identifying the effects of debt characteristics on the probability of impairment losses is sensitive to the choice of a reference parameter in terms of the reasonable return that the firm's net assets should generate.

Additional results presented in the section A.1 provide some support the Hypothesis H2 in the sense that the response of firms to the demand for impairment losses' recognition is more significant in the intermediate quintiles and deciles. These results are in line with the expectations derived from the results of Diamond (1991) and Minnis and Sutherland (2017).

In this sense, creditors have more significant incentives to mitigate the moral hazard problem that occurs when the firm increases its leverage, to a point where monitoring is no longer useful, as highly leveraged firms would have less to lose by hiding information (MINNIS; SUTHERLAND, 2017).

5.3 F-Score Criterion

Finally, the Table 21 presents a summary of the hypotheses testing concerning the F-Score selection criterion, composed of a sample of firms that present the indicator BTM greater than one for periods of two years and also have a low F-Score indicator. It is important to remember that the use of the Piotroski (2000)'s F-Score, in conjunction with the BTM ratio, stems from the argument presented by Barth, Israeli and Sridharan (2019). The high BTM may result from problems in the pricing mechanism, such that the firm's shares are undervalued by the market. That does not necessarily reflect a loss in the intrinsic value of the firm's assets. Thus, firms with a high BTM ratio and that also present a deteriorated financial health were selected, as indicated by an F-Score belonging to the first quartile of the statistical distribution. For these firms, the BTM ratio greater than one is more likely to be caused by poor financial health (BARTH; ISRAELI; SRIDHARAN, 2019).

The results reported in Table 21 are similar to those seen in Table 19 in terms of statistical significance for Hypotheses H1 to H4. These results were found, although the sample of firms considered by the F-Score criterion is substantially smaller than the sample by the BTM criterion. That results in larger standard errors and a stronger ex-ante probability of rejection of the null hypotheses corresponding to the estimated coefficients. This result is important because it suggests that financial restrictions may be related to the probability of recognizing impairment losses. For firms in a more precarious financial situation, captured by the F-Score indicator, debt may have a stronger relationship with the demand for conditional conservatism as a tool for mitigating information asymmetry.

Regarding hypothesis H2, although the results are statistically significant only for a positive relationship between debt and the probability of recognizing impairment losses, the potential non-linear relationship expected from the arguments of Diamond (1991) and Minnis and Sutherland (2017) shows significant results only at 10%. It is, therefore, not possible to reject the null hypothesis corresponding to the specification adopted. However, separating firms by debt quintiles and deciles (adjusted by segment, country, and year), there is evidence to suggest that the effect of debt on the probability of recognizing impairment losses may not be the same at all levels of leverage, as expected according to the relevant theory.

Table 21: Summary of Results - Sample selected by F-Score criteria

Hypothesis	Description	Predicted Sign	Actual Sign
H1	The existence of exchange traded-debt is positively related to the probability of recognizing economic losses through accounting impairments.	positive	positive
H2	The firm's debt level is related non-linearly to the probability of recognizing economic losses through accounting impairments.	positive and negative	positive
H3	The proportion of the firm's short-term debt to total debt is negatively related to the probability of recognizing economic losses through accounting impairments.	negative	n.s.
H4	The issuance of debt in the current period is positively associated with the probability of recognizing economic losses through accounting impairments.	positive	n.s.

Prepared by the author Note: n.s. = not significant at least 5%

6 FINAL REMARKS

This thesis explored the complicated relationship between debt characteristics and the probability of recognizing impairment losses, considering several characteristics of debt that can lead to imbalances in the information flow between the firm and its creditors. The firm may obtain capital from third parties in a direct relationship, as with banks, or through an indirect relationship, as in the issue of traded debt in debt markets. The levels of information asymmetry between the firm and the direct and indirect creditors will be potentially different in each type of funding. This difference arises from different channels for obtaining information used by direct and indirect creditors.

Type of creditor, maturity, and amount of debt are characteristics of debt that signal the existence of differences in the level of information asymmetry between the firm and direct and indirect creditors, whether they are potential or actual creditors. As a consequence, there is a difference in the amount of conditional accounting conservatism required by direct and indirect creditors, in response to the different levels of information asymmetry mentioned above. This difference affects the probability of impairment loss recognition for firms that have suffered economic shocks, as suggested by this thesis' results.

This thesis contributes to the accounting literature by addressing the provocations for research projects that can improve the identification of conditional accounting conservatism and its causes, furthering the understanding of accounting rules associated with debt contracting. The possibility of identifying conditions under which conservatism and debt contracting are positively related in some firms but not for others is an issue explored in this thesis. Results show that the level of conservatism adopted by sample firms in their financial statements, in the form of accounting impairments, is influenced by the demand for conservative accounting information faced by the firm.

As information asymmetry is the most significant economic friction that creates demand for conditional conservatism, this thesis started from the theoretical expectation that differences in asymmetry levels, reflecting the type of information demand suffered by the firm, affect the probability recognition of accounting impairments. After carrying out the proposed studies, analyzing how the characteristics of debt affect the likelihood of recognition of impairment losses by firms applying IFRS, and particularly IAS 36 - Impairment of Assets, one can state that the objectives of the thesis were achieved.

Based on a comprehensive sample of firms listed on the stock market of 16 countries, composed of firms that have suffered economic shocks, different mechanisms through which debt can affect the decision to recognize impairment losses were considered. These mechanisms

include whether the firm has exchange-traded debt, the total level of debt, the percentage of short-term debt over total debt, and the amount of debt issued by the firm in the analyzed period. These mechanisms signal that the information asymmetry characterized in the relations between the firm and its creditors, whether they are direct or indirect, potential or actual, is associated with the probability of recognition of impairment losses.

The results from the estimation of logistic regressions indicate that the probability of impairment loss recognition is positively associated with exchange-traded debt. In some specifications, the association between debt levels (regardless of differentiation between debt obtained in direct or indirect relations) and the probability of impairment recognition increases in decreasing levels. This result suggests a non-linear relationship. This relationship was captured through a quadratic term in the econometric models used, and, alternatively, through separating firms into debt quintiles and deciles.

Contrary to the theoretical expectation that short-term debt would replace accounting conservatism in mitigating information asymmetries, the results do not allow the rejection of the corresponding null hypothesis. In some robustness tests, there are even suggestions of the opposite effect, such that firms with more short-term debt are more likely to recognize impairment losses. An in-depth study of the relationship between short-term debt and information asymmetry between creditors and the firm can be an exciting path for future research.

In a similar sense, the results do not support the theoretical expectation that firms that issue debt in the period would be more likely to recognize impairment losses increase the probability of obtaining financing. A possible explanation for this result may be that the firms that were successful in obtaining debt financing were those that did not present impairment losses before obtaining credit. Testing this hypothesis is another path for future research, as it would improve our understanding of the behavior of firms looking for debt financing. However, such analysis would depend on the development of models to predict the firms most likely to intend to issue debt, so that it is possible to verify the impact of the recognition or not of the impairment on the actual obtaining of financing. The analysis of low leverage firms shows that the issuance of debt in the period has a more significant adverse effect on the probability of recognition of impairment losses, which may suggest that the asymmetry of information between firms with little leverage and creditors, either direct or indirect, is a problem that is not mitigated in practice by the registration of impairments.

Future research separately analyzing firms that do not have covenants in debt contracts and firms with such contractual commitments can also contribute to this literature. This analysis suffers from the limited availability of detailed information regarding contractual commitments, which is amplified in studies using a sample composed of multiple countries.

An alternative to face the difficulty of obtaining information about covenants could be the comparative analysis of the behavior of firms with more negotiated debt (e.g., firms in the fifth quintile of negotiated debt) with firms that do not have debt negotiated in the market. For these firms with high debt traded on the market, the use of covenants should be higher, and this more intense use would be positively associated with the probability of recording impairment losses. The underlying logic is that public debt contracts are not easily adjusted to compensate for a possible lack of accounting conservatism.

Finally, the results show evidence that the degree to which debt influences impairment decisions varies significantly, depending on the country under analysis. This finding leads to the recommendation that in-depth studies be carried out at the country level so that it is possible to identify factors that could constitute variables omitted in the analysis of the probabilities of recognition of impairment losses.

In summary, the results indicate that the probability of recognition of accounting impairments by firms that have suffered economic shocks is affected in a complicated way by characteristics of the firm's indebtedness. The role of debt characteristics is even more substantial for firms with deteriorating financial health, as indicated by the low F-Score indicator. The results suggest that the application of the impairment rule of IAS 36 is affected by the level of demand for conservative accounting information presented by direct and indirect creditors, which may impair the accurate representation of the firm's economic reality in its financial statements. Thus, auditors and regulators must consider the complexity of the relationship between debt characteristics and the probability of recognition of accounting impairments to identify situations in which there is a greater risk of inadequacy in the application of IAS 36.

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APPENDIX A ROBUSTNESS TESTS

Given the expected complexity of the relationship between Debt and the likelihood that the firm will recognize impairment losses, a series of alternative specifications was adopted, mentioned throughout the chapters of this thesis.

A.1 Level of debt divided into quintiles and deciles

This subsection presents a more in-depth test of the non-linear relationship between the firm's debt level and the probability of recognizing accounting impairments, provided for in Hypothesis H2. In this specification, the combined use of the Debt and Debt x Debt variables is replaced by dummy variables, identifying in which quintile or decile the firm belongs concerning its debt-to-market capitalization, adjusted for the sector, country and year. The results presented in Table 22, Table 23 and Table 24 are consistent with the nonlinear effect identified in our main specification. As the probability of recognizing an impairment loss increases from the initial quintiles to the fourth quintile, it decreases slightly for firms in the fifth quintile in the case of Table 23 and Table 24. The results reported in Table 25, Table 26 and Table 27, in which debt deciles are considered, are similar to results with separation by quintile.

The results in the analysis by debt quintiles and deciles with a sample defined by the BTM criterion are contrary to the theoretical expectation that, as firms increase their leverage, they become less likely to recognize impairment losses, which could occur to delay or prevent the breach of covenants in debt contracts. On the contrary, the results suggest that the demand for conditionally conservative accounting practices increases at the firm's Debt level for the firms considered in the sample. In the samples selected by the ROA and FScore criteria, both the analysis by debt quintiles and deciles suggest a certain non-linearity, with greater increases in the coefficients in the intermediate quintiles and deciles and negative variations for the higher quintiles and deciles.

