WHY ACT RESPONSIBLY? AN ANALYSIS OF THE RELATIONSHIP BETWEEN CORPORATE SOCIAL RESPONSIBILITY AND FINANCIAL RISK IN BRAZILIAN COMPANIES

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Resumo

This study aims to investigate the impact of the adoption of corporate social responsibility (CSR) practices on financial risk in Brazilian public companies. We collected the data using the Thomson Reuters platform. We choose the ASSET4 ESG base because it allows the observation of the individual effect of environmental, social, economic and governance aspects on financial risk. The dependent variable, the proxy for financial risk, is the rating, carried out by the credit rating companies Moody`s, Fitch and Standard & Poor`s. We use as methodology the unbalanced panel data analysis and we estimate the models using robust ordered logit. We developed twelve models to analyze the relationship between the CSR explanatory variables and the dependent variable. It was necessary to use control variables present in the international literature to guarantee the explanatory quality of the models. Such as capital composition, profitability, liquidity, asset turnover, leverage, company size, and analyst coverage. The results of these models suggest that CSR practices reduce financial risk in Brazilian companies, mainly through the economic dimension in investment grade companies, and the social dimension in non-investment grade companies. Through the results, managers can review the way they manage financial risk in their companies. Government institutions and risk rating agencies can analyze the impact of other factors, in addition to the traditional ones that affect risk.

Palavras-chave: Social responsibility; corporate social responsibility; financial risk; credit risk; rating.

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ABSTRACT

This study aims to investigate the impact of the adoption of corporate social responsibility (CSR) practices on financial risk in Brazilian public companies. We collected the data using the Thomson Reuters platform. We choose the ASSET4 ESG base because it allows the observation of the individual effect of environmental, social, economic and governance aspects on financial risk. The dependent variable, the proxy for financial risk, is the rating, carried out by the credit rating companies Moody's, Fitch and Standard & Poor's. We use as methodology the unbalanced panel data analysis and we estimate the models using robust ordered logit. We developed twelve models to analyze the relationship between the CSR explanatory variables and the dependent variable. It was necessary to use control variables present in the international literature to guarantee the explanatory quality of the models. Such as capital composition, profitability, liquidity, asset turnover, leverage, company size, and analyst coverage. The results of these models suggest that CSR practices reduce financial risk in Brazilian companies, mainly through the economic dimension in investment grade companies, and the social dimension in non-investment grade companies. Through the results, managers can review the way they manage financial risk in their companies. Government institutions and risk rating agencies can analyze the impact of other factors, in addition to the traditional ones that affect risk.

Keywords: Social responsibility; corporate social responsibility; financial risk; credit risk; rating.

1 INTRODUCTION

The concept of CSR has been discussed since the 1950s, a period when it was understood as philanthropy and its practice was consider unnecessary expenses that would undermine the company's real responsibility, the generation of profit. This classic view was defended by Milton Friedman in an article published in 1970, in which he categorically states that the only responsibility of companies is to generate the greatest possible profit for their shareholders (Friedman, 1970). However, with the development of several studies over the years, this definition is no longer widely accepted.

Studies such as Davis (1973), Freeman (1984), Wood (1991), Carroll (1991) and Moir (2001) argue that CSR does not only involve conduct within legal aspects and profit generation by companies. In this sense, McWilliams and Siegel (2001) understand CSR as actions that seek to promote social good, in addition to the company's interests and what is required by law.

A socially responsible organization is one that manages a business capable of generating profits, considering all the environmental, social and economic effects, positive and negative caused by it (Marsden, 2001). The concept of CSR covers both sustainable and economic development, relating economic and environmental issues, and socially responsible development, considering social aspects (Cetindamar & Husoy, 2007). Thus, although the CSR practices employed by the companies are not the same, since each company has its specificities and needs, actions such as the reduction of pollutant gas emissions, the conscious use of water resources with their proper reuse, training and employee training and accident prevention are common practices adopted.

Although the discussion on the social role of organizations has evolved, some questions still need to be investigated, such as, the benefits generated to companies by

adopting CSR practices and how these practices are related to financial performance (Hsu & Chen, 2015) .

Following this perspective, studies on CSR, such as Renneboog et al. (2008), Santis et al. (2016) and Nollet et al. (2016), sought to analyze the relationship between companies' social and financial performance, determining whether CSR policies are financially rewarded. Other studies highlight the relationship between social responsibility and value, seeking to analyze whether engagement with CSR creates or undermines the creation of value for shareholders, such as Gregory et al. (2011), Crisóstomo et al. (2011), Kim and Statman (2012), Jankalova (2016) and Ferrell et al. (2016).

