THE RELATIONSHIP BETWEEN AUDIT QUALITY, ACCOUNTING, AND FINANCIAL IRREGULARITIES IN BRAZILIAN COMPANIES LISTED ON THE B3

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ABSTRACT

This study aims to verify the relationship between audit quality and irregularities committed by Brazilian companies. This study employed quantitative methodology and the probability estimation was performed using the logit regression model. The sample data, which was related to Brazilian companies listed on the B3, were extracted from the Economatica® database, covering the period from 2010 to 2020. The Report on Sanctioning Administrative Proceedings (PAS), issued by the Securities Commission (CVM), was used for verification and classification of irregularities in accounting, financial, and others. The study provides empirical foundations to the national literature, in addition to being a source of research for users of accounting information, while also presenting previous similar studies, bringing to light new aspects that affect the level of irregularities in companies. The results showed that the quality of an audit has a negative impact on variable irregularities, in addition to suggesting that the high quality of an audit carried out in Brazil reduces the probability of irregularities in the companies' statements. As a practical contribution, this study provides insights to companies regarding their strategies for contracting audits, also regarding the definition of audit fee payment policies.

Keywords: External Audit; Audit Quality; Accounting and Financial Irregularities; Administrative Proceedings Judged by CVM.

RELAÇÃO ENTRE QUALIDADE DE AUDITORIA E IRREGULARIDADES CONTÁBEIS E FINANCEIRAS NAS EMPRESAS BRASILEIRAS LISTADAS NA B3

RESUMO

Esta pesquisa teve como objetivo verificar a relação entre qualidade de auditoria e irregularidades cometidas pelas empresas brasileiras. A metodologia utilizada na pesquisa foi do tipo quantitativa e a estimação da probabilidade foi realizada

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por meio do modelo de regressão logit. Os dados amostrais, relativos às empresas brasileiras listadas na B3, foram extraídos da Economatica®, compreendendo o período de 2010 a 2020. O Relatório dos Processos Administrativos Sancionadores (PAS), emitido pela Comissão de Valores Mobiliário (CVM), foi utilizado para apuração e classificação das irregularidades em contábeis, financeiras ou outros tipos. O estudo fornece fundamentos empíricos à literatura nacional, além de ser uma fonte de pesquisa para os usuários das informações contábeis e, ainda, apresenta estudos prévios análogos, trazendo novos aspectos que afetam o nível de irregularidades nas empresas. Os resultados mostraram que a qualidade da auditoria tem impacto negativo na variável irregularidades, além de sugerirem que a alta qualidade da auditoria desenvolvida no Brasil reduz a probabilidade de irregularidades nos demonstrativos das empresas. Como contribuição prática, o estudo fornece insights às empresas, quanto à estratégia de contratação das auditorias e, também, quanto à definição das políticas de pagamento de honorários de auditoria.

Palavras-chave: Auditoria Externa. Qualidade da Auditoria. Irregularidades Contábeis e Financeiras. Processos Administrativos Julgados pela CVM.

1. INTRODUCTION

Since the beginning of the 21st century, the occurrence of numerous corporate irregularities has been observed in different countries around the world (Lima et al., 2017). For Smaili and Labelle (2016), irregularity can be a *continuum* between errors, noncompliance with regulations, and fraud. Fraud is an intentional act for one's own benefit, and error is an unintentional act (Murcia et al., 2008). In Brazil, the typification of fraud is found in Art. 168 of Law 11.101/05 (Brazil, 2005). In the Brazilian stock market, irregularities result from transgression or non-compliance with legal norms and regulations relating to companies and the issuance of securities, such as Laws 6404/76 and 6385/76 and CVM Normative Instructions (Brasil, 1976).

The impacts of these irregularities increase the need for more diligent action by regulatory bodies to increase the quality of accounting information disclosed by companies (Ilyas & Jan, 2017; Imhoff, 2003). In Brazil, in accordance with the Basic Pronouncement (CPC 00 (R2) - Conceptual Framework for Financial Reporting), the qualitative attributes that improve the usefulness of information—so that it is relevant and provides a faithful representation of companies—for users of accounting information are: comparability, verifiability, timeliness, and comprehensibility.

Ahmad (2019) discuss relevant points in their work on how audit quality changes the behavior of financial information quality. One of the main applications of quality financial information is the possibility that it generates to reduce information asymmetry between investors and company managers (Ajward & Takehara, 2011). However, the literature indicates that there are several factors that can impact the quality of accounting information: the accounting standard adopted, the regulations imposed by stock exchange managers, corporate governance, etc. (Sufy et al., 2013).

In addition, audit quality is essential to increasing the reliability of financial

information and reduce information asymmetry, according to studies by Fan and Wong (2001) and Zhou and Elder (2003). Audit quality can be defined as an auditor's ability to detect and report distortions in financial information (DeAngelo, 1981) and significantly contributes to improving the quality of published financial information.

The association of audit quality and financial information quality is described in previous research as having a positive relationship. However, in general, these studies are carried out in capital markets located in developed countries (Francis, Maydew & Sparks, 1999; Chiang, Huang & Hsiao, 2011; Zhou & Elder, 2003).

These papers have concluded that a higher quality audit also improves the quality of financial information. However, in emerging and developing countries this problem has not been deepened and generates contradictory results. Memis and Cetenak (2012) studied 8 emerging countries between 2008 and 2009, and reported that high quality auditing is not effective in all emerging countries. Yasar (2013) indicates that the ability of auditors to monitor company managers depends on the institutional environment and the application of laws in these countries, while this is different in developed and developing countries.

