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JOÃO PAULO AUGUSTO EÇA

ESSAYS ON DEBT RENEGOTIATION: DETERMINANTS, MARKET REACTION AND EARNINGS MANAGEMENT

ENSAIOS SOBRE RENEGOCIAÇÃO DE DÍVIDAS: DETERMINANTES, REAÇÃO DO MERCADO E GERENCIAMENTO DE RESULTADOS

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Tese apresentada ao Programa de Pós-Graduação em Controladoria e Contabilidade do Departamento de Contabilidade e Atuária da Faculdade de Economia, Administração, Contabilidade e Atuária da Universidade de São Paulo como requisito parcial para obtenção do título de Doutor em Ciências.

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RESUMO

EÇA, J. P. A. (2023). Essays on Debt Renegotiation: Determinants, Market Reaction and Earnings Management. (Tese de Doutorado, Universidade de São Paulo, São Paulo).

Nas empresas são formados contratos entre diferentes tipos de agentes. Funcionários, fornecedores, clientes, credores, todos estes são alguns exemplos de agentes que estabelecem relações contratuais em uma empresa. Esses contratos são considerados incompletos, afinal, no momento de sua elaboração, tem-se a impossibilidade de se especificar todas as contingências importantes que podem surgir *ex-post*. Dessa forma, os agentes podem incorporar mecanismos contratuais que permitam renegociar os termos de troca no futuro, fazendo com que a renegociação assuma um papel relevante nas firmas. Mais especificamente em relação à renegociação de dívida, estudos recentes têm apresentado resultados importantes em contextos como o norte-americano e europeu. Não obstante, pouco se tem conhecimento a respeito das renegociações de dívida em contextos diferentes, como aqueles encontrados em economias emergentes. Dessa forma, este estudo tem como objetivo examinar as renegociações de dívida para o contexto brasileiro, partindo de uma abordagem holística da renegociação, analisando-a em três perspectivas distintas: i) perspectiva do credor (quais são os fatores determinantes da renegociação?); ii) perspectiva de mercado (como o mercado reage à ocorrência da renegociação?); e iii) perspectiva do gestor (gestores gerenciam resultados a fim de obter sucesso nas renegociações?). A amostra selecionada para este estudo compreende todas as empresas não financeiras listadas na B3. O período de análise é de 2010 a 2021. Os dados sobre renegociação são inéditos, coletados manualmente a partir de análise de mais de três mil notas explicativas. O estudo da perspectiva dos credores mostrou que a mudança na condição financeira das empresas (por exemplo, lucratividade, alavancagem, tamanho) aumenta a probabilidade de renegociação de dívidas para as empresas brasileiras. Além disso, os resultados mostraram que uma perda na capacidade de pagamento da firma aumenta a probabilidade de a renegociação ter uma contrapartida. O estudo da perspectiva de mercado mostrou que o mercado de capitais reage positivamente ao anúncio de renegociação das empresas. No entanto, essa reação tende a ser menos intensa do que a apresentada em outros contextos, como o europeu e o norte-americano. Por fim, o estudo da perspectiva do gestor indicou a ocorrência de gerenciamento de resultados nos trimestres que antecedem a renegociação. No entanto, o gerenciamento de resultados ocorre para reduzir o lucro contábil. Mais especificamente, o estudo mostrou que as empresas em dificuldade financeira buscam evidenciar sua má situação financeira a fim de obter melhores termos na renegociação (por exemplo, suavização dos covenants). Portanto, os três ensaios oferecem um panorama importante das renegociações no contexto brasileiro, contribuindo assim para uma melhor compreensão das renegociações em economias emergentes e para o aprimoramento da tomada de decisão das empresas e dos credores.

Palavras-Chave: Renegociação de dívida. Waiver. Reação de Mercado. Gerenciamento de resultados.

ABSTRACT

EÇA, J. P. A. (2023). Essays on Debt Renegotiation: Determinants, Market Reaction and Earnings Management. (PhD dissertation, University of São Paulo, São Paulo).

Companies form contracts with different types of agents. Employees, suppliers, customers, and creditors are examples of agents who establish contractual relationships within a company. These contracts are considered incomplete since it is impossible to specify all the important contingencies that may arise ex-post. Therefore, agents can incorporate contractual mechanisms that allow them to renegotiate the terms of trade in the future, making the renegotiation assume a relevant role in the firms. Specifically concerning debt renegotiation, recent studies have shown important results in the United States and European contexts. Nevertheless, we know little about debt renegotiations in different contexts, such as those found in emerging economies. Thus, I aim to examine debt renegotiations in the Brazilian context, starting from a holistic approach, analyzing debt renegotiation from three different perspectives: i) the creditor's perspective (what are the determinants of renegotiation?); ii) the market perspective (how does the market react to the occurrence of renegotiation?); and iii) manager's perspective (do managers manage income in order to be successful in renegotiations? The sample selected for this study comprises all non-financial companies listed on the Brazilian stock exchange (B3). The period of the analysis is from 2010 to 2021. Data on renegotiation are unprecedented, collected manually from the analysis of more than three thousand of notes to financial statements. The study of creditors' perspective showed that the change in the financial condition of companies (for example, profitability, leverage, size) increases the probability of debt renegotiation for Brazilian companies. Moreover, the results showed that a loss in the firm's ability to pay increases the probability of renegotiation having a compensation. The study of the market perspective showed that the capital market reacts positively to the announcement of firms' renegotiation. However, this reaction tends to be less intense than those presented in other contexts, such as European and U.S. Finally, the study of managers' perspective indicated the occurrence of earnings management in the quarters that precede the renegotiation. However, earnings management occurs to reduce accounting profits. More specifically, the study showed that companies in financial difficulty seek to show their bad financial situation in order to obtain better renegotiation terms (for example, covenant softening). Therefore, the three essays offered a key overview of renegotiations in the Brazilian context, thus contributing to a better understanding of renegotiations in emerging economies and improving decision-making by companies and creditors.

Keywords: Debt renegotiation. Waiver. Market Reaction. Earnings management.

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ACRONYMS

B3: Brasil, Bolsa e Balcão

BNDES: Banco Nacional de Desenvolvimento Econômico e Social

BNB: Banco do Nordeste

CDS: Credit Default Swap

CAR: Cumulative Abnormal Return

CPC: Comitê de Pronunciamentos Contábeis

CVM: Comissão de Valores Mobiliários

FEA/USP: Faculdade de Economia, Administração e Contabilidade da Universidade de São Paulo

IFRS: International Financial Reporting Standards

NEFINFEA-USP: Núcleo de Pesquisa em Economia Financeira da Universidade de São Paulo

PSM: Propensity Score Matching

SEC: Securities and Exchange Commission

US: United States

SUMMARY

1 INTRODUCTION

The firm can be seen as a set of contracts between specialized agents that emerges as a mechanism of reducing transaction costs (Coase, 1937). According to Jensen and Meckling (1976), employees, suppliers, customers, and creditors are some examples of agents that establish contractual relations within a firm. Nevertheless, the contracts are incompletes, as shown by Grossman and Hart (1986) and Hart and Moore (1988). An incomplete contract arises given the difficulty (or impossibility) of specifying all future states or actions.

In Grossman and Hart (1986) study, the authors found that the impossibility of predicting all future contingencies in a contract can change agents' choices regarding the allocation of control rights. According to the theory elaborated by the authors, the difficulty in specifying the long list of the particular rights of each party in a contractual relationship makes the ownership acquisition a less costly option. In other words, the party that acquires the ownership purchase all rights except those specifically mentioned in the contract, thus avoiding having to specify in a contract all future actions. Moreover, Hart and Moore (1988) emphasize the importance of renegotiation in the context of contractual incompleteness. More specifically, the authors show that agents can incorporate mechanisms for revising future trade terms to compensate for contractual incompleteness. Therefore, by contributing to maintaining the contract in the long term, renegotiation emerges as a mechanism that deserves to be highlighted in the economy.

Specifically regarding debt renegotiation, for many years, studies have focused on analyzing it within the specific context of companies in default or bankruptcy (e.g., Gilson, 1990; Gilson, John, and Kang, 1990, Chen and Wei, 1993; Chava and Roberts, 2008). Nevertheless, Robert and Sufi (2009) emerged to develop a study on renegotiations outside the context of bankruptcy and default. Using a U.S. sample of renegotiations, Robert and Sufi (2009) show that the renegotiation triggers a significant change in value, maturity, and price of debt contracts and rarely occurs due to the difficulty or default of the borrower or covenant violation. According to the authors, the renegotiations are mainly triggered by the emergence of new information about firms' credit quality, investment opportunities, and macroeconomic fluctuation in capital and credit markets.

In a later study, Roberts (2015) examines renegotiations from a dynamic perspective, covering the entire life of loan contracts from origination to termination. He found that most renegotiations (46%) result in covenants’ modification. According to the author, the change in

covenants can be explained by the companies' desire to change their investment, financing, or operational strategies. Moreover, the borrower's financial difficulty only leads to covenant changes in the least part of the cases.

Close to Robert and Sufi (2009) and Roberts (2015), studies such as Godlewski (2014, 2015) focus on the renegotiations in European firms. These studies show that the characteristics of the renegotiations are different between the U.S. and European contexts. To sum up, compared to the U.S. context, renegotiations in Europe occur less frequently, later regarding the loan period, and present a difference in the terms renegotiated.

Other studies have also emerged investigating the relation between renegotiation and aspects as: i) investment decisions (e.g., Jiang, Liu & Yang, 2019); ii) market reaction (e.g., Godlewskil, 2015; Silaghi, Martín-Oliver & Sewaid, 2022); and iii) accounting information (e.g., Saleh & Ahmed, 2005; Dou, 2020; Dyreng et al., 2022).

However, there is a common point between most mentioned studies: they focus on developed economy contexts, mainly U.S. and European ones. In other words, few studies have been dedicated to investigating renegotiations in other contexts (e.g., Mourad, Schiozer and Santos, 2020).

Filling this gap is important because emerging economies have specific characteristics such as greater information asymmetry and agency costs, poor corporate governance, low protection of creditors' rights, less demanding disclosure requirements, and less enforcement (La Porta et al. 1998; Alali & Foote, 2012). These characteristics tend to increase the risk for creditors, making them more cautious in decisions involving renegotiations. Therefore, emergent economies' characteristics may change the dynamics of renegotiations and present different results from those in developed economies.

Therefore, I aim to offer a detailed analysis of the occurrence of debt renegotiations in an emerging economy context underexplored, namely the Brazilian context. More specifically, for a better understanding of the phenomenon, this study starts from a holistic approach to renegotiation, analyzing it from the perspective of the three agents most affected by the renegotiation: i) creditor perspective; ii) investor perspective; and iii) manager perspective.

The analysis from the creditor perspective focuses on searching determinants' factors of its occurrence. Broadly speaking, I investigated which companies' characteristics increase the company's likelihood of renegotiating contract terms and having compensations imposed by creditors.

The analysis from the investor perspective aimed to comprehend the stock market reaction when the firm discloses renegotiation. Due to information asymmetry and contract incompleteness, creditor limits borrowers' behavior by imposing restrictive contracts as tight and restrictive covenants. According to Godlewskil (2015), when renegotiation occurs, the contract is updated, incorporating new conditions and making it more efficient and complete. Therefore, I investigated whether renegotiations' disclosure relates to companies' abnormal returns.

Lastly, I analyzed the relationship between debt renegotiation and earnings management. Due to the flexibility of the accounting rules, managers have greater freedom to measure the company's accounting results, which can be called earnings management (Sincerre et al., 2016). Thus, the company's need to renegotiate its debts can generate greater incentives for managers to adopt accounting policies to increase the probability of renegotiation. Therefore, I analyzed whether, before renegotiation, managers manage their accounting results upwards to obtain favorable contractual changes, such as reducing the interest rate or increasing the loan amount.

Each analysis composes a different essay that offers a comprehensive overview of renegotiation in an emergent market context. I chose Brazilian companies because Brazil is a suitable setting for this study. First, Brazil has representativeness among emerging countries. In 2021, Brazil was one of the emerging countries with the highest corporate credit market. More specifically, in 2021, the country presented US$82 billion of total net corporate debt, representing 16% of emerging countries (Corporate Debt Index, 2021). Second, Brazil has reduced the offer of subsidized credit since 2014, strengthening the country's private credit market. Finally, in 2020 alone, the country's largest banks renegotiated more than 1 trillion reais in loan contracts (Rodrigues & Castro, 2021).

Another important aspect of this study is related to renegotiation information. This information comes from a hand-collected Brazilian sample that has not been previously documented or examined. I analyzed more than three thousands of notes to financial statements between the years 2010 to 2021. For each company that announced the debt renegotiation, I collected information about modified covenants and changes in the: i) loan amount; ii) term (maturity and grace period); and iii) interest rate. I combined the hand-collected data with quarterly accounting data and stock price data from Capital IQ.

I expect this study will contribute to the literature in different ways. Firstly, by offering evidence of renegotiation using a hand-collected sample of renegotiation in the

emergent economy, which differs from most previous studies. By focusing on an emerging country, specifically Brazil, I expect to offer evidence of whether renegotiation studies results' could be generalizable for a context other than U.S. and Europe. This study did not cover other countries due to the difficulty of collecting information about renegotiations (which must be collected manually).

Secondly, this is one of the first studies to present an overview of the renegotiation in Brazil. Mourad et al. (2020) developed research on debt renegotiation in Brazil. However, the authors focused on renegotiations of distressed debts. Using a hand-collected sample allows me to use a broader concept of renegotiation, amplifying the empirical evidence about renegotiation.

Third, as far as I know, this is the first study that aims to analyze the relationship between earnings management and debt renegotiation outside the specific context of covenant violation. This novelty expands our knowledge about the phenomenon and opens space for new research.

Finally, this study also has a series of practical constructions. First, it shows the factors that increase the chances of companies getting renegotiations or having compensation in renegotiations. Therefore, companies can improve their decision-making or at least anticipate some renegotiation results.

Secondly, the study presented evidence that disclosing debt renegotiations triggers an increase in stock returns, thus showing that investors value renegotiations. Therefore, the study shows that debt renegotiation can be a strategy to company increase the shareholders' value perception.

Thirdly, the study alerts creditors about the possibility of accounting manipulation to increase bargaining power in renegotiations. This warning is important given that the creditor's decision to renegotiate can be based on numbers that do not represent the company' financial essence, leading it to assume unforeseen risks.

2 AN OUTLOOK OF THE DEBT RENEGOTIATION OF BRAZILIAN PUBLICLY LISTED FIRMS IN THE PERIOD 2010-2021

2.1 Introduction

Debt contracts are drawn up between creditors and borrowers in order to establish conditions (rights and duties) to which both parties must be subject over a period. Therefore, in a credit agreement are defined: value, interest rate, maturity, grace period, guarantees, restrictions (covenants), penalties, among others (Armstrong, Guay & Weber, 2010).

At some point during the contractual period, borrowers or lenders could become unable or unwilling to commit to the contracts' initial terms. On these occasions, debt contract renegotiation becomes an important instrument in the relationship between creditor and borrower. After all, renegotiation allows changes in the contractual terms, eliminating the need to draw up a new contract.

Through the lens of the incomplete contract framework, renegotiation arises precisely because of the impossibility of transacting parties to predict or describe all future states of the world when writing the initial contract (Xiang, Wang and Basu, 2022). So, renegotiation serves as a way of completing ex-post contracts.

This contractual incompleteness can be derived from different factors. Firstly, because of information asymmetry: the lender does not fully know the borrower's real intention to take out the loan and his willingness to pay. According to Xiang et al., (2022), if the creditor cannot identify the borrower's future actions, he cannot develop a contract that contemplates such actions.

However, it is not just information asymmetry that makes contracts incomplete. Authors such as Armstrong et al. (2010) and Xiang et al. (2022) state that the contracts would be incomplete even if it were possible to predict all borrower's future actions once the cost to incorporate them is prohibitive. For Xiang et al. (2022), costs such as excessive paper, hours, and legal fees to craft detailed action plans to address each future event would make a complete contract unfeasible. Therefore, contractual incompleteness highlights the importance of debt renegotiation for contractual relationships.

Renegotiations can also be analyzed from the point of view of creditor control rights. Overall, creditors can control the behavior of borrowers through renegotiations (Nikolaev, 2018). For example, in exchange for debt renegotiation, creditors may demand changes to suboptimal management strategies. In short, for Xiang et al. (2022), when deciding whether to

renegotiate and how to review contracts, lenders affect the borrower's incentives and actions over the life of a loan.

Therefore, through the lens of both information asymmetry and creditor protection rights, renegotiation plays an important role in the relationship between creditor and borrower. Furthermore, this importance can be even higher in contexts of high information asymmetry and low creditor rights protection, as in the case of emerging economies. After all, the renegotiations can reduce the information asymmetry between the creditor and borrower and increase the creditor's control over the borrower's actions.

Despite the importance, little is known about renegotiations in emerging economy contexts. The few studies that sought to provide an overview of renegotiations have focused on developed countries. For example, Roberts and Sufi (2009) and Roberts (2015) developed their studies considering the renegotiations of U.S. companies.

In general, these studies identified important characteristics regarding the occurrence of bank loan renegotiation in the U.S. market. First, almost all the credit agreements analyzed were renegotiated before maturity and several times. A typical loan has an original maturity of four and a half years, but is renegotiated nearly five times. Furthermore, the study revealed that the most renegotiated contractual terms are maturity extension and additional credit.

In the study by Godlewski (2014), the author outlined an overview of the renegotiations of European companies. The study identified that 64% of loans were renegotiated only once. In addition, the main renegotiated terms are: the amount (40% of renegotiations), followed by maturity (26%) and covenants (12%). The study also identified that more than half of the loans are secured, while 43% have some covenants.

Therefore, unlike Roberts and Sufi (2009), Godlewski (2014) and Roberts (2015), this chapter seeks to provide an overview of renegotiations in an emerging economy, more specifically, in Brazil. To develop a database on renegotiation in Brazil, I performed extensive hand-collection data, analyzing over three thousand notes to the financial statement. This analysis allowed for a better understanding of the renegotiation occurrence in Brazil and served as a basis for developing essays 1, 2 and 3, presented in chapters 3, 4 and 5.

2.2 Renegotiation Data

To outline an overview of negotiations in Brazil, I collected data from a sample of all 346 non-financial companies listed on B3 (Brasil, Bolsa and Balcão) in 2021. The analyzed period was from 2010 to 2021. I performed analyses directly from the notes to the financial

statements to identify the companies that completed debt renegotiations over the period. I searched for terms often used to describe contractual changes as “renegotiation”, “financial restructure”, “covenants”, “waiver”, “reclassified debt”, “consent”, “renegotiated conditions”, “debt restructuring”, “addition” among others. Therefore, I analyzed hand-collected data from over three thousand notes to the financial statements.

After having identified the renegotiations, I adopted two procedures. The first was the identification of the renegotiation quarter. Most companies reveal the data of renegotiation in the notes to the financial statements. However, when the renegotiation date was not available on the financial statement, I considered the quarter of the statement where renegotiation is first mentioned. For example, if the renegotiation appears on the financial statement of 2º, 3º and 4º quarter, I consider the 2º quarter as occurrence period because it is the first in which renegotiation is mentioned.

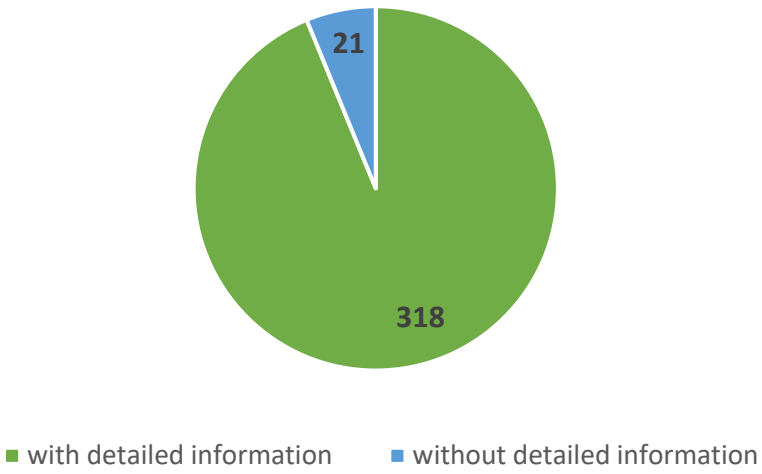
The second procedure involved gathering the renegotiation’s details. At this stage, in addition to reading explanatory notes, I also considered documents such as “Relevant Facts”, “Notice to the Market”, “Minutes of the Debenture Holders’ Meeting” and “Reference Forms”. Based on this analysis, it was possible to collect information regarding: i) renegotiated contractual terms; ii) compensation required by the creditor for renegotiation; and iii) creditor characteristics.