There are also studies that investigate the impact of CSR on the financial risk of companies, since the risk management of environmental and social aspects can influence financial performance. Most of these studies argue that CSR practices reduce the risk of companies (Pava & Krausz, 1996; Jo & Na, 2012; Gregory et al., 2014; Hsu & Chen, 2015; Lin et al., 2017 and Aalbuquerque et al., 2018).

Although the international literature presents many studies that seek to analyze this relationship, using several models, different variables and investigating the phenomenon in multiple ways, the research is mostly focused on developed countries, more specifically on the United States. In Brazil, studies mainly address the relationship between CSR and financial performance, some using the Social Balance as a social and environmental indicator (Borba, 2005; Cesar & Silva Júnior, 2008; Machado & Machado, 2011) and others using the B3 Corporate Sustainability Index (ISE) (Sousa et al., 2011; Pletsch, Silva & Hein, 2014; Oliveira et al., 2015).

Recently, the importance of adopting CSR practices has become more discussed in Brazil, after the cases of mining tailings dam dams in Mariana and Brumadinho, which occurred on November 5, 2015 and January 25, 2019, respectively. The disruption of the Fundão dam, owned by mining company Samarco, a subsidiary of Vale, is considered the biggest environmental disaster in Brazil. With the rupture of the dam, mining waste hit tributaries and the Doce River, causing the destruction of marine life and leaving the population without access to drinking water. In addition to causing the death of 19 people (G1, 2019a).

Despite all the ills brought about by the disaster, the rating company Moody's, five (5) days after the event, downgraded only the rating of some of Samarco's debt securities from Baa3 to Ba1, keeping Vale only under observation for possible downgrade of the global rating (G1, 2015a). Only after twenty-five (25) days did Fitch downgrade Samarco's rating from BBB to BB-, removing the investment grade (G1, 2015b).

In the case of the rupture of the Córrego do Feijão mine in Brumadinho, the social consequences were devastating, with 248 confirmed deaths and 22 missing until July 9, 2019 (G1, 2019b). One day after the disaster, Standard & Poor's placed Vale's ratings under observation for a possible fall (Época Negócios, 2019), and on the second day Moody's downgraded the company's global rating from Baa3 to Ba1 (Folha de São Paulo, 2019).

It is noticed when analyzing the cases, even superficially, that the adoption of CSR practices (or the lack of such adoption as in the case of disruptions) affects the risk classification and, therefore, the financial risk of companies. However, studies that investigate this relationship in emerging countries are less frequent, but necessary, as it is believed that investors in these developing economies do not consider relevant aspects related to social responsibility when selecting their investments (Aras et al., 2010). In addition, issues related to the greater uncertainty in these economies can alter this association.

In the context presented, it is not yet possible to observe the effects of the adoption of CSR practices on financial risk in Brazilian companies. In order to clarify this issue, the

following research problem arises: What is the impact of adopting corporate social responsibility practices on financial risk in Brazilian companies?

 From the data collected in the ASSET4 database, it is possible to individually assess the effects of environmental, social, economic and governance aspects on financial risk. This type of analysis was not found in the national literature.

After analyzing the results, we consider that CSR practices help to reduce financial risk, as indicated by the Stakeholder Theory and suggested in works such as Jo and Harjoto (2014), Hsu and Chen (2015) and Albuquerque et al. (2018). This risk reduction can occur through the economic dimension, in the case of companies with low financial risk which have an investment grade, or through the social dimension, for companies with high risk, which do not have an investment grade.

Financial managers and analysts could be interested in the results of the research, since they indicate which aspects of CSR are relevant to the management of financial risk. Shareholders and creditors may be interested in analyzing the impact of the adoption of CSR practices on companies' financial risk, since such risk can harm the company's financial performance.

2 LITERATURE REVIEW

After more than half a century of research and debate, there is no widely accepted definition for corporate social responsibility (Freeman et al., 2010). From the perspective of CSR many ideas, concepts and techniques were developed, such as corporate social performance (Carroll, 1979; Wartick & Cochran, 1985; Wood, 1991; Wang & Berens, 2015; and Arminen et al., 2018), corporate social responsiveness (Ackerman, 1973; Sethi, 1975; Waddock & Graves, 1997; Margolis & Walsh, 2001; and Ciliberti et al., 2008), and corporate citizenship (Wood & Logsdon, 2001; Sison, 2009).

Researchers commonly use the Stakeholder Theory, developed by Freeman (1984), to approach such concepts. The Stakeholder Theory is associated with better financial performance (Jones, 1995), since responsible treatment towards related parties can reduce, for example, outcomes such as lawsuits, adverse regulation, consumer boycotts, strikes and negative publicity (Cornell & Shapiro, 1987; Spicer, 1978; Steadman, Zimmerer & Green, 1995). By avoiding negative outcomes, the company reduces expenses and the financial risk associated with the uncertainty of return (Freeman et al., 2001).

