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ORIGINAL ARTICLE

The influence of CEO narcissistic personality traits on the indebtedness of B3 companies

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ABSTRACT

The objective of this article is to investigate the influence of CEO narcissistic personality traits on the indebtedness of Brazilian non-financial companies listed on the B3. Other research on narcissistic traits has focused on their impact on the profitability of organizations. Thus, this study aims to fill the gap in understanding the impact of CEO narcissistic traits on companies' debt decisions and their determinants by including a psychological characteristic. This research is relevant because it helps academics, business professionals and policymakers to identify patterns and trends that could warn of possible financial crises. The impact of this article is related to the evidence on the effects of hiring narcissistic CEOs on indebtedness, since understanding the interaction between the CEO's profile and the company's financial decisions can provide practical guidelines for risk management and informed decision making, thus contributing to the field of business strategy and corporate finance. A sample of 299 non-financial companies was analyzed from 2011 to 2020, using data from the Economática database, annual reports, integrated reports, sustainability reports and management reports. Two proxies were used to measure narcissistic personality traits, based on the CEO's signature and the prominence of his or her photo. Indebtedness was measured by the following indicators: onerous, total, short-term and long-term debt. The results show that the greater the narcissistic traits of the CEOs, the greater the indebtedness of the organizations. This contributes to a deeper understanding of the factors that influence companies' financial decisions, since identifying the factors that lead to risky debt decisions can enable the implementation of preventive measures and more effective risk management strategies.

Keywords: CEO characteristics, narcissism, indebtedness, upper echelons theory.

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Influência dos traços de personalidade narcisista dos CEOs no endividamento das empresas da B3

RESUMO

O objetivo deste artigo é investigar a influência dos traços de personalidade narcisista dos CEOs no endividamento das empresas brasileiras não financeiras listadas na B3. Pesquisas sobre os traços narcisistas têm como temática principal o impacto na rentabilidade das organizações. Desse modo, este trabalho visa preencher a lacuna da compreensão das implicações dos traços narcisistas dos CEOs nas decisões de endividamento das empresas e dos seus determinantes ao inserir uma característica psicológica. Esta pesquisa se torna relevante pois ajuda acadêmicos, profissionais de negócios e formuladores de políticas a identificarem padrões e tendências que possam alertar para possíveis crises financeiras. O impacto causado por este artigo está relacionado às evidências acerca dos efeitos que a contratação de CEOs narcisistas ocasionam no endividamento, pois compreender a interação entre o perfil do CEO e as escolhas financeiras da empresa pode fornecer orientações práticas para a gestão de riscos e tomadas de decisão informadas, contribuindo assim para o campo da estratégia empresarial e finanças corporativas. Foi utilizada uma amostra de 299 empresas não financeiras, analisadas de 2011 a 2020, com dados da base da Economatica, Relatórios Anuais, Relatos Integrados, Relatórios de Sustentabilidade e Relatórios da Administração. Para mensurar os traços de personalidade narcisista utilizou-se duas proxies, baseadas na assinatura e na proeminência da fotografia do CEO. O endividamento foi medido pelos indicadores: endividamento oneroso, total, de curto e longo prazo. Os resultados apontam que quanto maior os traços narcisistas dos CEOs maior será o endividamento das organizações, contribuindo para compreensão aprofundada dos fatores que influenciam as decisões financeiras das empresas, uma vez que identificar os fatores que levam a decisões arriscadas de endividamento pode permitir a implementação de medidas preventivas e estratégias de gestão de risco mais eficazes.

Palavras-chave: *características dos CEOs, narcisismo, endividamento, Teoria dos Escalões Superiores.*

1. INTRODUCTION

According to its precursors Hambrick and Mason (1984), upper echelons theory (UET) argues that the observable and psychological characteristics of top executives can influence the strategic decisions of organizations, thus affecting their performance. The observable characteristics are related to age, academic background, years of experience, and socioeconomic background, while the psychological characteristics are narcissism, Machiavellianism, psychopathy, and sadism (Góis, 2017).

