REVISTA AMBIENTE CONTÁBIL
Universidade Federal do Rio Grande do Norte
ISSN 2176-9036
Vol. 15, n. 1, Jan./Jun., 2023
Sítios: https://periodicos.ufrn.br/index.php/ambiente
http://www.atena.org.br/revista/ojs-2.2.3-06/index.php/Ambiente
Article received on: 25 February 2022. Peer reviewed on: 17 June 2022. Reformulated on: 05 August 2022. Evaluated by the double-blind review system.

DOI: 10.21680/2176-9036.2023v15n1ID31148

Accrualls and systematic risk in Brazilian companies

Accrualls y riesgo sistemático en empresas brasileñas

Accrualls e risco sistemático nas empresas brasileiras

Authors

José Luciano de Oliveira Junior
Master in Accounting. Fucape Business School. Address: Av. Fernando Ferrari, 1358, Boa Vista, Vitória – ES - Phone: (27) 4009 4444. Identifiers (ID):
Orcid: https://orcid.org/0000-0001-8377-1289
E-mail: eiccontabil@yahoo.com.br

Valcemiro Nossa
PhD in Controllership and Accounting from FEA/USP – Teacher of Fucape Business School. Address: Av. Fernando Ferrari, 1358, Boa Vista, Vitória – ES. Phone: (27) 4009 4444. Identifiers (ID):
Orcid: https://orcid.org/0000-0001-8091-2744
Lattes: http://lattes.cnpq.br/0702628573023694
E-mail: valcemiro@fucape.br

Silvania Neris Nossa
PhD in Accounting and Administration. Fucape Business School. Address: Av. Fernando Ferrari, 1358, Boa Vista, Vitória – ES. Phone: (27) 4009 4444. Identifiers (ID):
Orcid: https://orcid.org/0000-0001-8087-109X
Lattes: http://lattes.cnpq.br/9203317132271153
E-mail: silvanianossa@fucape.br

Edvan Soares Oliveira
PhD in Accountancy and Administration. Fucape Business School. Address: Av. Fernando Ferrari, 1358, Boa Vista, Vitória – ES. Phone: (27) 4009 4444. Identifiers (ID):
Orcid: https://orcid.org/0000-0002-0843-1556
Lattes: http://lattes.cnpq.br/3657658875444394
E-mail: edvansoares@fucape.br

Abstract

Purpose: The objective of this study was to investigate whether the systematic risk of companies listed on the Brazilian Stock Exchange (B3) is affected by the quality of accounting information. Additionally, it was verified if the systematic risk was affected differently after the mandatory adoption of IFRS in Brazil.

Methodology: The sample comprised all companies with observations listed on the Brazilian stock exchange (B3) from 2005 to 2021. Empirical research was carried out with descriptive analysis and a quantitative approach. Data were estimated in a panel with fixed effects. The total value of the accruals of Dechow and Dichev (2002) and Jones (1991) were used as measures of the quality of accounting information. The systematic risk measures were estimated using market models and three factors by Fama and French (1993).

Results: In general, companies that have higher quality accounting information are able to reduce information asymmetry problems, which increase systematic risk, thus, having higher quality in this information reduces the risk to the investor.

Contributions of the Study: The results of this paper bring practical contributions to the market and investors, who can feel more secure due to clarity and confidence in the information. Even with the adoption of IFRS in Brazil, the main conclusion of our research is that it actually contributes to the quality of information being converted into lower risks.

Keywords: Quality of the information; Risk; Accounting standards.

Resumen

Objetivo: El objetivo de este estudio fue investigar si el riesgo sistemático de las empresas que cotizan en la Bolsa de Valores de Brasil (B3) se ve afectado por la calidad de la información contable. Adicionalmente, se verificó si el riesgo sistemático se vio afectado de manera diferente luego de la adopción obligatoria de las NIIF en Brasil.

Metodología: La muestra estuvo compuesta por todas las empresas con observaciones que cotizan en la bolsa de valores brasileña (B3) de 2005 a 2021. Se realizó investigación empírica, con análisis descriptivo y enfoque cuantitativo. Los datos se estimaron en un panel de efectos fijos. El valor total de las acumulaciones de Dechow y Dichev (2002) y Jones (1991) se utilizaron como medidas de la calidad de la información contable. Las medidas de riesgo sistemáticas se estimaron utilizando los modelos de mercado y de tres factores de Fama y French (1993).

Resultados: Se obtuvo evidencia estadística que muestra que un aumento de la calidad implica una reducción del riesgo sistemático. Después de la adopción de las NIIF en Brasil, la relación fue positiva.

Contribuciones del Estudio: Los resultados de esta investigación aportan contribuciones prácticas al mercado y a los inversores. En cuanto a las empresas que busquen una mejor calidad de la información, podrán reducir su coste de capital y aumentar la rentabilidad de los inversores.

Palabras clave: Calidad de la información; Riesgo; Normas de contabilidad.

Resumo

Objetivo: Investigar se o risco sistemático das empresas listadas na Bolsa de valores brasileira (B3) é afetado pela qualidade das informações contábeis. Adicionalmente, verificou-se se o risco sistemático foi afetado de forma diferente após a obrigatoriedade da adoção das IFRS no Brasil.

Metodologia: A amostra compreendeu todas as empresas com observações listadas na bolsa de valores brasileira (B3) do período de 2005 a 2021. Foi realizada pesquisa empírica com análise descritiva e enfoque quantitativo. Os dados foram estimados em painel com efeitos fixo. Foram utilizadas como medidas de qualidade da informação contábil o valor total dos *accruals* de Dechow e Dichev (2002) e de Jones (1991). Já as medidas de risco sistemático foram estimadas por meio dos modelos de mercado e de três fatores de Fama e French (1993).

Resultados: De maneira geral, empresas que possuem informações contábeis de maior qualidade são capazes de reduzir problemas de assimetria informacional, que aumentam o risco sistemático, dessa maneira, ter maior qualidade nessas informações reduz o risco perante o investidor.

Contribuições do Estudo: Os resultados desta pesquisa trazem contribuições práticas para o mercado e investidores, que podem se sentir mais seguros pela clareza e confiança na informação. Inclusive, com a adoção das IFRS no Brasil, a principal conclusão é que ela de fato contribui para que qualidade da informação se converta em menores riscos.

Palavras-chave: Qualidade informacional; Risco; Normas contábeis.

1 Introduction

The possibility that corporate information disclosure decisions would affect companies' cost of capital has brought useful insights (Beyer, Cohen, Lys, & Walther, 2010). As proposed by Sharpe (1964) and Lintner (1965), the cost of capital is affected only by the risk to which the assets are exposed; systematic risk, that is, whose main measure is the Beta coefficient (βM). However, the portion of risk considered as non-systematic, that is, idiosyncratic, may be diversified through investment portfolios (Amorim, Lima, & Murcia, 2012; Stocker & Abib, 2019).

Markowitz (1952) proposes in his work that people are rational and risk averse and that, in investment decisions, it is essential to carry out an analysis of risk in order to obtain better returns. Thus, it appears that investors who opt for riskier investments demand gains that exceed those generated by risk-free assets, this difference being called the market premium. (Gonçalves, Rochman, Eid, & Chalela, 2011).

More specifically, Hughes, Jing and Liu (2007) emphasize that an organization's cost of capital depends specifically on the exposure to various systematic risk factors and the reward (risk premiums) of such factors. Similarly, Easley and O'Hara (2004) observed that there is a decrease in the cost of capital, and in the systematic risk of actions, by investors with little information. Lambert, Leuz and Verrecchia (2007) suggest that the quality of accounting information may be related to the cost of capital.

Core, Hail and Verdi (2015) found evidence that entities with clearer and more transparent reporting have lower systematic risk. The results of the study by Moeinadin, Heirany and Khoshnood (2014), with companies listed on the Tehran stock exchange, suggest a positive statistical relationship between accounting information and systematic risk. Xing and Yan (2018), when analyzing American data, found evidence that there is a significant association between the quality of accounting information and systematic risk. In their research, Xing and Yan (2018) used different ways of measuring earnings management and its relationship with systematic risk. The results of Xing and Yan (2018) refer to an environment in which IFRS was not implemented. Hence, the idea of studying the topic in the Brazilian market, which has passed through the adoption of IFRS.