Considering this theory, Wood (1991) argues that CSR is the 'tool' that defies the purpose of organizations, changing from a vision focused on shareholders - in which the purpose is the maximization of profit - to a social vision - in which the Organizations' purpose should include the interests of stakeholders. In his work, the author defines CSR as commitments that companies have with society, expressed through actions in favor of social well-being, positively affecting the community.

In 1998, Elkington established that the search for responsible development must consider three dimensions acting in an interconnected way, being the economic, social and environmental dimensions. This approach became known as the Triple Bottom Line, or TBL. According to Elkington (1998), these three pillars represent: (1) economic perspective, which addresses the economic result of the company and the impacts on the economic well-being of stakeholders; (2) social perspective, which refers to the company's fair and beneficial behavior towards employees, creditors and the community and; (3) environmental perspective, which refers to the environmental impacts caused by the company on ecosystems, soil, air and water.

The definition for CSR adopted for the development of the present work is that presented by Marsden (2001). For the author, CSR involves the behavior of companies and responsibility for their impact on the societies in which they operate, and not an optional

complement or an act of philanthropy. The author also states that a socially responsible organization is one that runs a business capable of generating profits, considering all the positive and negative environmental, social and economic effects caused by it (Marsden, 2001).

Social responsibility provides companies with long-term growth, as they maintain trust, support and legitimacy with the community, governments and employees, providing a solid foundation within organizations for the development of their activities, even in times of crisis. (CCPA, 2000). For Gregory et al. (2014), employing CSR practices can financially favor companies, reduce risk and improve long-term growth prospects. CSR practices are actions carried out by companies aiming to meet the demands of different stakeholders, such as, reducing pollutant gas emissions, the conscious use of water resources with their proper reuse, the training and training of employees and the prevention of accidents (Rodrigo & Arenas, 2008).
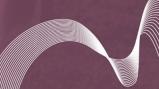
Despite the various economic benefits that the adoption of CSR practices can provide to the company, some authors argue that the adoption should not aim at financial interests, but responsible behavior, as this is what society implicitly expects from companies (Moir, 2001). Over the years, several studies on CSR and its impact on organizations have been developed, looking for empirical evidence. Some of these surveys investigate the link between corporate social performance and companies' financial performance, focusing mainly on determining whether social performance is financially rewarded (Orlitz et al., 2003; Margolis & Walsh, 2003; Renneboog et al., 2008). This approach is also widely used in Brazilian studies on CSR (Cesar & Silva Júnior, 2008; Machado & Machado, 2011; Pletsch, Silva & Hein, 2014; Oliveira et al., 2015).

Other researches seek to determine the relationship between CSR and value, verifying whether social responsibility creates or impairs the creation of value in companies, using several different models and measures (Hassel et al., 2005; Gregory et al. 2011; Crisóstomo et al. , 2011; Kim & Statman, 2012; Gregory & Whittaker, 2013).

Moreover, there are studies that seek to analyze the relationship between CSR and risk, investigating whether socially responsible companies have lower financial risks. Studies such as Jo and Na (2012), Gregory et al. (2014), Hsu and Chen (2015), Lin et al. (2017) and Albuquerque et al. (2018) show that by adopting CSR practices, companies end up reducing their financial risks.

The association between CSR and risk can be another way of investigation to analyze the impact of social responsibility practices on the financial performance of organizations. This relationship between CSR and financial risk is of considerable importance for managers and investors, as managers seek to reduce the uncertainty to which their companies are subject, providing safer investment to risk-averse investors. It is therefore useful to know whether the adoption of CSR practices can increase or decreasing the variability of the company's future performance (Oikonomou et al., 2012).

According to Waddock and Graves (1997), socially irresponsible companies may face problems in the future, which may hinder their growth and the maintenance of their activities in the long term (Oikonomou et al., 2012). Herremans et al. (1993) was one of the first studies to investigate the association between social responsibility and corporate risk. The authors propose that there is a negative relationship between CSR and risk, using Fortune Magazine's annual survey of corporate reputations to assess social responsibility. The study sample is made up of 76 companies in the United States, from 1982 to 1987. The results found by the authors show that a good reputation in relation to CSR is strongly associated with greater profitability and less risk. In addition, they claim that investors seem to associate abnormal positive returns with better CSR (Herremans et al., 1993).

Heal (2005) analyzes the role of CSR from an economic perspective, stating that, by adopting CSR practices, companies reduce conflicts with society, thus reducing the extent of their costs. Thus, according to the author, CSR can reduce financial risk, especially in sectors where there are inconsistencies between corporate profits and social objectives, or disagreement on issues of justice. Considering this economic perspective, Luo and Bhattacharya (2009) show that when CSR practices are well evaluated by stakeholders, there is a reduction in idiosyncratic risk, that is, in the specific risk associated with the strategies of each company. For this, the authors considered the corporate social performance of 541 companies, during 2002 and 2003, selecting them from the list of the largest Fortune companies.