Finally, when more than one renegotiation was disclosed in the same quarter, I collected information about renegotiation only from the highest-value renegotiation. To sum up, I identified 339 renegotiations over the entire period, which will be detailed below.

2.3 Overview of the Debt Renegotiation of companies listed on the B3

This section presents an overview of the renegotiations of 346 listed companies in Brazil. Of the 346 companies, only 118 had renegotiations over the period. Furthermore, of the companies that renegotiated, there were 339 renegotiations (some renegotiated more than once), as shown in figure 2.1. However, 21 renegotiations did not provide further details, such as the quarter that took place or the renegotiated terms. For this reason, I focused the analysis on the remaining 318 renegotiations.

Figure 2.1. Total of Renegotiations (2010-2021)

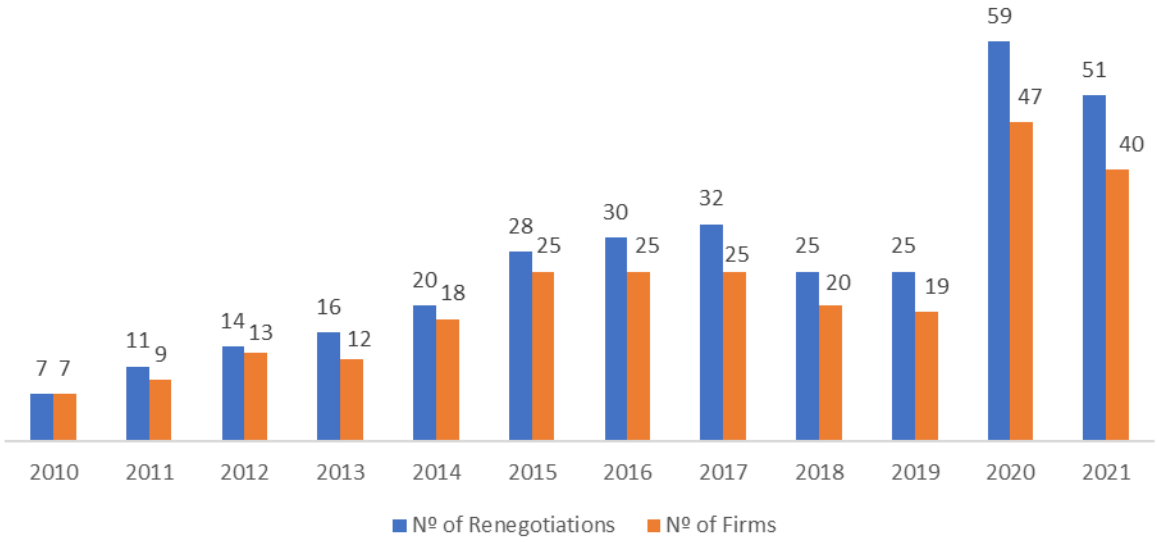


Note: There were 346 companies analyzed.

Another important fact to be mentioned is that, over the period, there were 41 failed renegotiation attempts. In other words, there were 41 situations in which the creditor did not accept the company's request to renegotiate the contractual terms. This denial of the request for renegotiation often results in breaches of covenants.

Of the 318 renegotiations surveyed, more than a third (110) of them took place in 2020 and 2021, according to figure 2.2. This result may reveal a possible impact of the Covid-19 pandemic on renegotiations. More specifically, with the drop in revenue, cost increase and a greater need to borrow, many companies may have sought to renegotiate contractual terms with their creditors, which would explain this significant renegotiation increase.

Figure 2.2. Number of Renegotiations and Firms per Year



Note: The total sample was 346 companies. There were 318 renegotiations analyzed from 118 companies.

One could argue that the results presented in Figure 2.2 are explained by the fact that the database was built only with companies that were publicly traded in 2021 and, therefore, many of them could not have had financial information disclosed in the previous years. However, of the 118 companies that presented renegotiation information in the period, 92 have information disclosed for the entire sample period.

In relation to the quarter in which the renegotiations occur, table 2.1 reveals that more than 50% of the renegotiations occur in the last quarter of the year.

Table 2.1. Number of Renegotiations per Quarter

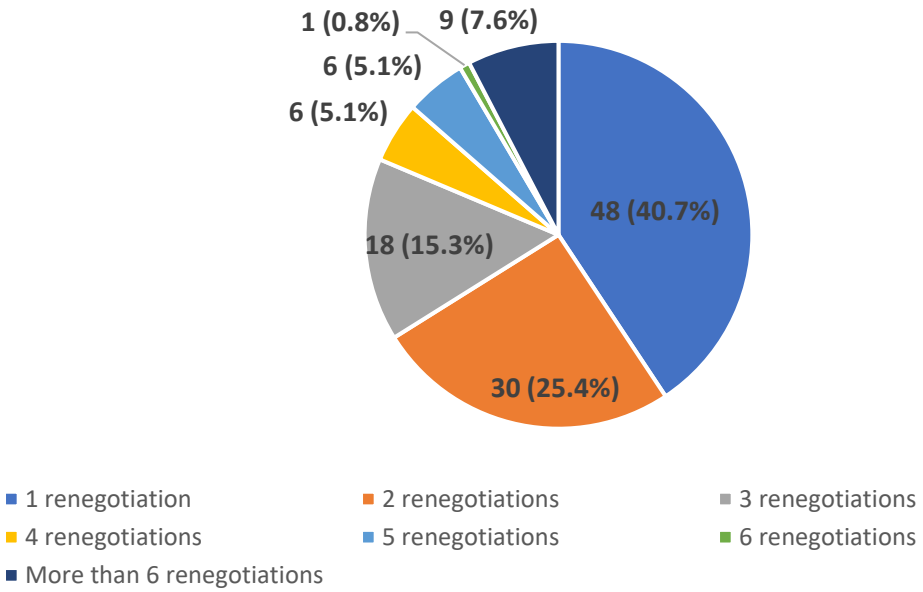
Quarters	**Number of Renegotiations**	**%**
First Quarter	34	11%
Second Quarter	69	22%
Third Quarter	55	17%
Fourth Quarter	160	50%
Total	**318**	**100%**

Note: The total sample was 346 companies. There were 318 renegotiations analyzed from 118 companies.

As mentioned earlier, of the 346 companies in the base, 118 renegotiated debt over the period analyzed. Therefore, on average, there were more than two renegotiations per company. However, Figure 2.3 shows that there is a relevant dispersion of data. More than

40% renegotiated only one time. About 25% were renegotiated twice and the rest more than three times over the period. Notably, among the almost 8% of companies that renegotiated more than six times, “Gol Linhas Aéreas S.A.” renegotiated 28 times. Most of “Gol's” renegotiations took place in 2016 and involved extending the payment period. These data may reflect the Brazilian economic crisis in 2015 and the crisis caused by the Covid-19 pandemic in 2020 and 2021.

Figure 2.3. Number of Renegotiations per Company



Note: The total sample was 346 companies. There were 318 renegotiations analyzed from 118 companies.

Table 2.2 reveals the frequency of renegotiation types. In other words, all the renegotiations are related to: obtaining a waiver, reducing the interest rate, extending of payment term or increasing the loan amount. According to table 2.2, payment term increases (both the term of the financing agreement and the grace period for payment) represent 45% of renegotiations. Waiver requests are also relevant, with 45% of the renegotiations. It is worth mentioning that the total of renegotiations presented in table 2.2 exceeds 318 renegotiations presented in table 2.1. because in some situations, the companies renegotiated more than one contractual term.

Table 2.2. Types of Renegotiations

Types of Renegotiations	Number of Renegotiations	%
Term Extension	163	45%
Waiver	161	45%
Interest Rate Reduction	29	8%
Increase in the Loan Amount	6	2%
Total	359	100%

Note: The total sample was 346 companies. There were 318 renegotiations analyzed from 118 companies. The total of renegotiations presented in table 2.2 exceeds 318 renegotiations because in some situations the companies renegotiated more than one contractual term.

The result presented in table 2.2 is close to Roberts (2015). The authors identified that a significant part of the renegotiations (54%) of the U.S. companies modify the interest rate, amount, or maturity. Furthermore, according to Roberts (2015), most renegotiations (46%) are related to changing covenants. In the case of European companies, most of the renegotiations (40%) are related to the increase in the amount (Godlewski, 2014).

Unlike Roberts (2015), in this study, the renegotiation of interest rates was not representative (8%). A considerable portion of the companies' debt was probably indexed to some interest rate, which reduces the need to renegotiate interest rate reductions.

When analyzing in more detail the renegotiations of 2020 and 2021 (table 2.3), periods in which the largest number of renegotiations took place, it is clear that there was a predominance of renegotiation of term extension.

Table 2.3. Types of Renegotiations in 2020 and 2021

Types of Renegotiations	Number of Renegotiations	%
Term Extension	65	54%
Waiver	42	35%
Interest Rate Reduction	12	10%
Increase in the Loan Amount	1	1%
Total	**120**	**100%**

Note: The total sample was 346 companies. There were 318 renegotiations analyzed from 118 companies.

Table 2.3 shows that more than 50% of the renegotiations in the period concern the increase in the contract term or the payment grace period. Besides that, 35% of renegotiations involve covenant waivers. Both results possibly reflect the effects of the Covid-19 pandemic on companies.

This study also revealed that most renegotiations (39%) are subject to compensation (table 2.4). More specifically, to obtain a waiver or an increase in contractual payment terms,

for example, sometimes companies accept an increase in the interest rate, an increase in the restrictions/conditions imposed, or even an increase in the guarantees. These were the three compensations identified in this research.

Table 2.4. Compensation of Renegotiations

Compensation of Renegotiations	**Number of Renegotiations**	**%**
No	195	61%
Yes	123	39%
Total	318	100%
Type of Compensation	**Number of Renegotiations**	**%**
Increase in Restrictions/Conditions Imposed	55	40%
Interest Increase	42	30%
Increase in Guarantees	41	30%
Total	138	100%

Note: The total sample was 346 companies. There were 318 renegotiations analyzed from 118 companies. The total of compensation types (138) exceeds the number of renegotiations with compensations (123) since some renegotiations involve more than one compensation.

According to table 2.4, most of the compensation involve increasing restrictions/conditions imposed by creditors (40%) (table 2.5 presents the details regarding these restrictions/conditions imposed). The increase in the interest rate represents 30% of the renegotiations and, finally, the increase in guarantees also represents 30%. Considering that some renegotiations have more than one compensation, the total of types of compensations (138) is greater than the total of renegotiations with compensations (123).

Table 2.5 details the main conditions/restrictions imposed by creditors.

Table 2.5. Restrictions/Conditions Imposed by Creditors

Restrictions/Conditions	**Number of Renegotiations**	**%**
Fee Payment	31	45.6%
Others	13	19%
More Restrictive Covenants	9	13.2%
Amortization of part of the debt	8	11.8%
Non-payment of dividends	5	7.3%
Cash Sweep	2	3%
Total	**68**	**100%**

Note: The total sample was 346 companies. There were 318 renegotiations analyzed from 118 companies. The total number of compensation identified was 138. The total of Restrictions/Conditions types (68) exceeds the number of renegotiations with Restrictions/Conditions Imposed (55) since some renegotiations involve more than one Restriction/Condition. Cash Sweep is related to the use of excess cash to pay debts that have not yet matured, instead of distributing them to shareholders

According to table 2.5, the most frequent condition imposed is the “fee payment”. In other words, in almost 46% of cases, the creditor establishes a fee payment due to renegotiation. Other conditions represent 19%. Examples of other conditions are: rating maintenance and shares public offering. Considering that some compensations have more than one restriction/condition, the total of types of restriction/condition (68) is greater than the total of renegotiations with restriction/condition (55).

Finally, Table 2.6 presents data related to the characteristics of creditors.

Table 2.6. Lender Characteristics

Lender Characteristics	**Number of Renegotiations**	**%**
Banks (Not Subsidized Credit)	142	44.7%
Banks (Subsidized Credit)	50	15.7%
Capital Market	126	39.6%
Total	**318**	**100%**
National Lender	283	89.0%
Foreign Lender	35	11.0%
Total	**318**	**100%**
Debt with Single Lender	194	61.0%
Debt with Different Lenders	124	39.0%
Total	**318**	**100%**

Note: The total sample was 346 companies. There were 318 renegotiations analyzed from 118 companies.

According to table 2.6, about 45% of the renegotiations were with banks. This category does not include financial institutions that grant subsidized credit (government loans at a lower-than-market interest rate), such as the National Bank for Economic and Social Development (BNDES) and Banco do Nordeste do Brasil (BNB). Renegotiations with these development banks represent only 15.7%. Debt renegotiation from the capital market corresponds to approximately 40%.

In terms of the nationality of the lender, the vast majority (89%) are lenders from Brazil. Finally, the study also pointed out that 61% of the renegotiations are with single lenders, such as banks or single debenture holders. On the other hand, 39% of the renegotiations are with different lenders as bank syndicates and dispersed debenture holders.

2.4 Concluding Remarks

Renegotiations are an important mechanism in the relationship between creditors and borrowers. In recent years, empirical studies have emerged focusing on debt renegotiation. However, in general, these studies focus on developed economies. Until then, little is known about the renegotiations of emergent economies, especially the Brazilian economy.

Based on a sample of publicly traded Brazilian companies, this study showed that, between 2010 and 2021, the last two years had the highest number of renegotiations, most likely due to the impact of the Covid-19 pandemic.

The study also showed that almost 50% of the companies that renegotiated in the period did so only once. Moreover, Waiver and Term Extension are the most renegotiated terms by companies, which differs from other results found for emerging economies (in which Waiver is not representative, and there is a more significant predominance of the Increased Loan Amount).

About 40% of the renegotiations had compensations demanded by the creditors. The most common compensation required in the renegotiations is the increase in restrictions/conditions. Furthermore, the fee payment is creditors' most imposed restriction/condition. Finally, the study also showed that most creditors are private banks (not subsidized credit).

Therefore, the information collected in this research allowed a better understanding of the context of renegotiations in Brazil. Furthermore, these results served as the basis for the analysis of the essays in chapters 3, 4 and 5.

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3 DEBT RENEGOTIATION: AN ANALYSIS OF ITS CHARACTERISTICS AND DETERMINANTS IN BRAZILIAN PUBLIC COMPANIES

3.1 Introduction

Companies form contracts with different types of agents. According to Jensen and Meckling (1976), employees, suppliers, customers, and creditors are some examples of agents that establish contractual relations within a firm. So, essentially, firms are legal fiction that emerges as a connection for contractual relations between different agents (Jensen & Meckling, 1976).

Specifically regarding contractual relations between company and creditor, global data reveal that this relationship has become increasingly intense. The volume of loans and financing contracted by companies has grown in recent years. In 2021, corporate debt soared to a total of 13.5 billion dollars, an increase of 45% compared to 2014 (Corporate Debt Index, 2021).

Given the expansion of the debt market and its importance in companies' balance sheets, one aspect deserves more attention: debt contract renegotiation. When the borrower and/or lenders are unable or unwilling to commit the contracts' initial terms, they may initiate a process to renegotiate the contract terms. For companies, renegotiation is important as it can improve financial health, for example, by reducing the interest rate or extending payment terms. Given its relevance to firms' financial health, the main focus of this study is to understand the dynamics of debt renegotiation.

For many years, studies have been limited to analyzing renegotiation only within the specific context of companies in default or bankruptcy (e.g., Gilson, 1990; Gilson, John, and Kang, 1990, Chen and Wei, 1993; Chava and Roberts, 2008). Robert and Sufi (2009) emerged intending to fill this gap in the literature. From a sample of U.S. companies' renegotiations, the authors sought to understand the frequency of renegotiations and their determinants. The authors showed that the accrual of new information concerning credit quality and outside options (existence of an alternative source of financing) could be considered predictors of renegotiation and its outcomes.

Unlike Robert and Sufi (2009), in a later study also with U.S. companies, Roberts (2015) examines renegotiations from a dynamic perspective, covering the entire life of loan contracts from origination to termination. According to the results, most renegotiations (46%) result in the modification of covenants. Moreover, in the least part of the cases, the covenant

renegotiation occurs due to the borrower's default. For Roberts (2015), most changes occur due to the companies' desire to change their investment, financing, or operational strategies.

Close to Robert and Sufi (2009) and Roberts (2015), studies such as Godlewski (2014) and Godlewski (2015) focus on the renegotiations in European firms. These studies show that the characteristics of the renegotiations are different between the U.S. and European contexts. In short, compared to the U.S. context, renegotiations in Europe occur less frequently, later regarding the loan period, and present a difference in the terms renegotiated.

Despite the importance of these studies, little is known about how renegotiations occur in a context different from U.S. or Europe, for example, in emerging economies. Unlike developed countries, emergents have greater information asymmetry, greater agency costs, and low protection of creditors' rights (La Porta et al. 1998; Machokotoa & Areneke, 2020). Due to these characteristics, the risk for the creditor tends to be greater in emerging economies. And this greater risk can change the dynamics of renegotiations in this context since creditors tend to be more cautious in their decisions. For this reason, I analyzed renegotiation and its determinants in an emergent market context: Brazilian companies.

This study analysis is based on a hand-collected sample of renegotiations from Brazilian companies not used in any previous study. The sample comprises all companies listed on the Brazilian stock exchange "B3" (Brasil, Bolsa e Balcão) in 2021. The renegotiation data comes from a revision of more than three thousand notes to financial statements between the years 2010 to 2021.

The results showed that changes in companies' financial condition (e.g., size, leverage and profitability) increase the probability of debt renegotiation for Brazilian companies. In addition, the results also showed that renegotiations are more likely to be accompanied by compensation when there is a worsening in the companies' ability to pay the debt. In other words, creditors tend to impose stricter conditions on renegotiations when the company has a worsening ability to pay (reduction of profitability, cash generation capacity and interest coverage ratio). Finally, the study also showed that, unlike banks, renegotiations with bondholders are more likely to have compensation.

This study contributes to the literature in different ways. Firstly, by expanding knowledge about renegotiation in a context that has not been addressed much in previous studies: an emerging market. Although Mourad et al. (2020) developed a study on renegotiations in Brazil, the authors focused on renegotiations of distressed debts. Therefore,

this study seeks to analyze renegotiations from a broader perspective (beyond the default context).

Second, this study adds to the literature by exploring compensations in renegotiations. This issue is very present in renegotiations but little explored in the literature. Third, unlike previous studies, this research considers renegotiations with bondholders, expanding knowledge about debt renegotiations. Fourth, this study contributes to the literature regarding funding sources. More specifically, the study showed that the intrinsic characteristics of the financing sources can be important determinants of renegotiation conditions.

Finally, this study offers a significant practical contribution, especially by showing companies the factors that tend to increase the chances of compensation in renegotiations. Therefore, companies can improve their decision-making or at least anticipate some renegotiation results.

3.2 Theoretical framework and hypothesis development

Firms are a nexus of contracts established between different agents to reduce transaction costs (Coase, 1937; Jensen & Meckling, 1976). Employees, suppliers, customers, and creditors are some examples of agents that establish contractual relations in a firm (Jensen & Meckling, 1976). At the time of drawing up these contracts, it is difficult to specify all the important contingencies that may arise ex-post, originating the so-called incomplete contracts widely discussed in seminal studies such as Grossman and Hart (1986) and Hart and Moore (1988). Therefore, to compensate for contractual incompleteness, agents can incorporate mechanisms for renegotiating future trade terms (Hart & Moore, 1988).

The renegotiation process begins when the borrower and/or lenders are unable or unwilling to commit the contracts' initial terms. Put it another way, the renegotiation begins when the borrower–lender relationship reaches a point where the initial contract terms generate inefficient outcomes (Godlewski, 2014). For example, eventually, borrowers wish to make decisions forbidden by the initial contract terms, such as increasing capital expenditure, undertaking an acquisition, selling assets, or increasing dividend payment (Godlewski, 2015a).

Empirical studies on debt renegotiation determinants are scarce in the literature, highlighting: Robert and Sufi (2009), Roberts (2015), Godlewski (2014) and Godlewski (2015b). Robert and Sufi (2009) analyzed a sample of 1,000 loan contracts from U.S.

companies. The authors identified that most contracts (75%) have an important term (maturity, principal, or interest) renegotiated before maturity. More specifically, the authors reveal that renegotiations tend to occur, on average, early in the loan's life. Moreover, less than 18% of renegotiations occur due to a breach of covenant or default. For the authors, the renegotiation is predicted by the accrual of new information concerning credit quality and outside options.