It is important to point out that high-quality audits suggest better quality of accounting information—in addition, as an assumption, they would help to minimize the occurrence of errors and irregularities and can help executives and investors to identify good and bad investments. Audit quality is a security measure against possible manipulations that may distort the information necessary for decision-making by stakeholders (Almeida, 2017).

An important question remains about how to measure the quality of the audit. Braunbeck (2010) defends the amount of audit fees paid as a metric to measure the quality of the audit on the grounds that the existence of incentives both in the supply and in the demand, for quality audit services, leads to the judgment that there is, in the audit market, significant differentiation in the product offered. It should also be noted that, since Francis (1984), it has been argued that audit fees have contained useful information for the analysis of audit quality.

The quality of the accounting information will be evaluated in this work by the level of irregularities identified for the analyzed companies. For Wells (2014), fraud refers mainly to the manipulation of information, transactions carried out for one's own benefit, bribes paid, and the subtraction of assets, caused by the improper use of accounting.

The arguments presented led to the following question: In what way, and to what extent is audit quality related to the level of accounting and financial irregularities of companies listed on the Brazilian B3 stock exchange?

The motivation for this study resided mainly in the importance of the audit quality theme and, above all, in the possibility of being able to relate it to the irregularities committed by Brazilian companies. And, also, due to the fact that even with the accounting and financial scandals in Brazil, such as Operation Lava-Jato and Sanctioning Administrative Processes (PAS), there are few studies carried out on irregularities (CVM, 2019). Previous studies, such as Yang et al. (2017) who examined only 82 cases of fraud over an 11-year period, Smaili and Labelle (2016) who used a sample of 107 observations of irregularities over 5 years, and Jaswadi

(2012) who analyzed a sample of 78 companies punished for irregularities between 2000 and 2009 indicate that irregularities are a research gap, due to limited observation on the subject.

The aim of this study was to analyze the relationship between audit quality and accounting and financial irregularities committed by Brazilian companies listed on the B3. Thus, to verify whether audit quality reduces the probability of Brazilian companies committing irregularities, the *Logit Regression Model was used*. The results showed that the quality of the audit negatively affected the variable irregularities, in addition to suggesting that a high quality of audit carried out in Brazil reduces the probability of irregularities in the companies' statements.

The results of this paper contribute to the literature by analyzing the relationship between the quality of accounting information and the presence of high quality audit characteristics, taking into account the characteristics of the Brazilian capital market. As a practical contribution, it is expected that the research will be useful for investors as they understand that the existence of a quality audit can result in financial statements that more faithfully portray the economic and financial situation of the companies in which they intend to invest.

2. THEORETICAL FRAMEWORK

2.1 Accounting and Financial Irregularities

Fraud, and other forms of misconduct observed in financial reporting, are a significant threat to the existence and efficiency of capital markets (Amiram *et al.*, 2018). As Santos (2021) emphasizes, fraudulent acts involving publicly traded public and/or private companies are what most concern regulatory and self-regulatory authorities and stakeholders, due to the impacts caused to economies and society. Large-scale financial scandals and cases of fraud have always driven significant regulatory changes. For example, the creation of the Sarbanes-Oxley Act (SOX) in 2002 was the most relevant reaction to the scandals at the beginning of the century, which created the *Public Company Accounting Oversight Board* (PCAOB) to regulate the auditing profession (Dantas & Medeiros, 2015). In this context, it is suggested that auditors have active participation, both in the investigation and—if applicable—in the denouncement of illegal acts, as well as in the indication of measures that aim to curb fraudulent actions.

Even so, despite the rules and principles put forward by the entities that act in the fight against fraud, fraud does happen, and takes authorities, investors, and other users of accounting information by surprise, often due to their recurrence and severity (Santos, 2021). The 2008 World Economic Crisis, shortly after the creation of SOX, resulted in the "crash" of investment banks (Freguete et al., 2015). In Brazil, cases of corporate irregularities involving Petrobras, Correios, Parmalat, Xerox, Banco Pan Americano, among others, had great repercussions in the media (Costa & Wood JR., 2012).

Costa and Wood (2012) defined corporate fraud as a sequence of illicit actions and conduct, in a premeditated and conscious manner, by senior management officials of an organization, aiming to exclusively serve their own interests and, consequently, harm third parties. In general, accounting frauds are

those committed on behalf of the organization, and which materialize through changes made to the companies' accounting reports. For Attie (2018), accounting frauds are methods of intentionally altering a company's accounting records, with the aim of inflating earnings for investors, as well as camouflaging information to obtain tax advantages or to benefit third parties.

Financial fraud, as defined by Rezaee (2005), is a deliberate attempt by companies to promote relevant distortions in their statements, seeking to deceive those who use the information, especially investors and creditors. The author also emphasizes that fraud in financial statements affects both individual investors and the stability of economies.

Irregularities around significant values, observed in large companies in the United States of America (USA), such as the case of Enron, WorldCom, HealthSouth, and Tyco, put the reliability of financial statements in check (Yang et al., 2017*)*. Enron, a large company in the US energy sector, filed for bankruptcy in December of 2001. At the time, Enron's papers were audited by the Arthur Andersen auditing firm (one of the Big Five), which was also responsible for the companies` accounting. For Yang *et al*. (2017), the fact that Arthur Andersen is responsible for accounting and auditing Enron's shares would, at the very least, constitute a conflict of interest.