Jo and Na (2012) present a different approach to the analysis of the association between CSR and risk, studying exactly companies in which there are divergences between profit and social objectives. In other words, the authors studied the relationship between CSR and risk in companies operating in sectors considered controversial, such as tobacco, alcoholic drinks and weapons. Analyzing American companies between 1991 and 2010, the authors seek to empirically investigate the impact of CSR on risk. The results of the analysis by Jo and Na (2012) show that even companies operating in controversial sectors can reduce risk and improve their image by engaging in social responsibility strategies or programs. In addition, the authors claim that the reduction in risk through this engagement is economically and statistically more significant for companies in controversial sectors than for other sectors of the economy.

The study by Oikonomou et al. (2012) investigates the relationship between corporate social performance and financial risk, seeking to identify whether companies are more likely to improve their economic performance (by reducing risk) by reducing the negative points of CSR than by improving the points positive. This division, between negative points (threats) and positive points (forces), is a characteristic of the database used by the authors for information on CSR (MSCIs ESG Research database, formerly known as KLD Research and Analytics).

The main conclusion found by the authors shows that most of the positive components associated with CSR, such as diversity, safety and product quality, are negatively related to risk, however this result is not statistically significant. The association between systematic risk and negative components was positive and significant. This result indicates that social irresponsibility can contribute to an increase in companies' financial risk.

Hsu and Chen (2015), as well as Attig et al. (2013), use the credit rating of companies based in the United States, to verify whether socially responsible companies present different behaviors in terms of financial risk, especially in relation to default risk. When examining 3,000 companies during 1991 to 2012, the authors claim that CSR practices reduce information asymmetry, thereby reducing risk in general. They also declare that social responsibility provides non-financial information capable of improving transparency and supporting investor decisions (Hsu & Chen, 2015).

The link between CSR and default risk was also studied by Sun and Cui (2014), focusing the analysis on companies classified as socially responsible by Fortune Magazine. The results found by the authors corroborate with the literature, stating that CSR strongly helps to reduce the risk of default, and the relationship is even more robust for companies operating in dynamic environments, that is, with low predictability (Sun & Cui, 2014).

Finally, Albuquerque et al. (2018) propose a model to assess how engagement in CSR activities, seen as an investment for product differentiation, affects companies' financial performance. According to the authors, the balance of the model shows that socially responsible companies have less systematic risk and higher market value.

Thus, after several studies have presented similar results, it can be maintained that there is a negative association between CSR and financial risk, as supported by the Stakeholder Theory. However, the research was carried out, mostly, with American companies, that is, in a developed economy and with a mature financial market. This fact harms the extension of the results to developing economies, such as Brazil.

In addition, it is believed that investors in these developing economies do not consider relevant aspects related to social responsibility when selecting their investments (Aras et al., 2010). In this environment, the relationship between risk and CSR is not determined, and may be contrary to that found in developed countries.

Therefore, seeking to analyze the relationship between CSR and financial risk in Brazil, this study proposes the following hypothesis:

H1: CSR reduces financial risk in Brazilian companies.

Considering the theoretical approach presented by Elkington (1988; 2006), CSR can be defined as the integration between the environmental, social, economic dimensions and, more recently, also by the dimension of corporate governance, since the governance system is capable of influencing positively the adoption of CSR practices by companies (Elkington, 2006). Thus, the following derivations of the hypothesis are also proposed:

H1a: the greater the engagement with environmental practices, the lower the financial risk.

H1b: the greater the engagement with social practices, the lower the financial risk.

H1c: the greater the engagement with economic practices, the lower the financial risk.

H1d: the greater the engagement with corporate governance practices, the lower the financial risk.

3 METHODOLOGY

The data used in this research were obtained, mainly, from the Thomson Reuters platform, in the databases Eikon Financial Analysis and ASSET4 ESG. Some rating data, not available on this platform, was collected from the websites of credit rating companies Moody's, Fitch and Standard & Poor's. In addition, the companies were separated according to the sector in which they operate, based on the B3 classification.

The universe of Brazilian companies available on the ASSET4 ESG database corresponds to a total of 89 companies, all of which are publicly traded. After an initial analysis, all financial institutions and companies that did not present information during the analyzed period were removed. Therefore, the study sample comprises 51 companies. Table 1 shows the number of companies according to the sector in which it operates.