In this scenario, Brazil, a developing country with high interest rates in comparison to 17 other competing countries with similar economies, is in last place in the ranking of availability and cost of capital (Confederação Nacional da Indústria, 2019). Thus, the present study is favorable, insofar as the verification of the relationship between the quality of accounting information and systematic risk, is relevant mainly because this risk is one of the main components of the companies' cost of capital. This work also differs from others in the field, as it seeks to capture the influence of IFRS adoption on the relationship between information quality and systematic risk.

In view of the discussion presented, the main objective of this study was to investigate whether the systematic risk of companies listed on the Brazilian Stock Exchange (B3) is affected by the quality of accounting information. As a secondary objective, we verified whether this risk was affected after the mandatory adoption of IFRS in Brazil, given that studies carried out in the country reveal controversial results regarding the increase in the quality of accounting information after mandatory adoption in 2008 (Silva, 2013; Gatsios, 2013; Cardoso, Souza, & Dantas, 2015; Rezende, Almeida, & Lemes, 2015; Silva, Brighenti, & Klann, 2018).

The results demonstrated that there is a negative relationship between systematic risk and the quality of accounting information, and that this risk tends to be positively affected after IFRS adoption.

The results of this research will contribute to the market, to companies and investors, and may impact decisions on disclosure of corporate information, such as in regards to comparability, as established by the Brazilian Accounting Standards (Basic Conceptual Pronouncement CPC-00 (R1), 2008). The results can also provide subsidies that can connect accounting information to the companies' conjunctural risk (Xing & Yan, 2018). Another contribution would be the possibility of increasing efficiency and portfolio management, since, upon becoming better informed, investors are more likely to change the composition of portfolios and better distribute weights (Easley & O'Hara, 2004).

In order to achieve the proposed objectives, the methodology was based on empirical research, using a descriptive analysis with a quantitative approach. A set of data extracted from the Economatica platform was collected, with observations from the period from 2005 to 2018 of publicly traded companies listed on the Brazilian stock exchange.

2 Literature revision

2.1 Systematic Risk

Currently, for professionals in the area of finane, accurately estimating the cost of capital for companies in regards to financing decisions, investments, and defining rates of return has been a major challenge (Laghi & Di Marcantonio, 2016; María & Ligia, 2017).

Research in accounting and finance has also focused over the years in the search for practical models and procedures that can become standard over time (Da, Guo, & Jagannathan, 2012; Laghi & Di Marcantonio, 2016). Among the most used and already established models in the calculation of the cost of capital, is the (CAPM), or Capital Asset Pricing Model, which uses the risk-free rate, the market risk premium, as well as the risk (usually represented by beta (β)) to estimate the cost of equity (Minardi, Sanvicente, Montenegro, Donatelli, & Bignotto, 2007).

It is observed that, in the stock market, there is the possibility of obtaining greater gains when compared to investments: for example,those of fixed income (CDB's, RDB's), however, for every investment in bonds there is a higher linked risk that can come to generate losses (Souza, Albuquerque, Anjos, & Rodrigues, 2018).

In finance, risk is a factor strongly linked to measures of uncertainty (Bernardo & Ikeda, 2013). In other words, risk is a factor that is associated with the probability of an investment return occurring differently than expected (Bernardo & Ikeda, 2013). Thus, Markowitz (1952) in his classic work Portfolio Selection, explains that the total risk of an asset results from the combination of idiosyncratic risk and systematic risk. Idiosyncratic risk can be eliminated with diversification, but systematic risk cannot be eliminated with diversification (Markowitz, 1952).

According to Duarte's (1996) explanations, systematic risk (market risk) is subdivided into the following areas: equity, commodities, interest, and exchange rates; and that this risk depends on how the asset price behaves in relation to market circumstances; with market fluctuations being quantified through volatilities and the correlation of the various factors that influence the formation of the asset's price.

In the same sense, when analyzing the role of risk in the earnings response coefficient, Pimentel (2015) concludes that the value of shares is a function of informational variables that predict dividends, transitory components, discount rates, growth expectation, and assumed risk by the companies traded.

2.2 Quality of Accounting Information and Agent Theory

It can be seen that, in order for resources from capital to be effectively invested in productive activities, not only investors but also investment recipients disclose and require information about these same investments (Ramos, Ribeiro, & Perlin, 2017). In financial decisions, information is a preponderant input and plays an indispensable role, constituting a crucial component of all financial transactions and markets (Liberti & Petersen, 2017; Souza, Flach, Borba & Broietti, 2019).

In this environment, accounting acts to fulfill its objective, which is to provide useful and relevant information for the decision-making process, and which satisfies the needs of different types of users, thus contributing to a better understanding of economic risks, investment by creditors, and investors (María & Ligia, 2017; Fully, Guimarães, Dias, & Lima, 2018). Agent theory predicts that the quality of accounting information can bring more information to investors, but this depends on how committed the manager is to the principal, since the manager tends to have more information than the shareholder (Jensen & Mecking, 1976). In accounting, agents have more information than the principal and IFRS can provide managers with more opportunities for choices. Rezende et al (2015) state that IFRS mitigates information asymmetry, and this can affect the risk assumed by companies.

It is from this scenario that a greater concern with the quality of the information generated by accounting emerges, because, as Corina and Nicolae (2010) teach us, the

competitive environment demands a constant need for adaptation, where the subsistence of companies is conditioned by obtaining relevant information which is reliable, timely, essential, clear, and of quality, in order to optimize decision making. Leuz and Verrecchia (2005), for example, state that the quality of the financial report affects the level of expected cash flows in companies.

In the international literature as well as in Brazilian studies, the criteria for defining the quality of accounting information are not identical, and different methodologies and different measures are used to assess the level or degree of quality of this information, as for example in Mendonça and Riccio (2008) who used the information provided voluntarily as a measure of information quality (Disclosure Index developed by Botosan (1997)). Nardi, Silva, Nakao and Valle (2009) used, among others, the modified Jones (1991) model to calculate the discretionary accrual, which serves as a proxy for earnings management.

From this perspective, Dechow, Ge and Schrand (2010) when analyzing the issue of quality of accounting information, developed works in search of measures to evaluate this variable, and highlighted some main characteristics, such as earnings management.

2.3 IFRS

The International Financial Reporting Standards (IFRS) were introduced in Brazil through the enactment of Law number 11,638/2007 and the creation of the Accounting Pronouncements Committee (CPC). This body was responsible for the process of convergence of the BRGAAP (Brazilian accounting standard) with the international standards issued by the International Accounting Standards Board (IASB), thus effecting their harmonization (Silva et al., 2018).

International studies, when analyzing the impacts of IFRS on the quality of accounting information, concluded the following: in studies with American companies, in the United Kingdom, and with several companies in the European Union, an increase in the quality of accounting information was observed (Chen, Tang, Jiang, & Lin, 2010; Latridis, 2010; Sun, Cahan, & Emanuel, 2011). When analyzing Chinese companies, Liu, Yao, Hu and Liu (2011), concluded that companies that adopted IFRS were less likely to smooth their results.

In Brazil, studies have pointed out some contradictory results regarding the relationship between the quality of accounting information and IFRS adoption, such as: Cardoso et al. (2015) who claimed that the full adoption of IFRS by publicly traded Brazilian companies caused a loss of comparability of accounting reports. Silva et al. (2018), concluded that the adoption of IFRS significantly contributed to the relevance and increase in the quality of accounting information, and even positively, can impact investors' decision making.

2.4 Quality of Accounting Information X Systematic Risk

Armstrong, Banerjee and Corona (2013) found that information specific to an organization can affect expected returns if it influences investors in their uncertainties. Leuz and Verrecchia (2005) showed that the existence of higher quality of information leads to a lower cost of capital due to its effect on expected cash flows. The results by Cai, Faff, Hillier and Mohamed (2007) showed positive and significant changes in systematic risk when the quality of the information in the result ads is low. Ng (2011) reports in his study that lower liquidity risk and consequent reduction in the cost of capital (composed of systematic risk) are associated with information quality. Thus, the following hypothesis is suggested:

H1: The quality of accounting information has a negative relation with systematic risk.

However, other studies found different results when analyzing similar relationships, such as Core, Guay and Verdi (2008) when they found a significant relationship between the quality of accounting information and idiosyncratic risk. For Savor and Wilson (2016) the change in systematic risk due to results announcements is due to what they call "advertising risk".