The global survey on fraud carried out by *PricewaterhouseCoopers* (PwC) in 2018 revealed that 49% of participants declared that their companies were victims of fraud and economic crimes—in 2016 the percentage was 36%. In Latin America, the percentage increased from 28% to 53% over the same period. In Brazil, the percentage of companies that identified some type of irregularity was 12% in 2016 and increased to 50% in 2018. In another survey by the Association of Certified Fraud Examiners (ACFE), carried out in 2011, the result showed that frauds represent losses of trillions of dollars per year, generating losses of approximately 5% of companies' revenues, equivalent to US$ 3.5 trillion.

Silva et al. (2012) compared the biggest accounting scandals disclosed in Brazil and in the United States (USA), in the previous period of 20 years. The result of the survey showed that 94% of frauds in the USA came from the increase of revenues, aiming to improve the financial situation of the companies. In Brazil, the fraudulent acts verified in revenues aimed at omitting amounts, probably to reduce fiscal obligations (taxes and contributions) calculated based on the company's results. Research by Felix and Teixeira (2021) showed that Brazilian companies, which are more aggressive from a tax perspective, are more likely to commit irregularities. The survey also revealed that financial irregularities are the most influenced by tax aggressiveness. Santos, Funchal and Nossa (2020) studied the relationship between irregularities and the market value of publicly traded Brazilian companies, however, they did not find evidence that irregularities, in the period, affected the market value of these companies.

2.1.1. Corporate Fraud Category

Association of Certified Fraud Examiners (ACFE) presented the first corporate fraud report (*Report to the Nation on Occupational Fraud and Abuse*), known as the fraud tree. In it, fraud was classified into: corruption, misappropriation of assets

and fraudulent financial statements (Castro *et al.*, 2018). Of the cases investigated by the ACFE, in 2016, embezzlement represented 83.5% of the frauds, followed by corruption with 35.4% and fraud in financial statements with 9.6%. However, in terms of the amounts of losses to organizations, the order is inverted, that is, on average, fraud in financial statements caused losses of US$ 975 thousand, corruption, US$ 200 thousand and in the misappropriation of assets losses amounted to US$125,000 (Castro *et al.*, 2018).

Still, in regard to fraud in the financial statements of corporations, Ramos and Martinez (2018) identified, in the restatement resolutions issued by the CVM, the following accounting improprieties: Recognition of Goodwill, Asset Valuation Criteria, Recognition of Contingent Assets, Errors and Change of Estimates, and Presentation of Financial Statements, among others. Armstrong et al. (2010) proposed three different types of accounting irregularities, namely: 1. financial restatements related to accounting manipulation; 2. a company accused of accounting manipulation in class action; and 3. a company accused of accounting manipulation in the *Securities and Exchange Commission* (SEC).

With the aim of detecting the systematic behavior of manipulation in statements, Henselmann et al. (2015) examined accounting irregularities, highlighting the importance of separating errors (involuntary actions) from accounting fraud (intentional acts), based on the causes and consequences of restatements of financial statements over time. For Martinez (2013), companies prefer different earnings management strategies, and these practices depend on their operating and accounting environment.

In Brazil, the Securities and Exchange Commission (CVM), an autonomous entity under a special regime whose purpose is to discipline, supervise, and develop the Securities Market, is empowered to charge violators of the Brazilian Corporate Law (Law No. 6,404/76), other Resolutions and other Legal Norms, sanctions such as: Warnings, Fines, Suspensions, Disqualifications, Cassations, and Prohibitions. Law nº 6.385/76, in its art. 9, items V and VI, establishes that the CVM is responsible for investigating illegal acts and unfair practices, through an Administrative Sanctioning Process (PAS) (Brasil, 1976). Within the scope of the CVM, there are six technical areas active in the verification and investigation processes for composing the PAS report. Thus, after consolidating the understandings of these areas, regarding the presentation of the companies' financial statements, the document is shared through the Circular Letters of the Securities and Exchange Commission (CVM, 2018, p. 6).

Borges and Andrade (2019) analyzed the typology of Sanctioning Administrative Proceedings (PAS) by the CVM in publicly traded companies, between 1989 and 2016, and concluded that, in general, the concentration of these processes is in the financial sector. Felix and Teixeira (2021) analyzed 1,122 Sanctioning Administrative Proceedings, judged by the CVM, in the period from 1999 to 2017, classifying irregularities into three types: accounting, financial, and other types of irregularities.

The information contained in the Report on Sanctioning Administrative Proceedings judged by the CVM served as the basis for classifying the irregularities into accounting, financial and other types of irregularities. The report was made available by the Coordination for the Control of Administrative Processes (CCP)

and included a total of 1,391 Administrative Proceedings judged by the CVM, in the period from 1999 to 2020. However, for this study, only irregularities committed by listed Brazilian companies were analyzed at B3, from 2010 to 2020, as shown in Figure 1, which summarizes irregularities by type:

Year of Irregularity	Number of Accounting Irregularities	Number of Financial Irregularities	Number of Other Types of Irregularities	Relative Frequency
2010	8	35	two	12.47%
2011	15	37	9	16.90%
2012	8	18	7	9.14%
2013	9	15	10	9.42%
2014	7	21	7	9.70%
2015	7	9	7	6.37%
2016	10	5	3	4.99%
2017	5	8	4	4.71%
2018	9	16	8	9.14%
2019	9	13	5	7.48%
2020	12	16	7	9.70%
Total	**99**	**193**	**69**	**100.00%**

Figure 1 - Distribution of Irregularities by Type
Source: Prepared by the authors

In Figure 1, there is a total of 361 irregularities (accounting, financial, and other types of irregularities) extracted from the PAS – CVM Report, referring to the sanctions imposed on Brazilian companies between 2010 and 2020. Of this total, 53% represent financial irregularities, 27.4% represent accounting irregularities and 19.1% represent other types of irregularities. It is observed, therefore, that financial irregularities represent the largest share of sanctions applied by the CVM, to Brazilian companies listed on the B3, in the period studied.