Subsequently, Roberts (2015) adopts a dynamic analysis of renegotiation that involves the entire life of loan contracts. As a result, the study indicated that most loans are renegotiated several times within a relatively short time frame, and each renegotiation triggers significant changes in contractual terms. The study also revealed that covenants tend to be modified much more frequently than other contractual terms during the loans' life. According to Roberts (2015, p.62), "these modifications are driven largely by borrowers' desires to alter their investment, operating, or financing policies and, to a lesser extent, by borrowers' financial distress." Finally, three main factors are related to the timing of renegotiation: i) parties' financial health; ii) borrowers' future profitability uncertainty; and iii) the outcome of renegotiation (Roberts, 2015).

Godlewski (2014) and Godlewski (2015b) differ from the previous studies since the focus is on European companies' renegotiations. To sum up, according to Godlewski (2014), in comparison with the U.S. context, in European companies, multiple renegotiations occur less frequently, and covenants are, on average, less renegotiated. On the other hand, most of the renegotiations (40%) are related to the increase in the loan amount. Besides that, the first renegotiation tends to occur later than in the U.S. In the subsequent study, Godlewski (2015b) identified that factors such as the complexity of the initial contract, the proximity between creditor and borrower, the characteristics of contractual changes and weak legal protection of creditors' rights determine renegotiations of European companies.

Collectively, studies on debt renegotiation focus mainly on companies in developed economies, especially in the United States and Europe. Therefore, I aim to find out the renegotiation determinants in a different context, characterized by information asymmetry and low protection of creditor's rights (La Porta et al., 1998; Machokotoa & Areneke, 2020).

In a scenario of information asymmetry, the creditor finds it challenging to assess the company's real situation and exercise efficient monitoring. In addition, low creditor's rights protection increases the creditor's risk of recovering the borrowed amount in case of borrowers' bankruptcy. For this reason, debt renegotiation can be an important instrument in

emerging economies to obtain new information from the borrower (reducing information asymmetry) and to reduce the possibility of borrowers' bankruptcy. Therefore, in an eventual reduction in the firm's ability to pay, lenders could use renegotiations to seek more information about the borrower and avoid his bankruptcy. So, hypothesis 1 of this study is:

H1: the worsening of companies' financial conditions can predict the occurrence of debt renegotiations.

An important aspect of debt renegotiation dynamics concerns the increase in creditor control through the imposition of compensation. In some cases, the acceptance of the renegotiation by the creditor may be subject to a restriction. For example, the renegotiation reduces the interest rate, but at the same time, the creditor imposes a more restrictive covenant. It is expected that a worsening in the companies' financial conditions could trigger the compensation in the renegotiation as a way to reduce the creditors' risks. Therefore, hypothesis 2 of this study is:

H2: the worsening of companies' financial conditions is positively related to the imposition of compensation in the renegotiation.

According to Armstrong, Guay and Weber (2010), the way creditors choose to exercise decision-making rights over the life of the contract depends on the formal terms of the contract and, in addition, on the information relationship established between the creditor and borrower. For this reason, the imposition of compensation in a renegotiation can also be related to the type of creditor.

Berlin and Loyes (1988) and Chemmanur and Fulghieri (1994) argue that banks operate from a long-term perspective, thus seeking to establish a closer relationship with borrowers. Nikolaev (2018) adds that being close to the borrower allows the lender to access informal information about the borrower, obtaining an informational advantage over external lenders. For this reason, banks are expected to be less willing to impose compensations on their borrowers. On the other hand, bondholders, in addition to having a shorter-term view (Lou & Otto, 2020), tend to have less access to soft information. Therefore, bondholders are more likely to demand compensation. So, hypothesis 3 of this study is:

H3: there is a positive and significant relationship between renegotiation with bondholders and the imposition of compensations.

3.3 Methods

3.3.1 Data and Sample

The analysis period covers all quarters between 2010 and 2021 for all non-financial companies listed in the Brazilian stock exchange "B3" (Brasil, Bolsa e Balcão). I chose 2010 because it was the starting period of Brazilian companies' full IFRS adoption, thus making the time-series comparable. In short, I analyzed more than three thousand notes to financial statements to identify whether and when renegotiation occurred and the renegotiation outcomes. Finally, I combined this data with quarterly accounting data from Capital IQ.

Initially, the base consisted of 16,608 observations (346 companies). I exclude all observations that: i) do not have any accounting information; ii) with total assets equal to zero; iii) the companies are undergoing judicial reorganization; iv) do not present details regarding the renegotiation; v) companies that did not show revenue in any of the sample periods. Therefore, 11,602 observations (326 companies) remained.

3.3.2 Renegotiation variables

I collected information about the renegotiations from the companies' notes to the financial statements[1]. Firstly, I analyzed annual financial statements to identify any renegotiation, searching for words as "renegotiation", "financial restructure", "covenants", "waiver", "reclassified debt", "consent", "renegotiated conditions", "debt restructuring", "addition" among others. After that, I identified the quarter of the renegotiation occurrence.

When the renegotiation date was not available on the financial statement, I considered the quarter of the statement where renegotiation was first mentioned. For example, if the renegotiation appears on the financial statement of 2º, 3º and 4º quarter, I considered the 2º quarter as occurrence period because it is the first in which renegotiation is mentioned.

After identifying all renegotiations, I analyzed the notes to financial statements, Relevant Facts ("Fatos Relevantes"), Notice to the Market ("Comunicado ao Mercado"),

[1] The data collection process was supported by the Laboratório de Finanças e Risco of FEA/USP

Debenture Holders Meeting Minutes ("Ata da Reunião de Debenturistas") and Reference Form ("Formulário de Referência"). Based on Roberts and Sufi (2009) and Roberts (2015) studies, I searched to identify all contractual terms changed (e.g., loan amount, interest rate, extension of maturity or grace period and covenant waiver). This information is not standardized. It means that some firms offered greater detail than others. Finally, when more than one renegotiation was disclosed in the same quarter, I collected information about renegotiation only from the highest-value renegotiation.

In Brazil, two norms govern the disclosure of renegotiations. Securities Commission Resolution – SCR - nº 44 (Resolução da Comissão de Valores Mobiliários - CVM – nº 44) deals with the rules for disclosing information on material acts or facts. Debt renegotiation is considered by the resolution as a material fact to be disclosed widely and immediately by companies.

Technical pronouncement of financial instruments "Accounting Pronouncements Committee – APC 40" (Comitê de Pronunciamentos Contábeis - CPC 40) deals with disclosing a contractual commitment breach in a note to the financial statement. Following that standard, an entity must disclose details of any breach of contract relating to loans. In addition, in case of contract renegotiation, the company must disclose the terms of such renegotiation.

3.3.3 Models

To identify determinants of renegotiation in the Brazilian context (Hypothesis 1), I estimate a logit model presented in Equation 3.1.

$$\begin{aligned} Reneg_{(i,t)} = {} & \beta_0 + \beta_1 Size_{(i,t-1)} + \beta_2\, Lev_{(i,t-1)} + \beta_3\, Ebitda_{(i,t-1)} + \beta_4\, MB_{(i,t-1)} \\ & + \beta_5\, Var\_Ebitda_{(i,t-1)} + \beta_6\, ROE_{(i,t-1)} + \beta_7\, IC\_Ratio_{(i,t-1)} \\ & + \beta_8\, Asset\_Int_{(i,t-1)} + \mu_i\, Industry\ FE + \sigma_i\, Time\ FE + e_{i,t} \end{aligned} \tag{3.1}$$

Where the dependent variable ($Reneg_{(i,t)}$) is one when any renegotiation is observed and zero otherwise; $Size_{(i,t-1)}$ is measured by natural logarithm of total assets; $Lev_{(i,t-1)}$ is leverage, obtained from interest-bearing liabilities over total assets; $Ebitda_{(i,t-1)}$ measured by Earnings Before Interest, Taxes, Depreciation and Amortization over total assets; $MB_{(i,t-1)}$ is Market-to-book, measured by market value of equity over book value of equity;

$Var\_Ebitda_{(i,t-1)}$ is variation of EBITDA ($Ebitda_{(t)} - Ebitda_{(t-1)}$) over total assets; $ROE_{(i,t-1)}$ is Return of Equity, measured by net income over market value of equity; $IC\_Ratio_{(i,t-1)}$ is interest coverage ratio, measured by EBIT over financial expense; and $Asset\_Int_{(i,t-1)}$ is asset intensity, measured by net property, plant, and equipment divided by total assets. Finally, I included dummies to control for the fixed effects of firm and time.

To test Hypothesis 1 that the worsening of companies' financial conditions can predict the occurrence of debt renegotiations, it is expected that the betas of the variables $Size_{(i,t-1)}$, $Ebitda_{(i,t-1)}$, $MB_{(i,t-1)}$, $ROE_{(i,t-1)}$, $IC\_Ratio_{(i,t-1)}$ and $Asset\_Int_{(i,t-1)}$ are negative and significant. On the other hand, the betas of the variables $Lev_{(i,t-1)}$ and $Var\_Ebitda_{(i,t-1)}$ are expected to be positive and significant.

Further, to test Hypothesis 2 and 3, I estimated the following logit model:

$$\begin{aligned}\text{Compensation}_{(i,t)} &= \beta_0 + \beta_1 Size_{(i,t-1)} + \beta_2\, Lev_{(i,t-1)} + \beta_3\, Ebitda_{(i,t-1)} + \beta_4\, MB_{(i,t-1)} \\ &+ \beta_5\, Var\_Ebitda_{(i,t-1)} + \beta_6\, ROE_{(i,t-1)} + \beta_7\, IC\_Ratio_{(i,t-1)} \\ &+ \beta_8\, Asset\_Int_{(i,t-1)} + \beta_9\, Bank_{(i,t-1)} + \beta_8\, Capt_{(i,t-1)} + \mu_i\, Industry\ FE \\ &+ \sigma_i\, Time\ FE + e_{i,t}\end{aligned} \tag{3.2}$$

Where the dependent variable ($\text{Compensation}_{(i,t)}$) is a dummy that assumes value one when the renegotiation has a compensation and zero otherwise; $Size_{(i,t-1)}$ is measured by natural logarithm of total assets; $Lev_{(i,t-1)}$ is leverage, obtained from interest-bearing liabilities over total assets; $Ebitda_{(i,t-1)}$ measured by Earnings Before Interest, Taxes, Depreciation and Amortization over total assets; $MB_{(i,t-1)}$ is Market-to-book, measured by market value of equity over book value of equity; $Var\_Ebitda_{(i,t-1)}$ is variation of EBITDA ($Ebitda_{(t)} - Ebitda_{(t-1)}$) over total assets; $ROE_{(i,t-1)}$ is Return of Equity, measured by net income over market value of equity; $IC\_Ratio_{(i,t-1)}$ is interest coverage ratio, measured by EBIT over financial expense; and $Asset\_Int_{(i,t-1)}$ is asset intensity, measured by net property, plant, and equipment divided by total assets; $Bank_{(i,t-1)}$ is a dummy that assumes value one when a bank debt (not subdivided) renegotiation occurs and zero otherwise; $Capt_{(i,t-1)}$ is a dummy that assumes value one when a market capital debt renegotiation occurs and zero otherwise. Finally, I included dummies to control for the fixed effects of firm and time.

To test Hypothesis 2 that the worsening of companies' financial conditions is positively related to the imposition of compensation in the renegotiation. it is expected that the betas of the variables $Size_{(i,t-1)}$, $Ebitda_{(i,t-1)}$, $MB_{(i,t-1)}$, $ROE_{(i,t-1)}$, $IC\_Ratio_{(i,t-1)}$ and $Asset\_Int_{(i,t-1)}$ are negative and significant. On the other hand, the betas of the variables $Lev_{(i,t-1)}$ and $Var\_Ebitda_{(i,t-1)}$ are expected to be positive and significant.

Finally, to test Hypothesis 3 that there is a positive and significant relationship between renegotiation with bondholders and the imposition of compensations, it is expected that the beta of the variable $Capt_{(i,t-1)}$ is positive and significant.

Table 3.1 presents each variable of the econometric model and its operationalization in detail.

Table 3.1. Summary of Models' Variables

Dependent Variable	**Acronym**	**Description**	**Basis' studies**
Renegotiation	$Reneg_{(i,t)}$	Dummy 1 when any renegotiation is observed and 0 otherwise	Roberts and Sufi (2009), Roberts (2015) and Nikolaev (2018).
Compensation	$\text{Compensation}_{(i,t)}$	Dummy 1 when the renegotiation has compensation and 0 otherwise	Roberts and Sufi (2009), Roberts (2015) and Nikolaev (2018).
Explanatory Variables			
Size	$Size_{(i,t-1)}$	Natural logarithm of total assets	Roberts and Sufi (2009) and Nikolaev (2018).
Leverage	$Lev_{(i,t-1)}$	interest-bearing liabilities over total assets	Roberts and Sufi (2009) and Godlewski (2015).
Ebitda	$Ebitda_{(i,t-1)}$	Earnings Before Interest, Taxes, Depreciation and Amortization over total assets	Roberts and Sufi (2009) and Roberts (2015).
Market-to-Book	$MB_{(i,t-1)}$	Market value of equity over book value of equity	Roberts and Sufi (2009), Godlewski (2015) and Nikolaev (2018).
Ebitda Volatility	$Var\_Ebitda_{(i,t-1)}$	Variation of EBITDA ($Ebitda_{(t)} - Ebitda_{(t-1)}$) over total assets	Roberts and Sufi (2009) and Dou (2019).

Return on Equity	$ROE_{(i,t-1)}$	Net income over market value of equity	Roberts and Sufi (2009).
Asset Intensity	$Asset\_Int_{(i,t-1)}$	Net property, plant, and equipment divided by total assets	Nikolaev (2018).
Interest Coverage Ratio	$IC\_Ratio_{(i,t-1)}$	EBIT over financial expense	Dyreng, Hillegeist and Penalva (2020).
Bank Debt	$Bank_{(i,t-1)}$	Dummy 1 when a bank debt (not subdivided) renegotiation occurs and 0 otherwise	Póvoa and Nakamura (2015) and Ivashina, Iverson and Smith (2016)
Market Capital Debt	$Capt_{(i,t-1)}$	Dummy 1 when a market capital debt renegotiation occurs and 0 otherwise	Póvoa and Nakamura (2015) and Ivashina, Iverson and Smith (2016)

Following Roberts and Sufi (2009) and Roberts (2015), I lag all firm characteristics proxies in one-quarter relative to the renegotiation. In addition, all variables were winsorized (2.5 – 97.5) to mitigate the effect of outliers.

3.4 Results

3.4.1 Descriptive Statistics

Table 3.2 presents the descriptive statistics. The table is divided into three parts: total sample, sample with renegotiations and sample without renegotiations.

Table 3.2. Descriptive Statistics

Total Sample						
Variables	Obs	Mean	Std. Dev.	Median	Min	Max
Size	11,602	7.805	1.808	7.926	3.796	11.222
Asset_int	11,602	0.263	0.233	0.217	0.000	0.805
IC_Ratio	11,149	6.661	17.42	2.109	-15.163	90.451
Lev	11,602	0.325	0.22	0.311	0.000	0.987
Ebitda	11,602	0.024	0.025	0.0231	-0.037	0.089
MB	11,602	1.746	2.186	1.083	-0.978	9.319
Var_Ebitda	11,193	0.001	0.02	0.001	-0.056	0.058
ROE	10,281	-0.024	0.153	0.011	-0.758	0.161
With Renegotiation						
Variables	Obs	Mean	Std. Dev.	Median	Min	Max
Size	299	8.44	1.297	8.44	4.077	11.222
Asset_int	299	0.288	0.25	0.255	0.000	0.805
IC_Ratio	295	1.865	10.356	0.863	-15.163	90.451
Lev	299	0.463	0.237	0.433	0.000	0.987
Ebitda	299	0.016	0.026	0.017	-0.037	0.089
MB	299	1.06	1.877	0.533	-0.978	8.879
Var_Ebitda	292	0.000	0.022	0.001	-0.056	0.058
ROE	259	-0.111	0.251	0.001	-0.758	0.161
Without Renegotiation						
Variables	Obs	Mean	Std. Dev.	Median	Min	Max
Size	11,303	7.788	1.816	7.909	3.796	11.222
Asset_int	11,303	0.263	0.233	0.216	0.000	0.805
IC_Ratio	10,854	6.791	17.554	2.165	-15.163	90.451
Lev	11,303	0.321	0.218	0.309	0.000	0.987
Ebitda	11,303	0.024	0.025	0.023	-0.037	0.089
MB	11,303	1.764	2.191	1.101	-0.978	9.319
Var_Ebitda	10,901	0.001	0.02	0.001	-0.056	0.058
ROE	10,022	-0.022	0.149	0.011	-0.758	0.161

Note: *Size* is measured by natural logarithm of total assets; *Asset_int* is asset intensity, measured by net property, plant, and equipment divided by total assets; *IC_Ratio* is interest coverage ratio, measured by EBIT over financial expense; *Lev* is leverage, obtained from interest-bearing liabilities over total assets; *Ebitda* measured by Earnings Before Interest, Taxes, Depreciation and Amortization over total assets; *MB* is Market-to-book, measured by market value of equity over book value of equity; *Var_Ebitda* is absolute variation of EBITDA; and *ROE* is Return of Equity, measured by net income over market value of equity.

Table 3.2 shows that renegotiated companies tend to be larger and more leveraged on average. The average of the Size variable is 8.44 for the observations that presented renegotiation, while for the observations without renegotiation, this variable drops to 7.78. The leverage is 32.5% for the general sample and 46.3% for the observations with a renegotiation.

On the other hand, Table 3.2 also shows that the renegotiated sample has lower profitability (more negative profitability), lower market-to-book ratio and lower interest

coverage ratio. The ROE of all companies, on average, is negative at -2.4%. For companies that renegotiated, this average goes to -11.1%. For renegotiated companies, the market-to-book ratio and interest coverage are 1.86 and 1.06, respectively. Whereas, for the sample that did not present renegotiation, these variables are 6.79 and 1.74, respectively. Roughly speaking, the results seem to show that companies that renegotiated their debts are larger but are going through a financially bad moment.

3.4.2 Analysis of Econometric Models

Table 3.3 presents the results of the logit model estimation (equation 3.1), where the dependent variable is a dummy that assumes value one when a renegotiation occurs and zero otherwise. In column I, the model was estimated without the fixed effects of time and industry. On the other hand, in column 2 are the model estimation with the time and industry fixed effects control.

The results of models I and II are in line with those obtained by descriptive statistics. The Lev variable showed a positive relationship with the renegotiation, while the Ebitda, MB and ROE variables showed a negative relationship. These results may indicate that a lower borrower's ability to repay the loan may trigger debt renegotiation with creditors. I can not reject hypothesis 1 that the worsening of companies' financial conditions can predict the occurrence of debt renegotiations.

Lenders tend to avoid the bankruptcy of companies. Firstly, due to the high costs involved in the bankruptcy process (Silaghi et al., 2022). Second, due to the low protection of creditor’s rights in emerging countries (Machokotoa & Areneke, 2020). Therefore, faced with a situation in which the company loses its ability to pay, creditors tend to agree to renegotiate the debt with the borrower.

Contrary to what was expected, the Size variable showed a positive relationship with renegotiations as in Roberts and Sufi (2009). This result may indicate the greater bargaining power of companies that manage to renegotiate. In other words, as the company's size grows, it tends to demand larger amounts of financing, thus increasing its bargaining power with creditors.

In general, these results were close to those found by Roberts and Sufi (2009) and demonstrate that not only the loss of payment capacity is the factor that triggers renegotiation. The increase in bargaining power also increased the likelihood of debt renegotiation.

Table 3.3. Determinants of Renegotiation

Variables	(1) Logit	(II) Logit
Size	**0.271*** **	**0.192*** **
	(0.0393)	**(0.0559)**
Asset_int	0.266	**0.639***
	(0.277)	**(0.332)**
IC_Ratio	-0.0115	-0.00846
	(0.00879)	(0.00831)
Lev	**2.050*** **	**0.807** **
	(0.286)	**(0.358)**
Ebitda	**-12.11*** **	**-11.16** **
	(3.958)	**(4.454)**
MB	**-0.130*** **	**-0.138*** **
	(0.0424)	**(0.0448)**
Var_Ebitda	**7.110** **	3.455
	(3.555)	(4.138)
ROE	**-1.076*** **	**-1.147*** **
	(0.329)	**(0.377)**
Constant	**-6.290*** **	**-3.960*** **
	(0.370)	**(0.800)**
Industry FE	NO	YES
Time FE	NO	YES
Observations	9,653	8,230
Pseudo R2	0.081	0.203
Prob	0.000	0.000
LRoc	0.730	0.834

Note: The dependent variable *Reneg* is a dummy that assumes value one when a renegotiation occurs and zero otherwise; *Size* is measured by natural logarithm of total assets; *Asset_int* is asset intensity, measured by net property, plant, and equipment divided by total assets; *IC_Ratio* is interest coverage ratio, measured by EBIT over financial expense; *Lev* is leverage, obtained from interest-bearing liabilities over total assets; *Ebitda* measured by Earnings Before Interest, Taxes, Depreciation and Amortization over total assets; *MB* is Market-to-book, measured by market value of equity over book value of equity; *Var_Ebitda* is absolute variation of EBITDA; and *ROE* is Return of Equity, measured by net income over market value of equity; ***p < 0.01, **p < 0.05, *p < 0.10.