According to Hambrick (2007), understanding the operations and performance of firms requires consideration of the preferences and dispositions of their most powerful players, i.e. the chief executive officers (CEOs). These professionals have a variety of duties depending on the company's statutes, such as deciding on subsidiaries, preparing management reports and setting regulations. In addition, CEOs are considered the leaders of organizations and are responsible for commanding the team that makes up the top echelon (Li & Jones, 2019).

It can be seen, then, that the activities carried out by CEOs in companies are related to the overall functioning of the companies and, above all, with a view to improving their performance, to the strategic decisions that shape their future. Among the various strategic decisions for which CEOs are responsible, we can mention the company's debt level, the distribution of dividends, investment decisions, among others.

For example, the level of indebtedness, which is part of the company's capital structure, is a relevant decision because it can jeopardize the organization's financial situation and lead to bankruptcy. According to Marion (2008), there are two ways to look at a high level of indebtedness in organizations: first, there is healthy indebtedness, where organizations use debt to invest in assets, guaranteeing resources to pay it off; and second, there is debt to pay off other debts, leading the organization into a cycle that results in bankruptcy. In addition, the capital structure of companies and its changes over the years convey important information to their investors (Myers, 1984).

Due to the role of CEOs in the organizations in which they work and the importance of debt decisions for these organizations, in this study it was decided to investigate the influence of CEOs' narcissistic personality traits on the indebtedness of Brazilian non-financial companies listed on the B3. Therefore, in light of upper echelons theory, it is argued that psychological traits, such as narcissism, can influence the indebtedness of organizations.

The relationship between debt and narcissism can be explained by the influence of CEOs on organizational fundraising decisions. Narcissistic CEOs who are concerned about their reputation will tend to choose resources that maximize their chances of success, even if this results in a high level of debt for the organization (Harris & Raviv, 1991).

Lubit (2002) noted that individuals with narcissistic traits tend to rise quickly to positions of power in the firm, but when these individuals reach the top position, such as CEO, they have a high probability of bankrupting the company. Another explanation is that this may be due to the overconfidence of narcissistic CEOs, as individuals with this trait tend to choose debt financing, especially short-term debt (Ting et al., 2015). Arguments to this effect are observed in the research of Chatterjee and Hambrick (2007), who found that the behavior of narcissistic CEOs leads them to make bolder decisions compared to other CEOs, resulting in extreme and fluctuating performance for organizations.

The results of this study indicate that total, short-term and long-term debt are consistent with the research hypothesis, while onerous debt is not consistent with the hypothesis. In this way, the results of this research are important for academics, business professionals and policymakers, as well as contributing to the identification of patterns and trends that signal possible financial crises, thus enabling the development of preventive measures and more effective risk management strategies.

Among the studies dealing with narcissistic behavior, it is possible to highlight the national studies that analyze the impact on organizations (Lubit, 2002), the quality of accounting information (Góis, 2017), academic dishonesty (Avelino & Lima, 2017), the impact on academic performance (Lima et al., 2017), risk and uncertainty (D'Souza & Lima, 2021) and corporate tax avoidance (Araújo et al., 2021). International research analyzes the effects on organizational strategies and performance (Chatterjee & Hambrick, 2007), increased vulnerability to lawsuits and fraud (O'Reilly et al., 2018; Rijsenbilt & Commandeur, 2013), executive compensation (O'Reilly et al., 2014) and learning from business failures (Liu et al., 2019).

In addition, there is a lack of research on narcissistic personality traits and their impact on firms' financial decisions, especially those related to debt. For these reasons, this research seeks to fill the gap regarding the determinants of indebtedness by including a psychological characteristic.