2.2 External Audit

The main purpose of the audit is the issuance of an auditor's opinion, in the form of an opinion, which aims to attest to the veracity of the financial statements. Thus, fraud or errors detected in the audits carried out must be reported to the company's management by the auditor, who must suggest actions to correct the facts (Brito & Fontenelle, 2019). About possible fraud or accounting manipulation, practiced by companies, lies a global concern of investors, especially those who operate in the capital markets. This is the perception of Brito and Fontenelle (2019), who claim that it is recommended that, in addition to audit professionals, management also make use of tools capable of assessing fraud risks and maintain investigation services in the fight against fraudulent practices.

The importance of the audit for the market may lie in the need to obtain the opinion of an independent professional, with renowned technical capacity, in order to impart quality to the information disclosed by companies (Brito & Fontenelle, 2019). They argue that this spurred the emergence of auditing, however, recognition of its importance came with the creation of the SEC – *Security and Exchange Commission* – USA (1934), considered one of the main milestones in the evolution of auditing. Attie (2018) emphasizes that the market's

demands for statements appreciated by a professional external to the company, aim at greater transparency of information, as well as reducing information asymmetry.

In the definition of Brito and Fontenelle (2019), the external audit consists of the careful, systematic, and independent analysis of transactions, documents, books, and record keeping, aiming to obtain a technical and improved opinion on the statements of a company, to attest to the adequacy of these procedures to the Fundamental Accounting Principles, as well as the specific legislation in force. CVM Instruction 308/99, amended by 509/11, provides for the registration and exercise of independent audit activity within the scope of the Brazilian securities market. In Brazil, the representative entity of independent auditors is the Institute of Independent Auditors of Brazil (IBRACON).

Law nº 6.385/76 created the CVM, imbuing it with powers to register and supervise independent auditors and, above all, with the enormous mission of exercising the role of supervising the Brazilian market (Attie, 2018). From then on, independent auditing of the financial statements of publicly-held companies became mandatory (Attie, 2018). In 2011, Resolution No. 1,328/11 of the Federal Accounting Council (CFC) was approved, aiming at the Brazilian Accounting Standards Structure, in accordance with the international standards issued by the International Accounting Standards Board *(IASB)*.

Compliance with auditing and accounting standards made financial information transparent, and this contributed to reducing information asymmetry (Attie, 2018). In organizations that adhere to the highest standards of auditing and accounting, there is commonly greater transparency in management, which makes it more difficult for corrupt practices to occur (Malagueño et al., 2010). In Brazil, with the publication of Law 11,638/07, the audit of financial statements by independent auditors registered with the CVM became mandatory for large companies (Brasil, 2007).

For Alrawashedh et al. (2020), auditing financial statements reduces information asymmetry and signals transparency in the information disclosed to the market. In addition, it contributes to the reduction of fraudulent actions in company statements (Brito & Fontenelle, 2019). Therefore, the financial statements must be audited with the minimum assumption of detection, by the auditors, of inaccuracies and fraud in the statements. Since then, management and other stakeholders of the company expect external auditors to identify and report inaccuracy, fraud, and illegal transactions (Alrawashedh et al., 2020; Almeida et al., 2019).

As the market becomes more demanding, in the pursuit of information transparency, the audit seeks to advance in actions aimed at mitigating the risk of fraud. Recently, in 2017, the *Public Company Accounting Oversight Board* (PCAOB) officially enacted Rule 3211/2017 requiring US accounting firms to disclose detailed information from audit partners on *Form AP, Auditor Reporting of Certain Audit Participants.* The results of the research carried out by Liu and Xu (2021) suggest positive reflections on the quality of the audit, from the perspective that with this imposition those responsible for the audits may incur sanctions directly on their behalf.

In Brazil, according to Law 6,404/76, the requirement regarding the signature of the Mandatory Statements falls on the accountant, who must sign them together with the legal representatives of the entity or owner of the individual company.

2.2.1. Audit Quality

A comprehensive definition for audit quality, commonly found in the literature, is the combined probability that the auditor will find and evidence a violation in the client's accounting system (DeAngelo, 1981), attesting that there is independence of the auditor in its position. For Dantas and Medeiros (2015), these market perceptions highlight the importance of quality auditing for the proper functioning of financial and capital markets, as it confers trust and credibility. Thus, the understanding of audit quality permeates the expectation that the auditor will notice a gap in the client's accounting system and report this in his opinion (DeAngelo, 1981).

Braunbeck (2010) says that the quality of the audit, used in the analysis of financial statements, contributes to the generation of reliable information, which signals transparency to the market. For Attie (2018), audit quality represents the auditor's responsibility in terms of the audit process or purpose. The importance of studying the quality of the audit aims to corroborate the quality of the information disclosed to the market (Braunbeck, 2010).