In a second test, I analyzed the determinants of renegotiation compensation. So, I kept only observations with renegotiation and created a dummy that assumes value one when the renegotiation has compensation and zero otherwise. The results are shown in table 3.4. In column I, the model was estimated without the fixed effects of time and industry. Column 2 presented the model estimation with the time and industry fixed effects control.

Table 3.4. Determinants of Compensations

VARIABLES	(I) Logit	(II) Logit
Size	0.146	0.134
	(0.116)	(0.172)
Asset_int	-0.432	-0.935
	(0.586)	(0.888)
IC_Ratio	**-0.110****	**-0.0647****
	(0.0478)	**(0.0294)**
Lev	-0.373	-1.569
	(0.623)	(1.059)
Ebitda	**35.11*****	**26.84****
	(9.846)	**(11.13)**
MB	**-0.177****	-0.156
	(0.0809)	(0.107)
Var_Ebitda	-6.586	-3.628
	(7.294)	(8.485)
ROE	**-1.383****	**-1.781****
	(0.683)	**(0.865)**
Bank	0.259	0.566
	(0.419)	(0.563)
Capt	**1.403*****	**2.049*****
	(0.438)	**(0.587)**
Constant	**-2.349****	-2.366
	(1.126)	(2.475)
Industry FE	NO	YES
Time FE	NO	YES
Observations	254	233
Pseudo R2	0.114	0.222
Prob	0.000	0.000
LRoc	0.732	0.814

Note: The dependent variable Compensation is a dummy that assumes value one when the renegotiation has a compensation and zero otherwise; *Size* is measured by natural logarithm of total assets; *Asset_int* is asset intensity, measured by net property, plant, and equipment divided by total assets; *IC_Ratio* is interest coverage ratio, measured by EBIT over financial expense; *Lev* is leverage, obtained from interest-bearing liabilities over total assets; *Ebitda* measured by Earnings Before Interest, Taxes, Depreciation and Amortization over total assets; *MB* is Market-to-book, measured by market value of equity over book value of equity; *Var_Ebitda* is absolute variation of EBITDA; *ROE* is Return of Equity, measured by net income over market value of equity; *Bank* is a dummy that assumes value one when a bank renegotiation occurs and zero otherwise; and *Capt* is a dummy that assumes value one when a market capital renegotiation occurs and zero otherwise. ***p < 0.01, **p < 0.05, *p < 0.10.

According to table 3.4, the variables MB, IC_Ratio and ROE were negatively significant. As these variables are reduced, the chance of renegotiation with compensation increases. This result may indicate a greater imposition of restrictions by the creditor due to

the increased risk promoted by the reduction in the firm's ability to pay. In other words, the increase in control through the imposition of compensation can be a mechanism the creditor uses to reduce the risks of reducing the firms' ability to pay. Therefore, I can not reject hypothesis 2 of this study that worsening companies' financial conditions is positively related to the imposition of compensation in the renegotiation.

On the other hand, contrary to what was expected, the Ebitda variable is statistically positive. This result can be interpreted in the light of agency theory. With a greater volume of available cash, the possibility of having unnecessary expenses, inefficient investments or transferring wealth to shareholders increases, thus may expropriate creditors (Jensen, 1986). To avoid the possibility of expropriation, creditors can establish, for example, covenants that restrict the use of resources by the company as compensation for the renegotiation. It is important to mention the high magnitude of the coefficient in both models (35.1 and 26.8, respectively), which denotes the economic significance of this variable in predicting the occurrence of renegotiation.

Finally, this model included two variables representing the type of creditor granted the renegotiation. The results showed that renegotiations with bondholders increase the chances of renegotiations with compensation, while there was no significance for banks.

Armstrong et al. (2010) argue that the informal relationship between creditors and borrowers can influence aspects related to debt contracts. Therefore, this result can be explained by the relationship characteristics promoted by these two types of creditors. On the one hand, banks seek to establish a closer relationship with borrowers since they operate with a long-term perspective (Berlin & Loyes, 1988; Chemmanur & Fulghieri, 1994). For this reason, banks are expected to be less willing to impose compensations on their borrowers. On the other hand, bondholders have a short-term view and have less access to soft information than banks (Lou & Otto, 2020). So, bondholders are expected to be more willing to impose compensations in debt renegotiation. Based on this result, I cannot reject hypothesis 3 of this study: there is a positive and significant relationship between renegotiation with bondholders and the imposition of compensations. As far as I know, these results are unprecedented in the debt renegotiation literature and contribute to the discussion about the impacts of different creditors on firms.

3.4.3 Additional Analysis: Determinants of the Compensation' Intensity

As an additional analysis, I estimate a model to test the determinants of the "intensity" of the compensation. The models' dependent variable is the number of existing compensation in a single renegotiation. Table 3.5 presents some characteristics of renegotiations with compensations.

Table 3.5. Characteristics of Compensations

Total Companies that Renegotiated	Companies that Renegotiated with Compensation	Total Renegotiations with Compensation	Minimum Renegotiations with Compensation	Maximum Renegotiation with Compensation
110	65	119	1	18

Note: The total number of renegotiations with compensation exceeds the total number of companies that renegotiated, given that there are companies that renegotiated more than once.

According to table 3.5, of the 110 companies that renegotiated, 65 (59%) renegotiated with compensations. The total number of renegotiations with compensations in the period was 119. A single company in the sample ("Gol Linhas Aéreas S.A") presented 18 renegotiations with compensations. Due to the crisis suffered by the company in recent years, the compensations may have been a way of reducing creditors' risks.

The model estimation was performed using a Poisson regression. The beta coefficient of the test proposed by Cameron and Triverdi (1990) (p-value 0.197) was not statistically significant. This shows that the model has no variance overdispersion, therefore the Poisson model is preferable to the Negative Binomial model. Table 3.6 presents the results of the Poisson estimation.

Table 3.6. Determinants of Compensation Intensity

Variables	(I) Poisson
Size	**0.173****
	(0.0737)
Asset_int	0.0158
	(0.387)
IC_Ratio	**-0.0721*****
	(0.0270)
Lev	-0.468
	(0.400)
Ebitda	**13.67****
	(5.688)
MB	**-0.119****
	(0.0593)
Var_Ebitda	4.228
	(4.762)
ROE	**-0.715***
	(0.388)
Bank	0.1000
	(0.307)
Capt	**0.748****
	(0.300)
Constant	**-2.456*****
	(0.728)
Observations	254
LR chi2	34.97***
Pseudo R2	0.074

Note: The dependent variable Compensation_Intensity represents the number of compensation in a renegotiation; *Size* is measured by natural logarithm of total assets; *Asset_int* is asset intensity, measured by net property, plant, and equipment divided by total assets; *IC_Ratio* is interest coverage ratio, measured by EBIT over financial expense; *Lev* is leverage, obtained from interest-bearing liabilities over total assets; *Ebitda* measured by Earnings Before Interest, Taxes, Depreciation and Amortization over total assets; *MB* is Market-to-book, measured by market value of equity over book value of equity; *Var_Ebitda* is absolute variation of EBITDA; *ROE* is Return of Equity, measured by net income over market value of equity; *Bank* is a dummy that assumes value one when a bank renegotiation occurs and zero otherwise; and *Capt* is a dummy that assumes value one when a market capital renegotiation occurs and zero otherwise. ***p < 0.01, **p < 0.05, *p < 0.10.

The variables IC_Ratio, MB and ROE were negatively significant. It means that creditors tend to impose more compensation in the face of a possible greater loss in the firm's ability to pay, reducing their risks.

The Capt variable was also significant and positive. Therefore, bondholders tend to impose more compensation when renegotiating with the borrower. The results also showed a positive relationship between Ebitda and renegotiation intensity. This result may be a response by creditors to the increased shareholders' expropriation risk in the face of greater

cash generation potential. Finally, contrary to what might be expected, the size variable was also positive and significant. It means that, the larger the company's size, the greater the compensation the creditor imposes. This result may indicate that larger companies renegotiate more and in greater volume, requiring more compensations to provide security to the creditor.

In general, this study presented unprecedented results in the literature, opening up an avenue of possibilities for further research. In addition, based on these results, companies can improve their decision-making regarding renegotiation or at least anticipate some renegotiation results.

3.5 Concluding Remarks

Given the existence of incomplete contracts (where it is impossible to specify all the contingencies that may occur in the future), debt renegotiation is an important instrument to guarantee the maintenance of long-term contracts. Previous studies have shown that debt renegotiation is common in companies' reality and may occur several times throughout the contract. However, most of these studies have focused on renegotiation in specific contexts, such as U.S. and European.

Characteristics typical of emerging economies, such as the low protection of the creditor's rights, underscore the importance of researching debt renegotiations in a context different from that of developed economies. Therefore, this study was born to offer empirical evidence about debt renegotiation in an emerging economy country: Brazil. For the preparation of this study, I built a hand-held data collection database of publicly held Brazilian companies' renegotiations between 2010 and 2021.

The results showed that the change in the financial condition of companies increases the probability of debt renegotiation for Brazilian companies. In addition, renegotiations are more likely to be accompanied by compensation when there is a worsening in the companies' ability to pay the debt. In other words, creditors tend to impose stricter conditions on renegotiations when the company has a worsening ability to pay (lower interest coverage ratio and return on equity). However, in addition, the study showed that the increase in potential cash flow (Ebitda) also tends to increase the probability of compensation in renegotiations (as a way of reducing the risk of creditors' expropriation) Finally, the study also showed that, unlike banks, renegotiations with bondholders are more likely to have compensations.

To sum up, the results related to the compensation are in line with the context in which the research was developed. In the context of low protection of the creditor's rights and high

information asymmetry, the compensation in renegotiations can reduce the creditor's risk. Future studies could investigate the compensations in contexts different from those of this study in order to expand the empirical evidence.

This study contributes to the literature by considering a context little explored in studies on renegotiation: emerging economy. In addition, this study innovates by addressing the compensations in renegotiations, which is also little explored in the literature. Furthermore, unlike previous studies, I collected data from renegotiations with bondholders, making it possible to identify differences between renegotiations of different types of creditors.

Finally, this study offers a significant practical contribution, especially by showing companies the factors that tend to increase the chances of a compensation in renegotiations. Therefore, companies can improve their decision-making or at least anticipate some renegotiation results.

It is important to mention that this study has some limitations. The first limitation concerns the quality of the information collected. Although there is a rule that requires renegotiation disclosure in case of a covenants' breach, there is no requirement regarding what information to publish. This may have biased the database. Furthermore, considering there is no exogenous shock in the econometric tests, there may be a bias in the firm's decision to seek to renegotiate the contracts, undermining the attribution of causality in the tests.

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4 DOES THE MARKET CARE ABOUT FIRMS' DEBT RENEGOTIATION? EVIDENCE FROM BRAZIL

4.1 Introduction

Companies are composed of contracts established between different agents (Jensen & Meckling, 1976). These contracts are considered incomplete due to the impossibility of anticipating all future contingencies (Christensen, Nikolaev & Wittenberg, 2016). However, as a means of protection against contractual incompleteness, creditors can design more restrictive contracts, using, for example, tight and restrictive covenants to limit the borrower's decisions (e.g., restricting asset sales, acquisitions, capital expenditures and dividend payments) (Roberts & Sufi, 2009).

Given these limitations imposed by creditors, borrowers can seek to renegotiate these contractual terms in the future. Thereby, renegotiation is an important occasion for the lender to seek new information about the borrower. For Godlewski (2015), renegotiations allow the incorporation of previously unavailable information into contracts, improving the contracts' efficiency over time. Since this new information about the borrower may not be public, the renegotiation generates important information about the quality of the borrower and, according to Silagh et al. (2022), may lead to a certification effect. Hence, this study aims to understand how investors react to this type of information.

Empirical evidence about the market reaction to the renegotiation is found in Godlewski (2015), Nikolaev (2018) and Silagh et al. (2022). Godlewski (2015) investigated the influence of debt renegotiations on the stocks of European companies. According to the author, changes in financial covenants and positive changes to loan amounts have positive effects on abnormal returns, ranging between 10% and 15%.

Nikolaev (2018) focuses on the U.S. stock market. According to the results, companies have a high volume of stock trading and high price volatility on renegotiation days. In addition, the study found that companies that manage to modify their debt contracts show a statistically significant increase in cumulative abnormal return by 30 basis points.

Unlike the studies mentioned above, Silagh et al. (2022) focused on analyzing the impact of renegotiations in the U.S. Credit Default Swap (CDS) market. According to the authors, the CDS market has specific characteristics (e.g., a higher concentration of sophisticated investors) that could lead to different results from those found in the two previous studies.

The results showed a positive reaction from the CDS market to the disclosure of credit agreement changes. Furthermore, the study revealed an anticipation effect in the CDS market of up to 30 days before the renegotiation announcement. Silagh et al. (2022) argue that this anticipation effect was expected considering the higher presence of sophisticated investors in this market that exploit their information advantage.

Despite the importance of these studies, the financial literature lacks empirical evidence regarding the market reaction to debt renegotiation in contexts different from those explored by Godlewski (2015), Nikolaev (2018) and Silagh et al. (2022).

The significant differences in emerging economies underscore the importance of exploring the market reaction to debt renegotiation in contexts different from developed economies. Emerging economies are characterized by having capital markets with less liquidity, more significant information asymmetry, less sophisticated investors, less demanding disclosure requirements, and less enforcement of these disclosures (Saleh & Ahmed, 2005; Bhagat et al., 2011; Alali & Foote, 2012; ElBannan, 2017). The idiosyncrasies present in developing countries may be relevant enough to make the results different from those of developed economies.

So, this paper aims to analyze the Brazilian stock market reaction to debt renegotiation disclosure and compare it to results from developed economies. Brazil presents a suitable context for this study since it has a highly globalized economy with significant representation among emerging economies, especially Latin America (Oura, Zilber & Lopes, 2016). For example, in 2021, Brazil was one of the emerging countries with the highest total net corporate debt (16% of the total net debt of emerging countries) (Corporate Debt Index, 2021). Moreover, in 2020, the country's largest banks renegotiated more than 1 trillion reais in loan contracts (Rodrigues & Castro, 2021).

Therefore, to analyze the Brazilian stock market reaction to debt renegotiation disclosure, I conducted an analysis based on a hand-collected sample of renegotiations from Brazilian companies not used in any previous study. The sample comprises all companies listed on B3, covering the 2010 to 2021 periods.

Overall, the results showed that the capital market reacts positively to the announcement of firms' renegotiation. However, this reaction tends to be less intense than those presented in other contexts, such as European (Godlewski, 2015) and U.S. (Nikolaev, 2018).

Despite the extensive literature on market reaction in emerging economies, to the best of my knowledge, this is the first study to focus on debt renegotiation. More specifically, some studies investigated market reaction in emerging economies to corporate social responsibility (CSR) (Arya & Zhang, 2009), dividend change announcements (Sharma & Pandey, 2014), terrorist attacks (Mnasri & Nechi, 2016) and Covid-19 (Topcu & Gulal, 2020). However, no research analyzes the market reaction to the debt renegotiation announcement focused on the emerging economy. This is an important topic to be addressed in emerging economies since debt renegotiation can be especially relevant in this context where there is low protection of creditor rights and more information asymmetry. More specifically, due to the low protection of creditors' rights, the bankruptcy of borrowers can make it extremely difficult to return the loan granted. Therefore, creditors tend to avoid the borrowers' bankruptcy as much as possible, and debt renegotiation can be an important instrument. Moreover, renegotiation is an ideal opportunity for the creditor to obtain new information about the borrower, thus reducing the information asymmetry characteristic of emerging economies.

This study differs from Godlewski (2015), Nikolaev (2018) and Silagh et al. (2022) when addressing not only bank debt renegotiations but also capital market debt renegotiations, which may expand knowledge on this topic.

Finally, once the study presents evidence that the disclosure of debt renegotiations triggers an increase in stock returns, I hope to contribute to corporate decision-making regarding information disclosure. In other words, this study shows that investors value renegotiations. For this reason, disclosure of renegotiation can be a companies' strategy to increase the shareholders' value perception.

The remainder of this paper is organized as follows. The next section provides a review of the literature and hypotheses developments. The third section describes the data and research methodologies used for this study. The fourth section presents the empirical results and final remarks are provided in the final section.

4.2 Theoretical framework and hypothesis development

Companies have a contractual relationship with different agents (e.g., customer, supplier, lender, employee etc). However, these contracts can be considered incomplete. According to Nikolaev (2018), contractual incompleteness comes from two reasons. The first

one is exogenous and concerns the contingencies or states of the world that are impossible to predict and incorporate when the contract is drawn up (Nikolaev, 2018). The second is endogenous and is related to the agent's non-contractible actions. More specifically, actions that "are difficult to induce via ex-ante contracts in the presence of agency and information problems, creating a need to monitor and discipline the agent ex-post, hence prompting future renegotiations" (Nikolaev, 2018, p.2).

Therefore, considering the uncertainties of incomplete contracts, creditors develop restrictive contracts that limit the borrower's decisions and provide greater bargaining power to them, for example, by designing tight and restrictive covenants (Silaghi et al., 2022). Given these contractual constraints, companies could be limited on asset sales, financing, acquisitions, capital expenditures, dividend payments, which demand ex-post renegotiations.

For this reason, renegotiations play an essential role in contributing to contracts' efficiency (Godlewski, 2014; Nikolaev, 2018). So, given the renegotiation's relevance, some studies have emerged analyzing whether the market reacts to debt renegotiation disclosure, as Godlewski (2015), Nikolaev (2018) and Silagh et al. (2022).

The central argument of these studies is that renegotiations generate a certifying effect. It is possible that, over time, the debt contract established *a priori* becomes ineffective in the face of the new situation of the company, making room for renegotiations (Nikolaev, 2018). For example, a contract whose interest rate is excessively high or has restrictive covenants that prevent the company from implementing its strategies efficiently. The renegotiation will allow the acquisition of new information about the company, thus generating revisions in contracts and improving the contracts' efficiency. Since the general public does not have access to this information, renegotiations can generate a certifying effect by signaling about borrower's quality (Godlewski, 2015).

Furthermore, debt renegotiation reduces the need for creditors to use costly bankruptcy filings as a disciplining mechanism, avoiding bankruptcy costs and thus provoking a positive reaction in the share price (Silaghi et al. 2022).

From a sample of bank loan renegotiations, Godlewski (2015) showed that renegotiations significantly alter the contractual characteristics of loans, thus benefiting shareholders. According to the study, most of the changes are related to the loan amount (36% of amendments), maturity (25%) and covenants (10%). According to Godlewski (2015), renegotiations have a certifying effect since empirical results show that changes in financial

covenants and positive changes to loan amounts positively affect abnormal returns, ranging between 10% and 15%.

Based on a sample of debt contract renegotiations in the U.S., Nikolaev (2018) analyzed whether the disclosure of renegotiations appears to reveal private information to outside investors. The author hypothesizes that the renegotiation transmitted private information to market participants, to whom they had no access until then, thus generating the aforementioned certifying effect. Nikolaev's (2018) showed that disclosing debt contracts' changes increases the cumulative abnormal return by 30 basis points in the U.S. stock market. Therefore, according to the author, this result indicates that renegotiations transmit significant information to outside market participants.

Unlike Godlewski (2015) and Nikolaev (2018), Silagh et al. (2022) sought to analyze the impact of loan renegotiations on firms' credit risk using the CDS market as a measure of credit risk. CDS are derivatives purchased by investors to insure against debtors' loan default. And, according to the authors, the CDS market promotes high-quality data for measuring credit risk. According to the results, there is a drop in CDS spreads around renegotiation announcements, which shows that renegotiations are informative for CDS investors. Furthermore, the biggest reactions are related to renegotiations of loan amounts.

Despite the literature advancement provided by Godlewski (2015), Nikolaev (2018) and Silagh et al. (2022), there is a gap in the market reaction literature regarding the renegotiation disclosure effects in contexts other than Europe and the U.S. Put it another way, we do not know if the results found by these studies are valid in other contexts, such as emerging economies. Unlike the U.S. and European economies, the stock markets of emerging economies may present several types of problems such as: less liquidity, more significant information asymmetry, less sophisticated investors, less demanding disclosure requirements, and less enforcement of these disclosures (Saleh & Ahmed, 2005; Bhagat et al., 2011; Alali & Foote, 2012; ElBannan, 2017).