Table 1. Sample composition

Sector	Number of companies
Industrial goods	5
Cyclic consumption	9
Noncyclic consumption	5
Basic materials	9
Oil and gas	3
Healthcare	2
Telephony	2
Public utility	11
Others	5
Total	51

The data were observed from 2012 to 2017, comprising the years with historical data available by the database.

Financial risk is broadly defined as the volatility of expected returns, and to measure it, several models and indicators have been developed. We chose to use the risk classification (or rating) carried out by Moody's, Standard & Poor's and Fitch as a measure for financial risk.

Credit risk is defined as the risk of economic loss due to non-compliance with the contractual obligation by the contracting party (Lima, 2015). Therefore, the credit risk rating measures the company's ability and willingness to honor or not meet its financial commitments. The risk rating companies consider several factors to calculate the ratings, for example, the companies' revenue and fixed assets, the business profile, cash flow and financial policy. The calculation methodology and the factors considered can be changed according to the sector in which the companies operate (Lima, 2015).

The credit rating represents a company's ability to meet the expectations of debt holders and, therefore, becomes a preferred measure of the company's financial risk. Studies such as Hsu and Chen (2015), Oikonomou et al. (2014), Sun and Cui (2014) and Attig et al. (2013), which have similar objectives to that proposed in this research, use the rating as a proxy for financial risk. However, in this research we seek to analyze the impact of the adoption of CSR practices on the rating, using a variable for each CSR dimension, and not just a single variable as employed by such works.

As companies can be rated by different credit rating companies, it was necessary to establish rating degrees to standardize the data. The chosen equivalence of ratings, presented by Lima et al. (2018), is a scale from 0 to 7, where 0 represents the best classification (AAA or Aaa) and 7 the worst, as shown in Chart 1.

Moody's	Standard & Poor's and Fitch	Credit risk level	Existence of investment grade
Aaa	AAA	0	
Aa1, Aa2, Aa3	AA+, AA, AA-	1	Yes
A1, A2, A3	A+, A, A-	2	
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	3	
Ba1, Ba2, Ba3	BB+, BB, BB-	4	
B1, B2, B3	B+, B, B-	5	No
Caa1, Caa2, Caa3	CCC+, CCC, CCC-	6	
Ca, C	CC, C, D	7	

Chart 1. Rating equivalence
Source: Adapted from Lima et al. (2018)

As a measure for CSR, it was decided to use all the dimensions present in the ASSET4 ESG database, and subsequently to calculate in a balanced way a single index for CSR, as advocated by Elkington (1988; 2006). Thus, the economic (econ), environmental (env), social (soc) and corporate governance (gov) pillars were used separately, so that it is possible to analyze the individual impact on financial risk. And using a proportion of 25% for each dimension, it was possible to calculate a single index for CSR.

In order to measure other effects that impact the determination of companies' financial risk, some control variables were used. The use of these variables was established according to previous studies. Altman (2005) proposes a new model to measure the credit risk of companies, instead of the rating defined by the risk classification companies, known as EMS model. According to the author, the proposed model would be more suitable for companies residing in emerging countries.

In the present study, the variables presented by Altman (2005) are considered as control variables. Moreover, other control variables were also incorporated. Therefore, all the control variables considered were: composition of capital (D_E, debt divided by equity), profitability (EBIT_TA, earnings before interest and income tax divided by total assets), liquidity (WC_TA, working capital divided by total assets), asset turnover (OR_TA, operating revenue divided by total assets), leverage (RE_TA, retained earnings divided by total assets), size (ln of market value), and logarithm of the number of analysts (LN_NUM).

In addition, we use binary variables that assume a value of 1 if the company belongs to a certain sector and 0, otherwise. The variables SEC_IG; SEC_CC; SEC_NCC; SEC_BM; SEC_OG; SEC_HC; SEC_TEL; SEC_PU; SEC_O, are dummies that represent the sectors of the economy in which each company operates, being, respectively, industrial goods, cyclical consumption, noncyclical consumption, basic materials, oil and gas, healthcare, telephony, public utility, and others. The dummy for other sectors was included to cover insurance companies and real estate companies. This classification is established by B3 and we chose to use it, instead of the classification proposed by the ASSET4 ESG database, because it represents the Brazilian economy.