According to Teixeira et al. (2016), the quality of the audit tends to be higher, as the auditor's judgment in the opinion truly represents the situation of the companies' financial statements. On the subject, Attie (2018) emphasizes that the auditor must be impartial and independent in the interpretation of all the facts presented to him, proving each piece of data in his conclusive pronouncement. Dantas and Medeiros (2015) point out that audit quality is not an externally verifiable aspect, hence the need to use *proxies* to determine it. The authors argue that, since DeAngelo (1981), there have been metrics that seek to capture the "perceived" quality of the audit.

Audit quality is commonly tested based on audits provided by the Big Four. For Edgley et al. (2016), the Big Four auditors have high levels of competence and commitment to their work, which corroborates higher audit quality. Braunbeck (2010) also found evidence of higher audit quality for the group of companies audited by a Big Four company. Likewise, DeAngelo (1981) writes that large auditing firms, when carrying out their work, seek to improve the quality of their analyses, since they have more to lose in terms of reputation, when they make a mistake.

Becker et al. (1998) carried out a study whose objective was to demonstrate the impact of audit quality on the quality of accounting information (earnings management). The study was carried out in the United States between 1889 and 1992. The authors showed that earnings management was higher in companies not audited by the Big 4.

The probable reasons that lead large audit companies to have a greater impact on the quality of the information evidenced by the companies may be related to the level of training, experience, and knowledge that these companies` teams have, which would allow a more adequate monitoring of the actions of the

managers and mitigate problems with irregularities (Krishnan, 2003; Geiger & Rama, 2006). There is a greater likelihood of having more informative and consistent financial information associated with the work performed by these teams (Lennox, 1999).

Bakarich and Kerr (2016) used the metric fees paid, arguing that higher audit fees may be related to greater tax concerns, greater planning effort by auditors, as well as the fact that higher audit fees are incurred. Francis (1984) emphasizes that reputational risk and material losses when associated with a notorious scandal suggest that the higher fees and, consequently, higher quality of services performed by auditors is worth it. Braunbeck (2010) argues that the existence of several incentives, both in the provision and in the demand for quality audit services, leads to the thought that there is a product differentiation in the audit market.

Higher audit quality produces positive effects on the quality of disclosed information, signaling greater transparency to the market (Dantas & Medeiros, 2015). Previous studies have shown several benefits provided by the high quality of the audit to corporations: a decrease in the cost of capital (Fernando et al., 2010), ease of access to financial resources (Kausar et al., 2016), and a higher market value of capital reserves cash (Kim et al., 2015), a lower likelihood of debt breach (Robin et al., 2017), and quality of financial reporting facilitating corporate investments in innovation (Nguyen et al., 2020). The quality of the audit is a great ally of the markets, acting as guardian of the financial statements of companies (Attie, 2018). It is this that, through quality analysis, polishes the information printed in the reports, seeking the integrity and transparency of the information disclosed (Crepaldi & Crepaldi, 2019).

Thus, based on the desirable effects of the analyzes carried out by the audits, it is expected that the quality of the audit will reduce the probability of occurrence of irregularities in the companies' statements. Thus, the following hypothesis was formulated:

H1: Audit quality negatively impacts accounting and financial irregularities in Brazilian companies listed on B3.

3. RESEARCH METHODOLOGY

3.1 Sample Selection and Data Processing

The methodology used for the development of the study was empirical, quantitative, and descriptive. The initial sample included all Brazilian companies listed on the B3 stock exchange between 2010 and 2020, totaling 389 companies and 4,279 observations. This choice of period is justified, as it was only as of 2010 that it became mandatory to disclose the amount of compensation paid to auditors in CVM Reference Reports (CVM Instruction No. 480/2009). The sample data were extracted from the CVM database, using the Economatica® database. To fulfill the objectives of the study, an empirical study was carried out where secondary data from Brazilian companies listed on the B3 were analyzed.

The classification of irregularities into accounting, financial, and other types of irregularities occurred in a similar way to the classification given by Felix and

Teixeira (2021), based on the nature of the matters and the notes of each proceeding judged by CVM. Therefore, to survey the irregularities committed by the companies, the CVM's PAS Report was used, a textual document released by the CVM, which contains information on the Sanctioning Administrative Proceedings related to Brazilian companies (access to information with the support of Law 12,527/11). To obtain information on companies audited by the Big Four and on audit fees paid, the Securities and Exchange Commission Reference Form, released at the end of each financial year, was used.

In this work, a variable was used as one of the explanatory variables to indicate the level of earnings management of the analyzed companies. For this, a model based on discretionary accruals was used. According to Martinez (2013), most Brazilian empirical studies use detection models based on discretionary *accruals* (DA) as metrics for detecting earnings management. To determine the values of this variable, the total *accruals (TA)* were first calculated by the difference between Net Income and Cash Flow from Operations of the analyzed companies (Martinez, 2013). Then, in line with previous studies by Rajgopal *et al*. (2021), Martinez (2013) and Kallapur *et al.* (2010), the Modified Jones Model was used to calculate non-discretionary *accruals* (NDA). Finally, by construction, discretionary *accruals* (DA) were calculated by deducting non-discretionary *accruals* (NDA) from total *accruals* (TA), that is, DA = (TA – AND).