Table 22: Pooled Logit Models with Debt Quintile dummies- Firms that met the BTM criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.22120*	(0.09058)		
DebtQuintile==2	0.24202*	(0.11646)	0.24085*	(0.11644)
DebtQuintile==3	0.26732*	(0.10975)	0.26536*	(0.10972)
DebtQuintile==4	0.39399***	(0.11058)	0.39089***	(0.11056)
DebtQuintile==5	0.40286***	(0.11036)	0.39830***	(0.11031)
ShortTerm	0.09599	(0.09899)	0.09910	(0.09899)
NetDebtIssued	-0.16137	(0.15733)	-0.16160	(0.15730)
BTM	0.10827*	(0.04533)	0.10838*	(0.04532)
ADJ_ROA	-0.01350*	(0.00648)	-0.01352*	(0.00648)
Return52Weeks	-0.34545***	(0.08992)	-0.34527***	(0.08995)
L.Return52Weeks	0.01435	(0.06500)	0.01447	(0.06500)
NumberofAnalysts	0.04935***	(0.00776)	0.04779***	(0.00787)
Risk	1.61086***	(0.44847)	1.60759***	(0.44838)
Float	0.51783**	(0.16145)	0.51747**	(0.16142)
Payout	-0.35646	(0.78807)	-0.34806	(0.78637)
Goodwill	1.41762**	(0.52233)	1.41517**	(0.52258)
Intangibles	1.31918*	(0.51690)	1.32172*	(0.51695)
FixedAssets	-0.05589	(0.19388)	-0.05694	(0.19385)
BATH==1	0.48618***	(0.06436)	0.48482***	(0.06435)
SMOOTH==1	0.52869***	(0.06599)	0.52792***	(0.06599)
LogExchangeTradedDebt			0.01402**	(0.00517)
Constant	-1.85002***	(0.50294)	-1.62639**	(0.49446)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.144		0.144	
AIC	1.11e+04		1.11e+04	
BIC	1.16e+04		1.16e+04	
coxsnell	0.177		0.177	
nagelkerke	0.239		0.239	
area	0.745		0.745	
ll	-5512.140		-5510.902	
chi2	762.476		763.488	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	66.820		66.778	
P_p1	70.996		70.763	
P_n0	63.977		64.066	
Observations	9542		9542	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 23: Pooled Logit Models with Debt Quintile dummies - Firms that met the ROA criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.17122	(0.10778)		
DebtQuintile==2	0.28889^{+}	(0.15196)	0.28772^{+}	(0.15193)
DebtQuintile==3	0.31237*	(0.13868)	0.31073*	(0.13862)
DebtQuintile==4	0.43791**	(0.13637)	0.43534**	(0.13633)
DebtQuintile==5	0.39462**	(0.13581)	0.39034**	(0.13574)
ShortTerm	0.11736	(0.11723)	0.11995	(0.11724)
NetDebtIssued	0.02205	(0.19034)	0.02208	(0.19029)
BTM	0.07103	(0.05060)	0.07101	(0.05059)
ADJ_ROA	-0.01246	(0.00909)	-0.01252	(0.00911)
Return52Weeks	-0.52280***	(0.12920)	-0.52286***	(0.12920)
L.Return52Weeks	-0.05998	(0.08513)	-0.05985	(0.08510)
NumberofAnalysts	0.05127***	(0.00925)	0.04995***	(0.00939)
Risk	1.70782**	(0.52794)	1.70337**	(0.52779)
Float	0.69357***	(0.19360)	0.69251***	(0.19356)
Payout	-0.47899	(1.00370)	-0.47290	(1.00182)
Goodwill	1.66303*	(0.73343)	1.66280*	(0.73348)
Intangibles	2.08972**	(0.74418)	2.09142**	(0.74407)
FixedAssets	-0.18002	(0.22349)	-0.18048	(0.22353)
BATH==1	0.41827***	(0.07604)	0.41709***	(0.07605)
SMOOTH==1	0.54416***	(0.08832)	0.54363***	(0.08833)
LogExchangeTradedDebt			0.01102^{+}	(0.00615)
Constant	-2.02211***	(0.56912)	-1.84979***	(0.55577)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.143		0.143	
AIC	6.89e+03		6.89e+03	
BIC	7.27e+03		7.27e+03	
coxsnell	0.177		0.178	
nagelkerke	0.239		0.239	
area	0.746		0.746	
ll	-3385.372		-3384.848	
chi2	514.641		515.686	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	66.816		66.851	
P_p1	74.735		74.817	
P_n0	61.010		61.010	
Observations	5801		5801	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 24: Pooled Logit Models with Debt Quintile dummies - Firms that met the F-Score criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.48543*	(0.19051)		
DebtQuintile==2	0.47521*	(0.21135)	0.47446*	(0.21140)
DebtQuintile==3	0.70436***	(0.19101)	0.70399***	(0.19098)
DebtQuintile==4	0.48570*	(0.20065)	0.48550*	(0.20068)
DebtQuintile==5	0.52111**	(0.19895)	0.52352**	(0.19889)
ShortTerm	0.06246	(0.18029)	0.06379	(0.18023)
NetDebtIssued	-0.39977	(0.25847)	-0.39886	(0.25856)
BTM	0.12282	(0.07578)	0.12261	(0.07581)
ADJ_ROA	-0.00208	(0.01146)	-0.00211	(0.01148)
Return52Weeks	-0.33817	(0.21831)	-0.33985	(0.21840)
L.Return52Weeks	-0.18120	(0.16610)	-0.18047	(0.16614)
NumberofAnalysts	0.02912^{+}	(0.01492)	0.02780^{+}	(0.01504)
Risk	1.32611	(0.91747)	1.32473	(0.91746)
Float	1.05953***	(0.29649)	1.06208***	(0.29641)
Payout	-3.75395*	(1.46149)	-3.75388*	(1.46201)
Goodwill	1.63477^{+}	(0.98186)	1.64252^{+}	(0.98279)
Intangibles	1.92229^{+}	(0.98836)	1.92420^{+}	(0.98816)
FixedAssets	0.10552	(0.33445)	0.10038	(0.33451)
BATH==1	0.47584***	(0.12862)	0.47610***	(0.12865)
SMOOTH==1	0.62673***	(0.17842)	0.62695***	(0.17842)
LogExchangeTradedDebt			0.02723*	(0.01092)
Constant	-3.68015***	(0.79456)	-3.19649***	(0.76750)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.157		0.157	
AIC	2.22e+03		2.22e+03	
BIC	2.52e+03		2.52e+03	
coxsnell	0.189		0.189	
nagelkerke	0.257		0.257	
area	0.758		0.758	
ll	-1052.545		-1052.684	
chi2	.		.	
p	.		.	
converged	1.000		1.000	
P_corr	65.343		65.397	
P_p1	81.669		81.532	
P_n0	54.810		54.987	
Observations	1864		1864	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 25: Pooled Logit Models with Debt Deciles - Firms that met the BTM criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.21654*	(0.09089)		
DebtDecile==2	0.13327	(0.17096)	0.13222	(0.17094)
DebtDecile==3	0.19621	(0.15326)	0.19504	(0.15324)
DebtDecile==4	0.37016*	(0.14949)	0.36831*	(0.14944)
DebtDecile==5	0.22935	(0.14029)	0.22734	(0.14018)
DebtDecile==6	0.37631**	(0.13303)	0.37378**	(0.13302)
DebtDecile==7	0.45641***	(0.13227)	0.45308***	(0.13224)
DebtDecile==8	0.42875**	(0.13170)	0.42519**	(0.13162)
DebtDecile==9	0.40724**	(0.12840)	0.40309**	(0.12831)
DebtDecile==10	0.49339***	(0.13309)	0.48775***	(0.13305)
ShortTerm	0.07768	(0.10103)	0.08089	(0.10103)
NetDebtIssued	-0.17038	(0.15706)	-0.17050	(0.15703)
BTM	0.10716*	(0.04557)	0.10730*	(0.04557)
ADJ_ROA	-0.01355*	(0.00653)	-0.01357*	(0.00653)
Return52Weeks	-0.34822***	(0.09017)	-0.34798***	(0.09021)
L.Return52Weeks	0.01615	(0.06520)	0.01623	(0.06521)
NumberofAnalysts	0.04920***	(0.00775)	0.04767***	(0.00787)
Risk	1.61012***	(0.44887)	1.60682***	(0.44878)
Float	0.52210**	(0.16162)	0.52164**	(0.16158)
Payout	-0.33757	(0.78578)	-0.32939	(0.78411)
Goodwill	1.40331**	(0.52247)	1.40101**	(0.52271)
Intangibles	1.30563*	(0.51755)	1.30832*	(0.51760)
FixedAssets	-0.06538	(0.19479)	-0.06625	(0.19475)
BATH==1	0.48193***	(0.06442)	0.48066***	(0.06441)
SMOOTH==1	0.52270***	(0.06587)	0.52202***	(0.06587)
LogExchangeTradedDebt			0.01375**	(0.00518)
Constant	-1.86590***	(0.50768)	-1.64694***	(0.49896)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.145		0.145	
AIC	1.11e+04		1.11e+04	
BIC	1.16e+04		1.16e+04	
coxsnell	0.177		0.178	
nagelkerke	0.239		0.240	
area	0.745		0.745	
ll	-5509.414		-5508.215	
chi2	770.994		771.840	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	66.642		66.674	
P_p1	70.944		70.893	
P_n0	63.713		63.801	
Observations	9542		9542	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 26: Pooled Logit Models with Debt Deciles - Firms that met the ROA Criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.17062	(0.10811)		
DebtDecile==2	0.09057	(0.22386)	0.08989	(0.22381)
DebtDecile==3	0.26422	(0.19494)	0.26356	(0.19490)
DebtDecile==4	0.35681^{+}	(0.18982)	0.35482^{+}	(0.18977)
DebtDecile==5	0.23621	(0.17122)	0.23450	(0.17106)
DebtDecile==6	0.41838*	(0.16588)	0.41640*	(0.16585)
DebtDecile==7	0.53442***	(0.15851)	0.53217***	(0.15847)
DebtDecile==8	0.40628*	(0.16025)	0.40302*	(0.16019)
DebtDecile==9	0.38529*	(0.15491)	0.38109*	(0.15483)
DebtDecile==10	0.45537**	(0.15962)	0.45059**	(0.15955)
ShortTerm	0.10610	(0.11862)	0.10879	(0.11863)
NetDebtIssued	0.01373	(0.18972)	0.01380	(0.18967)
BTM	0.07023	(0.05093)	0.07022	(0.05092)
ADJ_ROA	-0.01259	(0.00929)	-0.01266	(0.00931)
Return52Weeks	-0.52487***	(0.12992)	-0.52493***	(0.12992)
L.Return52Weeks	-0.05708	(0.08587)	-0.05699	(0.08584)
NumberofAnalysts	0.05109***	(0.00925)	0.04978***	(0.00938)
Risk	1.70957**	(0.52888)	1.70515**	(0.52873)
Float	0.69690***	(0.19381)	0.69580***	(0.19377)
Payout	-0.44706	(1.00585)	-0.44111	(1.00397)
Goodwill	1.66325*	(0.73353)	1.66317*	(0.73357)
Intangibles	2.09164**	(0.74439)	2.09342**	(0.74427)
FixedAssets	-0.17759	(0.22480)	-0.17795	(0.22484)
BATH==1	0.41501***	(0.07612)	0.41388***	(0.07613)
SMOOTH==1	0.53942***	(0.08825)	0.53892***	(0.08825)
LogExchangeTradedDebt			0.01098^{+}	(0.00617)
Constant	-2.04450***	(0.57716)	-1.87284***	(0.56344)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.144		0.144	
AIC	6.89e+03		6.89e+03	
BIC	7.31e+03		7.31e+03	
coxsnell	0.178		0.178	
nagelkerke	0.239		0.239	
area	0.746		0.747	
ll	-3383.642		-3383.122	
chi2	519.328		520.182	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	66.506		66.506	
P_p1	74.531		74.491	
P_n0	60.621		60.651	
Observations	5801		5801	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 27: Pooled Logit Models with Debt Deciles - Firms that met the F-Score Criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.48068*	(0.19166)		
DebtDecile==2	-0.23200	(0.30396)	-0.23143	(0.30363)
DebtDecile==3	0.30403	(0.28010)	0.30495	(0.28002)
DebtDecile==4	0.48871^{+}	(0.27394)	0.48705^{+}	(0.27401)
DebtDecile==5	0.56193*	(0.24747)	0.56251*	(0.24736)
DebtDecile==6	0.68216**	(0.23656)	0.68159**	(0.23650)
DebtDecile==7	0.37640	(0.24785)	0.37450	(0.24786)
DebtDecile==8	0.44721^{+}	(0.25631)	0.44908^{+}	(0.25616)
DebtDecile==9	0.55110*	(0.24252)	0.55405*	(0.24230)
DebtDecile==10	0.34779	(0.25028)	0.35021	(0.25021)
ShortTerm	0.09217	(0.18708)	0.09332	(0.18699)
NetDebtIssued	-0.41155	(0.25996)	-0.41081	(0.26010)
BTM	0.12598^{+}	(0.07591)	0.12576^{+}	(0.07593)
ADJ_ROA	-0.00175	(0.01144)	-0.00178	(0.01144)
Return52Weeks	-0.33308	(0.21740)	-0.33484	(0.21748)
L.Return52Weeks	-0.17595	(0.16677)	-0.17512	(0.16679)
NumberofAnalysts	0.02932^{+}	(0.01499)	0.02803^{+}	(0.01512)
Risk	1.31768	(0.92351)	1.31625	(0.92349)
Float	1.04565***	(0.29735)	1.04844***	(0.29726)
Payout	-3.70131*	(1.46914)	-3.70189*	(1.46945)
Goodwill	1.65587^{+}	(0.98820)	1.66298^{+}	(0.98915)
Intangibles	1.90582^{+}	(0.99157)	1.90751^{+}	(0.99122)
FixedAssets	0.11637	(0.33438)	0.11106	(0.33444)
BATH==1	0.48551***	(0.12898)	0.48574***	(0.12901)
SMOOTH==1	0.63624***	(0.17983)	0.63647***	(0.17983)
LogExchangeTradedDebt			0.02693*	(0.01098)
Constant	-3.64848***	(0.79654)	-3.16970***	(0.77016)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.158		0.158	
AIC	2.22e+03		2.22e+03	
BIC	2.55e+03		2.55e+03	
coxsnell	0.190		0.190	
nagelkerke	0.258		0.258	
area	0.759		0.759	
ll	-1051.370		-1051.511	
chi2	.		.	
p	.		.	
converged	1.000		1.000	
P_corr	65.075		65.021	
P_p1	80.438		80.438	
P_n0	55.163		55.075	
Observations	1864		1864	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.2 Replacing debt/market capitalization with debt/equity