In the reality of the Brazilian economic environment, factors such as changes in inflation rates and interest rates, changes in GDP, and regulations, as well as public policy guidelines, affect market expectations and projections in relation to companies (Fernandes, 2007). Additionally, there is the peculiarity of the country having passed through the mandatory implementation of IFRS as of 2010, being the object of studies that point to controversial results regarding the increase in information content in the quality of accounting information (Silva, 2013; Gatsios, 2013; Cardoso et al., 2015; Rezende et al., 2015; Silva et al., 2018).

Among the Brazilian studies, one can cite: Ramos and Caramori (2017), who, when analyzing the relationship between market risk and the quality of accounting information, concluded that companies with a higher level of disclosure have lower volatility of stock returns. Silva (2013) identified empirical evidence of a reduction in the cost of equity in relation to the higher quality of the financial statements after the convergence to international standards from 2010 onwards. In view of the results presented in the literature, the second hypothesis to be tested in the search:

H2: Systematic risk has a negative relation with IFRS implementation.

3 Methodological procedures

3.1 Research Strategy, Data and Method

A dataset from the period 2005 to 2021 of companies listed on B3 was collected from the Economatica platform. The start date is associated with the restriction of data before 2005. Financial institutions were excluded from the sample, in view of their characteristics and specific equity and capital structure, being different from the other entities to be surveyed. Companies with incomplete information, or no information, were excluded from the sample and a winsorization at the level of 1% was applied to each tail of the non-binary variables, in order to minimize possible biases arising from the existence of outliers. All data were processed in STATA software.

3.2 Data Analysis Technique and Definition of Variables

3.2.1 Dependent Variables

The dependent variable of the research is the systematic risk and for its measurement two approaches were adopted. First, the work of Low (2009) and Xing and Yan (2018) was followed, which decompose the total risk into systematic and non-systematic risk with the help of equation 1, which is estimated by ordinary least squares with error variance corrected by the

estimator. of White.

$$R_i = \alpha_i + \beta_i R_M + \varepsilon_i \quad (1)$$

Where:

- R_i : return on individual shares of company i;
- R_M : market return for the same period;
- ε_i : value of residuals.

Quarterly returns were used for each company in the sample. Based on Equation (3), the variance of both sides was calculated, and the total risk was expressed by dividing the terms into systematic and non-systematic components. In view of this, the first measure was calculated based on equation 2, which was called systematic risk 1, or RS1:

$$VAR(R_i) = \beta_i{}^2 VAR(R_M) + 2\beta_i COV\left(R_M, \varepsilon_{i_i}\right) + VAR(\varepsilon_i) \quad (2)$$

Thus, the first term on the right side of equation (2) is the systematic part of the company's risk, with the second term being the non-systematic part. For market returns R_M, the proxy for the index weighted by the value of the Bovespa index was used. The square of the company's beta was multiplied by the variance of market returns in the corresponding quarters and the product of this was defined as the systematic risk of each quarter.

For the second measure, which was called systematic risk 2, or RS2, the total risk was similarly separated into systematic and non-systematic risk, using the three-factor model of Fama and French (1993), according to equation 3, which was also estimated by ordinary least squares with error variance corrected by the White estimator.

$$R_{C_{it}} - R_{lr_t} = a + b\left[R_{m_t} - R_{lr_t}\right] + s[SMB_t] + h[HML_t] + \varepsilon_{it} \quad (3)$$

Where:

- $R_{C_{it}}$: return on portfolio i in month t;
- $R_{m_t} - R_{lr_t}$: market portfolio premium in quarter t;
- SMB_t : premium for the size factor in quarter t (defined as the difference between the average return on the portfolios of small and large companies;
- HML_t : premium for the B/M factor (Book to Market) in quarter t;
- ε_{it} : model residue referring to portfolio i in quarter t.

3.2.1 Independent variables

The first independent variable is the quality of accounting information, which was measured in two different ways (Marquardt & Zur, 2014; Xing & Yan, 2018).

The first, which was called quality measure 1, or MQ1, is the discretionary accrual, based on the proposal by Dechow and Dichev (2002), which analyzes the relationship between

accruals and cash flows and determines the residual of the model as a management proxy. The model was improved by Francis, LaFond, Olsson and Schipper (2005), who added the variation in revenues and gross value of the company's fixed assets as controls. We revisited the literature in search of other methodological proposals for the estimation of earnings management. We verified that the new models launched after Dechow and Dichev (2002) and modified Jones (1991) also suffer criticism in relation to other aspects. We even found a record in the literature of models proposed after the Modified Jones model and some of them criticized the Modified Jones model, which is the case of the KS model, which was later also criticized by other researchers, both in an event of the American Accounting Association by Dechow and his co-authors, as the KS Model was critical of the Dechow and Dichev (2002) and modified Jones (1991) Model, but the KS model itself was not bias-free, since the KS model does not correct for heteroscedasticity . Thus, it was decided to keep the Jones model (1991) and the Dechow and Dichev Model (2002), since, in recent literature, it was found that the Modified Jones model continues to be considered. What we did was use controls to mitigate endogeneity problems pointed out by KS to the model.

The residual of the regression model determined by equation 4 indicates the discretionary accrual, representing the first proxy (MQ1), which represents lower quality as the residual increases.

$$TCA_{it} = \beta_0 + \beta_1 CFO_{i(t-1)} + \beta_2 CFO_{it} + \beta_3 CFO_{i(t+1)} + \beta_4 \Delta REV_{it} + \beta_5 IMOB_{it} + \epsilon_{it} \quad (4)$$

Where:

- TCA_{it} : total accruals of company i in quarter t;
- $CFO_{i(t-1)}$: operating cash flow of company i in quarter t-1;
- CFO_{it} : cash flow operating cash of company i in quarter t;
- $CFO_{i(t+1)}$: operating cash flow of company i in quarter t+1;
- ΔREV_{it} : change in company i's revenues in quarter t;
- $IMOB_{it}$: gross value of fixed assets of company i in quarter t;
- ϵ_{it} : error term of firm i in quarter t.

For the second measure used, called quality measure 2, or MQ2, the modified Jones model (1991) was used, estimated from the residual of the regression model described by equation 2, also used as a management proxy by Rajgopal and Venkatachalam (2011) and Xing and Yan (2018). A higher residual means lower quality of accounting information.

$$TA_{it} = \beta_0 + \beta_1 (\Delta REV_{it} - \Delta AR_{it}) + \beta_2 IMOB_{it} + \beta_3 ROA_{it} + \epsilon_{it} \quad (5)$$

Where:

- TA_{it} : total company accruals and not quarter t;
- ΔREV_{it} : variation in company i's revenues in quarter t;
- ΔAR_{it} : change in accounts receivable of company i in quarter t;

- $IMOB_{it}$: gross value of fixed assets of company i in quarter t;
- ROA_{it} : Return on assets of company i in quarter t.
- ϵ_{it} : error term of firm i in quarter t (residual).

The second independent variable is a dummy, called IFRS, which assumes value 1 for adoption and post-adoption periods and 0 otherwise. Thus, the variable assumed value 1 from 2008 onwards. Additionally, we tried to capture, through the interaction of the IFRS variable with the information quality measurement variables, MQ1 and MQ2, whether there was a difference in the effect of the information quality variables on the dependent systematic risk after IFRS adoption.

3.2.2 Control Independent Variables

As control variables, metrics identified by Low (2009) and Xing and Yan (2018) were used as determining factors of company risk; variables that aimed to isolate the effects of the quality of accounting information on systematic risk.

Company Size was used, for its influence on returns and profitability; the Market-to-Book, as the company's market value is related to the market's perception of its ability to generate future cash flows; return on assets (ROA), given that profitability affects a company's return and consequently its risk; Liquid Capital Investments, which may cause changes in risk by the possible neglect of long-term investments and the pursuit of profitability only in the short term; Leverage, as it causes a change in the company's risk through its indebtedness; Business Segments, since the segment to which the company belongs differently affects the risk to which it is exposed; and the Herfindahl-Hirschman Index (HHI), which is an indicator that represents market concentration, and is also an instrument used to monitor the evolution of competitiveness, thus being intrinsically linked to risk.

Figure 1 provides an explanation of the research variables.