Regarding disclosure requirements, according to Roberts and Sufi (2009), the SEC has a variety of regulations that require companies to detail material debt agreements, sources of liquidity, and long-term debt schedules. According to the authors, as a result of these regulations, companies almost always give detailed explanations of their debt arrangements in their SEC filings. On the other hand, due to the lower disclosure requirements in emergent markets, the disclosure of negotiations may be less informative than the disclosures in

developed economies. Therefore, due to less disclosure, emerging market investors tend to have greater information asymmetry concerning company debt renegotiations.

In addition, the smaller number of sophisticated investors present in emerging markets may affect the market reaction to renegotiation once this type of investor is known to have more ability to maximize the usefulness of disclosed information (Hand, 1990). Sophisticated investors dedicate more time to their investments and, therefore, stand out compared to others (Kalay, 2015), especially when it comes to avoiding losses and making more assertive decisions in the market (Balsam, Bartov & Marquardt, 2002; Ferg & Seasholes, 2005).

Finally, the low level of disclosure and the information asymmetry in emerging markets tend to negatively affect stock market liquidity (Lakhal, 2008; Roulstone, 2013). So, this lower liquidity can reduce stocks' sensitivity to certain types of information.

Therefore, due to low liquidity, high information asymmetry, the smaller number of sophisticated investors and lower demand for disclosure, the hypothesis of this study is that:

H1: there is no market reaction to the debt renegotiation disclosure.

4.3 Methods

4.3.1 Data and Sample

The sample comprises all 346 non-financial companies listed on the Brazilian stock exchange “B3” (Brasil, Bolsa e Balcão) in 2021. The data analyzed are daily and comprise the period from 2010 to 2021[2]. Data collection involves two steps. The first step is the collection of renegotiation data, such as whether and when the company renegotiated and the renegotiation outcomes. The second step involves a combination of hand-collected renegotiation data with stock data available on Capital IQ.

4.3.2 Renegotiation Database and variables

To hand-collected the renegotiation data, I analyzed over three thousand notes to financial statements from 2010 to 2021. I searched for terms often used to describe contractual changes as “renegotiation”, “financial restructure”, “waiver”, “covenant”,

[2] The data collection process was supported by the Laboratório de Finanças e Risco of FEA/USP.

"reclassified debt", "consent", "renegotiated conditions", "debt restructuring", "addition" among others.

After identifying the occurrence of the renegotiation, I checked if there was a Material Fact ("Fato Relevante"), Notice to the Market ("Comunicado ao Mercado") or Minutes of the Debenture Holders' Meeting ("Ata da Assembleia Geral de Debenturistas") disclosure. In Brazil, under Resolution 44 of the CVM ("Comissão de Valores Mobiliários"), debt renegotiation is a material fact and must be disclosed widely and immediately by companies.

Only renegotiations published in one of the above reports were considered in this study. Putting it another way, I did not consider the renegotiations that are only disclosed in the notes to financial statements since their effect may be confused with other relevant information disclosed on the same date.

Once I identified the renegotiations, I proceeded to a more detailed analysis of the reports to identify the outcomes of this renegotiation. Following on Roberts and Sufi (2009) and Roberts (2015) studies, I searched to identify which contractual terms were changed: i) loan amount (i.e., if there was an increase in the loan amount); ii) interest rate (i.e., if there was an increase or reduction in the interest rate); iii) term (i.e., if there was an increase or reduction in the maturity and granting of grace period); and iv) waiver/ covenant renegotiated. This information can be found in Material Fact ("Material Fact"), Notice to the Market ("Notice to the Market") or Minutes of the Debenture Holders' Meeting ("Minutes of the General Meeting of Debenture Holders") and notes to the financial statement. However, information about renegotiation is not standardized, which means that some firms offer greater detail than others.

After this procedure, I obtained information from 117 renegotiations of 35 companies. Of these 117 renegotiations, I excluded 27 due to the impossibility of obtaining share price data. I also excluded renegotiations in which companies did not trade their shares in any of the five event window days (event day and the two days before and after). Subsequently, I exclude renegotiations whose companies have not traded in at least half of the days of the pre-event window (180 – 45 days). The event and pre-event window specifications will be presented in the following subsection. After all these exclusions, 54 renegotiations remained of 23 companies.

4.3.3 Models

In order to analyze whether the stock market reacts to the occurrence of debt renegotiation, I applied the traditional event study methodology to estimate the firms' abnormal returns, according to Camargos and Barboza (2007); Knauera and Wöhrmann (2016); Nikolaev (2018) and Zanon and Dantas (2020).

First, I used the logarithm form with continuous capitalization to calculate the stock return, as indicated in equation 3.1[3].

$$R_{it} = ln \frac{P_{it}}{P_{it-1}} \tag{3.1}$$

Where R_{it} is the return of stock *i*, in period *t*; P_{it} e P_{it-1} refer to the share price *i*, at moments *t* and *t-1*, respectively. Once the return has been calculated, I estimate the stock abnormal return, determined by:

$$AR_{it} = R_{it} - E(R_{it}) \tag{3.2}$$

Where AR_{it} is the abnormal return of stock *i*, in period *t*; R_{it} is the return of stock *i*, in period *t* e $E(R_{it})$ is the expected return on the stock *i*, in period *t*. The abnormal return can be considered the portion of the variation in the stock return caused by factors unrelated to the market variations (Brito et al., 2005). Thus, the abnormal return is obtained by the difference between the return obtained and the expected return if the event had not occurred (Zanon & Dantas, 2020).

I estimated the expected return through a linear regression between the stock's daily returns with the daily variation of the market index (BOVESPA index) as in Camargos and Barboza (2007) and Zanon and Dantas (2020). This model predicts which return is expected under "normal conditions". Equation 3.3 points out the expected return equation.

$$E(R_{it}) = \beta_0 + \beta_1 x\, R_{mt}$$

[3] We also used arithmetic return and the main results have not changed.

(3.3)

Where $E(R_{it})$ is the expected return of stock *I*, in period *t*, and R_{mt} is the return of the Bovespa index in period *t*. Following Nikolaev (2018), I calculate the expected return from a 180-day pre-event window ending 45 days before the renegotiation's release date. As in Nikolaev (2018), I assumed that the event does not influence the returns from 45 days before the event. Moreover, I considered as event's date the one on which the renegotiation was disclosed in a Material Fact, Notice to the Market or Minutes of the Debenture Holders' Meeting.

Furthermore, in addition to the previous model, to make the study more robust, I also estimated the expected return based on the 4-factor model by Fama and French (1993) and Carhart (1997), as in Borges and Martelanc (2015), Li, Zhang and Zheng (2018) and Machado and Faff (2018). The 4-factor model includes, in addition to the market factor considered in the previous model, three other factors known to have significant risk premiums: company size, market-to-book index, and momentum. The equation below presents the four-factor model.

$$R_{it} - R_{ft} = \alpha_{0i} + \beta_1 \left(R_{mt} - R_{ft}\right) + \beta_2 SMB_t + \beta_3 HML_t + \beta_3 MOM_t + e_{i,t} \quad (3.4)$$

Where R_{it} is the return of stock i in period t; R_{ft} is the risk-free return (proxied by SELIC rate); R_{mt} is the market return (proxied by Bovespa index); SMB_t is the size factor premium (Small minus Big), calculated by the difference between the return in períod t of the 50% smallest stocks (in terms of market value) and the 50% largest stocks; HML_t is the premium for the book-to-market factor (High Minus Low), calculated by the difference between the return of the 30% stocks with the highest book-to-market ratio and the 30% with the lowest ratio; MOM_t is the momentum factor premium, calculated by the difference between the 30% stocks with the best performance in t and the 30% stocks with the lowest performance in the same period.[4]

[4] These factors were obtained from the website of the Research Center in Financial Economics of the School of Economics, Business, Accounting and Actuarial Sciences of the University of São Paulo (NEFINFEA-USP) (http://www.nefin.com.br/).

After estimating the equation, α_{0i} indicate, for each stock, the presence or absence of abnormal returns. Thus, the statistically significant α_{0i} indicates the presence of abnormal returns after controlling all of the risk factors in the model.

To minimize the influence of other factors on the stock's return, I perform tests considering the 3-day window in this analysis (the day before, the day of, and the day after the event), 5-day event window (day of the event, two days before the event, and two days after the event) and 11-day event window (day of the event, five days before the event, and five days after the event) as Arya and Zhang (2009), Nikolaev (2018) and Silagh et al. (2022). According to H1, I do not expect significant coefficients. In other words, I do not expect any signs of a market reaction in the days following the renegotiation disclosure.

Finally, I implement another test as proposed by Nikolaev (2018). I regress the daily stock returns on five daily indicator variables. In short, from a sample with observations from the 15 days before and after the renegotiation, I estimate an OLS with abnormal returns as a dependent variable and proxies representing the days of the event window as explanatory variables, as indicated in equation 3.5.

$$AR_{it} = \beta_0 + \beta_1\, Day - 2_{i,} + \beta_2\, Day - 1_{i,} + \beta_3\, Day\, 0_{i,} + \beta_4\, Day + 1_{i,} + \beta_5\, Day + 2_{i,} + e_i \tag{3.5}$$

Where AR_{it} is the abnormal return calculated by the market and 4-factor models; $Day - 2_i$ is a dummy that assumes value 1 for the second day prior to the renegotiation; $Day - 1_i$ is a dummy that assumes value 1 for the second day prior to renegotiation; $Day\, 0_i$ is a dummy that assumes value 1 for the day of renegotiation; $Day + 1_i$ is a dummy that assumes value 1 for the first day after renegotiation; $Day + 2_i$ is a dummy that assumes value 1 for the second day after renegotiation.

As before, I do not expect significant beta coefficients (showing any signs of a market reaction in the days following the renegotiation disclosure).

4.4 Results

This section begins with the descriptive statistics of the study sample. Table 4.1 presents the number of renegotiations and companies that disclose renegotiations. The number

of renegotiations signals the amount of renegotiation disclosed in Material Fact ("Fato Relevante"), Notice to the Market ("Comunicado ao Mercado") or Minutes of the Debenture Holders' Meeting ("Ata da Assembleia Geral de Debenturistas"). The number of companies that disclosed their renegotiations represents the total number of companies that disclosed their renegotiations in some previously mentioned media per year.

Table 4.1. Number of Renegotiations and Companies that Disclose Renegotiations

	Renegotiations per year	Companies that Disclose Renegotiations per year
2010	0	0
2011	0	0
2012	1	1
2013	2	1
2014	1	1
2015	6	2
2016	6	6
2017	13	6
2018	0	0
2019	8	6
2020	10	9
2021	7	7
Total	**54**	**39**

Note: The number of renegotiations signals the amount of renegotiation disclosed in Material Fact ("Fato Relevante"), Notice to the Market ("Comunicado ao Mercado") or Minutes of the Debenture Holders' Meeting ("Ata da Assembleia Geral de Debenturistas"). The number of companies that disclosed their renegotiations represents the total number of companies that disclosed their renegotiations in some previously mentioned media per year.

According to table 4.1, the number of renegotiations has grown over the last few years, especially since 2015. Furthermore, 2017 was the year with the highest number of renegotiations. However, part of these renegotiations was from the same company. That is, only ATMA Participações S.A disclosed seven renegotiations this year. In addition, 2020 and 2021, the period marked by the covid-19 pandemic, was the years in which more companies disclosed their renegotiations with 9 and 7 companies, respectively.

Table 4.2 shows the industries of the companies that disclosed their renegotiations.

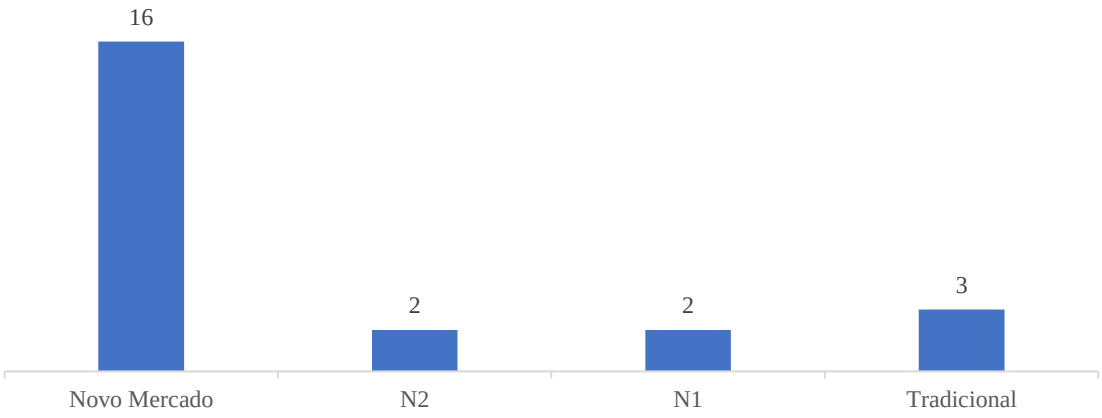
Table 4.2. Industries of Companies that Disclosed Renegotiation

Industries of Companies that Disclosed Renegotiation	
Transport and Services	4
Steel and Metallurgy	3
Construction	2
Chemistry	1
Vehicles and parts	1
Paper And Cellulose	1
Telecommunications	1
Business	1
Textile	1
Others	8
Total	**23**

The most representative industry in the sample is Transport and Services (4 companies), followed by the Steel and Metallurgy sector (3 companies). In the "Others" classification, there are industries such as: Educational Services, Medical Laboratories and Machinery, Equipment, And Supplies. Therefore, table 4.2 shows significant heterogeneity in the sample regarding industries.

Figure 4.1 shows the companies' level of corporate governance.

Figure 4.1. Corporate Governance Level



Note: Data refer to the remaining 23 companies in the sample. The X-axis presents the different levels of corporate governance of the companies in the sample.

According to figure 4.1, most companies that disclosed the renegotiations (16 companies) belong to the group with the highest level of corporate governance at B3. Due to the high level of corporate governance, these companies have a greater commitment to

transparency, which could explain the greater number of disclosures for companies in the "Novo Mercado" category.

Finally, table 4.3 presents the characteristics of the renegotiations in the sample.

Table 4.3. Characteristics of Renegotiations

	Number of Renegotiation	**%**
Types of Renegotiations		
Covenant Waiver/ Change	31	50%
Term Extension	28	45%
Interest Rate Reduction	1	2%
Loan Amount Increase	2	3%
Total	**62**	**100%**
Type of Lender		
Capital Market	43	80%
Banks	11	20%
Total	**54**	**100%**
Type of Announcement		
Relevant fact	33	52.40%
Notice to the Market	2	3.20%
Minutes of the Debenture Holders' Meeting	28	44.40%
Total	**63**	**100%**

Note: The data in table 4.3 refer to 54 disclosed renegotiations. The total of "Types of Renegotiation" and "Types of Announcement" is greater than 54 because, in some cases, the same renegotiation can be of different types (e.g., a company that renegotiates term extension and reduction of interest rate at the same time) or be disclosed in different ways simultaneously (e.g., a company that discloses renegotiation in Minutes of the Debenture Holders' Meeting and Relevant Facts at the same time).

The results presented in table 4.3 indicate that covenant waiver/change was the most common renegotiation disclosered over the period. After, the term extension appears in 45% of the renegotiations. The least renegotiated terms are the Interest Rate Reduction (2%) and the Loan Amount Increase (3%).

Other studies did not identify the predominance of covenant waiver/change among renegotiations for both U.S. and European companies. Term extension is the most relevant renegotiation in U.S. companies, according to Robers and Sufi (2009) (57% of renegotiations of U.S. companies are related to an extension of debt maturity). In the case of European companies, most of the renegotiations (40%) are related to the amount increasing (Godlewski, 2014). This difference may reflect the context in which Brazilian companies operate. More specifically, in a context of high information asymmetry and low creditor protection rights,

creditors may impose stricter restrictions on borrowers, thus increasing future covenant renegotiations (Albanez & Schiozer, 2022).

Also, according to table 4.3, most of the renegotiation announcements are for capital market debts (80%). Only 20% of the announcements are for bank debts (subsidized and unsubsidized).

Finally, according to table 4.3, Relevant Fact is the most common mean of renegotiation announcement (52.4%), followed by the Minute of the Debenture Holders' Meeting (44.4%). Notice to the Market has a share of only 3% of the renegotiations disclosed.

Table 4.4 presents the results of the market reaction to the renegotiation announcement. The second and fourth columns present the average of abnormal returns, considering the market model and the 4-factor model. The third and fifth columns present the t-statistics of both models to assess if abnormal returns are significantly different from 0. Besides the average abnormal return for the event (day 0), the table shows the averages for the five days before and after the event. In the last three lines are shown the accumulated returns for the following windows: 3-day (-1, 1), 5-day (-2, 2) and 11-day (-5, 5).

Table 4.4. Stock market reaction to renegotiation announcements

	Market Model		4 Factor Model	
Day	Mean	t-stat.	Mean	t-stat.
-5	0.000	0.091	0.000	0.014
-4	0.002	0.437	0.002	0.384
-3	0.002	0.356	0.002	0.305
-2	0.009	1.589	0.009	1.540
-1	-0.003	-0.767	-0.003	-0.841
0	0.005	1.049	0.005	0.995
1	0.012	1.560	0.011	1.527
2	-0.007	-1.626	**-0.008**	**-1.687***
3	-0.004	-0.719	-0.004	-0.761
4	-0.007	-1.238	-0.007	-1.286
5	-0.003	-0.486	-0.003	-0.526
[-1;1]	0.014	1.462	0.013	1.379
[-2;2]	0.016	1.527	0.015	1.397
[-5;5]	0.006	0.416	0.003	0.218

Note: Columns 2 and 3 present the mean and the t-statistic of the abnormal returns, respectively, calculated by the market model. Columns 4 and 5 present the mean and the t-statistic of the abnormal returns, respectively, calculated by the 4-factor model; [-1; 1] represents the cumulative abnormal return of the 3-day window; [-2, 2] represents the cumulative abnormal return of the 5-day window; [-5; 5] represents the cumulative abnormal return of the 11-day window. The superscripts ∗∗∗, ∗∗, and ∗ indicate significance at the 1%, 5%, and 10% levels, respectively. The sample is composed of 54 events.

The results for the 4-factor model showed signs of negative abnormal return on the

second day after the release. However, these results are inconsistent since they are only present in the 4-factor model. Therefore, the results in table 4.4 do not allow us to state that there is a market reaction on the day of the announcement and the days immediately after and before.

Figure 4.2 and 4.3 illustrate the results presented in table 4.4.