It is common in the reviewed literature to measure the variable Debt in terms of the debt-to-equity ratio. Although the measurement of Debt as the relation between the firm's debt and its market capitalization is convenient because it is not influenced by concerns about the measurement of assets, an alternative estimate of all models with Debt measured as the firm's debt-to-equity ratio. The evidence is still in favor of this research's hypotheses, in the sense that the Debt is not related to the probability of recognition of impairment when firms undergo economic shocks in a merely unidimensional fashion.

Table 28: Pooled Logit Models with Debt-to-equity - firms that met the BTM criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.23191*	(0.09064)		
Debt	0.29795*	(0.14962)	0.29358*	(0.14955)
Debt × Debt	-0.06961	(0.06468)	-0.06953	(0.06472)
ShortTerm	0.17852+	(0.09477)	0.18129+	(0.09477)
NetDebtIssued	-0.14513	(0.15715)	-0.14452	(0.15713)
BTM	0.13145**	(0.04548)	0.13102**	(0.04548)
ADJ_ROA	-0.01309*	(0.00639)	-0.01310*	(0.00639)
Return52Weeks	-0.31393***	(0.08898)	-0.31445***	(0.08905)
L.Return52Weeks	0.01558	(0.06480)	0.01567	(0.06482)
NumberofAnalysts	0.05064***	(0.00778)	0.04904***	(0.00790)
Risk	1.55492***	(0.45156)	1.55332***	(0.45145)
Float	0.53841***	(0.16126)	0.53787***	(0.16124)
Payout	-0.41021	(0.78549)	-0.40179	(0.78386)
Goodwill	1.52410**	(0.52775)	1.52119**	(0.52794)
Intangibles	1.38934**	(0.52236)	1.39178**	(0.52236)
FixedAssets	0.00351	(0.19243)	0.00257	(0.19240)
BATH==1	0.49566***	(0.06431)	0.49427***	(0.06430)
SMOOTH==1	0.53442***	(0.06610)	0.53389***	(0.06610)
LogExchangeTradedDebt			0.01462**	(0.00517)
Constant	-1.79816***	(0.49953)	-1.56392**	(0.49090)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.143		0.143	
AIC	1.12e+04		1.12e+04	
BIC	1.16e+04		1.16e+04	
coxsnell	0.175		0.176	
nagelkerke	0.237		0.237	
area	0.744		0.744	
ll	-5520.674		-5519.408	
chi2	747.935		748.991	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	66.852		66.894	
P_p1	70.763		70.841	
P_n0	64.189		64.206	
Observations	9542		9542	

Standard errors in parentheses

$^{+}\ p < 0.1$, $^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

Table 29: Pooled Logit Models - firms that met the ROA criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.18527^{+}	(0.10767)		
Debt	0.27523	(0.17751)	0.27087	(0.17749)
Debt $\times$ Debt	-0.07323	(0.07567)	-0.07286	(0.07582)
ShortTerm	0.21625^{+}	(0.11085)	0.21862*	(0.11086)
NetDebtIssued	0.04556	(0.19108)	0.04594	(0.19101)
BTM	0.08798^{+}	(0.05111)	0.08751^{+}	(0.05110)
ADJ_ROA	-0.01191	(0.00880)	-0.01198	(0.00881)
Return52Weeks	-0.50022***	(0.12814)	-0.50092***	(0.12817)
L.Return52Weeks	-0.05888	(0.08503)	-0.05876	(0.08501)
NumberofAnalysts	0.05295***	(0.00932)	0.05157***	(0.00946)
Risk	1.67397**	(0.53232)	1.67059**	(0.53212)
Float	0.71218***	(0.19356)	0.71100***	(0.19353)
Payout	-0.50736	(0.99644)	-0.50125	(0.99457)
Goodwill	1.79559*	(0.74358)	1.79486*	(0.74352)
Intangibles	2.14248**	(0.75867)	2.14416**	(0.75848)
FixedAssets	-0.11485	(0.22124)	-0.11535	(0.22126)
BATH==1	0.42984***	(0.07599)	0.42860***	(0.07599)
SMOOTH==1	0.55402***	(0.08853)	0.55360***	(0.08854)
LogExchangeTradedDebt			0.01181^{+}	(0.00614)
Constant	-1.98102***	(0.55727)	-1.79452***	(0.54408)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.142		0.142	
AIC	6.90e+03		6.90e+03	
BIC	7.27e+03		7.27e+03	
coxsnell	0.175		0.176	
nagelkerke	0.236		0.236	
area	0.746		0.746	
ll	-3392.216		-3391.661	
chi2	504.678		505.877	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	66.264		66.402	
P_p1	74.083		74.165	
P_n0	60.532		60.711	
Observations	5801		5801	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 30: Pooled Logit Models - firms that met the F-Score criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.54434**	(0.19337)		
Debt	0.66567*	(0.33233)	0.67055*	(0.33329)
Debt × Debt	-0.37028*	(0.18329)	-0.37286*	(0.18516)
ShortTerm	0.23993	(0.17063)	0.24122	(0.17055)
NetDebtIssued	-0.30418	(0.26255)	-0.30303	(0.26267)
BTM	0.12677+	(0.07608)	0.12670+	(0.07609)
ADJ_ROA	-0.00221	(0.01140)	-0.00224	(0.01141)
Return52Weeks	-0.33425	(0.21282)	-0.33609	(0.21294)
L.Return52Weeks	-0.17864	(0.16633)	-0.17792	(0.16638)
NumberofAnalysts	0.03101*	(0.01520)	0.02945+	(0.01532)
Risk	1.45228+	(0.87715)	1.45007+	(0.87722)
Float	1.06693***	(0.29508)	1.06879***	(0.29505)
Payout	-3.53424*	(1.47885)	-3.53390*	(1.47905)
Goodwill	1.76189+	(1.01182)	1.77053+	(1.01302)
Intangibles	1.99576*	(0.98903)	1.99861*	(0.98897)
FixedAssets	0.18292	(0.33096)	0.17699	(0.33105)
BATH==1	0.48087***	(0.12806)	0.48107***	(0.12807)
SMOOTH==1	0.63432***	(0.18041)	0.63457***	(0.18042)
LogExchangeTradedDebt			0.03083**	(0.01107)
Constant	-3.53304***	(0.78062)	-2.99084***	(0.75585)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.153		0.153	
AIC	2.22e+03		2.22e+03	
BIC	2.51e+03		2.51e+03	
coxsnell	0.185		0.185	
nagelkerke	0.251		0.250	
area	0.757		0.757	
ll	-1057.743		-1057.846	
chi2	.		.	
p	.		.	
converged	1.000		1.000	
P_corr	65.290		65.290	
P_p1	81.122		81.122	
P_n0	55.075		55.075	
Observations	1864		1864	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.3 Inclusion of size quintiles

This section presents the inclusion of dummy variables representing the size of the firm, measured by the total assets before the impairment record.