The structure of the article is divided into several sections that deal with the theoretical framework, discussing upper echelons theory, narcissistic personality traits in CEOs, financial leverage, and the impact of CEO narcissism on organizational indebtedness. Then, the methodological procedures are presented, followed by the presentation and discussion of the results, and finally, the concluding remarks.

2. THEORETICAL FRAMEWORK

2.1 Upper Echelons Theory

According to Hambrick and Mason (1984), the cognitive bases and values of CEOs shape their perceptions of specific situations, influencing the strategic choices they make and, consequently, the impact of these choices on organizational performance, according to upper echelons theory (Hambrick, 2007). For Crossland and Hambrick (2007), the relevance of CEOs in the outcomes of organizations is linked to the identity of the entities, which can enhance or constrain the individuality of senior executives.

In light of this, UET has been widely studied with the aim of uncovering the relationship between the characteristics of executives and their decision-making process. The first model proposed by Hambrick and Mason (1984) divided the characteristics of CEOs into observable and psychological. Based on this division, when analyzing the studies related to UET, it can be seen that there is a focus on observable characteristics, such as financial position (Hambrick & Mason, 1984), professional experience (Ting et al., 2015), marital status (Neyland, 2019), academic background and gender (Pacheco et al., 2019), and age (Bassyouny et al., 2020).

Ting et al. (2015) found that CEO overconfidence, age, and prior experience are negatively related to financial leverage, while Plöckinger et al. (2016) found evidence supporting the influence of CEO characteristics on financial accounting irregularities, earnings management, accounting conservatism, disclosure quality, and specific corporate decisions related to financial accounting. Pacheco et al. (2019), studying Brazilian firms in the non-cyclical sector of the B3, found that only the gender and background of CEOs are directly related to firm performance. Regarding the narrative tone of financial reports, Bassyouny et al. (2020) concluded that female CEOs who are older and have more experience in the financial sector tend to present a less positive tone.

In addition to these, other studies that focus on the psychological aspects of CEOs are noteworthy. These include personality traits such as psychopathy, Machiavellianism, and narcissism (Armani et al., 2019), as well as sadism (Góis, 2017). Of these, it is narcissism among the most powerful executives that often attracts the attention of journalists, analysts and the general public (Chatterjee & Hambrick, 2007). Consequently, it is essential to investigate the narcissistic traits of CEOs in order to clarify their real impact on organizations (Abatecola & Cristofaro, 2020).

2.2 Narcissistic Personality Traits in CEOs

Narcissism can manifest itself in individuals through various feelings and behaviors, such as their aggressive disposition to achieve positions of power (Vries, 1990), their feeling that others must serve them, and their tendency to engage in exploitative and manipulative behaviors (Sankowsky, 1995). Narcissists' interpersonal relationships, according to Campbell, Hoffman, Campbell and Marchisio (2011), contain low levels of empathy and emotional intimacy, and are superficial relationships that range from exciting and engaging to manipulative and exploitative.

According to Lubit (2002), narcissistic traits create a desire for power in CEOs, leading them to overcome obstacles in order to achieve privileged positions within the company. By its very nature, narcissism can encourage CEOs to make decisions that defy convention in order to gain attention and applause, thus affecting organizational performance (Chatterjee & Hambrick, 2007). Because of their characteristics, society tends to view narcissists as the prototypical leaders (Nevicka et al., 2011). However, in organizations, objective employee evaluations indicate that narcissism is negatively associated with leadership performance (O'Reilly et al., 2018).

Thus, narcissism in CEOs has the potential to create harmful consequences for the organization (Rijsenbilt & Commandeur, 2013), as narcissistic CEOs make impulsive decisions (O'Reilly et al., 2014) and prefer dynamic strategies and extremely risky investments (Zhang, et al., 2017).