Variable	Type	Definition	Source	Literature
Systematic Risk Market Model (RS1)	Dependent	Equation (4)	Economatica	Low (2009) Xing e Yan (2018)
Systematic Risk 3-Factor Model (RS2)	Dependent	Equation (5)	Economatica Nefin (USP)	Low (2009) Xing e Yan (2018)
Quality of accounting information: relationship between accruals and cash flows (MQ1)	Independent	Equation (1)	Economatica	Dechow e Dichev (2002) Francis et al. (2005) Xing e Yan (2018)
Quality of accounting information: total value of accruals (MQ2)	Independent	Equation (2)	Economatica	Jones (1991) Xing e Yan (2018)
IFRS	Independent	0 - Before IFRS 1 - Adoption and after IFRS	-	-
Company Size (TAM)	Control	ln ($asset_{it}$)	Economatica	Low (2009) Xing e Yan (2018)

Market-to-book (MTB)	Control	$\frac{Market\ value_{it}}{Stockholders\ equity_{it}}$	Economatica	Low (2009) Xing e Yan (2018)
Return on Assets (ROA)	Control	$\frac{(net\ income_{it})}{asset_{it-1}}$	Economatica	Low (2009) Xing e Yan (2018)
Net capital investments (INV CAP)	Control	$(capital\ expenditure - real\ estate\ asset\ sales) / asset$	Economatica	Low (2009) Xing e Yan (2018)
Size	Control	Ln (Asset)	Economatica	Low (2009) Xing e Yan (2018)
Leverage (ALA)	Control	$\frac{Liability}{Asset}$	Economatica	Low (2009) Xing e Yan (2018)
Business Segments (SEG)	Control	Is the number of operating segments of the companies that make up the sample.	Economatica	Low (2009) Xing e Yan (2018)
Sales Herfindahl-Hirschman Index (HHI)	Control	Sum of square rates of segment sales to total sales. $H = \sum_{i=l}^{N} w_i^2$	Economatica	Low (2009) Xing e Yan (2018)

Figure 1 *Variables*
Source: *Research data (2022).*

3.3 Hypothesis tests

3.3.1 Regression Models, Estimations and Tests

To achieve the research objectives, the regression model described by equation 6 was estimated:

$$RS_{it} = \beta_0 + \beta_1 MQ_{itj} + \beta_2 IFRS_{it} + \beta_3 MQ_{it} * IFRS_{it} + \sum_j \beta_j control_{jit} + \epsilon_{it} \quad (6)$$

The systematic risk was evidenced in the two different ways mentioned above, in the same way the quality of the accounting information was assessed by the two metrics evidenced, thus the model described by equation 6 unfolded in 4 estimations, which are presented as a robustness analysis of the results.

The β_1 coefficient helps to verify the first research hypothesis, since it shows the effect of the quality of accounting information on systematic risk. The β_3 coefficient allows the second hypothesis of the research to be evaluated, since it determines the joint effect of the adoption of IFRS and the quality of accounting information.

The models were estimated by fixed effect and by random effect estimator and for the decision as to the best estimator to adopt, the Hausman test was used. All estimated models showed to be more adequate with fixed effect, thus, this was the estimator used in all specifications. The variance of errors was estimated by the White estimator, which according to Wooldridge (2010), is robust to possible problems of heteroscedasticity. To check for

multicollinearity in the models, the inflationary variance factor (VIF) was used.

3.3.2. Robustness Tests

To verify the robustness of the research results, an additional analysis was conducted. Although in 2008 and 2009 Brazil went through the process of convergence of accounting standards to the international standard, in those years it was not yet mandatory to adapt to the standard. This factor leads to questions about the decision to include in a single group the years in which the IFRS standard was mandatory and those that had the standard as optional.

Thus, a new methodological approach was tested, in which dates are separated into three groups instead of two. Two dummy variables were created, as described in equations 7 and 8.

1 for the period in which the pattern is obligatory

$$obligatory = \begin{cases} 1\ for\ the\ period\ in\ which\ the\ pattern\ is\ obligatory \\ 0\ otherwise \end{cases} \quad (7)$$

$$facultative = \begin{cases} 1\ for\ the\ period\ in\ which\ the\ pattern\ is\ facultativ \\ 0\ otherwise \end{cases} \quad (8)$$

To differentiate the effects of the quality of accounting information and the adoption of IFRS, for different stages, a new specification was brought to light, which is described by equation 9.

$$RS_{it} = \beta_0 + \beta_1 MQ_{itj} + \beta_2 mandatory_{it} + \beta_3 optional_{it} + \beta_4 MQ_{it} * mandattory_{it} + \beta_5 MQ_{it} * optional_{it} + \sum_j \beta_j control_{jit} + \epsilon_{it} \quad (9)$$

The main difference between this model and the one described above is that it is possible to assess the effect of the quality of accounting information on systematic risk during and after the process of convergence of accounting standards, by the coefficients β_4 and β_5, respectively.

The models, which unfold by the different ways of measuring quality of information and systematic risk, were also estimated by fixed effect with error variances estimated by White's estimator, after the Hausman test pointed to the fixed effect estimator as more adequate than the random effect.

4 Results and Analysis

4.1 Sample Characterization

Table 1 presents some descriptive statistics of the variables in the study

It can be seen that the means of the explained variables RS1 and RS2—which represent the proxies for systematic risk, have different magnitudes due to the different way of obtaining them by different models. Variable RS1 had a mean of -0.00001. Based on this result, it can be inferred that, on average, the sample companies generate below-market returns, which is associated with lower risk. In a different way, variable RS2 had an average of 3.83, showing that, based on this risk measure, the sample companies on average generate above-market return and have high risk, since the average risk was greater than 1 (Table 1).

Table 1
Descriptive Statistics

Variable	Note	Mean	Standard Deviation	Minimun	Q1	Median	Q3	Maximum
RS1	10146	-0.00001	0.00004	-0.00025	0.00	0.00	0	0.00001
RS2	10146	3.86	10.21	-16.76	-3.44	4.72	9.26	22.89
MQ1	10146	0.33	1.12	0.00	0.03	0.08	0.24	20.20
MQ2	10146	0.13	1.45	-7.34	-0.04	0.01	0.08	32.51
IFRS	10146	0.94	0.24	0	1	1	1	1
TAM	10146	14.93	1.57	11.23	13.87	14.98	16.04	18.21
MTB	10146	2.14	2.16	0.20	0.78	1.44	2.61	10.84
ROA	10146	0.03	0.05	-0.09	0.00	0.02	0.05	0.15
INV CAP	10146	0.71	0.13	0.34	0.63	0.73	0.81	0.94
HHI	10146	0.06	0.01	0.05	0.05	0.06	0.06	0.10
ALA	10146	0.57	0.20	0.01	0.44	0.58	0.71	1
SEG	10146	166.7	38.29	36	170	183	189	198
RS1	10146	-0.00001	0.00004	-0.00025	0.00	0.00	0	0.00001
RS2	10146	3.86	10.21	-16.76	-3.44	4.72	9.26	22.89

RS1 is the metric for systematic risk calculated based on the market model; RS2 is the metric for systematic risk calculated based on the 3-factor model; MQ1 is the metric for quality of information based on the Dechow and Dichev (2002) model; MQ2 is the metric for information quality based on the modified Jones model (1991); IFRS represents a dummy that takes value 1 for the period after 2007 and 0 otherwise; IFRS_MQ1 and IFRS_MQ2 are interaction dummies between the IFRS dummy and the quality measures; Size (TAM) is defined as the natural logarithm of total assets; market-to-book (MTB) is defined as market value divided by equity; return on assets (ROA) is defined as net income divided by total assets at the beginning of the period; capital investment (CAP INV) is defined as capital investment minus sales of fixed assets divided by total assets; Herfindal index (HHI) is defined as a metric of market concentration based on the level of sales; leverage (ALA) is defined as liabilities divided by total assets and (SEG) is defined as the segments in which the sample companies operate.

Source: *Research Data (2022).*

For the two risk measures, there is a high dispersion among the companies during the period studied, which shows great heterogeneity in terms of the systematic risk of these companies, demonstrating that there is great diversity among the observations in the sample, which may be reflecting a great differentiation of firms in terms of risk in the Brazilian market, or high market instability in terms of risk (Table 1).

Similar results are evidenced regarding the quality of accounting information, which is highly heterogeneous. It can be stated that quality, as evidenced by earnings management, is different among the observations in the sample, which indicates discrepancies among the firms

with regard to discretionary accruals, which may be a factor that explains the heterogeneity observed in systematic risk (Table 1).

4.2 Pearson's correlation analysis

Table 2 presents the Pearson correlations between the study variables.