Table 31: Pooled Logit Models with Size Quintiles - firms that met the BTM criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.18510*	(0.09018)		
Debt	0.18177^{+}	(0.10182)	0.17959^{+}	(0.10179)
Debt × Debt	-0.03718	(0.02817)	-0.03702	(0.02816)
ShortTerm	0.17881^{+}	(0.09608)	0.18102^{+}	(0.09609)
NetDebtIssued	-0.18220	(0.16017)	-0.18179	(0.16013)
BTM	0.08487^{+}	(0.04620)	0.08515^{+}	(0.04619)
ADJ_ROA	-0.01473*	(0.00682)	-0.01473*	(0.00681)
Return52Weeks	-0.35914***	(0.09253)	-0.35861***	(0.09253)
L.Return52Weeks	-0.00493	(0.06607)	-0.00493	(0.06607)
SizeQuintile==2	0.07106	(0.11722)	0.07105	(0.11720)
SizeQuintile==3	0.11949	(0.12212)	0.11905	(0.12207)
SizeQuintile==4	0.28509*	(0.12849)	0.28360*	(0.12845)
SizeQuintile==5	0.77161***	(0.14205)	0.76846***	(0.14197)
NumberofAnalysts	0.03052***	(0.00789)	0.02934***	(0.00799)
Risk	1.97957***	(0.45900)	1.97667***	(0.45892)
Float	0.59999***	(0.16263)	0.59931***	(0.16260)
Payout	-0.62187	(0.83294)	-0.61473	(0.83146)
Goodwill	1.42923**	(0.52756)	1.42770**	(0.52768)
Intangibles	1.26525*	(0.51889)	1.26759*	(0.51879)
FixedAssets	-0.07292	(0.19401)	-0.07333	(0.19397)
BATH==1	0.32275***	(0.06670)	0.32247***	(0.06671)
SMOOTH==1	0.35912***	(0.06689)	0.35938***	(0.06690)
LogExchangeTradedDebt			0.01166*	(0.00515)
Constant	-1.79303***	(0.50137)	-1.60708**	(0.49222)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.150		0.150	
AIC	1.11e+04		1.11e+04	
BIC	1.15e+04		1.15e+04	
coxsnell	0.183		0.184	
nagelkerke	0.248		0.248	
area	0.751		0.751	
ll	-5474.349		-5473.551	
chi2	774.749		775.753	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	67.292		67.313	
P_p1	71.358		71.410	
P_n0	64.524		64.524	
Observations	9542		9542	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 32: Pooled Logit Models with Size Quintiles - firms that met the ROA criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.13767	(0.10700)		
Debt	0.14791	(0.12216)	0.14596	(0.12213)
Debt × Debt	-0.02740	(0.03401)	-0.02720	(0.03401)
ShortTerm	0.22198*	(0.11242)	0.22370*	(0.11245)
NetDebtIssued	0.00970	(0.19433)	0.00992	(0.19425)
BTM	0.04498	(0.05217)	0.04510	(0.05215)
ADJ_ROA	-0.01482	(0.01023)	-0.01486	(0.01023)
Return52Weeks	-0.56343***	(0.13343)	-0.56310***	(0.13340)
L.Return52Weeks	-0.07425	(0.08739)	-0.07421	(0.08737)
SizeQuintile==2	0.07993	(0.14438)	0.08013	(0.14435)
SizeQuintile==3	0.18997	(0.14941)	0.18973	(0.14936)
SizeQuintile==4	0.25175	(0.15612)	0.25046	(0.15611)
SizeQuintile==5	0.78234***	(0.17506)	0.77987***	(0.17502)
NumberofAnalysts	0.03214***	(0.00962)	0.03120**	(0.00974)
Risk	2.06394***	(0.54337)	2.06016***	(0.54321)
Float	0.78074***	(0.19501)	0.77969***	(0.19499)
Payout	-0.76884	(1.04382)	-0.76369	(1.04214)
Goodwill	1.76328*	(0.75150)	1.76305*	(0.75149)
Intangibles	2.05280**	(0.76084)	2.05425**	(0.76062)
FixedAssets	-0.19848	(0.22281)	-0.19857	(0.22281)
BATH==1	0.27266***	(0.07994)	0.27242***	(0.07995)
SMOOTH==1	0.38163***	(0.09076)	0.38193***	(0.09077)
LogExchangeTradedDebt			0.00876	(0.00611)
Constant	-2.01397***	(0.55349)	-1.87613***	(0.53982)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.149		0.149	
AIC	6.85e+03		6.85e+03	
BIC	7.25e+03		7.25e+03	
coxsnell	0.184		0.184	
nagelkerke	0.247		0.247	
area	0.753		0.753	
ll	-3363.758		-3363.459	
chi2	519.466		520.251	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	67.454		67.592	
P_p1	75.632		75.754	
P_n0	61.458		61.607	
Observations	5801		5801	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 33: Pooled Logit Models with Size Quintiles - firms that met the F-Score criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.45209*	(0.19320)		
Debt	0.44126^{+}	(0.23309)	0.44425^{+}	(0.23307)
Debt × Debt	-0.14764^{+}	(0.08084)	-0.14835^{+}	(0.08094)
ShortTerm	0.23532	(0.17330)	0.23603	(0.17321)
NetDebtIssued	-0.37006	(0.26136)	-0.36907	(0.26146)
BTM	0.11414	(0.07582)	0.11407	(0.07587)
ADJ_ROA	-0.00434	(0.01106)	-0.00436	(0.01107)
Return52Weeks	-0.31050	(0.21608)	-0.31218	(0.21621)
L.Return52Weeks	-0.16991	(0.17100)	-0.16923	(0.17102)
SizeQuintile==2	0.19961	(0.20226)	0.20003	(0.20215)
SizeQuintile==3	0.10021	(0.20922)	0.09916	(0.20911)
SizeQuintile==4	0.18477	(0.23097)	0.18312	(0.23078)
SizeQuintile==5	0.56753*	(0.25735)	0.56469*	(0.25743)
NumberofAnalysts	0.01867	(0.01570)	0.01753	(0.01582)
Risk	1.60571^{+}	(0.88230)	1.60331^{+}	(0.88238)
Float	1.08596***	(0.29714)	1.08824***	(0.29712)
Payout	-3.72883*	(1.52095)	-3.72873*	(1.52114)
Goodwill	1.72690^{+}	(1.01047)	1.73505^{+}	(1.01158)
Intangibles	1.85838^{+}	(1.00378)	1.86020^{+}	(1.00344)
FixedAssets	0.12932	(0.33158)	0.12456	(0.33158)
BATH==1	0.41906**	(0.13747)	0.42011**	(0.13746)
SMOOTH==1	0.53712**	(0.18638)	0.53817**	(0.18643)
LogExchangeTradedDebt			0.02530*	(0.01110)
Constant	-3.46655***	(0.77855)	-3.01661***	(0.75297)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.156		0.156	
AIC	2.22e+03		2.22e+03	
BIC	2.54e+03		2.54e+03	
coxsnell	0.189		0.188	
nagelkerke	0.256		0.255	
area	0.761		0.761	
ll	-1053.576		-1053.714	
chi2	.		.	
p	.		.	
converged	1.000		1.000	
P_corr	65.397		65.236	
P_p1	81.395		81.532	
P_n0	55.075		54.722	
Observations	1864		1864	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.4 Only firms with low leverage

Table 34: Pooled Logit Models with firms in the 1st Debt Quintile - firms that met the BTM criterion

	(1)		(2)	
DummyExchangeTradedDebt	-0.16368	(0.48219)		
Debt	0.59698	(0.94957)	0.59822	(0.95112)
Debt × Debt	-0.47472	(0.42277)	-0.47529	(0.42286)
ShortTerm	0.29680	(0.19752)	0.29649	(0.19748)
NetDebtIssued	-1.87440**	(0.71397)	-1.87811**	(0.71313)
BTM	-0.08533	(0.09878)	-0.08546	(0.09876)
ADJ_ROA	-0.00157	(0.01339)	-0.00153	(0.01336)
Return52Weeks	-0.87734***	(0.25904)	-0.87714***	(0.25909)
L.Return52Weeks	0.01285	(0.20078)	0.01292	(0.20068)
NumberofAnalysts	0.03182	(0.02667)	0.03197	(0.02696)
Risk	1.83591*	(0.88066)	1.83311*	(0.88109)
Float	0.16965	(0.40736)	0.16984	(0.40757)
Payout	-0.40648	(1.72309)	-0.41038	(1.72319)
Goodwill	-2.31441+	(1.34958)	-2.31528+	(1.34936)
Intangibles	0.74326	(1.31246)	0.74311	(1.31288)
FixedAssets	0.69324	(0.43521)	0.69396	(0.43520)
BATH==1	0.40873*	(0.17053)	0.40885*	(0.17054)
SMOOTH==1	0.58122**	(0.18419)	0.58069**	(0.18415)
LogExchangeTradedDebt			-0.00855	(0.02774)
Constant	-1.54611	(1.28570)	-1.70891	(1.20571)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.152		0.152	
AIC	1.68e+03		1.68e+03	
BIC	1.95e+03		1.95e+03	
coxsnell	0.170		0.170	
nagelkerke	0.240		0.240	
area	0.756		0.756	
ll	-786.565		-786.579	
chi2	.		.	
p	.		.	
converged	1.000		1.000	
P_corr	72.619		72.619	
P_p1	52.183		52.183	
P_n0	81.499		81.499	
Observations	1512		1512	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 35: Pooled Logit Models with firms in the 1st Debt Quintile - firms that met the ROA criterion

	(1)		(2)	
DummyExchangeTradedDebt	-0.61923	(0.81961)		
Debt	1.14306	(1.16227)	1.12907	(1.16526)
Debt × Debt	-0.53751	(0.39188)	-0.53249	(0.39215)
ShortTerm	0.55149*	(0.24975)	0.55160*	(0.25002)
NetDebtIssued	-1.67295*	(0.68160)	-1.69968*	(0.68651)
BTM	-0.09030	(0.10780)	-0.09092	(0.10784)
ADJ_ROA	-0.01953	(0.02378)	-0.01891	(0.02287)
Return52Weeks	-1.43414***	(0.36197)	-1.43359***	(0.36235)
L.Return52Weeks	-0.18613	(0.23148)	-0.18615	(0.23168)
NumberofAnalysts	0.02819	(0.03156)	0.02759	(0.03201)
Risk	2.23784*	(1.04616)	2.21004*	(1.05014)
Float	0.73655	(0.52964)	0.72932	(0.53002)
Payout	0.10162	(2.26281)	0.09313	(2.26001)
Goodwill	-0.66168	(1.82317)	-0.65264	(1.82282)
Intangibles	-0.25060	(1.35280)	-0.23970	(1.35321)
FixedAssets	0.82764+	(0.50198)	0.83046+	(0.50166)
BATH==1	0.34245+	(0.20011)	0.34303+	(0.20003)
SMOOTH==1	0.57226*	(0.23003)	0.57375*	(0.23004)
LogExchangeTradedDebt			-0.02661	(0.04626)
Constant	-1.50058	(1.53723)	-2.11131	(1.29858)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.178		0.178	
AIC	1.10e+03		1.10e+03	
BIC	1.35e+03		1.35e+03	
coxsnell	0.200		0.199	
nagelkerke	0.280		0.279	
area	0.778		0.779	
ll	-499.052		-499.251	
chi2	161.748		160.915	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	73.895		73.998	
P_p1	61.039		61.364	
P_n0	79.850		79.850	
Observations	973		973	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 36: Pooled Logit Models with firms in the 1st Debt Quintile - firms that met the F-Score criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.85986	(0.65471)		
Debt	-2.30972	(4.95896)	-2.44010	(4.89865)
Debt × Debt	1.13588	(6.05621)	1.24976	(5.93074)
ShortTerm	0.53432	(0.32846)	0.53824	(0.32827)
NetDebtIssued	-2.45193**	(0.85418)	-2.46099**	(0.85377)
BTM	-0.08553	(0.18785)	-0.08471	(0.18765)
ADJ_ROA	-0.01116	(0.01403)	-0.01122	(0.01403)
Return52Weeks	-1.21698**	(0.42051)	-1.21395**	(0.42072)
L.Return52Weeks	-0.96965*	(0.42639)	-0.96675*	(0.42670)
NumberofAnalysts	0.01674	(0.05726)	0.01669	(0.05707)
Risk	2.04511	(1.87267)	2.04688	(1.87072)
Float	0.93833	(0.73652)	0.94155	(0.73889)
Payout	-4.01072	(4.54520)	-4.03512	(4.54307)
Goodwill	-2.39466	(2.57503)	-2.40409	(2.58150)
Intangibles	0.10422	(1.93818)	0.11827	(1.94009)
FixedAssets	2.38288**	(0.73152)	2.37352**	(0.73243)
BATH==1	0.64438*	(0.32341)	0.64748*	(0.32365)
SMOOTH==1	0.12763	(0.40308)	0.12692	(0.40400)
LogExchangeTradedDebt			0.05667	(0.03904)
Constant	-4.65570**	(1.43467)	-3.78794**	(1.29099)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.226		0.226	
AIC	525.21199		524.98448	
BIC	735.68232		735.45481	
coxsnell	0.236		0.236	
nagelkerke	0.339		0.339	
area	0.816		0.816	
ll	-211.606		-211.492	
chi2	113.356		113.565	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	76.638		76.419	
P_p1	72.308		72.308	
P_n0	78.354		78.049	
Observations	458		458	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.5 Country cluster

Separate estimation according to the clusters suggested by Leuz (2010). Sample by the BTM criterion.