The Narcissistic Personality Inventory was studied by Raskin and Terry (1988), who identified its main components and used it as a basis for calculating the narcissism of managers. Taking this into account, the narcissistic characteristics of CEOs are associated with the following behaviors: the belief that they are superior and incomparable (Zhang et al., 2017), a constant need to receive positive feedback (Lima et al., 2017), feelings of grandiosity, aggressiveness, self-love (Góis, 2017), a sense of entitlement, vanity, exploitation, exhibitionism, self-promotion, authority, self-sufficiency (D'Souza et al., 2018), self-importance, an inflated and unrealistic self-image, a need for status and recognition, arrogance, self-confidence, charisma and persuasion (Araújo et al., 2021).

Accounting has a body of literature on narcissism, so it is possible to identify examples and real consequences of the damage caused by this personality trait in organizations (Bailey, 2019). According to organizational psychology, narcissism is considered to be a personality trait rather than a mental illness, which is seen as relatively stable and manifested to varying degrees in all individuals (Braun, 2017). Therefore, narcissism is considered a personality trait and not a clinical diagnosis, as the prerogative to conduct a clinical assessment of this disorder falls only to mental health professionals, such as psychologists and psychiatrists.

According to Sankowsky (1995), narcissism is associated with the abuse of power because CEOs with this trait tend to impose their view of a situation as true, distorting information and rejecting critical feedback in order to make their subordinates accept and believe in their decisions. In terms of the impact on organizations, Lubit (2002) concluded that the behaviors of narcissistic CEOs are harmful to their employees, draining their morale, motivation and energy, and even driving talent away from the organization. Chatterjee and Hambrick's (2007) research found that the bold decisions of narcissistic CEOs result in erratic performance marked by great successes and great failures.

Guedes (2017) found that narcissistic CEOs tend to believe that their performance is superior to that indicated by accounting indices, while Góis (2017) suggests that CEO narcissism harms the quality of accounting information. Lima et al. (2017) highlight that unethical behavior in the workplace can lead to similar attitudes in the academic environment. The inflated and positive view that narcissistic CEOs have of themselves, according to Liu et al. (2019), makes them less likely to learn from past mistakes. Araújo et al. (2021) found that CEO narcissism is positively associated with corporate tax avoidance, as their aggressive personality makes them more susceptible to this type of strategy.

The importance of studying narcissistic personality traits in CEOs lies in the way they define themselves and perceive others and the environment, and this perception and processing of information influences their decisions (Al-Shammari et al., 2019). Therefore, the focus of this research is on the impact of narcissistic CEOs on organizational debt.

2.3 Financial Indebtedness of Organizations

The capital structure of an organization is made up of its forms of financing, equity, and third-party capital, which cause variations in the debt ratio of companies that seek to achieve an optimal structure (Tristão & Souza, 2019).

In light of this, theories have emerged to explain the variation in leverage across firms, suggesting that organizations choose their capital structure based on the pros and cons of equity or third-party financing (Titman & Wessels, 1988). Market conditions play a fundamental role in the likelihood that firms will take on debt: when they observe other organizations seeking debt, they are more likely to do so (Harris & Raviv, 1991). On the other hand, Lopes et al. (2019) find that firms' choice of third-party financing is largely due to the fact that investors demand a higher return than the value of the debt. Consequently, these authors argue that firm growth is associated with an increase in indebtedness, due to investor pressure for a higher return. Nevertheless, Myers (1984) already explained that companies should analyze and balance the tax benefits of debt, bearing in mind that by increasing indebtedness in order to maximize the value of the company, they will also be exposed to the various risks of bankruptcy and financial embarrassment.

In terms of duration, the debt acquired by organizations can be both short-term and long-term (Mogha & Williams, 2020). Organizations can have several types of debt in their capital structure at the same time and do not necessarily have to choose only one type, as some organizations do not have access to all types of capital, thus limiting their choices (Orlova et al., 2020).