Figure 4.2. Cumulative abnormal stock returns (CAR) around the renegotiation date (Market Model)

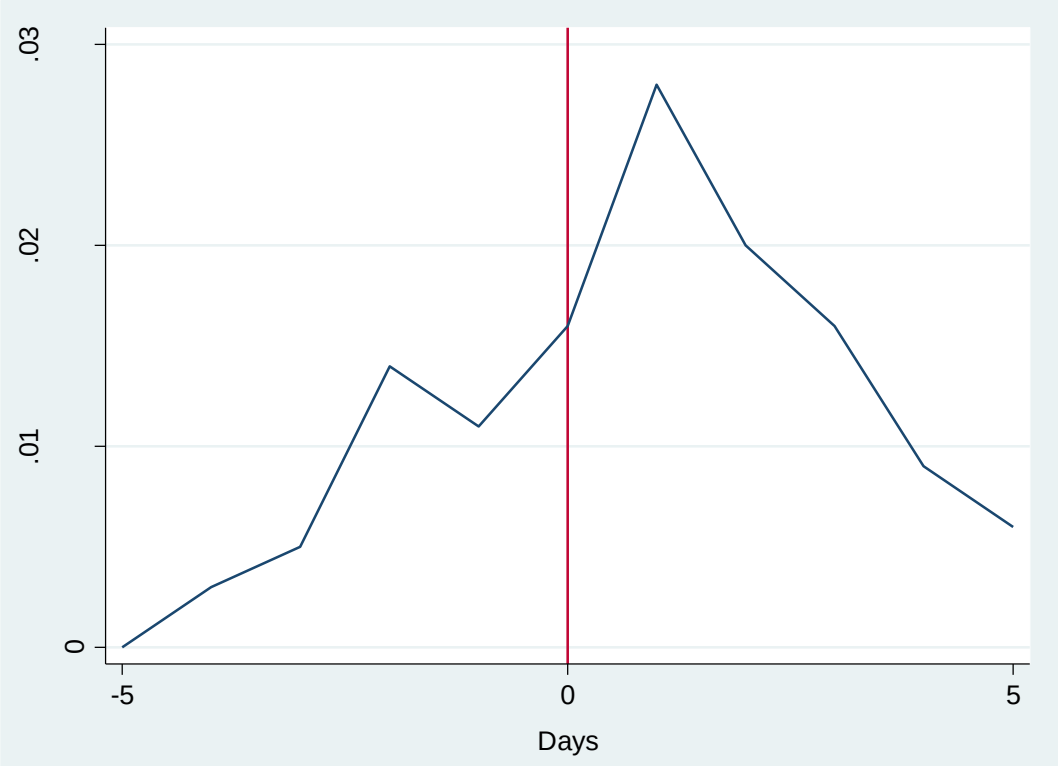
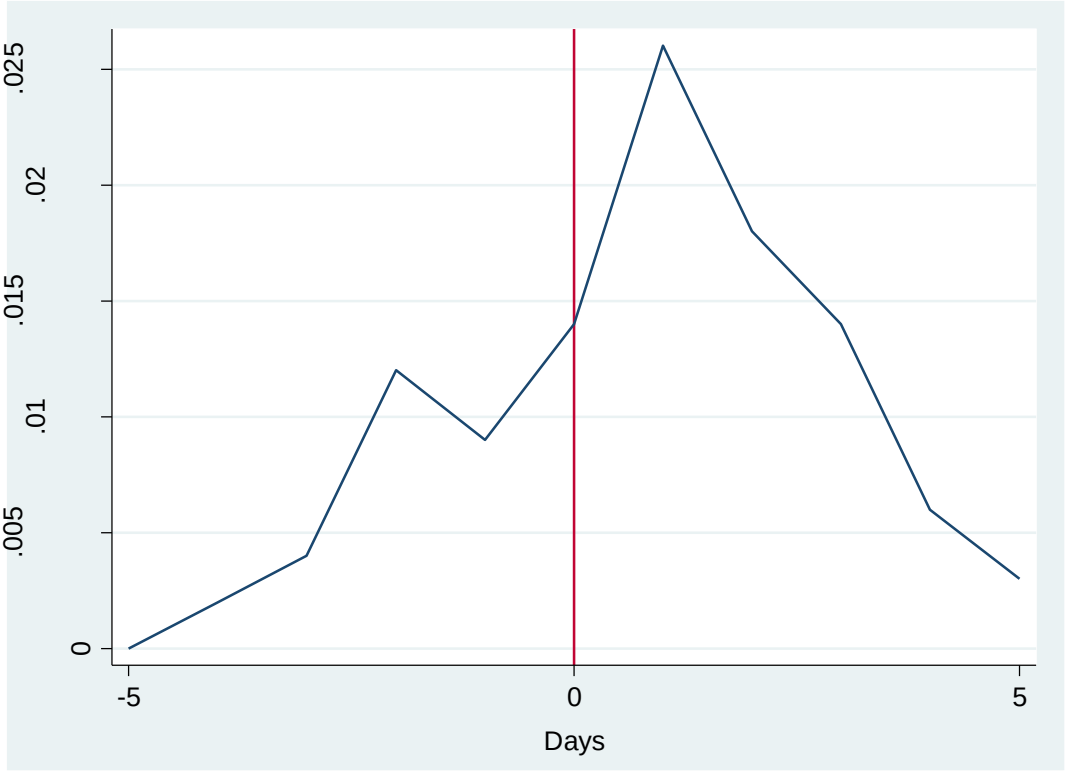


Figure 4.3. Cumulative abnormal stock returns (CAR) around the renegotiation date (4 Factor Model)



Therefore, figures 4.2 and 4.3, as well as table 4.4, show no indications of a market reaction to debt renegotiation. Nevertheless, one could argue that these results might be absorbing the effects of other important information disclosed by the companies in the days following the event. In other words, these results may be reflections of confounding events. Therefore, following Godlewski (2015) and Silaghi et al. (2022), I drop all confounding events. I considered as confounding events when material facts, minutes of the management meeting, notice to the market, results from the period, reference form, minutes of the annual general meeting and sustainability report were disclosed within five days before and after the renegotiation announcement.

By excluding all Confounding Events, the renegotiation amount dropped to 21. Table 4.5 presents the characteristics of these 21 renegotiations.

Table 4.5. Characteristics of Renegotiations (Without Confounding Events)

	Number of Renegotiation	%
Types of Renegotiations		
Covenant Waiver/ Change	12	50%
Term Extension	11	46%
Loan Amount Increase	1	4%
Interest Rate Reduction	0	0%
Total	**24**	**100%**
Type of Lender		
Capital Market	17	81%
Banks	4	19%
Total	**21**	**100%**
Type of Announcement		
Relevant fact	13	52%
Minutes of the Debenture Holders' Meeting	11	44%
Notice to the Market	1	4%
Total	**25**	**100%**

Note: The data in table 4.5 refer to 21 disclosed renegotiations. The total of "Types of Renegotiation" and "Types of Announcement" is greater than 21 because, in some cases, the same renegotiation can be of different types (e.g., a company that renegotiates term extension and reduction of interest rate at the same time) or be disclosed in different ways simultaneously (e.g., a company that discloses renegotiation in Minutes of the Debenture Holders' Meeting and Relevant Facts at the same time).

In summary, the characteristics of the remaining 21 renegotiations are similar to those presented in table 4.4. Covenant Waiver/Change and Term Extension are the most common contractual amendments, most renegotiations were carried out with bondholders, and Minutes of the Debenture Holders' Meeting and Relevant facts are the most common means of disclosing the renegotiation.

Considering only the 21 renegotiations, I created new tests and the results are shown in table 4.6.

Table 4.6. Stock market reaction to renegotiation announcements (Without Confounding Events)

	Market Model		4 Factor Model	
Day	Mean	t-stat.	Mean	t-stat.
-5	- 0.001	- 0.241	-0.002	-0.280
-4	**- 0.011**	**- 1.789***	**-0.011**	**-1.828***
-3	- 0.001	- 0.092	-0.001	-0.125
-2	0.007	1.180	0.007	1.142
-1	- 0.007	0.918	-0.007	-0.950
0	**0.011**	**2.132****	**0.011**	**2.092****
1	**0.017**	**1.916***	**0.017**	**1.893***
2	0.004	0.663	0.004	0.628
3	- 0.019	- 1.609	-0.019	-1.626
4	- 0.005	- 0.457	-0.005	-0.477
5	0.004	0.400	0.004	0.381
[-1;1]	0.022	1.674	0.021	1.622
[-2;2]	**0.033**	**2.179****	**0.031**	**2.104****
[-5;5]	- 0.001	- 0.021	-0.003	0.116

Note: Columns 2 and 3 present the mean and the t-statistic of the abnormal returns, respectively, calculated by the market model. Columns 4 and 5 present the mean and the t-statistic of the abnormal returns, respectively, calculated by the 4-factor model; [-1; 1] represents the cumulative abnormal return of the 3-day window; [-2, 2] represents the cumulative abnormal return of the 5-day window; [-5; 5] represents the cumulative abnormal return of the 11-day window. The superscripts ∗∗∗, ∗∗, and ∗ indicate significance at the 1%, 5%, and 10% levels, respectively. The sample is composed of 21 events.

Table 4.6 shows signs of a positive market reaction on the day of the renegotiation and the day immediately after the renegotiation. When we consider the accumulated return in the different windows, there are signs of a market reaction in the 5-day window (-2; 2). The results also show a significant abnormal return on the fourth day before the renegotiation. However, due to the reduced sample size, this result may have been influenced by distortions caused by specific companies. For example, one of the companies in the sample had a share price drop of more than 10% on the fourth day before the announcement of renegotiation. Important to mention that both the market model and the 4-factor model presented similar results.

Figures 4.4 and 4.5 allow better visualization of these results.

Figure 4.4. Cumulative abnormal stock returns (CAR) around the renegotiation date (Market Model) (Without Confounding Events)

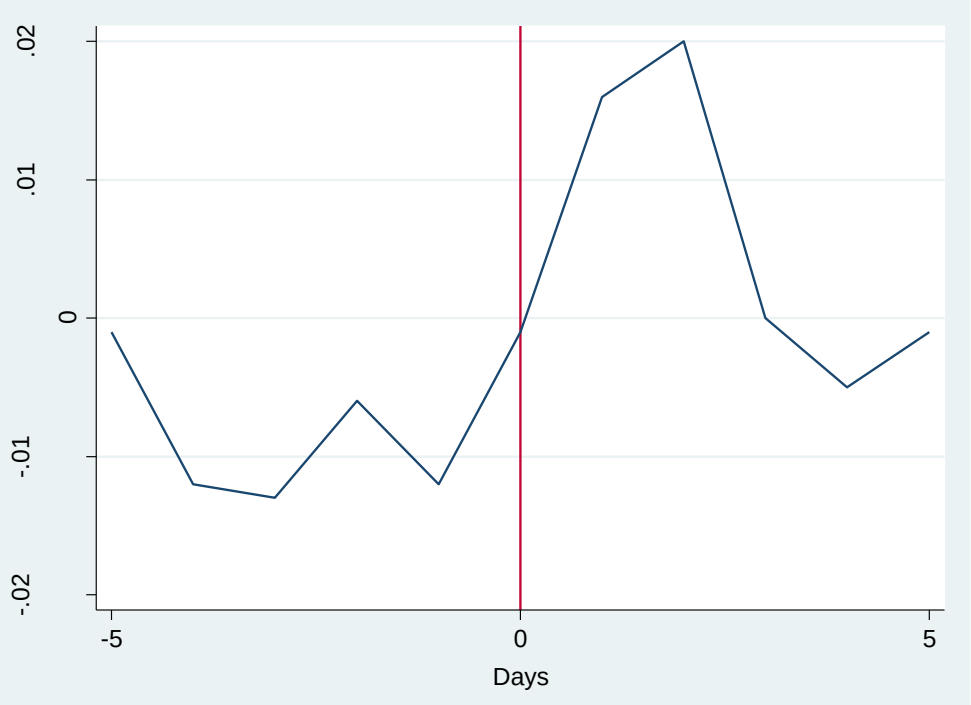
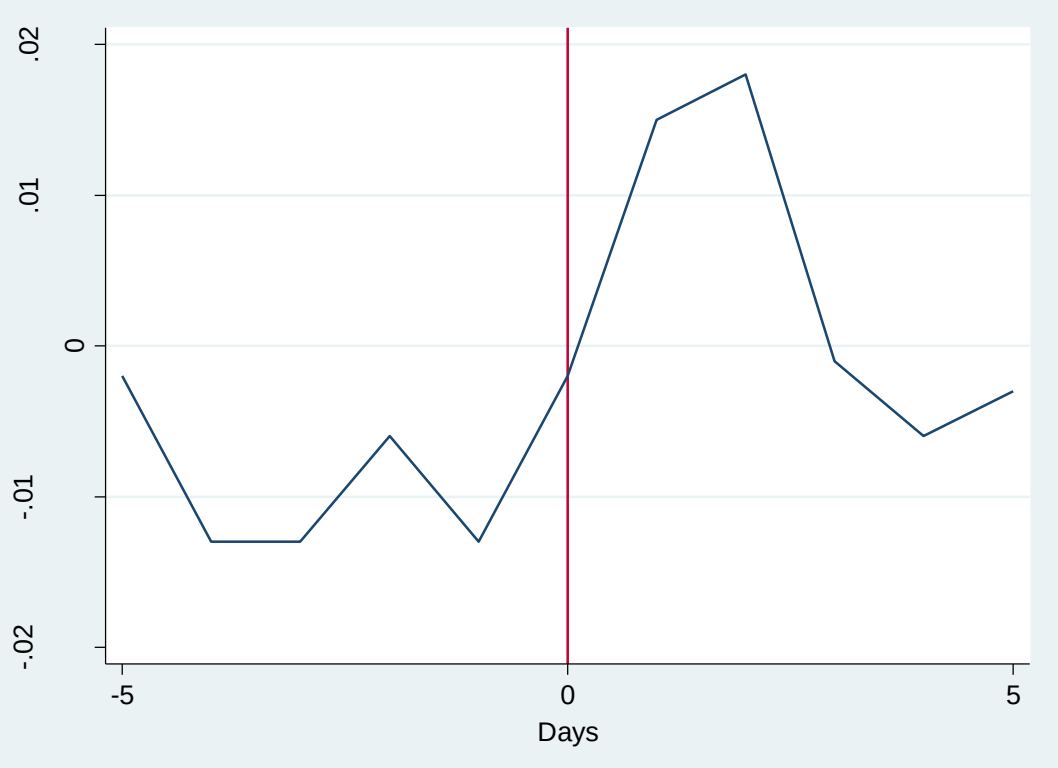


Figure 4.5. Cumulative abnormal stock returns (CAR) around the renegotiation date (4 Factor Model) (Without Confounding Events)



Figures 4.4 and 4.5 show signs of a market reaction on the day of the event and immediately after. It is expected that the positive effects of the market reaction would be maintained over the days of the window, showing a greater relevance attributed by the market to the disclosed information. However, Figures 4.4 and 4.5 show that this positive effect does not seem to last long since the accumulated return drops from the third day onwards. Table 4.6 also shows a drop of 0.019 on the third day after the renegotiation, an average higher than all other days. On the other hand, Nikolaev (2018) shows a pronounced positive market reaction surrounding the day of renegotiation, but it does not show a later reversal, even 20 days after the disclosure. Once again, the reversal presented in Figures 4.4 and 4.5 can be influenced by specific events in certain sample companies. For example, the share value of one samples' company dropped more than 20% on the third day after the renegotiation, influencing the overall average.

The so-called certifying effect can explain the market reaction presented on the day of the event and the day after. Contracts between agents are intrinsically incomplete (Hart, 1995). In other words, there is no way to consider every contingency and future state of the world in the contracts. Therefore, contracts may eventually become inefficient over time. Nikolaev (2018) cites, as an example of inefficiency in the contracts, covenant becoming overly tight or the loan term becoming insufficient.

Therefore, renegotiations are a good opportunity for lenders to seek new information about borrowers to support their decision regarding renegotiation. So, in renegotiations, private information could be transmitted to the market to participants who do not have access to such information, which is the so-called certifying effect. This effect, therefore, tends to provoke a positive stock market reaction (Godlewski, 2015; Nikolaev; 2018).

In addition, debt renegotiation reduces the need for creditors to use costly bankruptcy filings as a disciplining mechanism, avoiding bankruptcy costs and translating into a higher company equity value (Silaghi et al., 2022).

Following Nikolaev (2018), I also ran a regression model test. I sampled observations during the period of −15 to +15 trading days around a renegotiation and considered as explanatory variables 5-day indicator dummies: "Day −2", "Day −1", "Day 0", "Day + 1" and "Day + 2", defined concerning the renegotiation date. As in Nikolaev (2018), this estimation aims to verify if there are associations between the 5-day window and the presence of abnormal returns. Table 4.7 presents the results of this regression analysis.

Table 4.7. Stock market reaction to renegotiation announcements (Without Confounding Events)

VARIABLES	(1) Market Model	(2) 4 Factors Model
Day -2	0.00877	0.00878
	(0.00537)	(0.00537)
Day -1	-0.00352	-0.00352
	(0.00547)	(0.00547)
Day 0	0.00505	0.00506
	(0.00542)	(0.00542)
Day 1	**0.0122****	**0.0122****
	(0.00558)	**(0.00558)**
Day 2	-0.00797	-0.00796
	(0.00542)	(0.00542)
Constant	0.00183	0.00160
	(0.00162)	(0.00162)
Observations	1,577	1,577
R-squared	0.008	0.008
Confounding Event Dummies	Yes	Yes

Note: Dependent variable: abnormal return; "Day – 2" assumes value 1 for the second day prior to the renegotiation; Note: "Day - 1" assumes value 1 for the second day prior to renegotiation; "Day 0" assumes value 1 for the day of renegotiation; "Day + 1" assumes value 1 for the first day after renegotiation; "Day + 2" assumes value 1 for the second day after renegotiation; Confounding Event Dummies assumes a value of 1 if other information is published during the five days before and after the disclosure of the renegotiation. The superscripts ∗∗∗, ∗∗, and ∗ indicate significance at the 1%, 5%, and 10% levels, respectively. The sample is composed of 21 events.

Table 4.7 shows a relationship between the first day after the renegotiation announcement and the abnormal returns. This result is in line with the previous results presented in table 4.6.

Furthermore, these results are consistent with Godlewski (2015) and Nikolaev (2018). In Godlewski (2015), the financial covenant renegotiation of European companies (most significant amendment type) led to a cumulative abnormal return of 14% in the 3-day window. In this study, as shown in Table 4.6, the 3-day window did not show statistical significance. However, the cumulative abnormal return for the 5-day window (statistically significant) was only approximately 3%.

Nikolaev (2018) indicated the presence of abnormal returns on the first day after disclosure of only 0.07%, while in this study, the percentage was 1.22% (Table 4.7). On the other hand, table 4.7 showed abnormal returns only on the first day after the renegotiation, while in Nikolaev (2018), besides the first day, the same test showed abnormal returns on the

renegotiation day and the two previous days.

Therefore, broadly speaking, we showed that there is a market reaction to the renegotiation announcement in Brazil, rejecting Hypothesis 1 of this study. However, this reaction tends to be less intense than in developed economies. This lower intensity is perceived by the lower economic significance of the reaction (compared to Godlewski (2015)) or by the reaction duration (compared to Nikolaev (2018)), and can be a reflection of the idiosyncrasies present in an emerging market like Brazil (i.e., less liquidity, more significant information asymmetry, less sophisticated investors, less demanding disclosure requirements, and less enforcement of these disclosures).

With a lower level of disclosure, there is a greater information asymmetry between the company and the investor, thus making the renegotiation disclosure less informative than in countries with higher disclosure levels, possibly affecting the market reaction. In addition, the smaller number of qualified investors present in emerging economies may reduce the intensity of the market reaction to renegotiations, given that this type of investor is known to have more ability to maximize the usefulness of disclosed information (Hand, 1990). Finally, the lower liquidity present in emerging markets tends to reduce stocks' sensitivity to the disclosed information, which could also explain the results found in this study.

Beyond the emerging economy contexts' argument, the divergence between the results could also be explained by the difference in the renegotiations characteristics. As it was possible to notice in the descriptive statistics (table 4.5), more than 80% of the renegotiations in the sample are with bondholders, unlike Nikolaev (2018) and Goldewski (2015), who focused on renegotiations with private debt.

This is a significant difference since bondholders cannot access soft information like bank creditors (Nikolaev, 2018; Lou & Otto, 2020). By having access to less information than banks, bondholders tend to reduce the certifying effect since the bondholder's decision-making tends to be through the information that is already public, making the disclosure of the renegotiation less informative to the market.

4.4.1 Additional Analysis

One could argue that market reactions may differ depending on the type of renegotiation disclosed. For this reason, I separate the renegotiations into two types: renegotiations without compensation and renegotiations with compensation. Renegotiations

without compensations generate only positive outcomes for companies, such as loosening covenants or increasing the loan amount. On the other hand, renegotiations with compensations are those that, despite generating positive outcomes, also generate an adverse one (e.g., interest rate increases or the imposition of tight covenants). Table 4.8 presents the results of this test.

Table 4.8. Stock market reaction to renegotiation announcements (models with compensation and without compensation)

	(1) Market Model (without compensation)	(2) 4 Factors Model (without compensation)	(3) Market Model (with compensation)	(4) 4 Factors Model (with compensation)
Day -2	0.00680	0.00680	0.0104	0.0104
	(0.00761)	(0.00761)	(0.00753)	(0.00753)
Day -1	-0.0121	-0.0121	0.00418	0.00417
	(0.00761)	(0.00761)	(0.00779)	(0.00779)
Day 0	0.00539	0.00540	0.00479	0.00480
	(0.00761)	(0.00761)	(0.00765)	(0.00765)
Day 1	**0.0139***	**0.0139***	0.0110	0.0110
	(0.00811)	**(0.00811)**	(0.00765)	(0.00765)
Day 2	-0.00667	-0.00667	-0.00899	-0.00898
	(0.00776)	(0.00776)	(0.00753)	(0.00753)
Constant	0.00178	0.00152	0.00201	0.00181
	(0.00209)	(0.00209)	(0.00251)	(0.00251)
Observations	690	690	887	887
R-squared	0.013	0.013	0.007	0.007
Confounding Event Dummies	Yes	Yes	Yes	Yes

Note: "Day - 2" assumes value 1 for the second day prior to renegotiation; Day – 1" assumes value 1 for the first day prior to the renegotiation; "Day 0" assumes value 1 for the day of renegotiation; "Day + 1" assumes value 1 for the first day after renegotiation; "Day + 2" assumes value 1 for the second day after renegotiation; Confounding Event Dummies assumes a value of 1 if other information is published during the 5 days before and after the disclosure of the renegotiation. The superscripts ∗∗∗, ∗∗, and ∗ indicate significance at the 1%, 5%, and 10% levels, respectively. The sample is composed of 21 events.