The first point to note in Table 2 is that the measures seeking to measure systematic risk are positively associated, evidencing a conformity of the ability that the metrics have to measure similar parameters. The same is true for the quality measures of accounting information.

As for the relationship evidenced between the quality of information and risk, one can state that there is no statistically significant correlation. With the exception of company size and capital investment, all controls were statistically correlated with systematic risk for at least one risk metric.

When analyzing the correlation of the control variables with the quality measures, TAM and ROA were found to correlate positively with the MQ1 and MQ2 measures, being significant at the 1% level. This allows us to infer that an increase in company size and profitability tends to increase the quality of accounting information. The MTB variable showed a negative correlation with both MQ1 and MQ2, being significant at the 1% level.

In general, the explanatory variables of the exposed models are correlated, which would lead to a concern regarding possible multicollinearity problems, however, when evaluating the variance inflation factor (VIF) of the model, it could be verified that all were below 5, which shows the absence of severe multicollinearity problems.

Table 2

Correlation between Variables (Pearson)

	RS1	*RS2*	*MQ1*	*MQ2*	*TAM*	*MTB*	*ROA*	*INV CAP*	*HHI*	*ALA*	*SEG*
RS1	1.0000										
RS2	-0.1561***	1.0000									
MQ1	-0.00900	-0.00890	1.0000								
MQ2	-0.00920	-0.00810	0.6968***	1.0000							
TAM	-0.0141	0.00420	-0.4636***	-0.1901***	1.0000						
MTB	0.00980	0.0503***	0.1532***	0.1265***	-0.0145	1.0000					
ROA	0.0440***	0.0262**	-0.1033***	-0.2860***	0.0118	0.2412***	1.0000				
INV CAP	0.00820	-0.0158	-0.0939***	0.0286**	0.1786***	-0.3097***	-0.1408***	1.0000			
HHI	0.1251***	-0.1224***	-0.0171	-0.0124	-0.0412***	0.0681***	0.1348***	-0.0354***	1.0000		
ALA	-0.0322***	-0.00680	-0.0082	0.1104***	0.2726***	0.2052***	-0.3514***	-0.0689***	-0.0561***	1.0000	
SEG	-0.0917***	-0.1253***	0.0380***	0.0261**	0.0213	-0.1038***	-0.1573***	0.0667***	-0.8355***	0.0697***	1.0000

Note: The symbols ***, ** and * indicate that the correlation is significant at the 1%, 5% and 10% levels, respectively.

Source: Prepared by the authors (2022)

4.3 Regression analysis

The results obtained for the estimation of the models described by equation 1 are shown in Table 3.

Table 3
Regression Analysis

Estimates of the models are presented:

Model 1: $RS1_{it} = \beta_0 + \beta_1 MQ1_{it} + \beta_2 IFRS_{it} + \beta_3 IFRS_{it} * MQ1_{it} + \beta_4 TAM_{it} + \beta_5 MTB_{it} + \beta_6 ROA_{it} + \beta_7 INV\ CAP_{it} + \beta_8 ALA_{it} + \beta_9 SEG_{it} + \beta_{10} HHI + \varepsilon_{it}$

Model 2: $RS1_{it} = \beta_0 + \beta_1 MQ2_{it} + \beta_2 IFRS_{it} + \beta_3 IFRS_{it} * MQ2_{it} + \beta_4 TAM_{it} + \beta_5 MTB_{it} + \beta_6 ROA_{it} + \beta_7 INV\ CAP_{it} + \beta_8 ALA_{it} + \beta_9 SEG_{it} + \beta_{10} HHI + \varepsilon_{it}$

Model 3: $RS2_{it} = \beta_0 + \beta_1 MQ1_{it} + \beta_2 IFRS_{it} + \beta_3 IFRS_{it} * MQ1_{it} + \beta_4 TAM_{it} + \beta_5 MTB_{it} + \beta_6 ROA_{it} + \beta_7 INV\ CAP_{it} + \beta_8 ALA_{it} + \beta_9 SEG_{it} + \beta_{10} HHI + \varepsilon_{it}$

Model 4: $RS2_{it} = \beta_0 + \beta_1 MQ2_{it} + \beta_2 IFRS_{it} + \beta_3 IFRS_{it} * MQ2_{it} + \beta_4 TAM_{it} + \beta_5 MTB_{it} + \beta_6 ROA_{it} + \beta_7 INV\ CAP_{it} + \beta_8 ALA_{it} + \beta_9 SEG_{it} + \beta_{10} HHI + \varepsilon_{it}$

Variables	*RS1*		*RS2*	
	Model 1	*Model 2*	*Model 3*	*Model 4*
MQ1	-0.000012		2.331768**	
MQ2		0.000019**		1.744519
IFRS	0.000029***	0.000038***	1.867034**	1.825008**
*IFRS*MQ1*	-0.000019		0.165776	
*IFRS*MQ2*		-0.000025**		-2.303443
TAM	-0.000018***	-0,000087***	-1.358809***	-1.844001**
MTB	0,000038***	0,000002**	0.310221***	0.183083***
ROA	0.000049***	0.000067***	4.660761	2.677992
INV CAP	0.000013	0.000014	3.770869***	3.777612
HHI	0.000804***	0.000818***	-602.4213	-701.4532
ALA	0.000029***	0.000028***	0.445541*	0.363093***
SEG	-0.000001	-0.000002*	-0.190016***	-0.195441***
CONST	0.000091**	0.000038	97.44321**	102.4412*
PROB > F	0.0000	0.0000	0.0000	0.0000
R2 adjusted	19.33%	21.12%	16.22%	15.38%
Note	10146	10146	10146	10146

RS1 is the metric for systematic risk calculated based on the market model; RS2 is the metric for systematic risk calculated based on the 3-factor model, and both were standardized by the natural logarithm of total assets; MQ1 is the metric for quality of information based on the Dechow and Dichev (2002) model; MQ2 is the metric for quality of information based on the modified Jones model (1991), and both were standardized by total assets; IFRS represents a dummy that takes value 1 for the period after 2007 and 0 otherwise; Size (TAM) is defined as the natural logarithm of total assets; market-to-book (MTB) is defined as market value divided by equity; return on assets (ROA) is defined as net income divided by total assets at the beginning of the period; capital investment (CAP INV) is defined as capital investment less sales of fixed assets divided by total assets; Herfindal index (HHI) is defined as a metric of market concentration based on the level of sales; leverage (ALA) is defined as liabilities divided by total assets and (SEG) is defined as the segments in which the sample companies operate. All variables were winsorized at the 1% level.

Note: Coefficients masked with ***, ** and * indicate that the coefficient is significant at the 1%, 5% and 10% levels, respectively.

Source: Survey data (2022).

When assessing the effect of the quality of accounting information on systematic risk, under the first risk metric, one can see that the first quality metric is not statistically significant; however, when assessed by the second quality measure, a statistically significant and positive effect is evidenced, at the 1% level. This result shows that, as the quality metric increases, the systematic risk also increases; thus, companies with lower quality accounting information have higher systematic risk (Table 3).

When it comes to the second risk measure, a statistically significant relationship is evidenced only with the first metric of quality of information, which is verified at 5% significance (Table 3). This finding also brings evidence of a higher systematic risk for companies that have less quality in accounting information.

Together, these results lead to the validation of the first research hypothesis, H1, since it is evident that companies that have a higher quality of accounting information have lower systematic risk, which can be justified by the reduced cost of capital by increasing information (Easley & O'Hara, 2004) and by increased transparency (Core, Hail & Verdi, 2015).

Findings regarding the validation of the first hypothesis are in line with the literature, which has sought to highlight the relationship in other environments, such as Core, Hail and Verdi (2015) who demonstrated that clearer reports decrease risk, as well as Heirany and Khoshnood (2014) who evaluated companies listed on the Tehran stock exchange and showed that he greater systematic risk, the more evident the poor quality of information. This is also corroborated by Xing and Yan (2018) who obtained the same results for the American market.

It is possible to state that the cost of capital of companies is reduced, since it is composed of the beta coefficient that composes the systematic risk as prescribed by Sharpe (1964) and Lintner (1965), thus corroborating studies by Leuz and Verrecchia (2005), Cai et al. (2007), Armstrong et al. (2013), Core et al. (2015) and Ramos and Caramori (2017) that higher quality of accounting information is reflected in lower uncertainties and lower volatility of stock returns, and well as reducing systematic risk, leading to a lower cost of capital.