On the other hand, considering what is disseminated by upper echelons theory (Hambrick & Mason, 1984), debt decisions can also be influenced by characteristics and aspects related to CEOs, who are responsible for making the most important organizational decisions. In this sense, Harris and Raviv (1991) point out that raising funds through third-party capital is partly due to CEOs' concern for their own reputation. According to these authors, given two different projects, investors will prefer the project with the highest return, while CEOs will prefer the project that maximizes their chances of success. As a result, firms may end up with high debt ratios because CEOs make decisions with their individual reputations in mind. Mogha and Williams (2020) believe that both financial capital and human capital influence the choice of an organization's capital structure.

2.4 Impacts of CEO Narcissistic Personality Traits on Organizational Indebtedness

According to Campbell et al. (2011), narcissism has significant impacts on judgment and decision-making. These effects are the central theme of research on CEO narcissism. For example, Cragun et al. (2019) found that there are five ways in which narcissistic CEOs can significantly affect organizations: organizational performance, innovation and growth, policy and risk, financial leverage, and questionable behavior.

In this sense, Lin et al. (2019) state that the narcissistic traits of CEOs directly affect financial decisions. In this regard, it can be argued that when managing third-party capital, narcissistic individuals can make riskier decisions without any shame (D'Souza et al., 2019), that is, companies led by narcissists face high-risk behavior (O'Reilly et al., 2018). Based on the premise that CEOs' characteristics influence firms' strategic decisions, as advocated by UET, this study developed the following research hypothesis: CEOs' narcissistic personality traits are positively related to firms' indebtedness.

This hypothesis considers that individuals with such personality traits tend to opt for riskier decisions (Zhang et al., 2017), which can lead to extreme performance for organizations (Chatterjee & Hambrick, 2007). According to Vries (1990), the narcissistic CEO's high confidence in his or her manipulative power means that he or she does not thoroughly analyze the characteristics of the organization's internal and external environment, which provides essential information for decision-making, leading to errors in the decision-making process when the CEO chooses projects that are doomed to fail.

In support of this thesis, Lubit (2002) commented in his article that more narcissistic leaders tend to quickly reach positions of power in the company. However, when these individuals reach the top position, such as CEO, there is a great chance of them bankrupting the company. Narcissistic leadership styles, such as that of Frank Lorenzo, the former head of Eastern Airlines, led to disastrous results, resulting in the loss of many jobs and the closure of the airline (Sankowsky, 1995).

Finally, it is expected that the greater the CEO's narcissistic personality traits, the greater the company's indebtedness, given that CEOs with excessive self-confidence, as in the case of narcissists, tend to choose debt financing, especially short-term debt (Ting et al., 2015).

3. METHODOLOGICAL PROCEDURES

3.1 Sample and Data Collection

The initial sample of this study includes all public companies listed on the *Brasil, Bolsa, Balcão* (B3) with active shares in July 2021, totaling 412 companies. After tabulating the data, financial companies and observations that did not contain all the data required for the analysis were excluded from the sample, leaving 299 companies, which allowed for a total of 2,007 firm-year observations in an unbalanced panel. Financial companies were excluded because of their particular accounting standards and capital structure, which could lead to biased results.

The 299 companies were analyzed from 2011 to 2020. The year 2011 was chosen as the starting year of the analysis because the International Financial Reporting Standards (IFRS) were adopted in 2010, and the econometric model uses some variables with a one-year lag. The data were collected from the Economática database and from the companies' annual reports, reference forms, integrated reports, sustainability reports, and management reports.

It should also be noted that this is a quantitative study that uses econometric models to analyze the expected relationships. In terms of objective, it can be characterized as descriptive, since it seeks to describe the influence of CEO narcissistic personality traits on the indebtedness of B3 companies.