Table 4.8 shows a market reaction only for renegotiations that did not present a compensations. In other words, it is not just any renegotiation that tends to be valued by the market, but only those that generate only positive outcomes for the borrower. Therefore, I showed that debt renegotiations can provoke stock market reactions, even in emerging economy markets.

To sum up, these results reject the hypothesis that there is no market reaction to the debt renegotiation disclosure. However, these results also differ from those found in developed economies, given that the reaction was less intense. This lower intensity may reflect the idiosyncrasies in an emerging economy and the lender characteristics.

4.5 Concluding Remarks

Debt renegotiation is essential in the contractual relationship between the creditor and borrower. The theory of incomplete contracts asserts that it is impossible to establish contracts that cover all contingencies or future states of the world. Therefore, renegotiation serves to adjust the contract in the face of new realities that arise.

Previous studies have shown that debt renegotiations transmit information to the market. This happens because the renegotiation implies the collection of new information from the borrower by the creditor to subsidize their decisions about the renegotiation. Since this new information may not be public, the renegotiations can offer relevant signals about the borrower's quality, generating the certifying effect in the market.

Nevertheless, these studies have been contracted in developed economies such as the United States and European countries. Therefore, this study aimed to analyze the market reaction to renegotiations in the Brazilian market, whose characteristics differ substantially from those of developed markets.

The results show that, even in a market with less liquidity, more significant information asymmetry, less sophisticated investors, less demanding disclosure requirements, and less enforcement of these disclosures, there is evidence of a positive market reaction to renegotiations. However, this reaction tends to be less intense than those seen in developed economies.

These results are new in the literature. To the best of my knowledge, this is the first market reaction study to focus on debt renegotiation. Furthermore, I innovate by addressing capital market debt renegotiations in addition to bank debts traditionally addressed in previous studies. As a practical contribution, the results showed that debt renegotiation disclosure can be a strategy to increase the shareholders' value perception of the company.

Finally, the main limitation of this study is related to a possible bias regarding the companies that discloses renegotiations. More specifically, not all companies that renegotiated their debts disclosed this renegotiation. Therefore, this may bias the results found

in this study. In addition, this study's small sample makes it challenging to design additional tests to explore other approaches.

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5 EARNINGS MANAGEMENT AS A STRATEGY FOR DEBT RENEGOTIATION: EVIDENCE FROM BRAZIL

5.1 Introduction

An important instrument for satisfying firms' investment needs is external financing. Through the transfer of resources, the creditor establishes a contractual relationship with the firm. However, these contracts are incomplete given the impossibility of specifying all the contingencies, as Grossman and Hart (1986) pointed out. So, in order to compensate for contractual incompleteness, agents can renegotiate contract terms in the future (Hart & Moore, 1988).

Empirical evidence shows that, in addition to restrictive contractual clauses (covenants), companies usually renegotiate the interest rate, maturity and debt amount (Roberts & Sufi, 2009). Generally speaking, debt renegotiations can provide favorable outcomes to companies (e.g., interest rate reduction, loosening of covenants etc). For this reason, managers likely seek to increase the probability of renegotiation with their creditors.

To increase bargaining power during renegotiation, one could expect that managers use the discretion granted by the accounting standard to manipulate the company's accounting earnings (Choi & Nam, 2019; Melo & Lamonier, 2020). According to Richardson (2000), the useful life definition of an asset and its residual value, allowance for doubtful accounts, and asset impairment are examples of economic events where the manager has greater flexibility in defining estimates. Therefore, managers can manage the earnings to present a better financial situation to creditors since creditors use accounting numbers to monitor credit contracts.

Therefore, this study aims to analyze whether there is evidence of earnings management in the quarters that precede the debt renegotiation of Brazilian companies. The main hypothesis is that managers seek to artificially improve their earnings (i.e., manage earnings upwards) in the quarters prior to the renegotiation to increase their bargaining power when renegotiating the contract terms.

Brazil is a suitable setting for this study given that it has characteristics that can favor the earnings management practice, such as: high information asymmetry and agency costs, low corporate governance, less protection of creditors' rights and low legal compliance (Alali & Foote, 2012; Almeida & Dalmácio, 2015; Roma, Louzada, Roma, Goto & Souma, 2021).

I used the Jones (1991) model modified by Dechow et al. (1995) and Kothari et al. (2005) as a proxy for earnings management. Information on debt renegotiation came from hand-collected of publicly traded companies. Furthermore, the analysis period comprises all quarters between 2010 and 2021.

The main results of this study revealed that only companies in a bad financial situation manage earnings in the quarters before the renegotiation. However, contrasting what was expected, the results indicate that these companies manage downward earnings in the quarters that precede debt renegotiation. On the other hand, the study did not find evidence that companies not in a distressed situation manage their results before renegotiation.

This study contributes to the literature as it sheds light on factors related to debt contracts that generate incentives for earnings management practice. So far, studies have focused only on earnings management as a mechanism to avoid breaching covenants, thus failing to address other contractual mechanisms that may also encourage earnings management practice.

DeFond and Jiambalvo (1994) and Dichev and Skinner (2002), for example, identified that, since the breach of covenants can be costly to companies, managers tend to manage results to reduce the probability of a breach. Jha (2013) has found the same using quarterly management data instead of annual data. Furthermore, this result is not limited to accruals earnings management. For Franz, Hassabelnaby and Lobo (2014), earnings management through operational activities is also used to reduce the probability of covenant violation. Finally, Dyreng et al. (2020) also reveal that, by avoiding the covenant breach, earnings management can be favorable to the shareholder, increasing the firm's value.

In Brazil, Duarte, Galdi and Damasceno (2020) found that companies with financial ratios close to the covenant limits tend to artificially improve earnings to avoid breaches. Focusing on the covenants linked to bonds contracts, Konraht and Colauto (2021) also found that managers tend to manage the accounting earnings as the company approaches covenant violation.

Despite the relevance of these studies, there is a lack in the literature of empirical evidence that analyzes, in a more comprehensive way, the debt contracts incentives that can lead to earnings management (i.e., beyond the covenant violation), which constitutes the main contribution of this study.

I also contribute by alerting creditors about the possibility of accounting manipulation to increase bargaining power in renegotiations. This warning is important, considering that the

creditor's decision to renegotiate can be based on numbers that do not represent the company' financial essence, leading it to assume unforeseen risks.

5.2 Theoretical Framework and Hypothesis Development

The firm is a composition of contracts between different stakeholders, such as employees, suppliers, customers, and creditors (Jensen & Meckling, 1976). An important mechanism for monitoring and regulating contracts is accounting data (Healy & Wahlen, 1999). However, the literature recognizes that these accounting data can be used as an instrument for a practice known as earnings management, thus obscuring the stakeholders' analysis in monitoring the company.

Earnings management is a term used to designate the practice implemented by managers to "alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers." (Healy & Wahlen, 1999, p. 368). The literature points out two ways managers can manage accounting results: i) through real activities (operational decisions); or ii) through accounting estimates and methods.

Earnings management through real activities is, for Roychowdhury (2006), the result of managers' desire to demonstrate to their stakeholders the fulfillment of certain goals throughout the ordinary course of operations. This type of earnings management consists of adopting managerial decisions such as price discounting or reducing discretionary expenses.

Roychowdhury (2006) recognizes that these management decisions can be considered optimal under certain circumstances. However, when applied more broadly than usual, aiming solely at achieving goals, they are considered earnings management. Empirical evidence regarding earnings management by real activities can be found in studies such as Dechow and Sloan (1991), Baber, Fairfield and Haggard (1991) and Al-Shattarat Hussainey and Al-Shattarat (2018). Dechow and Sloan (1991) and Baber et al. (1991) found that CEOs tend to reduce research and development spending to meet earnings benchmarks. Al-Shattarat et al. (2018) show that companies tend to manipulate operating activities such as sales, discretionary expenditures, and production costs to meet earnings benchmarks and improve their performance.

On the other hand, earnings management can also be carried out through estimates and accounting methods. In this case, managers use the discretion allowed by accounting

standards to manipulate the reported results (Richardson, 2000). There are several economic events where the manager has greater flexibility in defining estimates, for example, the definition of the useful life of an asset and its residual value, allowance for doubtful accounts, asset impairment, among others (Richardson, 2000).

Therefore, given that creditors use accounting numbers to monitor credit contracts, managers can manage the earnings to present a better financial situation to creditors. In the literature, several studies seek to analyze whether the restrictive clauses (covenants) established in debt contracts can motivate the practice of earnings management.

DeFond and Jiambalvo (1994) and Dichev and Skinner (2002), for example, sought to analyze the relationship between financial covenant breach and earnings management. According to DeFond and Jiambalvo (1994), the purpose of covenants is to restrict financing and investment decisions that may harm creditors, reducing monitoring costs. Considering that these clauses are established based on accounting numbers and that, in addition, violating the limit can be costly for companies, managers can manage the results when the company is close to breaching any of these clauses. The results found by DeFond and Jiambalvo (1994) and Dichev and Skinner (2002) support the hypothesis that managers act through earnings management to avoid covenant violation.

The study by Jaggi and Lee (2002) suggests that not all companies manage profits upwards to avoid a breach. More specifically, unlike the studies mentioned so far, Jaggi and Lee (2002) argue that management's response through earnings management depends on the severity of the firm's financial difficulty and the concession of a waiver by the creditor (in case of covenant breach).

Therefore, the authors argue that if the financial difficulty is only temporary, managers tend to incur earnings management upwards, increasing the firms' accounting profit. In other words, managers would choose to improve the firms' reported performance to convince the creditor that this is not a severe financial difficulty, thus increasing the probability of obtaining a waiver.

On the other hand, if the financial difficulty faced by the company is severe, managers tend to manage their earnings downwards to underline the company's financial difficulties. By worsening results, managers expect to renegotiate better loan terms or more favorable limits for debt covenants (Jaggi & Lee, 2002).

Unlike DeFond and Jiambalvo (1994), Dichev and Skinner (2002) and Jaggi and Lee (2002), in Jha (2013), the author sought to analyze the relationship between covenant

violation and earnings management using quarterly information. This is an important feature of Jha (2013), given that previous studies have examined the abnormal use of accruals considering yearly data. The use of yearly data on earnings management studies is a limitation because this data may not capture the earnings management in the last quarters prior to a violation (Jha, 2013).

The results of Jha (2013) are compatible with those of Jaggi and Lee (2002): companies with good financial positions manage their earnings upwards to project a healthy image and, therefore, obtain forgiveness (waiver) from the creditor for a covenant violation. On the other hand, financially distressed companies manage profits down during these quarters. More specifically, the company tends to worsen its results, expecting the creditor to impose less restrictive covenants (Jha, 2013).

Subsequently, Franz, Hassabelnaby and Lobo (2014) made an important contribution to the empirical literature by analyzing whether, in order to avoid covenants violation, companies have engaged in both accrual earnings management and earnings management through real activities. The study showed that companies tend to perform earnings management through real activities more than through accruals.

Dyreng, Hillegeist and Penalva (2020) analyzed whether earnings management to avoid covenants violating is, in fact, harmful to shareholder value generation. On the one hand, the authors recognize that earnings management can negatively affect the firm. According to Dyreng et al. (2020, p.2), earnings management through accruals can “result in more costly scrutiny by auditors and regulators and can increase the likelihood of shareholder litigation”. On the other hand, the authors argue that, by avoiding the breach of the covenants, earnings management allows the company not to incur several direct and indirect costs, such as, for example, an increase in the interest rate, a reduction in access to credit and an increase of the number of covenants, contributing to increasing the firm's value.

The results of Dyreng et al. (2020) showed that earnings management related to covenant violations could benefit shareholders and, therefore, does not necessarily give rise to agency conflicts between shareholders and managers. The study also shows that companies that violate the covenant but do not manage earnings impose higher costs on shareholders.

In Brazil, Duarte et al. (2020) and Konraht and Colauto (2021) also sought to understand whether earnings management practice reduces the probability of covenant breach. Duarte et al. (2020) used a sample of publicly-traded Brazilian companies from 2012 to 2016. According to the authors, companies close to breaching covenants (i.e., with accounting

indexes close to 10% of the boundary established in the covenants) tend to have a higher earnings management than companies not close to the covenant boundary.

Konraht and Colauto (2021) found similar results to Duarte et al. (2020). The study is based on a sample of 100 companies that issued bonds between 2010 and 2016. According to Konraht and Colauto (2021), earnings management tends to be more significant in raising the accounting earnings as companies get closer to breaching covenants.

As presented in this section, the literature has several studies showing that covenants can generate incentives for earnings management. However, beyond the covenants, other aspects also subject to renegotiation in debt contracts (such as the interest rate, maturity or debt amount) are underexplored by previous studies. Thereby, managers can artificially increase their earnings to increase their bargaining power and, consequently, obtain more favorable outcomes in the renegotiation. Hence, Hypothesis 1 of this study is:

H1: Managers tend to manage the earnings upwards in the quarters that precede the renegotiation.

Although the renegotiation of interest rate, maturity, and debt amount can generate incentives for earnings management, I expect that covenants renegotiation will trigger a higher level of earnings management. In summary, covenants have more profound effects on the company given that they can restrict companies in their decisions to increase investment, carry out acquisitions, sell assets or increase dividend payments (Godlewski, 2015). Moreover, any covenants breach can make the debt immediately enforceable. Therefore, Hypothesis 2 of this study is:

H2: Earnings management tends to be more intense in covenant renegotiations when compared to other contractual terms (maturity, interest and amount).

5.3 Methods

5.3.1 Data and Sample

The sample comprises all non-financial companies listed in the B3 (Brasil, Bolsa e Balcão) in 2021, and the analysis period covers all quarters between 2010 and 2021[5]. I chose

[5] The data collection process was supported by the Laboratório de Finanças e Risco of FEA/USP.

2010 because it was the starting period of Brazilian companies' full IFRS adoption, thus making the time-series comparable. Debt renegotiation information comes from analyses of more than three thousand notes to financial statements. Finally, I combined this data with quarterly accounting data from Capital IQ.

Initially, the base consisted of 16,608 observations (346 companies). I exclude all observations that: i) do not have any accounting information; ii) with total assets equal to zero; iii) the companies are undergoing judicial reorganization; iv) do not present details regarding the renegotiation; v) companies that did not show revenue in any of the sample periods. Therefore, 11,603 observations (326 companies) remained.

5.3.2 Renegotiation

I collected the debt renegotiations information from the companies' notes to financial statements. Firstly, I analyzed annual financial statements to identify any renegotiation. I searched for words as "renegotiation", "financial restructure", "waiver", "covenant", "reclassified debt", ", "consent", "renegotiated conditions", "debt restructuring", "addition", among others.

After that, I identified which quarter the renegotiation occurred. If the renegotiation date is not available on the financial statement, I considered the quarter of the statement where renegotiation is mentioned first. For example, suppose the same renegotiation appears on the 2º, 3º and 4º quarter financial statements. In that case, I considered the 2º quarter as the occurrence period.

After identifying all renegotiations and the quarter of occurrence, I analyzed the notes to financial statements, Relevant Facts ("Fatos Relevantes"), Announcement to the Market ("Comunicado ao Mercado" and Minutes of the Debenture Holders' Meeting ("Atas da Reunião de Debenturistas") to find out the characteristics of renegotiations. Based on Roberts and Sufi (2009) and Roberts (2015), I searched to identify all contractual terms were changed (e.g., loan amount, interest rate, extension of maturity or grace period and covenant waiver). This information is not standardized. It means that some firms may offer greater detail than others.

In Brazil, the Accounting Pronouncements Committee ("Comitê de Pronunciamentos Contábeis") and the Securities Commission ("Comissão de Valores Mobiliários") have rules governing the disclosure of renegotiations. The Securities Commission Resolution 44 deals

with the rules for disclosing information on material acts or facts. According to the rule, debt renegotiation is considered a material fact to be disclosed widely and immediately by companies.

Moreover, the Accounting Pronouncements Committee issued a technical pronouncement of financial instruments “Accounting Pronouncements Committee – APC 40” (Comitê de Pronunciamentos Contábeis - CPC 40), which determines the disclosure in a note to the financial statement of any contractual breach. Following that standard, an entity must disclose details of any breach of contract relating to loans. In addition, in case of contract renegotiation, the company must disclose the terms of such renegotiation.

5.3.3 Models

I estimate two econometric models to analyze whether managers manage earnings before debt renegotiation. First, I estimate a multivariate regression based on the Jones (1991) model modified by Dechow, Sloan and Sweeney (1995) in order to identify earnings management practice.

The modified Jones model considers discretionary accruals as a proxy for earnings management. In summary, accruals are the difference between net income and net operating cash flow. These accruals are divided between discretionary and non-discretionary accruals. Non-discretionary ones are inherent to the company's activity. More specifically, non-discretionary accruals arise from the entity's ordinary transactions, given its performance, business strategy etc (Melo & Lamonier, 2020). On the other hand, discretionary accruals arise from accounting choices and treatments and can be adopted to manipulate accounting numbers (Melo & Lamonier, 2020). According to Jiang et al. (2020), managers can use discretionary accruals to meet or beat earnings benchmarks.

Equation 5.1 presents the Jones model modified by Dechow et al. (1995). Modified Jones model considers the total accruals as a dependent variable. Therefore, the part of total accruals not explained by non-discretionary accruals (regular for the company) are considered discretionary accruals, estimated by the error term ($e_{i,t}$). Thus, the model's error term is a proxy for earnings management (Melo & Lamonier, 2020). In summary, the greater the error term, the greater the earnings management.

$$\frac{TAC_{it}}{TA_{t-1}} = \beta_0 + \beta_1 \left(\frac{1}{TA_{t-1}}\right) + \beta_2 \left(\frac{\Delta R_{it} - \Delta AR_{it}}{TA_{t-1}}\right) + \beta_3 \left(\frac{PPE_{it}}{TA_{t-1}}\right) + e_{i,t}$$

(5.1)

Where TAC_{it} is total accruals of the company i at time t calculated by the difference between net income and operating cash flow; TA_{t-1} is the total assets of the firm i from the end of period t-1; ΔR_{it} is the change in the net operating revenues of firm i from the end of time t-1 to the end of time t; ΔAR is the change in accounts receivable of the company i from the end of time t-1 to the end of time t; PPE_{it} is the balance of the account "Property, Plant and Equipment" of firm i from the end of time t-1 to the end of time t.

To offer even more robustness to the analyses, in addition to the earnings management model proposed by Dechow et al. (1995), I also estimated the model proposed by Kothari, Leone and Wasley (2005). Kothari et al. (2005) suggest that discretionary accruals measured by the Jones (1991) and Jones model modified by Dechow et al. (1995) can be significantly influenced by company performance. In summary, as a company improves its performance over time, its non-discretionary accruals tend to increase. So, for Kothari et al. (2005), it is important to consider the firm's performance in earnings management models to avoid misclassifying the non-discretionary accruals. Hence, Kothari et al. (2005) recommend adding assets return on earnings management models to proxy the firm's performance (equation 4.2).

$$\frac{TAC_{it}}{TA_{t-1}} = \beta_0 + \beta_1 \left(\frac{1}{TA_{t-1}}\right) + \beta_2 \left(\frac{\Delta R_{it} - \Delta AR_{it}}{TA_{t-1}}\right) + \beta_3 \left(\frac{PPE_{it}}{TA_{t-1}}\right) + \beta_1 (ROA_{it-1}) + e_{i,t}$$

(5.2)

Where TAC_{it} is total accruals of the company I at time t calculated by the difference between net income and operating cash flow; TA_{t-1} is the total assets of the firm i from the end of period t-1; ΔR_{it} is the change in the net operating revenues of firm i from the end of time t-1 to the end of time t; ΔAR is the change in accounts receivable of the company i from the end of time t-1 to the end of time t; PPE_{it} is the balance of the account "Property, Plant and Equipment" of firm i from the end of time t-1 to the end of time t; ROA_{it-1} is return on assets for the period t – 1.