Cluster 1 = columns (1) e (4)

Cluster 2 = columns (2) e (5)

Cluster 3 = columns (3) e (6)

Table 37: Pooled Logit Models - firms that met the BTM criterion split by Cluster

	(1)		(2)		(3)		(4)		(5)		(6)	
DummyExchangeTradedDebt	0.33087	(0.22601)	0.24306*	(0.10620)	-0.44487	(0.68745)						
Debt	0.08831	(0.19730)	0.37664**	(0.12578)	0.91365	(0.67514)	0.08459	(0.19721)	0.37350**	(0.12591)	0.88418	(0.67233)
Debt × Debt	-0.03324	(0.05448)	-0.05682	(0.03522)	-0.22149	(0.14966)	-0.03285	(0.05438)	-0.05643	(0.03526)	-0.21603	(0.14952)
ShortTerm	0.14701	(0.17090)	0.13885	(0.11894)	-1.05427	(0.90707)	0.14809	(0.17090)	0.14193	(0.11896)	-0.98439	(0.91261)
NetDebtIssued	-0.82244**	(0.30001)	0.28445	(0.20319)	2.63520+	(1.58625)	-0.82119**	(0.29998)	0.28403	(0.20322)	2.75471+	(1.59398)
BTM	0.14598+	(0.07540)	0.01636	(0.06876)	0.23948	(0.22302)	0.14656+	(0.07541)	0.01623	(0.06877)	0.22946	(0.22058)
ADJ_ROA	-0.01671	(0.01076)	-0.02475*	(0.01224)	0.00262	(0.00716)	-0.01667	(0.01076)	-0.02475*	(0.01225)	0.00234	(0.00710)
Return52Weeks	-0.60295***	(0.17529)	-0.36719**	(0.11949)	0.04281	(0.41923)	-0.60278***	(0.17530)	-0.36648**	(0.11950)	0.02724	(0.41901)
L.Return52Weeks	-0.23842*	(0.11216)	0.14440	(0.09633)	0.12197	(0.47167)	-0.23833*	(0.11211)	0.14452	(0.09634)	0.11011	(0.47599)
NumberofAnalysts	0.03957**	(0.01478)	0.05206***	(0.00973)	0.01817	(0.08669)	0.03825*	(0.01491)	0.05048***	(0.00988)	0.00651	(0.08746)
Risk	0.92218	(0.65935)	1.50223*	(0.64717)	0.86075	(2.38558)	0.92206	(0.65872)	1.50364*	(0.64703)	0.75183	(2.42855)
Float	0.52714+	(0.29898)	0.48471*	(0.20492)	2.43569	(1.81813)	0.52477+	(0.29906)	0.48344*	(0.20490)	2.63643	(1.80421)
Payout	-2.99008*	(1.43689)	3.95727**	(1.46530)	-4.32452	(2.73834)	-2.97341*	(1.43578)	3.94991**	(1.46193)	-3.97890	(2.74440)
Goodwill	1.60284*	(0.75170)	2.49741**	(0.85414)	6.64362	(4.90597)	1.60639*	(0.75186)	2.49218**	(0.85503)	6.22363	(4.86431)
Intangibles	1.41731+	(0.76952)	2.46820**	(0.94548)	0.57197	(1.19892)	1.42048+	(0.76959)	2.46930**	(0.94505)	0.45061	(1.21458)
FixedAssets	-0.02097	(0.31783)	-0.33280	(0.26331)	3.02752*	(1.34977)	-0.01872	(0.31785)	-0.33244	(0.26325)	2.88812*	(1.33946)
BATH==1	0.37646**	(0.12227)	0.52747***	(0.07967)	0.84926	(0.71587)	0.37640**	(0.12234)	0.52590***	(0.07966)	0.82469	(0.71857)
SMOOTH==1	0.28665*	(0.12648)	0.70757***	(0.08330)	-0.35368	(0.72955)	0.28716*	(0.12649)	0.70652***	(0.08330)	-0.40714	(0.73617)
LogExchangeTradedDebt							0.01898	(0.01180)	0.01516*	(0.00624)	-0.00324	(0.03632)
Constant	-1.95195**	(0.68019)	-1.28058	(0.89766)	-0.53116	(1.18737)	-1.61959*	(0.62894)	-1.03922	(0.88997)	-0.89595	(0.98631)
Industry Fixed-effects	Yes		Yes		Yes		Yes		Yes		Yes	
Country Fixed-effects	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed-Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Pseudo R^2	0.225		0.112		0.368		0.226		0.112		0.367	
AIC	3.19e+03		6.98e+03		277.82369		3.19e+03		6.98e+03		278.32058	
BIC	3.46e+03		7.28e+03		390.76542		3.46e+03		7.28e+03		391.26231	
coxsnell	0.267		0.139		0.390		0.267		0.139		0.389	
nagelkerke	0.357		0.188		0.528		0.357		0.189		0.527	
area	0.808		0.714		0.878		0.808		0.714		0.878	
ll	-1552.199		-3447.185		-106.912		-1551.826		-3446.564		-107.160	
chi2	336.409		415.741		103.560		336.922		415.695		105.707	
p	0.000		0.000		0.000		0.000		0.000		0.000	
converged	1.000		1.000		1.000		1.000		1.000		1.000	
P_corr	71.576		65.509		78.175		71.714		65.509		77.778	
P_p1	83.922		65.171		82.000		83.847		65.171		82.000	
P_n0	61.143		65.722		75.658		61.460		65.722		75.000	
Observations	2906		5816		252		2906		5816		252	

Standard errors in parentheses

$^{+}\ p < 0.1$, $^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

Separate estimation according to the clusters suggested by Leuz (2010). Sample by the ROA criterion.

Cluster 1 = columns (1) e (4)

Cluster 2 = columns (2) e (5)

Cluster 3 = columns (3) e (6)

Table 38: Pooled Logit Models - firms that met the ROA criterion by Cluster

	(1)		(2)		(3)		(4)		(5)		(6)	
DummyExchangeTradedDebt	0.15046	(0.28331)	0.21001^{+}	(0.12336)	-0.92350	(1.01129)						
Debt	0.17551	(0.23984)	0.25888^{+}	(0.15285)	1.36699	(1.02225)	0.17076	(0.23975)	0.25625^{+}	(0.15305)	1.34468	(1.04996)
Debt × Debt	-0.07188	(0.06882)	-0.02205	(0.04231)	-0.27379	(0.23381)	-0.07121	(0.06873)	-0.02176	(0.04237)	-0.26601	(0.23798)
ShortTerm	0.06288	(0.18614)	0.19079	(0.14761)	-0.51212	(1.25403)	0.06389	(0.18618)	0.19389	(0.14768)	-0.47921	(1.27879)
NetDebtIssued	-0.86399*	(0.38440)	0.61714*	(0.24482)	1.59796	(2.15910)	-0.86289*	(0.38388)	0.61689*	(0.24490)	1.70615	(2.16881)
BTM	0.08400	(0.08817)	0.04778	(0.07682)	-0.12601	(0.31134)	0.08464	(0.08819)	0.04745	(0.07682)	-0.14714	(0.30544)
ADJ_ROA	-0.02495^{+}	(0.01371)	-0.01892	(0.01517)	-0.00664	(0.01997)	-0.02506^{+}	(0.01370)	-0.01897	(0.01519)	-0.00601	(0.02007)
Return52Weeks	-0.90798**	(0.27940)	-0.46804**	(0.16160)	-1.28218	(1.03933)	-0.90735**	(0.27940)	-0.46738**	(0.16168)	-1.34813	(1.04979)
L.Return52Weeks	-0.45047*	(0.18445)	0.07381	(0.12169)	0.87224	(0.64244)	-0.45066*	(0.18434)	0.07413	(0.12171)	0.84079	(0.65000)
NumberofAnalysts	0.04068*	(0.01724)	0.05804***	(0.01262)	0.15057	(0.13959)	0.03953*	(0.01746)	0.05655***	(0.01277)	0.14648	(0.13870)
Risk	0.93450	(0.72337)	1.56178*	(0.76881)	5.80287	(6.60777)	0.92875	(0.72343)	1.56217*	(0.76896)	5.31755	(6.66633)
Float	0.72335*	(0.35051)	0.64592*	(0.25639)	1.02931	(3.08359)	0.72149*	(0.35062)	0.64402*	(0.25638)	1.31589	(3.03101)
Payout	-3.03505^{+}	(1.80506)	2.45931^{+}	(1.43650)	-7.69090^{+}	(4.49125)	-3.02428^{+}	(1.80410)	2.45467^{+}	(1.43608)	-7.30033	(4.51056)
Goodwill	1.64557	(1.05092)	2.02565^{+}	(1.15147)	34.26076***	(8.97208)	1.64548	(1.05220)	2.02728^{+}	(1.15251)	33.66717***	(8.91216)
Intangibles	1.34151	(1.05318)	4.41279**	(1.46897)	-1.90031	(4.37957)	1.34508	(1.05300)	4.41212**	(1.46728)	-2.08811	(4.10364)
FixedAssets	-0.18730	(0.35859)	-0.38027	(0.30442)	6.06671*	(2.54619)	-0.18648	(0.35865)	-0.37982	(0.30432)	6.03191*	(2.65575)
BATH==1	0.28144^{+}	(0.14383)	0.49661***	(0.09656)	1.24563	(1.15825)	0.28183^{+}	(0.14394)	0.49517***	(0.09654)	1.16202	(1.17977)
SMOOTH==1	0.12701	(0.17611)	0.77029***	(0.10866)	-1.25257	(1.07618)	0.12842	(0.17612)	0.76902***	(0.10866)	-1.32266	(1.07559)
LogExchangeTradedDebt							0.00969	(0.01457)	0.01317^{+}	(0.00724)	-0.03170	(0.05735)
Constant	-1.90634*	(0.74358)	-1.50703	(0.99557)	-3.26353^{+}	(1.91398)	-1.75866**	(0.66674)	-1.29851	(0.98468)	-4.02488*	(1.98636)
Industry Fixed-effects	Yes		Yes		Yes		Yes		Yes		Yes	
Country Fixed-effects	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed-Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Pseudo R^2	0.199		0.127		0.455		0.199		0.127		0.453	
AIC	1.99e+03		4.35e+03		147.11034		1.99e+03		4.35e+03		147.54015	
BIC	2.23e+03		4.63e+03		227.94760		2.23e+03		4.63e+03		228.37742	
coxsnell	0.241		0.157		0.463		0.241		0.157		0.461	
nagelkerke	0.321		0.212		0.622		0.321		0.212		0.619	
area	0.790		0.731		0.912		0.790		0.731		0.910	
ll	-948.813		-2130.283		-44.555		-948.686		-2129.957		-44.770	
chi2	201.803		285.555		356.979		202.086		286.456		337.044	
p	0.000		0.000		0.000		0.000		0.000		0.000	
converged	1.000		1.000		1.000		1.000		1.000		1.000	
P_corr	68.618		66.465		83.333		68.560		66.355		82.500	
P_p1	87.413		67.201		86.275		87.296		67.061		88.235	
P_n0	49.647		65.985		81.159		49.647		65.895		78.261	
Observations	1708		3638		120		1708		3638		120	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Separate estimation according to the clusters suggested by Leuz (2010). Sample by the FScore criterion.