The model developed to investigate the relationship between the dependent, independent and control variables was structured according to the panel data methodology. To test hypothesis H1: CSR reduces financial risk in Brazilian companies, we use the following model:

$$RAT_{it} = \alpha + \beta_1 csr_{it} + \beta_2 D\_E_{it} + \beta_3 EBIT\_TA_{it} + \beta_4 WC\_TA_{it} + \beta_5 OR\_TA_{it}$$
$$+ \beta_6 RE\_TA_{it} + \beta_7 SIZE_{it} + \beta_8 LN\_NUM_{it} + \beta_9 SEC\_IG_{it} + \beta_{10} SEC\_CC_{it}$$
$$+ \beta_{11} SEC\_NCC_{it} + \beta_{12} SEC\_BM_{it} + \beta_{13} SEC\_OG_{it} + \beta_{14} SEC\_HC_{it}$$
$$+ \beta_{15} SEC\_TEL_{it} + \beta_{16} SEC\_PU_{it} + \beta_{17} SEC\_O_{it}$$

In which, the coefficient β_1 expresses the relationship between financial risk and the proxy for CSR that encompasses the environmental, social, corporate governance and economic dimensions. To test the other hypotheses, H1a, H1b, H1c and H1d, respectively, we opted for the model expressed in the following equation:

$$RAT_{it} = \alpha + \beta_1 env_{it} + \beta_2 soc_{it} + \beta_3 gov_{it} + \beta_4 econ_{it} + \beta_5 D\_E_{it} + \beta_6 EBIT\_TA_{it}$$
$$+ \beta_7 WC\_TA_{it} + \beta_8 OR\_TA_{it} + \beta_9 RE\_TA_{it} + \beta_{10} SIZE_{it} + \beta_{11} LN\_NUM_{it}$$
$$+ \beta_{12} SEC\_IG_{it} + \beta_{13} SEC\_CC_{it} + \beta_{14} SEC\_NCC_{it} + \beta_{15} SEC\_BM_{it}$$
$$+ \beta_{16} SEC\_OG_{it} + \beta_{17} SEC\_HC_{it} + \beta_{18} SEC\_TEL_{it} + \beta_{19} SEC\_PU_{it}$$
$$+ \beta_{20} SEC\_O_{it}$$

In which, the coefficients β_1, β_2, β_3 and β_4 express the relationship between financial risk and the environmental, social, governance and economic dimensions, respectively.

To analyze the relationships between RAT_{it} and the explanatory variables, all models presented were estimated by logistic regression, or ordered logit. This regression technique allows the prediction of values of a categorical variable from explanatory variables. The standard errors were adjusted to avoid the problem of heteroscedasticity (robust command in Stata).
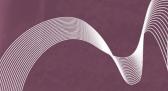
Subsequently, in order to analyze the impact of adopting CSR practices in a sample with similar risk classification, the sample was segregated between companies with low risk and high financial risk. For this, the investment grade classification was used.

4 RESULTS

Table 2 shows the results of the ordered logistic regression for four different models. Model 1 presents the results for the regression expressed in Equation 1, but without the economy sector dummies. Model 2 the results for Equation 1, considering the economy sector

dummies. Model 3 for Equation 2, but without the economy sector dummies. And Model 4 for Equation 2, considering the economy sector dummies.

Model 1, in which we use only the CSR variable, and do not consider the sectors, the results show that there is no significant relationship between CSR and financial risk. However, Model 2 shows us that there is a negative and significant relationship between CSR and financial risk for cyclical consumption, healthcare and other sectors. (securities and real estate companies).

Table 2. All companies from the sample

Variables	Model 1	Model 2	Model 3	Model 4
CSR	-0.9	-3.24***		
	(0.99)	(1.26)		
ENV			-0.02	-0.66
			(0.94)	(1.16)
SOC			1.36	-0.07
			(1.03)	(1.29)
GOV			-0.67	0.22
			(0.90)	(1.12)
ECON			-1.96***	-2.37***
			(0.76)	(0.84)
D_E	0.07*	0.06*	0.04	0.05
	(0.04)	(0.04)	(0.04)	(0.04)
EBIT_TA	-2.77	0.77	-2.10	-0.19
	(4.27)	(4.38)	(4.04)	(4.10)
WC_TA	0.11	1.44	0.07	0.88
	(0.89)	(1.43)	(0.93)	(1.49)
OR_TA	0.14	-1.89	0.4	-1.05
	(2.97)	(3.27)	(2.94)	(3.25)
RE_TA	-3.56***	-3.41***	-3.16***	-2.69**
	(0.94)	(1.19)	(0.90)	(1.19)
SIZE	-0.40***	-0.55***	-0.42***	-0.51***
	(0.13)	(0.15)	(0.14)	(0.15)
LN_NUM	-0.16	-0.03	-0.16	-0.09
	(0.20)	(0.21)	(0.23)	(0.22)
Observations	239	239	239	239
Wald chi2	61.20	86.84	90.26	100.96
Prob > chi2	0.0000	0.0000	0.0000	0.0000
Pseudo R2	0.11	0.15	0.12	0.16

Note: RAT=rating; CSR=performance of all dimensions combined; ENV=performance of the environmental dimension; SOC=performance of the social dimension; GOV=performance of the corporate governance dimension; ECON=performance of the economic dimension; D_E = debts/equity; EBIT_TA=earnings before interest and income tax/total assets; WC_TA=total working capital /total assets; OR_TA=total operating revenue/assets; RE_TA=retained earnings/total assets; SIZE=ln of market value; LN_NUM=ln of the number of analysts.
*** 1% significance level; ** 5% significance level, and * 10% significance level.