3.2 Econometric Model

To achieve the objective of the study, an ordinary least squares (OLS) multiple regression estimation model was used according to the following equations:

$$Debt_{it} = \beta_0 + \beta_1 CEO\_Sign_{it} + \beta_2 TANG_{it} + \beta_3 SIZE_{it} + \beta_4 PROF_{it} + \beta_5 RISK_{it} \tag{1}$$

$$Debt_{it} = \beta_0 + \beta_1 CEO\_Photo_{it} + \beta_2 TANG_{it} + \beta_3 SIZE_{it} + \beta_4 PROF_{it} + \beta_5 RISK_{it} \tag{2}$$

It should be noted that eight regressions were estimated, since there are two proxies for the narcissism variables and four ways of calculating the dependent variable of debt, in terms of short-term, long-term, total and onerous debt, as can be seen in Table 1.

As can be seen in Table 1, the following control variables were included: asset tangibility, firm size, profitability and business risk. Asset tangibility, according to Cavalcanti et al. (2018), is a variable used by organizations as a guarantee to obtain loans and financing, so it is assumed that tangibility has a positive relationship with debt.

Table 1
Dependent, independent and control variables in the model

Variables	Acronym	Forms of Calculation	Authors
Dependent			
Short-term debt	STD	Current Liabilities/Total Assets	Avelare et al. (2020); Do (2020); Mogha & Williams (2020)
Long-term debt	LTD	Non-Current Liabilities/Total Assets	Avelar et al. (2020); Mogha & Williams (2020); Moura (2020)
Total debt	TD	Current Liabilities + Non-Current Liabilities/ Total Assets	Gitman (2002); Welch (2006); Machado et al. (2010)
Onerous debt	OD	Onerous Liabilities/Invested Capital	Welch (2006); Machado et al. (2010); Cavalcanti et al. (2018)
Independent			
Proxy for the CEO's narcissism, considering his or her signature	CEO_Sign	Square area of the signature/Number of letters in the CEO's name	Zweigenhaft (1977); Ham et al. (2017); Ham et al. (2018); O'Reilly et al. (2018); Cragun et al. (2019); Garcia (2021)
Proxy for the CEO's narcissism, considering the prominence of his or her photo	CEO_ Photo	The following values were assigned: 1 when there is no photo; 2 when there is one or more executives in the photo; 3 when the CEO's photo takes up less than half a page; 4 when it takes up half a page; and 5 when it takes up an entire page.	Chatterjee & Hambrick (2007); Rijsenbilt & Commandeur (2013); Kime et al. (2018); Ahn et al. (2019); Araújo et al. (2021); Garcia (2021)
Control			
Asset tangibility	TANG	Fixed Assets/Total Assets	Avelare et al. (2019); Avelar et al. (2020); Orlova et al. (2020)
Company size	SIZE	Ln(Total Assets)	Avelar et al. (2019); Cragun et al. (2019); Tristão & Sonza (2019); Avelar et al. (2020); Do (2020); Mogha & Williams (2020); Moura (2020); Orlova et al. (2020)
Profitability	PROF	Operating Profit$_{i,t}$/Total Assets$_{i,t-1}$	Titman & Wessels (1988); Avelar et al. (2019); Mogha & Williams (2020); Orlova et al. (2020)
Business risk	RISK	Current Assets/Current Liabilities	Avelar et al. (2019); Cragun et al. (2019); Tristão & Sonza (2019); Avelar et al. (2020).

Source: *Prepared by the authors.*

Firm size is expected to be positively related to indebtedness because the larger the firm, the better its reputation in the creditor market, thus making it easier to obtain third-party capital (Avelar et al., 2019).

According to Mogha and Williams (2020), profitability maintains a significant correlation with both short-term and long-term debt, as the most profitable organizations incur debt mainly due to their high ability to generate profits to pay off their debts (Avelar et al., 2019). Finally, the risk of the business influences the level of debt, such that the higher the risk, the lower the organization's level of debt (Machado et al., 2010).

3.2.1 Definition of narcissism variables

To measure the narcissistic personality traits of CEOs, based on the studies of Ahn et al. (2019), Araújo et al. (2021), Chatterjee and Hambrick (2007), Garcia (2021), Ham et al. (2018), Kim et al. (2018), Rijsenbilt and Commandeur (2013), and Zweigenhaft (1977), the variables related to the CEO's signature and the prominence of his or her photo in the company reports were used, which are explained in the following topics.