Cluster 1 = columns (1) e (3)

Cluster 2 = columns (2) e (4)

Cluster 3 = it was not possible to estimate due to the small number of observations.

Table 39: Pooled Logit Models - firms that met the F-Score criterion by Cluster

	(1)		(2)	
DummyExchangeTradedDebt	-0.13836	(0.49019)	0.59053**	(0.22364)
Debt	0.42111	(0.42805)	0.45007	(0.32286)
Debt × Debt	-0.09652	(0.13272)	-0.12691	(0.11559)
ShortTerm	0.29900	(0.31706)	0.32566	(0.22192)
NetDebtIssued	-1.53973**	(0.46980)	0.45708	(0.36572)
BTM	0.16410	(0.12054)	0.10010	(0.12534)
ADJ_ROA	-0.00384	(0.02512)	-0.01587	(0.02330)
Return52Weeks	-0.43363	(0.36507)	-0.46808	(0.33993)
L.Return52Weeks	-0.17665	(0.28774)	-0.25585	(0.23651)
NumberofAnalysts	0.03387	(0.03769)	0.02838	(0.01787)
Risk	0.06110	(1.56535)	2.16002	(1.34604)
Float	1.67699**	(0.58409)	0.88840*	(0.38670)
Payout	-4.76100*	(2.33935)	-0.90147	(2.41900)
Goodwill	0.65944	(1.68518)	3.68509*	(1.66623)
Intangibles	2.60965+	(1.46181)	4.11924*	(1.84925)
FixedAssets	0.24860	(0.55334)	-0.27030	(0.49533)
BATH==1	0.26813	(0.25321)	0.55754***	(0.16650)
SMOOTH==1	0.05273	(0.30681)	0.91858***	(0.24782)
Constant	-3.42333**	(1.22757)	-2.87506**	(1.03543)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.247		0.139	
AIC	686.84179		1.37e+03	
BIC	874.52608		1.59e+03	
coxsnell	0.287		0.168	
nagelkerke	0.385		0.229	
area	0.817		0.745	
ll	-300.421		-641.143	
chi2	.		.	
p	.		.	
converged	1.000		1.000	
P_corr	70.396		63.588	
P_p1	88.716		76.777	
P_n0	55.864		55.682	
Observations	581		1126	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.6 Panel data and Random Effects

Table 40: Random Effects Logit models - firms that met the BTM criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.24932*	(0.12423)		
Debt	0.25516^{+}	(0.14076)	0.28041*	(0.14189)
Debt × Debt	-0.02093	(0.03943)	-0.02721	(0.03950)
ShortTerm	0.25262*	(0.12857)	0.28458*	(0.13026)
NetDebtIssued	-0.15387	(0.22025)	-0.09392	(0.22556)
BTM	0.12286*	(0.06237)	0.13912*	(0.06443)
ADJ_ROA	-0.02567**	(0.00833)	-0.02589**	(0.00832)
Return52Weeks	-0.44731***	(0.12696)	-0.44342***	(0.13023)
L.Return52Weeks	0.23207*	(0.09359)	0.15317	(0.09478)
NumberofAnalysts	0.08431***	(0.01130)	0.08469***	(0.01171)
Risk	1.52454*	(0.60146)	1.88161**	(0.62333)
Float	0.79479***	(0.22136)	0.79988***	(0.22531)
Payout	-0.65643	(1.10896)	-0.34314	(1.08129)
Goodwill	2.98058***	(0.76148)	3.14468***	(0.77654)
Intangibles	1.00862	(0.73561)	0.94213	(0.73551)
FixedAssets	-0.24211	(0.28587)	-0.28268	(0.29049)
BATH==1	0.47912***	(0.08779)	0.46787***	(0.08909)
SMOOTH==1	0.56011***	(0.08802)	0.53671***	(0.08922)
LogExchangeTradedDebt			0.01364^{+}	(0.00725)
Constant	-2.07044**	(0.69276)	-1.95288**	(0.69620)
lnsig2u	1.33978***	(0.07811)	1.36996***	(0.07833)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	No		Yes	
Pseudo R^2				
AIC	1.00e+04		9.95e+03	
BIC	1.04e+04		1.04e+04	
ll	-4958.728		-4919.991	
chi2	620.472		643.550	
p	0.000		0.000	
converged	1.000		1.000	
Observations	9542		9542	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 41: Random Effects Logit models - firms that met the ROA criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.27246^{+}	(0.14882)		
Debt	0.23063	(0.17184)	0.23871	(0.17254)
Debt $\times$ Debt	-0.01408	(0.04875)	-0.01778	(0.04881)
ShortTerm	0.29830^{+}	(0.15755)	0.31399*	(0.15900)
NetDebtIssued	0.06606	(0.25919)	0.10927	(0.26244)
BTM	0.05338	(0.07312)	0.06518	(0.07529)
ADJ_ROA	-0.02013^{+}	(0.01177)	-0.02181^{+}	(0.01244)
Return52Weeks	-0.70988***	(0.18179)	-0.73855***	(0.18624)
L.Return52Weeks	0.04354	(0.12587)	-0.01673	(0.12774)
NumberofAnalysts	0.08182***	(0.01307)	0.08048***	(0.01353)
Risk	1.37934^{+}	(0.72971)	1.76909*	(0.75751)
Float	1.11337***	(0.27398)	1.13712***	(0.27744)
Payout	-0.34413	(1.44298)	-0.14012	(1.41354)
Goodwill	3.42128**	(1.07099)	3.53172**	(1.07958)
Intangibles	1.95855^{+}	(1.00917)	1.92618^{+}	(0.99715)
FixedAssets	-0.38597	(0.33255)	-0.43519	(0.33696)
BATH==1	0.49560***	(0.10594)	0.50004***	(0.10743)
SMOOTH==1	0.67167***	(0.11979)	0.65902***	(0.12091)
LogExchangeTradedDebt			0.01528^{+}	(0.00874)
Constant	-2.33150**	(0.78584)	-2.20763**	(0.78260)
lnsig2u	1.34561***	(0.10123)	1.36466***	(0.10150)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	No		Yes	
Pseudo R^2				
AIC	6.30e+03		6.28e+03	
BIC	6.64e+03		6.66e+03	
ll	-3101.463		-3080.619	
chi2	411.243		423.636	
p	0.000		0.000	
converged	1.000		1.000	
Observations	5801		5801	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 42: Random Effects Logit models - firms that met the F-Score criterion

	(1)		(2)	
DummyExchangeTradedDebt	0.66498*	(0.27447)		
Debt	0.63793*	(0.31877)	0.62047*	(0.31620)
Debt × Debt	-0.21224+	(0.10854)	-0.19425+	(0.10817)
ShortTerm	0.39643	(0.24635)	0.40775+	(0.24768)
NetDebtIssued	-0.43974	(0.37928)	-0.40168	(0.38090)
BTM	0.19702+	(0.11112)	0.19551+	(0.11061)
ADJ_ROA	-0.00642	(0.01474)	-0.00379	(0.01443)
Return52Weeks	-0.38511	(0.30080)	-0.35977	(0.31078)
L.Return52Weeks	-0.03541	(0.24743)	-0.16699	(0.24861)
NumberofAnalysts	0.04693*	(0.02185)	0.04528*	(0.02158)
Risk	1.68250	(1.29071)	2.25912+	(1.30884)
Float	1.67887***	(0.44358)	1.68516***	(0.44133)
Payout	-5.41691*	(2.14873)	-5.09559*	(2.09614)
Goodwill	2.21923	(1.46506)	2.29110	(1.47105)
Intangibles	2.82823*	(1.37192)	2.43589+	(1.35787)
FixedAssets	0.19885	(0.49156)	0.15586	(0.48670)
BATH==1	0.68730***	(0.18928)	0.66680***	(0.18753)
SMOOTH==1	0.86961***	(0.26215)	0.83806**	(0.25964)
LogExchangeTradedDebt			0.03833*	(0.01590)
Constant	-4.71842***	(1.12462)	-4.12274***	(1.09079)
lnsig2u	1.19831***	(0.24008)	1.15746***	(0.24267)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	No		Yes	
Pseudo R^2				
AIC	2.17e+03		2.16e+03	
BIC	2.43e+03		2.46e+03	
ll	-1034.985		-1025.961	
chi2	4880.637		4732.381	
p	0.000		0.000	
converged	1.000		1.000	
Observations	1864		1864	

Standard errors in parentheses

$^{+}\ p < 0.1$, $^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

A.7 All firms, without sample selection criteria

Table 43: Pooled Logit Models - All firms

	(1)		(2)	
DummyExchangeTradedDebt	0.25339***	(0.04907)		
Debt	0.44951***	(0.06843)	0.44151***	(0.06852)
Debt × Debt	-0.09213***	(0.02017)	-0.09044***	(0.02018)
ShortTerm	0.09932+	(0.05098)	0.10323*	(0.05095)
NetDebtIssued	-0.22477*	(0.10987)	-0.22304*	(0.10985)
BTM	0.15616***	(0.02964)	0.15614***	(0.02963)
ADJ_ROA	-0.00662***	(0.00173)	-0.00662***	(0.00173)
Return52Weeks	-0.13777***	(0.02830)	-0.13759***	(0.02828)
L.Return52Weeks	-0.04400*	(0.01937)	-0.04398*	(0.01936)
NumberofAnalysts	0.04041***	(0.00368)	0.03912***	(0.00371)
Risk	1.29391***	(0.21489)	1.29976***	(0.21493)
Float	0.36421***	(0.08644)	0.36172***	(0.08646)
Payout	-0.79021	(0.54361)	-0.79544	(0.54381)
Goodwill	0.54483**	(0.20653)	0.54342**	(0.20689)
Intangibles	0.79811***	(0.21422)	0.79196***	(0.21435)
FixedAssets	0.25686*	(0.11222)	0.25507*	(0.11223)
BATH==1	0.46973***	(0.03533)	0.46788***	(0.03534)
SMOOTH==1	0.48815***	(0.03426)	0.48672***	(0.03425)
LogExchangeTradedDebt			0.01531***	(0.00277)
Constant	-1.88500***	(0.24045)	-1.62767***	(0.23577)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.124		0.124	
AIC	4.24e+04		4.23e+04	
BIC	4.28e+04		4.28e+04	
coxsnell	0.151		0.151	
nagelkerke	0.206		0.206	
area	0.729		0.729	
ll	-2.11e+04		-2.11e+04	
chi2	2142.042		2144.443	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	66.593		66.582	
P_p1	65.063		64.989	
P_n0	67.493		67.519	
Observations	36579		36579	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.8 Firms with *Goodwill* between the 1st and 4th quintiles of the statistical distribution