Once identifying the discretionary accruals using the Jones model modified by Dechow et al. (1995) and Kothari et al. (2005), I estimated a new regression to analyze whether the discretionary accruals are related to the periods preceding the debt renegotiation. I measured the discretionary accruals for each firm-quarter and examined the earnings

management patterns in the four quarters preceding the debt renegotiation, as demonstrated in equation 5.3.

$$Disc\_Acc_{(i,t)} = \beta_0 + \beta_1 Reneg + \beta_2 Lev_{it} + \beta_3 Size_{it} + \beta_4 Grow_{it} + \beta_5 GovLevel_i + \upsilon + \gamma + \varepsilon \quad (5.3)$$

Where $Disc\_Acc_{(i,t)}$ is the discretionary accruals (proxied by the error term of two different models); $Reneg$ is a dummy variable that is equal to 1 for quarter t-1 to quarter t-4 (where t = 0 is the quarter when renegotiation occurs) and 0 otherwise; Lev_{it} (leverage) is equal to the ratio of the total debt to the total assets; $Size_{it}$ is equal to natural logarithm of the total asset; $Grow_{it}$ is equal to ratio of the variation in net operating revenue between t-1 and t to the total assets at t-1; $GovLevel_i$ is a dummy variable that takes the value 1 if company i is listed on "Level 2" or "Novo Mercado" of B3, and 0 otherwise; υ is the time (quarter) fixed effect; γ is the industry fixed effect and ε is the error term.

Based on Hypothesis 1, I expect the estimator β_1 to be positive and significant, signaling that managers manage their earnings in the quarters that precede the renegotiation to renegotiate the contractual terms that favor them. To test Hypothesis 2, I estimated two more equation.

$$Disc\_Acc_{(i,t)} = \beta_0 + \beta_1 Reneg_{Cov} + \beta_2 Lev_{it} + \beta_3 ROA_{it} + \beta_4 Size_{it} + \beta_5 Grow_{it} + \eta + \upsilon + \varepsilon \quad (5.4)$$

$$Disc\_Acc_{(i,t)} = \beta_0 + \beta_1 Reneg_{Others} + \beta_2 Lev_{it} + \beta_3 ROA_{it} + \beta_4 Size_{it} + \beta_5 Grow_{it} + \eta + \upsilon + \varepsilon \quad (5.5)$$

Where $Reneg_{Cov}$ is a specific dummy for covenant renegotiations. This dummy assumes the value 1 for quarter t-1 to quarter t-4 (where t = 0 is the quarter in which the renegotiation takes place) and 0 otherwise. $Reneg_{Others}$ is a dummy representing renegotiations of other contractual terms (i.e., maturity, amount and interest).

Based on Hypothesis 2, I expect that both β_1 of $Reneg_{Cov}$ and β_1 of $Reneg_{Others}$ are positive and significant. However, I expect that the coefficient $Reneg_{Cov}$ is greater than

$Reneg_{Others}$ indicating a greater intensity of earnings management in the quarters that precede the covenant renegotiation.

Therefore, in all models (5.3, 5.4 and 5.5), I estimated fixed effect panel data regression, by ordinary least squares, with robust standard error. Moreover, all variables were winsorized (2.5 – 97.5) to mitigate the effect of outliers. Table 5.1 presents in greater detail all the variables used in the models.

Table 5.1. Models' variables

Dependent Variable	**Acronym**	**Description**	**Basis' studies**
Discretionary Accruals	$Disc\_Acc_{(i,t)}$	Proxied by the error term of two different models	Jones (1991) and Dechow et al. (1995).
Explanatory Variables			
Renegotiation	$Reneg$	Dummy that is equal to 1 for quarter t-1 to quarter t-4 and 0 otherwise	-
Covenant Renegotiation	$Reneg_{Cov}$	Dummy that is equal to 1 for quarter t-1 to quarter t-4 and 0 otherwise	Saleh and Ahmed (2005).
Others Renegotiation	$Reneg_{Others}$	Dummy that is equal to 1 for quarter t-1 to quarter t-4 and 0 otherwise	-
Leverage	Lev_{it}	Interest-bearing liabilities over total assets	Jha (2013); Roma et al. (2020).
Size	$Size_{it}$	Natural logarithm of total assets	Saleh and Ahmed (2005) and Konraht; Colauto (2020).
Grow	$Grow_{it}$	Ratio of the variation in net operating revenue between t-1 and t to the total assets at t-1	Konraht and Colauto (2020); Gomes et al. (2021).
Governance Level	$GovLevel_i$	Dummy variable that takes the value 1 if company i is listed on "Level 2" or "Novo Mercado" of B3, and 0 otherwise	Sincerre et al. (2016).

Note: the approach proposed for the variables "Renegotiation" and "Other Renegotiations" is unprecedented in the earnings management literature, so there is no base study.

5.4 Results

Table 5.2 presents the descriptive statistics. The table is divided into three parts: all companies, companies that renegotiated debts, and companies that did not renegotiate their debts during the sample period.

Table 5.2. Descriptive Statistics

	All Companies			Renegotiated			Not Renegotiated		
Variable	Obs	Mean	S.D.	Obs	Mean	S.D.	Obs	Mean	S.D.
Size	11,603	7.805	1.807	4,412	8.163	1.473	7,191	7.585	1.953
Lev	11,603	0.325	0.220	4,412	0.387	0.208	7,191	0.286	0.218
Grow	11,602	0.004	0.045	4,412	0.004	0.043	7,190	0.005	0.047

Note: *S.D.* is Standard Deviation; *Size* is measured by natural logarithm of total assets; *Lev* is leverage, obtained from interest-bearing liabilities over total assets; *Grow* measured by ratio of the variation in net operating revenue between t-1 and t to the total assets at t-1; *GovLevel* is a dummy variable that takes the value 1 if company i is listed on "Level 2" or "Novo Mercado" of B3, and 0 otherwise.

According to Table 5.2, the companies that renegotiated their debts during this period are larger and more leveraged. The average size of companies that renegotiated is 8.16, while companies that did not renegotiate have an average size of 7.58. The average leverage of companies that renegotiated is 0.39, while that of companies that did not renegotiate is 0.29. The difference in growth variable between the companies that renegotiated and those that did not renegotiate is small, around 0.1%.

I estimated a panel data model with fixed effects to analyze the earnings management incidence in the quarters preceding the renegotiation. Table 5.3 shows the estimation results.

According to Table 5.3, the variable "Reneg" is statistically significant, suggesting a relationship between companies close to renegotiating debt and the use of discretionary accruals. However, the variables' negative sign shows that firms manage earnings downward to a greater extent in the quarters that precede the debt renegotiation. More specifically, the variables' negative signs indicate that companies may be worsening their results in the quarters prior to the renegotiation. The theoretical implications regarding this result will be discussed later.

Table 5.3. Relationship between debt renegotiation and earnings management

	Modified Jones		Modified Jones With ROA	
VARIABLES	(I)	(II)	(III)	(IV)
Reneg	**-0.0061*** **	**-0.0043*** **	**-0.0050*** **	**-0.0034** **
	(0.0014)	**(0.0014)**	**(0.0014)**	**(0.0014)**
Size	-5.24e-05	**0.0005***	-0.0002	0.0004
	(0.0002)	**(0.0003)**	(0.0002)	(0.0003)
Lev	**-0.0247*** **	**-0.0263*** **	**-0.0243*** **	**-0.0255*** **
	(0.0024)	**(0.0025)**	**(0.0024)**	**(0.0025)**
Grow	**0.1280*** **	**0.1340*** **	**0.1300*** **	**0.1370*** **
	(0.0109)	**(0.0113)**	**(0.0108)**	**(0.0113)**
GovLev	**0.0021*** **	0.0009	**0.0020*** **	0.0009
	(0.0008)	(0.0009)	**(0.0007)**	(0.0009)
Constant	**0.0072*** **	**0.0542*** **	**0.0080*** **	**0.0552*** **
	(0.0019)	**(0.0149)**	**(0.0019)**	**(0.0150)**
Observations	11,602	11,602	11,601	11,601
R-squared	0.041	0.096	0.040	0.093
Industry FE	NO	YES	NO	YES
Time FE	NO	YES	NO	YES

Note: *Disc_Acc* (dependent variable) is the discretionary accruals (proxied by the error term of two different models); *Reneg* is a dummy variable that is equal to 1 for quarter t-1 to quarter t-4 (where t = 0 is the quarter when renegotiation occurs) and 0 otherwise; *Size* is measured by natural logarithm of total assets; *Lev* is leverage, obtained from interest-bearing liabilities over total assets; *Grow* measured by ratio of the variation in net operating revenue between t-1 and t to the total assets at t-1; *GovLevel* is a dummy variable that takes the value 1 if company i is listed on "Level 2" or "Novo Mercado" of B3, and 0 otherwise. ***p < 0.01, **p < 0.05, *p < 0.10.

The coefficients for the control variables are similar to those reported in the literature. For example, I find that the discretionary accruals are negatively associated with the debt ratio as in Jha (2013), Barros et al. (2014) and Konraht and Colauto (2021), and positively associated with firm growth as in Nardi and Nakao (2009) Sincerre et al. (2016). The Size and GovLev variables did not show consistent results related to statistical significance.

To minimize possible problems with sample selection bias, I perform a new test using the Propensity Score Matching (PSM) method. The purpose of the PSM is to make the control and treatment groups more comparable. Following Sincerre et al. (2016), the matching was estimated considering similar companies in terms of size, leverage and profitability. According to the authors, it is expected that companies with similar size, leverage and profitability also have similar levels of earnings management. Table 5.4 presents the results of the test performed using the PSM.

Table 5.4. Propensity Score Matching Test

	Modified Jones	Modified Jones With ROA
Coef	**-0.0049****	**-0.0053****
z	**(-2.08)**	**(-2.32)**

Note. For each companies' period before the renegotiation, I matched with a company with similar profitability, leverage and sales growth but had not renegotiated the debt. The dependent variable is the level of earnings management for company i in quarter t calculated using two different models (Modified Jones and Modified Jones with ROA; t-statistics are shown in parentheses; *, ** and *** denote significance at levels of 10%, 5% and 1%, respectively

The result of the PSM test also showed indications that companies managed earnings downward in the quarters before debt renegotiation when compared to companies that did not renegotiate their debts.

Therefore, the results from Tables 5.3 and 5.4 reject the hypothesis that firms increase their results in the renegotiations' preceding quarters. On the contrary, the results showed evidence that firms manage downward earnings before renegotiation. However, this result may be influenced by companies facing financial difficulties. DeAngelo et al. (1994) found that managers of financially troubled firms use negative abnormal accruals before debt renegotiation. The idea is that, by highlighting the firm's financial difficulties by reducing the reported earnings, the manager hopes to obtain better terms in their contract renegotiations (for example, creditors might set less restrictive covenants than they might otherwise).

Besides DeAngelo et al. (1994), Jaggi and Lee (2002) argue that managers are likely to highlight the severity of financial difficulties in case of severe financial distress. Moreover, Saleh and Ahmed (2005), analyzing Malasyas companies in times of crisis, identified that companies with difficulty manipulate profits downwards. In other words, the magnitude of discretionary accruals is significantly negative during the year surrounding renegotiations with lenders.

Therefore, in a sequence of new tests, I sought to verify whether the results found were specific to companies facing financial distress. Following Saleh and Ahmed (2005), I calculated the Altman Z Score and constructed the "Distress" variable (that equals one if the Altman Z score is in the lowest 25th percentile and zero otherwise). Therefore, the variable Distress categorizes the financially distressed firms with a higher chance of bankruptcy. Table 5.5 presents the results of the test with the variable Distress.

Table 5.5. Relationship between debt renegotiation and earnings management

VARIABLES	(1) Jones Mod.	(2) Jones Mod. ROA
Reneg	0.0005	0.0012
	(0.0016)	(0.0016)
Distress	**-0.0130*** **	**-0.0114*** **
	(0.0011)	**(0.0011)**
Reneg x Distress	**-0.0068** **	**-0.0070** **
	(0.0028)	**(0.0028)**
Size	5.50e-05	-1.52e-05
	(0.0003)	(0.0003)
Lev	**-0.0197*** **	**-0.0197*** **
	(0.0025)	**(0.0025)**
Grow	**0.125*** **	**0.129*** **
	(0.0113)	**(0.0113)**
GovLev	-0.0013	-0.0011
	(0.0009)	(0.0010)
Constant	**0.0584*** **	**0.0590*** **
	(0.0148)	**(0.0149)**
Observations	11,602	11,601
R-squared	0.112	0.106
Industry FE	YES	YES
Time FE	YES	YES

Note: Panel data estimation with Robust standard error clustered in parentheses below each coefficient. *Disc_Acc* (dependent variable) is the discretionary accruals (proxied by the error term of two different models); *Reneg* is a dummy variable that is equal to 1 for quarter t-1 to quarter t-4 (where t = 0 is the quarter when renegotiation occurs) and 0 otherwise; Distress is a dummy that is equals one if the Altman z score is in the lowest 25th percentile and zero otherwise; *Size* is measured by natural logarithm of total assets; *Lev* is leverage, obtained from interest-bearing liabilities over total assets; *Grow* measured by ratio of the variation in net operating revenue between t-1 and t to the total assets at t-1; *GovLevel* is a dummy variable that takes the value 1 if company i is listed on "Level 2" or "Novo Mercado" of B3, and 0 otherwise. ***p < 0.01, **p < 0.05, *p < 0.10.

The results of table 5.4 show that companies in distress tend to manipulate downward profits in the quarters prior to renegotiation, in line with the studies by DeAngelo et al. (1994), Jaggi and Lee (2002) and Saleh and Ahmed (2005). In addition, it was not possible to find evidence that companies not in distress managed their earnings in the periods before the renegotiation.

In order to test hypothesis 2 of this study, I proceeded with new estimations. Renegotiations involving covenants were separated into a specific variable ("Reneg_Cov"), while the other types of renegotiations were grouped into the "Reneg_Others" variable. Table 5.6 presents the results of the new tests.

Table 5.6. Relationship between different renegotiations and earnings management

	Modified Jones		Modified Jones With ROA	
VARIABLES	(I)	(II)	(III)	(IV)
Reneg_Cov	**-0.0043****		**-0.0033***	
	(0.0018)		**(0.0017)**	
Reneg_Others		-0.0035		-0.0029
		(0.0021)		(0.0021)
Size	0.0005	0.0005	0.0004	0.0004
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Lev	**-0.0264*****	**-0.0267*****	**-0.0257*****	**-0.0259*****
	(0.0025)	**(0.0025)**	**(0.0025)**	**(0.0025)**
Grow	**0.134*****	**0.134*****	**0.137*****	**0.137*****
	(0.0113)	**(0.0113)**	**(0.0113)**	**(0.0113)**
GovLev	0.0009	0.0010	0.0009	0.0009
	(0.0009)	(0.0009)	(0.0009)	(0.0009)
Constant	**0.0545*****	**0.0546*****	**0.0555*****	**0.0555*****
	(0.0149)	**(0.0149)**	**(0.0150)**	**(0.0150)**
Observations	11,602	11,602	11,601	11,601
R-squared	0.096	0.095	0.092	0.092
Industry FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES

Note: Panel data estimation with Robust standard error clustered in parentheses below each coefficient. *Disc_Acc* (dependent variable) is the discretionary accruals (proxied by the error term of two different models); *Reneg_Cov* is a dummy that assumes the value 1 for quarter t-1 to quarter t-4 (where t = 0 is the quarter in which the renegotiation takes place) and 0 otherwise; *Reneg_Others* is a dummy representing renegotiations of other contractual terms (i.e., maturity, amount and interest).; *Size* is measured by natural logarithm of total assets; *Lev* is leverage, obtained from interest-bearing liabilities over total assets; *Grow* measured by ratio of the variation in net operating revenue between t-1 and t to the total assets at t-1; *GovLevel* is a dummy variable that takes the value 1 if company i is listed on "Level 2" or "Novo Mercado" of B3, and 0 otherwise. ***p < 0.01, **p < 0.05, *p < 0.10.

Table 5.6 shows statistical significance for the variable that represents renegotiations involving covenants (Reneg_Cov). On the other hand, the variable that represents the other types of renegotiation (Reneg_Others) did not show statistical significance.

These results point to a greater preference of managers to manage results in renegotiations involving covenants. Covenants can profoundly restrict the companies' decision-making of companies related to: investments, mergers and acquisitions, asset sales, dividend payments etc. (Godlewski, 2015). For this reason, managers would be more concerned about managing earnings to increase bargaining power in covenants' renegotiations. Therefore, the results do not reject hypothesis 2 that "earnings management

tends to be more intense in covenant renegotiations when compared to other contractual terms (maturity, interest and amount).”

5.5 Concluding Remarks

Debt renegotiation is an important tool for maintaining long-term contracts. By renegotiating contracts with creditors, the company can obtain favorable outcomes, for example, reduction of interest rates, loosening of covenants etc. For this reason, managers likely seek to increase the probability of renegotiation with their creditors.

This study sought to investigate whether there are indications that managers use earnings management to increase their probability of obtaining good outcomes in renegotiation. In other words, this study verified whether managers manipulate their earnings to make them more attractive to creditors to obtain advantages in the renegotiation.

The study was developed from a hand-collected sample of renegotiations of listed Brazilian companies, considering the period from 2010 to 2021. Brazil represents an adequate context for this research due to the intrinsic characteristics that contribute to the earnings management practice such as: high information asymmetry and agency costs, low corporate governance, less protection of creditors' rights and low legal compliance.

To sum up, the results rejected the hypothesis that companies manage their profits upwards in the quarters before the renegotiation. More specifically, the results show that distressed companies manage their results downwards in the quarters before renegotiations. Therefore, companies tend to worsen their results to obtain greater ease in renegotiating with creditors. On the other hand, the study did not find evidence that companies not in a situation of distress manage their earnings before renegotiation.

These results point to strategies used by managers of distressed companies to renegotiate their debts. Therefore, it also serves as a warning to creditors regarding decision-making involving debt renegotiation.

This study has as a limitation the possible problem of endogeneity of the model. More specifically, the attribution of a causal relationship in this study is impaired because there is no exogenous shock in the model (there may be a bias in the firm's decision to seek to renegotiate the contracts).

Despite this, this study is relevant to the literature given that, as far as I know, it is the first to analyze the relationship between earnings management and renegotiation from a broader perspective (not specifically related to the breach of covenants).

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6 CONCLUSION

This research aimed to investigate the occurrence of debt renegotiations in an underexplored emerging economy context, namely the Brazilian context. Divided into three essays, I analyzed debt renegotiation from the perspective of the three agents most affected by the renegotiation: i) creditor perspective; ii) investor perspective; and iii) manager perspective.

The first essay dealt with the creditor's perspective and is presented in chapter 3. In this study, I sought to investigate the companies' characteristics considered determinants of debt renegotiation. The results showed that the change in the financial condition of companies (for example, profitability, leverage, size) increases the probability of debt renegotiation for Brazilian companies. Subsequently, I analyzed the determinants of the occurrence of compensations in renegotiations. The results showed that when there is a loss in the firm's ability to pay (reduction of profitability, cash generation capacity and interest coverage ratio), the probability of renegotiation having a compensation is increased. Finally, the study also showed that, unlike banks, renegotiations with bondholders are more likely to have compensations.

The second essay deals with the market perspective and is presented in chapter 4. In this second essay, I sought to investigate whether the disclosure of the renegotiation of Brazilian companies causes a reaction in the stock market, as well as empirical evidence in developed markets. The results showed that the capital market reacts positively to the announcement of firms' renegotiation. However, this reaction tends to be less intense than those presented in other contexts, such as European (Godlewski, 2015) and U.S. (Nikolaev, 2018).

Finally, the third essay deals with managers' perspective and is presented in chapter 5. In this essay, I investigated whether there is evidence that managers manage profits to make them more attractive to creditors and, thus, obtain advantages in debt renegotiations. The results showed indications of earnings management in the quarters that precede the renegotiation. However, earnings management occurs to reduce accounting profits. In a subsequent analysis, the study showed that these results are typical of distressed companies. More specifically, a distressed company seeks to highlight the firm's financial difficulties to sensitize creditors and thus obtain better terms in their contract renegotiations. The study found no evidence that companies not in distress manage earnings.

The three essays offer a key overview of renegotiations in the Brazilian context. The results found are important in different ways. Firstly, by offering evidence of renegotiation using a hand-collected sample of renegotiation in the emerging economy, which differs from most previous studies. Second, this study offers an unprecedented overview of renegotiations in Brazil. Although Mourad et al. (2020) developed a study on renegotiations in Brazil, the authors focused on distressed debts. Using a hand-collected sample allows me to use a broader concept of renegotiation, amplifying the empirical evidence about renegotiation. Thirdly, unlike previous studies focusing on bank loans, this research considers renegotiations with bondholders, expanding knowledge about debt renegotiations. Fourthly, this is the first study to analyze the relationship between earnings management and renegotiation outside the specific context of covenant violation.

Finally, this study also contributes to the decision-making of different agents. The results can help creditors by alerting them about the possibility of managers' accounting manipulation. In addition, they can help companies' decision-making by showing the factors that tend to increase the chances of compensation in renegotiations. Moreover, the study also contributes to companies' decision-making by showing that debt renegotiation can be a strategy to increase the shareholders' value perception of the company.

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