When it comes to the joint effect of the dummy of IFRS and quality of information, it is noted that in model 2 and model 4 (Table 3), which use the second measure of quality of accounting information, the effect is statistically significant and negative, with 5% significance in both cases. These results mean that the perceived positive effect of the quality metric on risk becomes less positive after the adoption of IFRS. In other words, the worse the information, the higher the risk; however, after the adoption of the international accounting standard, the lower this effect, evidencing that the absence of information is characterized as less of a risk for the investor after the adoption.

The findings do not support the second research hypothesis, H2, which states that the joint effect should be positive, indicating a greater effect of quality on risk after IFRS adoption, a result that contradicts Silva, Brighenti and Klann (2018), Latridis (2010), Sun, Cahan and Emanuel (2011), Silva (2013), Rezende, Almeida and Lemes (2015) and Silva et al. (2018), which show that the adoption of IFRS relevantly contributed to the relevance and increased quality of accounting information, and further positively, can impact the decision making of investors. A possible explanation for the non-compliance of such hypothesis lies in the mixture of periods when the adoption of IFRS was mandatory, and the period when the use of the new standard was optional.

Regarding, the control variables, size is statistically significant and has a negative coefficient in all specifications, showing that larger companies are less risky (Table 3). Market-to-book was also significant in all specifications and with positive sign, allowing us to infer that the higher the market value of a company, the higher the propensity to increase risk (Table 3).

Leverage is also statistically significant in all specifications, with a positive sign, showing that risk is higher in companies that are more indebted (Table 3). Return on assets shows significance only in the specifications that deal with the first risk metric (Table 3). And also in Table 3, one can see that the other controls oscillate their significance among the different specifications.

4.4 Additional Analyses

Table 4 presents the additional model estimates, which separates the IFRS dummy between the optional period and the mandatory period.

Table 4

Additional analysis (optional versus mandatory adoption)

Estimates of the models are presented:

Model 1: $RS1_{it} = \beta_0 + \beta_1 MQ1_{it} + \beta_2 facult_{it} + \beta_3 oblig_{it} + \beta_4 facult_{it} * MQ1_{it} + \beta_5 oblig_{it} * MQ1_{it} + \beta_6 TAM_{it} + \beta_7 MTB_{it} + \beta_8 ROA_{it} + \beta_9 INV\ CAP_{it} + \beta_{10} ALA_{it} + \beta_{11} SEG_{it} + \beta_{12} HHI + \varepsilon_{it}$

Model 2: $RS1_{it} = \beta_0 + \beta_1 MQ2_{it} + \beta_2 facult_{it} + \beta_3 oblig_{it} + \beta_4 facult_{it} * MQ2_{it} + \beta_5 oblig_{it} * MQ2_{it} + \beta_6 TAM_{it} + \beta_7 MTB_{it} + \beta_8 ROA_{it} + \beta_9 INV\ CAP_{it} + \beta_{10} ALA_{it} + \beta_{11} SEG_{it} + \beta_{12} HHI + \varepsilon_{it}$

Model 3: $RS2_{it} = \beta_0 + \beta_1 MQ1_{it} + \beta_2 facult_{it} + \beta_3 oblig_{it} + \beta_4 facult_{it} * MQ1_{it} + \beta_5 oblig_{it} * MQ1_{it} + \beta_6 TAM_{it} + \beta_7 MTB_{it} + \beta_8 ROA_{it} + \beta_9 INV\ CAP_{it} + \beta_{10} ALA_{it} + \beta_{11} SEG_{it} + \beta_{12} HHI + \varepsilon_{it}$

Model 4: $RS2_{it} = \beta_0 + \beta_1 MQ2_{it} + \beta_2 facult_{it} + \beta_3 oblig_{it} + \beta_4 facult_{it} * MQ2_{it} + \beta_5 oblig_{it} * MQ2_{it} + \beta_6 TAM_{it} + \beta_7 MTB_{it} + \beta_8 ROA_{it} + \beta_9 INV\ CAP_{it} + \beta_{10} ALA_{it} + \beta_{11} SEG_{it} + \beta_{12} HHI + \varepsilon_{it}$

Variables	*RS1*		*RS2*	
	Model 1	*Model 2*	*Model 3*	*Model 4*
MQ1	0.000013		2.411301***	
MQ2		0.000022**		1.766761**
IFRS	0.000029***	0.000036***	1.860029**	1.822185**
*facult*MQ1*	-0,000078	-0.000052**		
*oblig*MQ1*	0,000086*	0.000077**		
*facult*MQ2*			-0.223398	-0.398432*
*oblig*MQ2*			2.246590**	3.964591**
TAM	-0.000028***	-0,000087***	-1.358809***	-1.844001**
MTB	0,000038***	0,000002**	0.310221***	0.183083***
ROA	0.000049***	0.000067***	4.660761	2.677992
INV CAP	0.000013	0.000014	3.770869***	3.777564
HHI	0.000907***	0.000818***	-602.4216	-701.4532
ALA	-0.000029***	-0.000028***	0.455541**	0.363887***
SEG	-0.000001	-0.000002*	-0.190016***	-0.195441***
CONST	0.000091**	0.000044	97.44321**	102.4412*
PROB > F	0.0000	0.0000	0.0000	0.0000
R2 ajusted	21.33%	24.32%	16.89%	16.22%
Notes	10146	10146	10146	10146

RS1 is the metric for systematic risk calculated based on the market model; RS2 is the metric for systematic risk calculated based on the 3-factor model, and both were standardized by the natural logarithm of total assets; MQ1 is the metric for quality of information based on the Dechow and Dichev (2002) model; MQ2 is the metric for information quality based on the modified Jones model (1991), and both were standardized by total assets; facult

represents a dummy that takes value 1 for the period 2008 and 2009 and 0 otherwise; obrig represents a dummy that takes value 1 from 2010 onward and 0 otherwise; size (TAM) is defined as the natural logarithm of total assets; market-to-book (MTB) is defined as market value divided by equity; return on assets (ROA) is defined as net income divided by total assets at the beginning of the period; capital investment (INV CAP) is defined as capital investment minus sales of fixed assets divided by total assets; Herfindal index (HHI) is defined as a metric of market concentration based on the level of sales; leverage (ALA) is defined as liabilities divided by total assets and (SEG) is defined as the segments in which the sample companies operate. All variables were winsorized at the 1% level.

Note: Coefficients masked with ***, ** and * indicate that the coefficient is significant at the 1%, 5% and 10% levels, respectively.
Source: Research data (2022).

When the effects of the quality of accounting information on risk are evaluated, it can be noted that the results are consistent with those already discussed, with the difference that one more coefficient appears as significant and positive (which is associated with model 3). These findings corroborate the validation of the first research hypothesis already discussed and it becomes evident that, regardless of the way of measuring the adoption of IFRS, a higher quality of information reduces systematic risk in Brazilian companies.

The most important discussion in this topic, however, focuses on the joint relationship of IFRS adoption and quality in risk. The segregation of the FRS dummy has as its main objective to verify whether the joint relationship occurs differently depending on whether: (i) companies in the country are going through a transition period of the standard, in which there is no obligation to adopt international standards, or (ii) companies in the country are obliged to adhere to the standard.

When the joint effect of the mandatory period with quality is evaluated, a statistically significant and positive coefficient can be noted for all specifications, which indicates that after the mandatory adoption of IFRS, a higher quality of accounting information decreases risk more intensely than before this period (Table 4). These results are in line with the second research hypothesis, which supports the theory that there is a reduction in the cost of capital as one converges to international standards (Silva, 2013).

It is possible to infer that what did not allow the second research hypothesis to be confirmed in the situation where there is a single IFRS adoption metric, was the fact that there were contradictory effects on systematic risk. Note that the coefficients of the interaction between the period of adoption and the quality of information are always negative, being significant in two specifications, and, when the effects are summed up, they tend to find a non-significant result. This finding may be linked to the uncertainty about the new accounting standard during the period of its implementation, which according to Cardoso, Souza and Dantas (2015) there were discussions about the loss of comparability of accounting reports.
Thus, what can be stated is that for the IFRS adoption to cause the quality to have a greater impact on risk, it is necessary for its full adoption to be mandatory, since the uncertainty concerning the adoption process is able to dissipate this incremental effect.