Table 44: Pooled Logit Models - Firms that met the BTM Criterion - Goodwill Quintiles 1 to 4

	(1)		(2)	
DummyExchangeTradedDebt	0.20544*	(0.09627)		
Debt	0.28366**	(0.10445)	0.27952**	(0.10441)
Debt × Debt	-0.04879+	(0.02892)	-0.04832+	(0.02891)
ShortTerm	0.19358+	(0.10006)	0.19676*	(0.10007)
NetDebtIssued	-0.05531	(0.16049)	-0.05525	(0.16047)
BTM	0.08189+	(0.04828)	0.08251+	(0.04828)
ADJ_ROA	-0.01256+	(0.00649)	-0.01257+	(0.00649)
Return52Weeks	-0.32662***	(0.09706)	-0.32539***	(0.09705)
L.Return52Weeks	0.07114	(0.06828)	0.07122	(0.06829)
NumberofAnalysts	0.04900***	(0.00833)	0.04758***	(0.00843)
Risk	1.45785**	(0.46438)	1.45564**	(0.46426)
Float	0.57739***	(0.17323)	0.57685***	(0.17318)
Payout	-0.12758	(0.80556)	-0.12169	(0.80385)
Intangibles	1.81643**	(0.62393)	1.81764**	(0.62416)
FixedAssets	-0.14468	(0.19777)	-0.14552	(0.19773)
BATH==1	0.43620***	(0.06808)	0.43440***	(0.06807)
SMOOTH==1	0.50706***	(0.06934)	0.50628***	(0.06934)
LogExchangeTradedDebt			0.01341*	(0.00551)
Constant	-1.88988**	(0.62760)	-1.68400**	(0.62092)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.139		0.139	
AIC	9.99e+03		9.99e+03	
BIC	1.04e+04		1.04e+04	
coxsnell	0.169		0.169	
nagelkerke	0.229		0.230	
area	0.740		0.740	
ll	-4943.304		-4942.140	
chi2	655.835		657.410	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	66.931		67.024	
P_p1	68.220		68.130	
P_n0	66.106		66.316	
Observations	8579		8579	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 45: Pooled Logit Models - Firms that met the ROA Criterion - Goodwill Quintiles 1 to 4

	(1)		(2)	
DummyExchangeTradedDebt	0.14194	(0.11138)		
Debt	0.25614*	(0.12513)	0.25147*	(0.12513)
Debt × Debt	-0.03757	(0.03498)	-0.03691	(0.03498)
ShortTerm	0.21441+	(0.11654)	0.21711+	(0.11657)
NetDebtIssued	0.11959	(0.19374)	0.12007	(0.19371)
BTM	0.03890	(0.05460)	0.03935	(0.05458)
ADJ_ROA	-0.01246	(0.00932)	-0.01252	(0.00934)
Return52Weeks	-0.53865***	(0.14126)	-0.53730***	(0.14120)
L.Return52Weeks	-0.03106	(0.09051)	-0.03119	(0.09047)
NumberofAnalysts	0.05149***	(0.00999)	0.05023***	(0.01012)
Risk	1.51002**	(0.54600)	1.50583**	(0.54589)
Float	0.78735***	(0.20488)	0.78598***	(0.20479)
Payout	-0.05641	(1.02760)	-0.05313	(1.02518)
Intangibles	2.79632**	(0.87571)	2.79706**	(0.87561)
FixedAssets	-0.27614	(0.22738)	-0.27625	(0.22741)
BATH==1	0.40409***	(0.08026)	0.40276***	(0.08027)
SMOOTH==1	0.56344***	(0.09162)	0.56302***	(0.09163)
LogExchangeTradedDebt			0.00975	(0.00639)
Constant	-1.98507**	(0.72388)	-1.84247*	(0.71550)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.137		0.137	
AIC	6.26e+03		6.26e+03	
BIC	6.61e+03		6.61e+03	
coxsnell	0.169		0.169	
nagelkerke	0.228		0.228	
area	0.740		0.740	
ll	-3075.220		-3074.707	
chi2	454.465		455.752	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	66.174		66.212	
P_p1	71.135		71.088	
P_n0	62.787		62.883	
Observations	5277		5277	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 46: Pooled Logit Models - Firms that met the F-Score Criterion - Goodwill Quintiles 1 to 4

	(1)		(2)	
DummyExchangeTradedDebt	0.41597*	(0.20349)		
Debt	0.46938^{+}	(0.24737)	0.47154^{+}	(0.24736)
Debt × Debt	-0.15542^{+}	(0.08771)	-0.15591^{+}	(0.08780)
ShortTerm	0.18563	(0.17796)	0.18688	(0.17794)
NetDebtIssued	-0.27184	(0.27344)	-0.27162	(0.27358)
BTM	0.15912*	(0.08045)	0.15911*	(0.08050)
ADJ_ROA	-0.00611	(0.01230)	-0.00616	(0.01231)
Return52Weeks	-0.39937^{+}	(0.23333)	-0.40146^{+}	(0.23354)
L.Return52Weeks	-0.08961	(0.17625)	-0.08940	(0.17628)
NumberofAnalysts	0.03020^{+}	(0.01629)	0.02909^{+}	(0.01638)
Risk	1.85422*	(0.89864)	1.85561*	(0.89883)
Float	0.99287**	(0.31359)	0.99437**	(0.31364)
Payout	-3.34872*	(1.46907)	-3.34590*	(1.46924)
Goodwill	28.57017***	(6.95825)	28.58356***	(6.96558)
Intangibles	2.90500**	(1.11200)	2.91190**	(1.11330)
FixedAssets	0.07359	(0.34486)	0.06895	(0.34496)
BATH==1	0.48009***	(0.13526)	0.48060***	(0.13529)
SMOOTH==1	0.55405**	(0.19440)	0.55487**	(0.19443)
LogExchangeTradedDebt			0.02345*	(0.01172)
Constant	-3.98859***	(0.82720)	-3.57490***	(0.79666)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.162		0.162	
AIC	2.02e+03		2.02e+03	
BIC	2.31e+03		2.31e+03	
coxsnell	0.194		0.194	
nagelkerke	0.264		0.264	
area	0.768		0.768	
ll	-955.512		-955.584	
chi2	.		.	
p	.		.	
converged	1.000		1.000	
P_corr	66.919		67.036	
P_p1	79.479		79.479	
P_n0	59.211		59.398	
Observations	1717		1717	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.9 Firms with *goodwill* in the 5th quintile of the statistical distribution

Table 47: Pooled Logit Models - Firms that met the BTM Criterion- Goodwill 5th Quintile

	(1)		(2)	
DummyExchangeTradedDebt	0.15089	(0.28755)		
Debt	0.17581	(0.32518)	0.17951	(0.32622)
Debt × Debt	-0.05350	(0.10032)	-0.05429	(0.10060)
ShortTerm	-0.21211	(0.32034)	-0.21364	(0.32047)
NetDebtIssued	-1.47982*	(0.70272)	-1.48163*	(0.70301)
BTM	0.32754*	(0.14470)	0.32844*	(0.14461)
ADJ_ROA	-0.01697	(0.02414)	-0.01689	(0.02410)
Return52Weeks	-0.59706*	(0.26346)	-0.59641*	(0.26330)
L.Return52Weeks	-0.31885	(0.21636)	-0.31868	(0.21646)
NumberofAnalysts	0.05698**	(0.01891)	0.05721**	(0.01973)
Risk	2.14329	(1.71918)	2.14256	(1.71793)
Float	0.71712	(0.44946)	0.72157	(0.44933)
Payout	-1.61711	(1.90689)	-1.64449	(1.90369)
Intangibles	-1.02505	(0.91230)	-1.02040	(0.91230)
FixedAssets	0.75135	(0.73300)	0.74725	(0.73285)
BATH==1	1.13676***	(0.21239)	1.13535***	(0.21230)
SMOOTH==1	0.86808***	(0.22343)	0.86662***	(0.22348)
LogExchangeTradedDebt			0.00666	(0.01577)
Constant	-1.20704	(1.11481)	-1.05735	(1.05427)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.211		0.211	
AIC	1.15e+03		1.15e+03	
BIC	1.41e+03		1.41e+03	
coxsnell	0.253		0.253	
nagelkerke	0.338		0.338	
area	0.797		0.797	
ll	-523.119		-523.193	
chi2	176.467		176.519	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	71.488		71.592	
P_p1	87.234		87.234	
P_n0	53.153		53.378	
Observations	961		961	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 48: Pooled Logit Models - Firms that met the ROA Criterion- Goodwill 5th Quintile

	(1)		(2)	
DummyExchangeTradedDebt	0.29354	(0.42678)		
Debt	-0.04118	(0.41704)	-0.02606	(0.41806)
Debt × Debt	-0.04689	(0.12875)	-0.05050	(0.12915)
ShortTerm	-0.25901	(0.43958)	-0.26759	(0.43994)
NetDebtIssued	-2.21704^{+}	(1.21736)	-2.20665^{+}	(1.22132)
BTM	0.49224**	(0.17510)	0.49455**	(0.17438)
ADJ_ROA	-0.01315	(0.03479)	-0.01299	(0.03455)
Return52Weeks	-0.46622	(0.36969)	-0.45657	(0.36929)
L.Return52Weeks	-0.22341	(0.32300)	-0.22012	(0.32305)
NumberofAnalysts	0.07377**	(0.02760)	0.07529**	(0.02852)
Risk	4.16426^{+}	(2.29350)	4.17019^{+}	(2.29865)
Float	0.56943	(0.62115)	0.57471	(0.61980)
Payout	-6.66029	(4.08529)	-6.72039^{+}	(4.08122)
Intangibles	-1.34679	(1.40971)	-1.34345	(1.41027)
FixedAssets	1.17919	(1.03165)	1.16590	(1.03277)
BATH==1	0.87386**	(0.28561)	0.87073**	(0.28562)
SMOOTH==1	0.41995	(0.33985)	0.41847	(0.33931)
LogExchangeTradedDebt			0.01135	(0.02322)
Constant	-2.16874^{+}	(1.29590)	-1.87008	(1.14905)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.213		0.212	
AIC	647.85297		648.21546	
BIC	864.40442		864.76690	
coxsnell	0.249		0.248	
nagelkerke	0.336		0.336	
area	0.797		0.797	
ll	-272.926		-273.108	
chi2	99.591		100.467	
p	0.000		0.000	
converged	1.000		1.000	
P_corr	72.093		72.093	
P_p1	92.605		92.283	
P_n0	40.976		41.463	
Observations	516		516	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 49: Pooled Logit Models - Firms that met the F-Score Criterion- Goodwill 5th Quintile