When we look at the results for models 3 and 4, we see that the relationship between CSR and financial risk, in this case, must be caused by the economic dimension. This dimension presents significant results, when we consider the economic sectors and, also when we do not consider them. It is important to highlight that the sectors to which the results apply are only cyclical consumption, healthcare and others.

Table 3 shows the results of the ordered logistic regression considering just companies classified as investment grade. Following the same logic previously presented, Model 5 presents the results for the regression expressed in Equation 1, but without the economy sector dummies. Model 6 the results for Equation 1, considering the economy sector dummies. Model 7 for Equation 2, but without the economy sector dummies. And Model 8 for Equation 2, considering the economy sector dummies.

Table 3. Investment grade companies

Variables	Model 5	Model 6	Model 7	Model 8
CSR	-1.32	-4.93*		
	(1.24)	(2.61)		
ENV			-0.45	0.13
			(1.41)	(2.24)
SOC			2.47	-1.21
			(1.75)	(3.81)
GOV			1.81	3.48*
			(1.77)	(2.10)
ECON			-4.10**	-8.15***
			(1.70)	(2.31)
D_E	1.28***	1.74***	1.47***	1.97***
	(0.42)	(0.45)	(0.49)	(0.59)
EBIT_TA	-15.90*	-13.14	-19.05**	-26.48*
	(8.76)	(12.16)	(9.38)	(15.20)
WC_TA	5.01**	5.38*	5.23*	7.15**
	(2.51)	(3.12)	(3.01)	(3.27)
OR_TA	10.83	7.98	14.71**	17.85
	(6.82)	(9.63)	(7.15)	(12.98)
RE_TA	2.16	0.92	4.09	-1.09
	(2.88)	(4.87)	(3.71)	(7.71)
SIZE	-0.07	0.17	-0.19	0.32
	(0.22)	(0.37)	(0.26)	(0.49)
LN_NUM	0.08	-0.48	0.08	-0.82
	(0.37)	(0.38)	(0.38)	(0.52)
Observations	134	134	130	130
Wald chi2	15.86	37.94	18.54	39.51
Prob > chi2	0.0444	0.0015	0.0698	0.0038
Pseudo R2	0.17	0.30	0.22	0.41

Note: RAT=rating; CSR=performance of all dimensions combined; ENV=performance of the environmental dimension; SOC=performance of the social dimension; GOV=performance of the corporate governance dimension; ECON=performance of the economic dimension; D_E = debts/equity; EBIT_TA=earnings before interest and income tax/total assets; WC_TA=total working capital /total assets; OR_TA=total operating revenue/assets; RE_TA=retained earnings/total assets; SIZE=ln of market value; LN_NUM=ln of the number of analysts.
*** 1% significance level; ** 5% significance level, and * 10% significance level.

For companies classified as investment grade we can notice that the economic performance dimension is the only one that presents significant result. The corporate governance dimension also presents significant result, but in this case, it contributes to increase the financial risk, what was not expected and not foreseen in the literature.

Finally, Table 4 shows the results of the ordered logistic regression considering just companies classified as non-investment grade. So, Model 9 presents the results for the

regression expressed in Equation 1, but without the economy sector dummies. Model 10 the results for Equation 1, considering the economy sector dummies. Model 11 for Equation 2, but without the economy sector dummies. And Model 12 for Equation 2, considering the economy sector dummies.
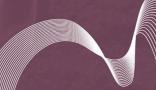
Table 4. Non-investment grade companies

Variables	Model 9	Model 10	Model 11	Model 12
CSR	-4.16***	-9.42***		
	(1.46)	(2.18)		
ENV			5.16***	6.36**
			(1.92)	(3.17)
SOC			-4.85**	-14.21***
			(2.06)	(3.66)
GOV			-3.21*	-0.31
			(1.74)	(1.91)
ECON			-1.92*	-0.98
			(1.04)	(1.76)
D_E	0.07	0.05	0.02	-0.02
	(0.05)	(0.05)	(0.05)	(0.05)
EBIT_TA	-14.96**	-33.48**	-20.56**	-49.69***
	(6.79)	(13.79)	(8.45)	(19.35)
WC_TA	3.52**	10.20***	3.72***	12.38***
	(1.40)	(3.78)	(1.31)	(4.56)
OR_TA	12.33**	26.11**	14.85**	34.97**
	(5.74)	(11.25)	(7.08)	(16.01)
RE_TA	-6.18***	-8.18***	-6.65***	-8.99**
	(1.66)	(2.46)	(1.93)	(3.91)
SIZE	-0.32	-0.73**	-0.64***	-1.29***
	(0.21)	(0.31)	(0.24)	(0.48)
LN_NUM	-0.17	0.15	0.12	0.87*
	(0.31)	(0.31)	(0.41)	(0.48)
Observations	157	157	157	157
Wald chi2	72.48	1094.39	75.31	1348.10
Prob > chi2	0.0000	0.0000	0.0000	0.0000
Pseudo R2	0.31	0.46	0.36	0.54