5 Closing Remarks

The main objective of this paper was to analyze whether the systematic risk of companies listed on the Brazilian Stock Exchange (B3) is affected by the quality of accounting information. As a secondary objective, it was verified whether systematic risk was affected after the mandatory adoption of IFRS in Brazil. The support of the study is given by the reduction of informational asymmetry coming from the increased informational quality and the adoption of international accounting standards.

The results evidenced in the research allow us to say that, in general, companies that have accounting information of higher quality can reduce problems of informational asymmetry, which increase the systematic risk, and, thus, having higher quality in this information reduces the risk before the investor, who may feel more secure because of the clarity and confidence in the information.

As for the adoption of IFRS in Brazil, the main conclusion is that it actually contributes to the quality of the information becoming lower risk, but for this to occur there is a need for full implementation, so that the uncertainties associated with the transition period do not distort this relationship: thus, Brazil only experienced a real change in risk associated with the adoption of IFRS after 2010, when there was full implementation of the new accounting standard.

For companies, this generates a contribution regarding the discussion about the importance of providing quality accounting information to the user, which will allow investors to feel more secure and thus generate greater value for the company in the long term, since it will attract such investors. In addition, it is evident that Brazil is a suitable country for reducing risks by improving accounting information, since there has been, since 2010, full adoption of the IFRS.

For the investor, it generates contributions regarding the ability to make better decisions, based on the company's expected risk, which must have, as a sign of this, better quality of information for organizations to pass to their users. Thus, the investor must evaluate the quality of the information to anticipate which risk to expect from such a company and thus make investment decisions.

The study presented as a research limitation, the absence of the control variable R&D (spending on research and development), originally used by Low (2009). The absence of such a measure in the econometric models can be configured as a problem of estimation bias. When collecting data on the R&D variable at Economatica we found that the number of observations is greatly reduced because the number of entities that disclose about R&D is very low (reducing the number of observations to one third of the base used without this variable). Thus, we chose to exclude the R&D variable from this analysis, because the harm of the absence of this variable as a control variable is less damaging than reducing the sample analyzed, considering the companies with R&D information available. In addition, the percentage of companies that actually adopted international standards during the transition period from accounting standards to international standards is not considered in this study, which could help to better understand how that actual adoption helps in reducing systematic risk.

As suggestions for future research, it is suggested to verify whether the quality of accounting information is related to idiosyncratic risk factors, since international studies have found such evidence. Another suggestion is to analyze using other metrics of accounting information quality and considering the portion of companies that actually adhered to IFRS during the transition period.

References

Amorim, A. L. G. C., Lima, I. S., & Murcia, F. D. (2012). Análise da relação entre as informações contábeis e o risco sistemático no mercado brasileiro. *Revista Contabilidade & Finanças - USP*, *23*(60), 199-211. https://doi.org/10.1590/S1519-70772012000300005

Armstrong, C. S., Banerjee, S., & Corona, C. (2013). Factor-loading uncertainty and expected returns. *Review of Financial Studies, 26*(1), 158–207. Doi: 10.1093/rfs/hhs102

Bernardo, H., & Ikeda, R. (2013). O Enigma dos dividendos e o risco sistemático. *Revista*

Universo Contábil, *9*(1), 104-120. doi:http://dx.doi.org/10.4270/ruc.20139.

Beyer A., Cohen D. A., Lys T. Z., & Walther B. R. (2010). The financial reporting environment: Review of the recent literature. *Journal of Accounting and Economics, 50*(22-3), 296–343. Doi: https://doi.org/10.1016/j.jacceco.2010.10.003

Botosan, C. A. (1997). Disclosure level and the cost of equity capital. *The Accounting* Review. *72*, 323-349. DOI: 10.4236/me.2011.24066

Cai, C. X., Faff, R. W., Hillier, D., & Mohamed, S. (2007). Exploring the link between information quality and systematic risk. *Journal of Financial Research, 30,*335–353. Doi: https://doi.org/10.1111/j.1475-6803.2007.00217.x

Cardoso, R. L., Souza, F. S. R. N., & Dantas, M. (2015). Impactos da adoção do IFRS na acumulação discricionária e na pesquisa em gerenciamento de resultados no Brasil. *Revista Universo Contábil*, *11*(2), 65-84. Doi: doi:10.4270/ruc.2015212

Chen, H., Tang, Q., Jiang, Y., & Lin, Z. (2010). The role of international financial reporting standards in accounting quality: evidence from the European Union. *Journal of International Financial Management & Accounting, 21*(3), 220–278. doi:10.1111/j.1467-646x.2010.01041.x.

Comitê de Pronunciamentos Contábeis. (2008). Pronunciamento Conceitual Básico CPC-00 (R1). *Estrutura Conceitual para Elaboração e Divulgação de Relatório Contábil-Financeiro.* Recuperado de http://static.cpc.aatb.com.br/Documentos/147_CPC00_R1.pdf.

Confederação Nacional da Indústria – CNI. (2019). *Competitividade Brasil 2018-2019: comparação com países selecionados.*

Core, J. E., Guay, W. R., & Verdi, R. (2008). Is accruals quality a priced risk factor? *Journal of Accounting and Economics*, *46*(1), 2–22. doi:10.1016/j.jacceco.2007.08.001.

Core, J. E., Hail, L., & Verdi, R. S. (2015). Mandatory disclosure quality, inside ownership, and cost of capital. *European Accounting Review, 24*,1–29. Doi: https://doi.org/10.1080/09638180.2014.985691

Corina, M., & Nicolae, M. M. (2012). Quality of accounting information to optimize the decisional process. *Annals of the University of Oradea: Economic Science*, *1*(2), 694-699.Recuperado de: https://search.ebscohost.com/login.aspx?direct=true&db=buh&AN=85949009&lang=pt-br&site=ehost-live. Acesso em: 3 ago. 2022

Da, Z., Guo, R.-J., & Jagannathan, R. (2012). CAPM for estimating the cost of equity capital: Interpreting the empirical evidence. *Journal of Financial Economics*, *103*(1), 204–220. Recuperado de https://doi.org/10.1016/j.jfineco.2011.08.011.

Dechow, P. M., & Dichev, I. D. (2002). The quality of accruals and earnings: the role of accrual estimation errors. *Account Review*, *77*(s-1), 35–59. Doi:

https://doi.org/10.2308/accr.2002.77.s-1.35

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, *50*(2-3), 344-401. doi:10.1016/j.jacceco.2010.09.001.

Duarte, A. M. Jr. (1996). Risco: definições, tipos, medição e recomendações para seu gerenciamento. *Resenha BM&F*, *114*, 25-33.

Easley, D., & O'hara, M. (2004). Information and the cost of capital. *The Journal of Finance, 59*(4), 1553-1583. Doi: https://doi.org/10.1111/j.1540-6261.2004.00672.x

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial and Economics*, *33*(1), 3-56. doi:10.1016/0304-405x(93)90023-5.

Fernandes, A.S. (2007). *Análise empírica de fatores determinantes do risco sistemático das empresas brasileiras.* (Dissertação de mestrado). Universidade de Brasília, Brasília, DF, Brasil.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2005). The market pricing of accruals quality. *Journal of Accounting and Economics*, *39*(2), 295-327. doi:10.1016/j.jacceco.2004.06.003.

Fully, R. M. P., Guimarães, A. A. B., Dias, L. A. F., & Lima, L. F. V. (2018). A qualidade da informação contábil para o mercado de ações: evidência nas companhias de edificações que atuam no novo mercado da Bovespa. *Revista de Auditoria Governança e Contabilidade, 6*(23), 34-45.

Gatsios, R. C. (2013). *Acurácia e dispersão das estimativas dos analistas no mercado de capitais brasileiro: impacto da adoção do padrão IFRS sobre a qualidade preditiva da informação contábil* (Dissertação de mestrado). Faculdade de Economia, Administração e Contabilidade de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto, SP, Brasil. Recuperado em 11 nov., 2018, de www.teses.usp.br. doi:10.11606/D.96.2013.tde-12022014-172732.

Gonçalves, W. Jr., Rochman, R. R., Eid, W. Jr., & Chalela, L. R. (2011). Estimando o prêmio de mercado brasileiro. *Revista de Administração Contemporânea*, *15*(5), 931-954. https://dx.doi.org/10.1590/S1415-65552011000500009.