Table 1, below, presents the details of the sample composition:

Table 1
Sample Composition

Description	Amount
Total companies in the study (initial)	389
Total companies in the study (final)	284
Period searched (in years)	11
(=) Total observations in the period	4,279
(-) Exclusion of company observations without information to calculate the variables	(1,735)
(=) Number of final observations used	2,544

Source: Prepared by the authors.

3.2 Definition of the Variables and the Econometric Model

Quantitative analysis was performed using the *Logit regression model*, with a maximum likelihood estimation, in addition, panel data controlled by year was used. Thus, to answer H1, that is, whether the quality of the audit negatively impacts the accounting and financial irregularities of Brazilian companies listed on B3, the following equation (1) was modeled:

$$\text{Irreg\_geral}_{it} = \beta_0 + \beta_1 \text{DA}_{it} + \beta_2 \text{Big\_Four}_{it} + \beta_3 \text{Hono\_pago}_{it} + \beta_4 \text{Smlprofit}_{it} + \beta_5 \text{Smlbeat}_{it} + \sum_{k=6}^{11} \beta_k \text{controles}_{kit} + \xi_{it}$$

Where: the dependent variable Irreg_geral *it* indicates whether or not a

company listed on B3 suffered an administrative sanction by the CVM, in the analyzed period, as a result of irregularities. This is a *Dummy variable* that takes the value 1 if the company has committed accounting, financial, and/or other types of irregularities, and 0 (zero) in other cases. Additionally, with the objective of analyzing which types of irregularities are impacted by the quality of the audit applied to the analysis of the Financial Statements, logistic regression was run, individually, by type of irregularities: accounting, financial, and other types of irregularities.

The explanatory variable discretionary *accruals* (*DAit*), represents the management values controlled by administrators in corporations' balance sheets. Dantas and Medeiros (2015) and Kallapur *et al.* (2010) point out that *accruals* affect the quality of earnings and, consequently, the quality of reported information. For Martinez (2013), intervention in the reported accounting results is a critical procedure, since the financial statements summarize relevant information about the company's performance. Thus, the greater expressiveness of earnings management (discretionary *accruals*), observed in the balance sheets, suggests lower audit quality (Rajgopal *et al*., 2021).

The explanatory variable, Big_Four *it* is a dummy that takes the value 1 if a company listed on B3 was audited by one of the Big Four (Deloitte, PwC, Ernst & Young and KPMG) and 0 (zero) in other cases. In the literature, the use of this variable as a metric to measure audit quality is advocated by Lennox et al. (2013), Braunbeck (2010) and DeAngelo (1981). Thus, based on the results of previous studies, it is expected that the Big Four variable will negatively impact the variable irregularities.

The explanatory variable paid audit fees represents the amounts disbursed by companies as remuneration for audits provided. This is a variable supported by the literature, since the studies by Francis (1984), under the argument that the fees paid are sources of information that allow inferences about the quality of audits. Faustino and Damasceno (2020) and Braunbeck (2010) defend the use of the variable fees paid, arguing that higher amounts paid in fees indicate more hours of analysis, which suggests greater quality in the services provided.

The explanatory variable Smlprofit it is a dummy and takes the value of 1 if the ROA value, deflated by Total Assets, is less than 3%. Likewise, the explanatory variable Smlbeat *it* (dummy) assumes the value of 1 if the variation between ROA (year after year) is less than 1%. In the literature, these variables are defended by Rajgopal *et al*. (2021) under the argument that both the low ROA and the low variation observed, year after year, in the ROA positively predict deficiencies in the audit.

Control variables were selected based on previous research, such as Felix and Teixeira (2021); Santos et al. (2020), Faustino and Damasceno (2020) and Lennox *et al*. (2013). Lennox *et al*. (2013) suggest controlling both Company Size (ln_size *it*) and Leverage (leverage *it*), as they are variables that can affect the magnitude of the market reaction. For Mills and Newberry (2001), Debt (endiv *it*) is an economic-financial index controlled and established in contracts. The controlvariable (ROA *it*), was used in the study by Erickson et al. (2006), aiming to explain the effects of the financial performance of firms. Lennox *et al.* (2013) emphasize that Negative Shareholders' Equity (PL_Negativo *it*) is an indication of

facing financial difficulties and that it may suggest evidence of fraud in companies.

In Figure 2, a summary of the variables (name, type, and description) will be presented, in addition to the sources used in the search for the necessary information to carry out this research:

Variable	Type	Description	Literature	Data source	Signals
Irregularities: Accounting, Financial and Other Types	explained	*Dummy* variable: If you committed irregularities = 1. If you did not = 0	Lennox and Pittman (2010); Felix and Teixeira (2021)	PAS - CVM Report	
Earnings Management (Discretionary *Accruals)*	Explanatory	Metric - Discretionary *Accruals* (Modified Jones Model).	Rajgopal *et al*. (2021); Martinez (2013); Kallapur *et al*. (2010)	Economática®	Positive
Big Four Audit Firm (BIG4)	Explanatory	*Dummy* variable: If Big four= 1 otherwise = 0 (zero) in other cases	Felix and Teixeira (2021); Edgley *et al.* (2016); Braunbeck (2010)	CVM Reference Form	Negative
Paid Audit Fees	Explanatory	Amount of fees paid divided by Total Assets	Faustino *et al*. (2020); Braunbeck (2010); Francis (1984)	CVM Reference Form	Negative
SmlProfit	Explanatory	If ROA/Asset < 3% = 1, otherwise = 0	Rajgopal *et al.* (2021)	Economática®	Positive
SmlBeat	Explanatory	If the variation of ROA, year after year, is < 1%, the variable will be 1, if not, assume 0	Rajgopal *et al*. (2021)	Economática®	Positive
Company Size (TAM)	Control	Natural logarithm of the company's Total Assets (annual).	Felix and Teixeira (2021); Lennox *et al*. (2013)	Economatica®	Positive
Leverage (ALAV)	Control	Relationship between Long-Term Debt and AT, in t-1.	Felix and Teixeira (2021); Lennox *et al*. (2013)	Economatica®	Positive
Indebtedness	Control	Ratio between Liabilities (current and non-current) and total assets	Felix and Teixeira (2021); Mills and Newberry (2001)	Economatica®	Positive