	(1)		(2)	
DummyExchangeTradedDebt	2.43226*	(1.21354)		
Debt	-3.15149	(2.35661)	-3.16144	(2.34797)
Debt × Debt	0.79856	(0.71512)	0.79419	(0.70929)
ShortTerm	0.13463	(1.39975)	0.12525	(1.39661)
NetDebtIssued	-6.25312*	(2.56948)	-6.24612*	(2.58020)
BTM	1.16747+	(0.66211)	1.17023+	(0.65642)
ADJ_ROA	0.06633	(0.07621)	0.06761	(0.07610)
Return52Weeks	3.88215*	(1.60056)	3.92955*	(1.60200)
L.Return52Weeks	-2.08641	(1.41339)	-2.06224	(1.41183)
NumberofAnalysts	0.04633	(0.09337)	0.04070	(0.09432)
Risk	-12.17854	(9.35893)	-12.00880	(9.35563)
Float	4.68563+	(2.55192)	4.70900+	(2.57935)
Payout	-25.74986	(16.14060)	-25.65411	(16.18522)
Goodwill	-6.94034+	(3.63895)	-7.04161+	(3.65661)
Intangibles	0.67871	(2.58440)	0.69802	(2.58193)
FixedAssets	-2.40033	(3.49307)	-2.39556	(3.48269)
BATH==1	2.45844+	(1.48570)	2.42360	(1.48440)
SMOOTH==1	1.96617	(1.20012)	1.95674+	(1.18513)
LogExchangeTradedDebt			0.14296*	(0.06963)
Constant	-2.62749	(2.47355)	-0.17054	(2.68921)
Industry Fixed-effects	Yes		Yes	
Country Fixed-effects	Yes		Yes	
Year Fixed-Effects	Yes		Yes	
Pseudo R^2	0.500		0.500	
AIC	190.25266		190.28858	
BIC	328.17293		328.20886	
coxsnell	0.500		0.500	
nagelkerke	0.667		0.667	
area	0.932		0.933	
ll	-48.126		-48.144	
chi2	.		.	
p	.		.	
converged	1.000		1.000	
P_corr	82.014		82.014	
P_p1	92.958		92.958	
P_n0	70.588		70.588	
Observations	139		139	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.10 Treatment Effects measured by Inverse Probability Weighting (IPW)

Calendar year of estimation: 2011

Table 50: Treatment Effects

		(1) P(Impairment)
ATE		
r1vs0.DummyExchangeTradedDebt	-0.00977	(0.02431)
POmean		
DummyExchangeTradedDebt=0	0.22383***	(0.01531)
TME1		
DebtQuitile==2	1.01491**	(0.34083)
DebtQuitile==3	1.49321***	(0.33255)
DebtQuitile==4	1.95542***	(0.33797)
DebtQuitile==5	2.36575***	(0.35340)
ShortTerm	-1.42841***	(0.32132)
NetDebtIssued	0.45440*	(0.22061)
BTM	-0.24046+	(0.13178)
Return52Weeks	0.17444	(0.21068)
NumberofAnalysts	0.11093***	(0.01000)
Goodwill	-0.25876	(0.69125)
Intangibles	1.13347+	(0.63885)
BATH==1	0.27385	(0.19204)
SMOOTH==1	0.23498	(0.18406)
Constant	-1.88971*	(0.86695)
Industry Fixed-effects	Yes	
Country Fixed-effects	Yes	
Observations	1263	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Calendar year of estimation: 2012

Table 51: Treatment Effects

		(1) P(Impairment)
ATE		
r1vs0.DummyExchangeTradedDebt	0.05510*	(0.02509)
POmean		
DummyExchangeTradedDebt=0	0.32117***	(0.01414)
TME1		
DebtQuitile==2	0.93490***	(0.26827)
DebtQuitile==3	1.25866***	(0.26396)
DebtQuitile==4	1.54577***	(0.26385)
DebtQuitile==5	1.96961***	(0.27931)
ShortTerm	-1.13211***	(0.24960)
NetDebtIssued	0.92662*	(0.38557)
BTM	-0.35796***	(0.10510)
Return52Weeks	-0.57660**	(0.18376)
NumberofAnalysts	0.08294***	(0.00847)
Goodwill	-0.12612	(0.54122)
Intangibles	1.32651**	(0.51202)
BATH==1	0.54379***	(0.14378)
SMOOTH==1	0.22875	(0.14854)
Constant	-2.76538***	(0.63615)
Industry Fixed-effects	Yes	
Country Fixed-effects	Yes	
Observations	1854	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Calendar year of estimation: 2013

Table 52: Treatment Effects

		(1) P(Impairment)
ATE		
r1vs0.DummyExchangeTradedDebt	0.01325	(0.01971)
POmean		
DummyExchangeTradedDebt=0	0.38049***	(0.01088)
TME1		
DebtQuitile==2	0.96831***	(0.22529)
DebtQuitile==3	1.36353***	(0.22296)
DebtQuitile==4	1.69599***	(0.22700)
DebtQuitile==5	2.09820***	(0.23507)
ShortTerm	-1.05553***	(0.16973)
NetDebtIssued	0.96596***	(0.28573)
BTM	-0.33287***	(0.08500)
Return52Weeks	-0.36221**	(0.11653)
NumberofAnalysts	0.09152***	(0.00801)
Goodwill	0.04372	(0.49328)
Intangibles	1.36099**	(0.44484)
BATH==1	0.04398	(0.10718)
SMOOTH==1	0.13662	(0.10719)
Constant	-3.60650***	(0.56472)
Industry Fixed-effects	Yes	
Country Fixed-effects	Yes	
Observations	3217	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Calendar year of estimation: 2014

Table 53: Treatment Effects

		(1) P(Impairment)
ATE		
r1vs0.DummyExchangeTradedDebt	0.03604	(0.03544)
POmean		
DummyExchangeTradedDebt=0	0.39791***	(0.01832)
TME1		
DebtQuitile==2	0.40920	(0.35007)
DebtQuitile==3	0.72772*	(0.34303)
DebtQuitile==4	1.05247**	(0.35698)
DebtQuitile==5	1.84522***	(0.37090)
ShortTerm	-1.76193***	(0.35497)
NetDebtIssued	-0.53415	(0.59374)
BTM	-0.20733	(0.15787)
Return52Weeks	-0.55758*	(0.26928)
NumberofAnalysts	0.13721***	(0.01209)
Goodwill	-0.16872	(0.70007)
Intangibles	0.00129	(0.62987)
BATH==1	0.58456**	(0.20977)
SMOOTH==1	0.51020**	(0.19703)
Constant	-4.20469***	(0.69146)
Industry Fixed-effects	Yes	
Country Fixed-effects	Yes	
Observations	1227	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Calendar year of estimation: 2015

Table 54: Treatment Effects

		(1) P(Impairment)
ATE		
r1vs0.DummyExchangeTradedDebt	0.03631^{+}	(0.02088)
POmean		
DummyExchangeTradedDebt=0	0.40632***	(0.01079)
TME1		
DebtQuitile==2	1.22115***	(0.27875)
DebtQuitile==3	1.39696***	(0.27706)
DebtQuitile==4	1.91148***	(0.28029)
DebtQuitile==5	2.25914***	(0.28614)
ShortTerm	-0.69728***	(0.16744)
NetDebtIssued	-0.66969^{+}	(0.39169)
BTM	-0.29193***	(0.08254)
Return52Weeks	-0.15092^{+}	(0.07805)
NumberofAnalysts	0.10304***	(0.00814)
Goodwill	0.01803	(0.48402)
Intangibles	1.33804**	(0.42715)
BATH==1	0.24909*	(0.12007)
SMOOTH==1	0.26777*	(0.10826)
Constant	-4.35738***	(0.53906)
Industry Fixed-effects	Yes	
Country Fixed-effects	Yes	
Observations	3186	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Calendar year of estimation: 2016

Table 55: Treatment Effects

		(1) P(Impairment)
ATE		
r1vs0.DummyExchangeTradedDebt	0.05403**	(0.02002)
POmean		
DummyExchangeTradedDebt=0	0.41130***	(0.01057)
TME1		
DebtQuitile==2	1.40043***	(0.26586)
DebtQuitile==3	1.63397***	(0.26355)
DebtQuitile==4	2.15797***	(0.26727)
DebtQuitile==5	2.67711***	(0.27847)
ShortTerm	-0.57493***	(0.16187)
NetDebtIssued	-0.28074	(0.36833)
BTM	-0.38716***	(0.08929)
Return52Weeks	-0.55561***	(0.11729)
NumberofAnalysts	0.11660***	(0.00824)
Goodwill	0.51977	(0.45880)
Intangibles	1.00589*	(0.44399)
BATH==1	0.38626***	(0.11221)
SMOOTH==1	0.21994*	(0.10426)
Constant	-4.63523***	(0.55035)
Industry Fixed-effects	Yes	
Country Fixed-effects	Yes	
Observations	3376	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Calendar year of estimation: 2017

Table 56: Treatment Effects

		(1) P(Impairment)
ATE		
r1vs0.DummyExchangeTradedDebt	0.05051**	(0.01908)
POmean		
DummyExchangeTradedDebt=0	0.39686***	(0.01008)
TME1		
DebtQuitile==2	1.37667***	(0.25324)
DebtQuitile==3	1.67251***	(0.25058)
DebtQuitile==4	2.18349***	(0.25168)
DebtQuitile==5	2.54717***	(0.25987)
ShortTerm	-0.48113**	(0.15506)
NetDebtIssued	0.23473	(0.26505)
BTM	-0.55830***	(0.10210)
Return52Weeks	-0.28631**	(0.10496)
NumberofAnalysts	0.10826***	(0.00786)
Goodwill	0.41410	(0.43322)
Intangibles	1.17159**	(0.40079)
BATH==1	0.08625	(0.10924)
SMOOTH==1	0.37108***	(0.10126)
Constant	-4.49803***	(0.51823)
Industry Fixed-effects	Yes	
Country Fixed-effects	Yes	
Observations	3616	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Calendar year of estimation: 2018

Table 57: Treatment Effects

		(1) P(Impairment)
ATE		
r1vs0.DummyExchangeTradedDebt	0.08750***	(0.01954)
POmean		
DummyExchangeTradedDebt=0	0.41816***	(0.01052)
TME1		
DebtQuitile==2	1.46733***	(0.29018)
DebtQuitile==3	1.89709***	(0.28796)
DebtQuitile==4	2.43935***	(0.28903)
DebtQuitile==5	2.86569***	(0.29706)
ShortTerm	-0.46178**	(0.15431)
NetDebtIssued	0.39759	(0.28629)
BTM	-0.31654***	(0.07714)
Return52Weeks	-0.48379**	(0.14891)
NumberofAnalysts	0.12503***	(0.00850)
Goodwill	-0.71975	(0.45861)
Intangibles	0.95176*	(0.40923)
BATH==1	0.58223***	(0.10787)
SMOOTH==1	0.57235***	(0.10541)
Constant	-4.58533***	(0.55428)
Industry Fixed-effects	Yes	
Country Fixed-effects	Yes	
Observations	3436	

Standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$