Hughes, J. S., Jing Liu, & Liu, J. (2007). Information asymmetry, diversification, and cost of capital. The *Accounting Review, 82*(3), 705-729. Doi:10.2308/accr.2007.82.3.705 Hughes

Jensen, M; Meckling, W. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(1), 305-360. Doi: https://doi.org/10.1016/0304-405X(76)90026-X

Jones, J. J. (1991). Earnings management during import relief investigations. *Journal of accounting research*, *29*(2), 193-228. Doi: https://doi.org/10.2307/2491047

Laghi, E; & DI Marcantonio, M. (2016). Beyond CAPM: estimating the cost of equity considering idiosyncratic risks. *Quantitative Finance, 16*(8), 1273-1296. Doi: 10.1080/14697688.2015.1124136

Lambert, R., Leuz, C., & Verrecchia, R. E. (2007). Accounting information, disclosure, and the cost of capital. *Journal of Accounting Research*, *45*(2), 385-420. Doi:10.1111/j.1475-679x.2007.00238.x

Latridis, G. (2010). International financial reporting standards and the quality of financial statement information. *International Review of Financial Analysis, 19*(3), 193-204. Doi:10.1016/j.irfa.2010.02.004.

Leuz, C., & Verrecchia, R. E. (2007). Firms' capital allocation choices, information quality, and the cost of capital. *Information Quality, and the Cost of Capital (2005).* Doi: 10.1111/j.1475-679X.2007.00238.x.

Leuz, Christian and Verrecchia, Robert E., (2005). Firms' Capital Allocation Choices, Information Quality, and the Cost of Capital. Recuperado de SSRN: https://ssrn.com/abstract=495363. Doi:http://dx.doi.org/10.2139/ssrn.495363.

Liberti J. M., & Petersen M. A. (2017). Information: hard and soft. [Working Paper nº 25075]. *National Bureau of Economic Research,* Cambridge, MA.

Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *The Review of Economics and Statistics*, *47*(1), 13. Doi:10.2307/1924119.

Liu, C., Yao, L. J., Hu, N., & Liu, L. (2011). The impact of IFRS on accounting quality in a regulated market. *Journal of Accounting, Auditing & Finance*, *26*(4), 659-676. Doi:10.1177/0148558x11409164.

Low, A. (2009). Managerial risk-taking behavior and equity-based compensation. *Journal of Financial Economics*, *92*, 470-490. Doi: https://doi.org/10.1016/j.jfineco.2008.05.004

María, G. S. I. & Ligia, N. G. (2017). Integrated information and the cost of capital. *International Business Review*, *26*(5), 959-975. Doi:10.1016/j.ibusrev.2017.03.004.

Markowitz, H. (1952). Portfolio selection. *The Journal of Finance*, *7*(1), 77–91. Doi:10.1111/j.1540-6261.1952.tb01525.x.

Marquardt, C., & Zur, E. (2014). The role of accounting quality in the M&A market. *Management Science*, *61*, 604–623. Doi: http://dx.doi.org/10.1287/mnsc.2013.1873

Mendonça, O. R., Neto, & Riccio, E. L. (2008). A qualidade da informação contábil e o risco de liquidez de mercado. *Revista Organizações em Contexto*, *4*(8), 100-120. Doi: DOI:10.15603/1982-8756/roc.v4n8p100-120

Minardi, A., Sanvicente, A. Z., Montenegro, C. M. G., Donatelli, D. H., & Bignotto, F. G. (2007). Estimando o custo de capital de companhias fechadas no Brasil para uma melhor gestao estrategica de projetos. [WPE-092/2007]. *IBMEC Working Paper*, 1-26.

Moeinadin, M., Heirany, F., & Khoshnood, E. (2014). The effect of the reliability of accounting information on systemic risk on listed companies at Tehran Stock Exchange. *International Journal of Academic Research in Economics and Management Sciences*, *3*(1), 1-11. Doi: 10.6007/IJAREMS/v3-i1/502.

Nardi, P. C. C., Silva, R. L. M., Nakao, S., & Valle, M. R. (2009). A relação entre gerenciamento de resultados contábeis e o custo de capital das companhias abertas brasileiras. *Revista Universo Contábil, 5*(4), 06-26. Doi:http://dx.doi.org/10.4270/ruc.20095.

Ng, J. (2011). The effect of information quality on liquidity risk. *Journal of Accounting and Economics*, *52*(2-3), 126–143. Doi:10.1016/j.jacceco.2011.03.004.

Pimentel, R. C. (2015). Lucros inesperados, retorno das ações e risco no mercado de capitais brasileiro. *Revista Contabilidade & Finanças - USP*, *27*(69), 290–303. Doi :httpsdoi.org10.15901808-057x201501270.

Rajgopal, S., & Venkatachalam, M. (2011). Financial reporting quality and idiosyncratic return volatility. *Journal of Accounting and Economics*, *51,*1–20. Doi: https://doi.org/10.1016/j.jacceco.2010.06.001

Ramos, F. M., Caramori, R. (2017). Relation between the market risk and the quality of accounting information for the brazilian financial institutions. *Revista de Administração FACES Journal*, *16*(4), 85-101. Doi: http://dx.doi.org/10.21714/1984-6975FACES2017V16N4ART4201.

Ramos, H. P., Ribeiro, K. K. M., & Perlin, M. S. (2017). The forecasting power of internet search queries in the brazilian financial market. *Revista de Administração Mackenzie - RAM*, *18*(2), 184-210. Doi:10.1590/1678-69712017/administracao.v18n2p184-210.

Rezende, C., Almeida, N., & Lemes, S. (2015). Impacto das IFRS na assimetria de informação evidenciada no mercado de capitais brasileiro. Revista De *Contabilidade e Organizações*, *9*(24), 18-30. Doi:https://doi.org/10.11606/rco.v9i24.55524.

Savor, P., & Wilson, M. (2016). Earnings announcements and systematic risk. *The Journal of Finance*, *71*(1), 83-138. Doi:10.1111/jofi.12361.

Sharpe, W. (1964). Capital asset prices: a theory of market equilibrium under conditions of risk. *Journal of Finance*, *19*(3), 425-442. Doi:https://doi.org/10.1111/j.1540-6261.1964.tb02865.x

Silva, A., Brighenti, J., & Klann, R. (2018). Efeitos da convergência às normas contábeis internacionais na relevância da informação contábil de empresas brasileiras. *Revista ambiente contábil*, *10*(1), 121-138. Recuperado 8 nov., 2018, de http://www.atena.org.br/revista/ojs-2.2.306/index.php/Ambiente/article/view/3245/2506

Silva, R. L. M. (2013). *Adoção completa das IFRS no Brasil: qualidade das demonstrações contábeis e o custo de capital próprio*. (Tese de doutorado). Faculdade de Economia, Administração e Contabilidade, Universidade de São Paulo, São Paulo, SP, Brasil. Recuperado em 11 nov., 2018, de www.teses.usp.br. Doi:10.11606/T.12.2013.tde-03062013-162758.

Souza, E. A., Filho, Albuquerque, J. R., Anjos, L. C. M. dos, & Rodrigues, R. N. (2018). Assimetria informacional no mercado de capitais do brasil: os relatórios contábeis são capazes de reduzir o risco de investimento? *Revista de Contabilidade do Mestrado em Ciências Contábeis da UERJ*, *22*(2), 39-53. Doi: https://doi.org/10.12979/32364

Souza, J. A. S. de, Flach, L., Borba, J. A., & Broietti, C. (2019). Financial Reporting Quality and Sustainability Information Disclosure in Brazil. *Brazilian Business Review, 16*(6), 555-575. Doi: https://doi.org/10.15728/bbr.2019.16.6.2

Sun, J., Cahan, S. F., & Emanuel, D. (2011) How would the mandatory adoption of IFRS affect the earnings quality of U.S. firms? Evidence from cross-listed firms in the U.S. *Accounting Horizons*, *25*(4), 837-860. Doi: 10.2308/acch-50049.

Stocker, F., & Abib, G. (2019). Risk Management in Born Globals: the Case of Brazilian Craft Breweries. *Brazilian Business Review, 16*(4), 334-349. Doi: https://doi.org/10.15728/bbr.2019.16.4.2

Wooldridge, J.M. (2010). Econometric Analysis of cross section and panel data. MIT Press (MA); (2nd dição).

Xing, X., & Yan, S. (2018). Accounting information quality and systematic risk. *Review of Quantitative Finance and Accounting, 52* (1), 85–103. Doi: 10.1007/s11156-018-0703-z