ROA	Control	Customer performance: ratio of net income to total assets	Felix and Teixeira (2021); Lennox and Pittman, 2010; Erickson *et al*. (2006)	Economatica®	Positive
PL_NEGATIVE	Control	*Dummy* variable. if PL Negative = 1, on the contrary, it assumes 0	Felix and Teixeira (2021); Lennox *et al.* (2013)	Economatica®	Positive
Market Value (*Market to Book*)	Control	Relationship between Market Value (beginning of the year) and Shareholders' Equity	Felix and Teixeira (2021)	Economatica®	Positive

Figure 2 - Variable Names and Definitions
Source: Prepared by the author.

4. DATA ANALYSIS

4.1. Analysis of the Results of the Regressions

From the model developed in the methodology, the results obtained will be demonstrated and analyzed in this section. Thus, Table 2 will show the results of the estimation performed, considering all the irregularities observed between 2010 and 2020:

Table 2
Logistic Regression - General Estimation

Variables	***logit*** **Coefficient**	**Marginal Effect (dy/dx) Coefficient**
Discretionary Accrual (DA)	0.3077	0.0104
big four	-0.8410***	-0.0285***
Fee_paid	-10.5149***	-0.3567***
SmlProfit	0.6030**	0.0204**
SmlBeat	-0.0638	-0.0022
indebtedness	0.3274	0.0111
market to book	-0.0398	-0.0013
leverage	0.0212	0.0007
ROA	0.1679	0.0057
Negative PL	0.2749	0.0093
Constant	-2.8830***	
Dummy for each year	Yes	
Wald Chi²	65.21	
Prob > Chi²	0.0000	
Pseudo R²	8.51%	
Average VIF	2.28	
Comments	**2544**	

Legend: * p<.0.10, ** p<0.05, *** p<0.01 (1%, 5% and 10% significance).
Source: prepared by the author.

The regression results, in Table 2, reveal that both the Big_Four variable and the Paid Audit Fees variable negatively impacted the Irregularities variable of interest. In this context, it can be inferred that the effect of the variables Big_Four and Paid Audit Fees on the Irregularities variable suggests a reduction in the probability of the studied companies committing irregularities.

Still, it can be seen in Table 2 that the Big_Four variable had a negative coefficient of 0.84, at 1% significance. Therefore, the negative impact of the Big_Four variable on the irregularity variable suggests the probability of reducing irregularities in Brazilian companies that were audited by one of the Big_Four. Similarly, the Paid Audit Fees variable had a negative coefficient of 10.51, at 1% significance. Therefore, based on the coefficient of the marginal effect (dy/dx), it can be inferred that for the increase of 1 million in paid audit fees, the probability of the companies analyzed is reduced by 0.36 percentage points. commit irregularities. The results presented are in line with the findings of previous studies by Felix and Teixeira (2021), Faustino and Damasceno (2020), Edgley *et al*. (2016) and Braunbeck (2010). It should be noted that once the quality of the audit is perceived, as suggested by the results of the survey in Table 2, more specifically, in the variables Big Four and Paid Audit Fees, the effects of this quality negatively impact irregularities.

Table 3 presents the results of the estimation with Panel Data for the dependent variables Accounting, financial and other types of irregularities, based on the explanatory variables: Discretionary Accruals (DA), Big_Four, Fees Paid, Size of ROA (SmlProfit) and Annual Variation of ROA (SmlBeat) as follows:

Table 3
Logistic Regression - Estimation by Type of Irregularities

	Accounting Irregularities		**Financial Irregularities**		**Other Types of Irregularities**	
Variables	**Coef.**	**dy/dx**	**Coef.**	**dy/dx**	**Coef.**	**dy/dx**
Accrual Discric. (FROM THE)	0.4230	0.0097	0.4279	0.0122	1.1309	0.0185
big four	-0.6929**	-0.0158**	-0.6400**	-0.0183**	-0.6942*	-0.0114*
fee paid	-8.2420**	-0.1884**	-10.9177***	-0.3126***	-11.3698**	-0.1861**
SmlProfit	0.4627	0.0106	0.8045***	0.0230***	0.5329	0.0087
SmlBeat	0.2077	0.0047	-0.1760	-0.0050	0.3616	0.0059
indebtedness	0.6154*	0.0141*	0.5215*	0.0149*	0.1774	0.0029
market to book	-0.0156	-0.0003	-0.0564	-0.0016	-0.0449	-0.0007
leverage	0.0400*	0.0009*	0.0278	0.0008	0.0318	0.0005
ROA	0.2364**	0.0054**	0.1857	0.0053	0.1118	0.0018
PL_Negative	-0.0840	-0.0019	0.0910	0.0026	-0.0284	-0.0005
Constant	-3.6497***		-3.1543***		-5.2235***	
Dummy for each year	Yes		Yes		Yes	
Wald Chi²	42.02		67.71		35.37	
Prob > Chi²	0.0028		0.0000		0.0182	
Pseudo R²	7.07%		9.09%		6.53%	
Average VIF	2.28		2.28		2.28	
Comments	**2,544**		**2,544**		**2,544**	

Legend: * p<.0.10, ** p<0.05, *** p<0.01 (1%, 5% and 10% significance). Marginal Effect (dy/dx).
Source: Prepared by the author.