Note: RAT=rating; CSR=performance of all dimensions combined; ENV=performance of the environmental dimension; SOC=performance of the social dimension; GOV=performance of the corporate governance dimension; ECON=performance of the economic dimension; D_E = debts/equity; EBIT_TA=earnings before interest and income tax/total assets; WC_TA=total working capital /total assets; OR_TA=total operating revenue/assets; RE_TA=retained earnings/total assets; SIZE=ln of market value; LN_NUM=ln of the number of analysts. *** 1% significance level; ** 5% significance level, and * 10% significance level.

The non-investment grade companies present a significant relationship between CSR practices and financial risk, even when economy sectors are considered. For cyclic consumption, noncyclic consumption, oil and gas, healthcare and other sectors the social dimension presents a very significant result. The performance of the social dimension is the most significant to reduce risk. In other words, companies without an investment grade can reduce their high financial risk by adopting CSR practices that contemplate the social dimension.

Besides that, Model 12 suggests that CSR practices that contemplate the environmental dimension may increase the financial risk of companies with high financial

risk, although, as previously seen, they possibly help to reduce the cost of capital for third parties. The companies in the sample have a higher average performance in the social dimension when compared to the environmental and governance dimensions, as explained in the previous section. This may be explained by the possibility of reducing financial risk if companies adopt good social practices. In other words, high social performance would be stimulated within companies as it generates a reduction in risk, which is not observed in the environmental and governance dimensions.

Therefore, after analyzing the results, we consider that CSR practices help to reduce financial risk, as indicated by the Stakeholder Theory and suggested in works such as Jo and Harjoto (2014), Hsu and Chen (2015) and Albuquerque et al. (2018). This risk reduction can occur through the economic dimension, in the case of companies with low financial risk which have an investment grade, or through the social dimension, for companies with high risk, which do not have an investment grade. From these findings, it can be inferred that companies must act responsibly because by adopting CSR practices, companies will be able to reduce financial risk.
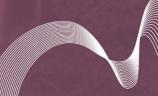
5 CONCLUSION AND FINAL REMARKS

The present work sought to investigate the impact of adopting corporate social responsibility (CSR) practices on financial risk in publicly traded Brazilian companies, answering the following research hypotheses: H1: corporate social responsibility reduces financial risk in Brazilian companies; H1a: the greater the engagement with environmental practices, the lower the financial risk; H1b: the greater the engagement with social practices, the lower the financial risk; H1c: the greater the engagement with economic practices, the lower the financial risk; and H1d: the greater the engagement with corporate governance practices, the lower the financial risk.

The dependent variable chosen as a proxy for financial risk was the rating, carried out by the credit risk rating companies Moody's, Fitch and Standard & Poor's. The methodology used was the data analysis in an unbalanced panel, with the estimation of the model by robust ordered logit. The research sought to contribute to the investigation of how each dimensions of CSR affect financial risk. Through the results, managers can review the way they manage financial risk in their companies, government institutions and risk rating agencies can analyze the impact of other factors, in addition to the traditional financials that affect risk.

The work also contributes to the advancement of discussions on the topic, by using this individual analysis of CSR dimensions, segregating Brazilian companies according to their investment grade. None of these analyzes were found in previous studies about Brazilian companies.

We presented twelve models to analyze the relationship between the explanatory variables of CSR and the dependent variable. The results of these models suggest that CSR practices can reduce financial risk in Brazilian companies, mainly through the economic dimension in investment grade companies, and the social dimension in companies with a high credit risk. Thus, hypotheses H1, H1b and H1d are accepted. According to the findings, the environmental and governance dimensions cannot reduce financial risk, therefore hypotheses H1a and H1c are rejected.

Future research may investigate, for example, why the dimension of corporate governance contributes to the increase in financial risk in companies with low risk, that is, classified as investment grade. We also recommend the development of studies that investigate which aspects of CSR dimensions help to reduce financial risk. Such studies would contribute to the companies' risk management.

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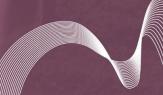Freeman, R.E. (1984). Strategic management: a stakeholder approach. Boston, MA: Pitman Publising Inc.

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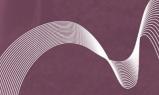
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