According to the results presented in Table 3, the coefficients of the variables of interest Big Four and Paid Audit Fees were statistically significant, at least at 10%, in the estimates made for the three types of irregularities (accounting, financial and other types of irregularities). irregularities). Also, based on the data in Table 3, it is observed that the coefficients (fruits of the estimates) were negative, suggesting that both the Big Four variable and the Paid Fees variable negatively impacted the Irregularities variable of interest. These results are in line with the findings of previous studies by Felix and Teixeira (2021) and Faustino and Damasceno (2020).

Continuing with the analysis of Table 3, it was found that the variable SmlProfit (small profits) had a positive impact on the Interest variable Financial Irregularities, at 1% significance, suggesting that less profitable companies are more likely to commit irregularities. The results reinforce Francis and Yu's (2009) perception that higher reported earnings can lead to the achievement of goals and business continuity, and that this predicts a certain quality of the audit. It is also reinforced that Erickson *et al*. (2006), used the control variable (ROA), seeking to explain the effects of the financial performance of corporations.

The Indebtedness variable had a positive coefficient, at 10% significance, both in the estimates made for Accounting Irregularities and in those made for Financial Irregularities. Also, the control variables Leverage and ROA were statistically significant and had a positive impact on the Accounting Irregularities variable. The results found reinforce the findings of the study by Felix and Teixeira (2021). Additionally, based on the estimates made, it was identified that for the researched sample, financial irregularities are the most influenced by the quality of the audit. These results strengthen the findings of research carried out by Felix and Teixeira (2021) and by Borges and Andrade (2019).

5. FINAL CONSIDERATIONS

This research analyzed the effects of audit quality on accounting and financial irregularities, specifically, whether the audit quality applied to the analysis of financial statements reduces the probability that Brazilian companies listed on B3 stock exchange commiting some type of irregularity. The motivation for carrying out this study was centered on the search for a better understanding of the determining factors of audit quality, as well as, with a view to presenting results capable of helping to understand the effects of this quality, regarding the probability of reducing acts fraud observed in the financial statements of companies.

The results of the tests carried out showed that the Big Four variables and fees paid were statistically significant at 1% and that they had a negative impact on the variable irregularities. Also, the SmlProfit variable was statistically significant at 5%, positively impacting the irregularity variable of interest. These results contribute to strengthening the belief that the determinants of audit quality have been shown to be effective regressors in studies in which audit quality is the object of analysis. It should be noted that these determinants are perceived, in the academic environment, as excellent metrics to assess the quality of the services

performed by the external audit.

Furthermore, it should be noted that, for the proper functioning of the market, it is necessary for the various actors involved to participate collaboratively. Thus, it is of fundamental importance for the inspection bodies to act effectively, using control and monitoring mechanisms that reflect good market practices. In this context, the importance of the independent auditor is highlighted, as he is responsible for auditing the financial statements, aiming to provide greater transparency to the reported information, as well as to protect corporations against fraudulent acts.

The research showed the importance of the external audit in the analysis of the financial statements, mainly from the perspective of the quality of the audit printed on the accuracy of the information to be reported, making them trustworthy and reliable. The research also reinforces in its framework the arguments that information transparency is something desired by stakeholders in their decisions, above all, because it reduces information asymmetry.

In the field of national literature, this paper brings new contributions that complement the studies already carried out on the subject, mainly those focused on the Brazilian market. As a practical contribution, this study provides insights to companies with regard to audit hiring strategies, as well as with regard to the definition of audit fee payment policies, since the results presented suggest that companies audited by a Big Four, as well as, companies that pay higher audit fees are less likely to commit irregularities.

Regarding the limitations of the study, the model used in the analysis involved an eminently quantitative approach. However, the phenomenon of irregularities also encompasses qualitative aspects such as: deficiency of control systems, effectiveness of Administrative Councils (CA), level of compliance, difficulties of Regulatory Bodies in applying sanctions, slowness in the judgment of processes, among others, which were not captured by the model. In addition, data extraction limited to 2010, as only from that year onwards, disclosure of fees paid to audits became mandatory (CVM Instruction No. 480/2009), contributed to the reduction of the sample.

For further studies, it is suggested to replicate this research by excluding the variable Paid Audit Fees from the model, to enable data collection, starting from 1999 (year of publication of the first PAS Report - CVM). Thus, in addition to increasing the number of observations in the sample, it would allow a time frame to analyze, for example, the behavior of Irregularities before and after the *Sarbanes-Oxley Act* (SOX-2002). It is also suggested to evaluate the effective performance of the Statutory Audit Committee - CAE, in the face of Irregularities in corporations, or even, to assess whether the existence of the CAE corroborates the reduction of irregularities and criminal practices in the company where it is installed, since one of the functions of the CAE is the assessment and monitoring of the company's risk exposures.

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