The CEO_Sign variable is formed by calculating the size of the CEO's signature according to Equation (3):

$$CEO\_Sign = \frac{Square\ Area\ of\ the\ Signature}{Number\ of\ Letters\ in\ the\ CEO's\ Name} \quad (3)$$

To obtain the value of the square area of the signature, we used the same parameters as Zweigenhaft (1977) and Ham et al. (2018), which consisted of drawing a rectangle around the CEO's most recent signature – captured in the company's annual report, reference form, integrated report, sustainability report or management report – so that each side of the rectangle touched the most extreme endpoint of the signature. Once each signature was captured, it was transferred to CorelDRAW software so that the area of each one could be measured using the rectangle tool. It was then possible to measure the square area of each signature in centimeters and calculate the CEO_Sign variable as shown in Equation 3.

The CEO_Photo variable was selected because of the high visibility of CEOs in company reports. According to Rijsenbilt and Commandeur (2013), a large photo of the CEO can be seen as evidence that the CEO is the most important person in the organization. Therefore, the higher the CEO's score due to the prominence of his or her photograph in the reports, the more narcissistic he or she can be considered to be (Araújo et al., 2021). Table 2 shows the prominence of the CEO's photo and the scores for measuring narcissism.

Table 2
CEO narcissism based on the size of their photos

Photo size	Score
No photo of the CEO	1
Photo of the CEO with one or more executives	2
Photo of the CEO alone, taking up less than half a page	3
Photo of the CEO alone, taking up more than half a page, with the rest occupied by text	4
Photo of the CEO alone, taking up an entire page	5

Source: *Adapted from Ahn et al. (2019), Araújo et al. (2021), Chatterjee and Hambrick (2007), Garcia (2021), Kim et al. (2018), and Rijsenbilt and Commandeur (2013).*

In order to create the spreadsheet with the scores in Table 2 for the variable CEO_Photo, we consulted the sustainability reports, annual reports, management reports and integrated reports published by the companies between 2010 and 2020. It should be noted that annual reports provide an opportunity to report on the company's progress and prospects, as well as an opportunity for the CEO to present him or herself as the company's leader through his or her photo, which, although a standard feature of annual reports, is neither universal nor uniform (Chatterjee & Hambrick, 2007). It should be noted that the metrics used in this study were adopted to show evidence of the characterization of the narcissistic personality trait and are therefore not the result of a clinical analysis.

4. PRESENTATION AND DISCUSSION OF RESULTS

This section will present the results found, as well as a detailed analysis of the descriptive and inferential statistics. At the end, there will be a discussion of previous findings and their relationship with the results of this research.

4.1 Descriptive Statistics

The descriptive statistics are presented to show the previous behavior of the variables used in the regression estimations. Table 3 shows the descriptive statistics of the variables selected for this study.

With regard to the indebtedness variables, which are the dependent variables of the study, it can be seen that the averages for the organizations are as follows: 69.9% for onerous debt (OD), 79.4% for total debt (TD), 36.9% for short-term debt (STD) and 42.5% for long-term debt (LTD). On the other hand, the maximum values of these dependent variables indicate that organizations can reach a situation of indebtedness beyond their ability to pay. In contrast to this result, Araújo et al. (2021) found companies with lower average total debt, at around 26.7%, perhaps due to the fact that they only worked with data until 2017, unlike this one, which extends until 2020.

The independent variables measure the narcissistic personality traits of the CEOs. The mean of the variable CEO_Sign is 0.655, which indicates that the size of the signature is small in relation to the number of letters in the CEO's name, which is similar to the mean found in the international study by Ham et al. (2017), which was 0.78 for this variable, indicating a low narcissistic trait. On the other hand, the maximum value of 4.782 indicates a higher narcissistic trait. As for the variable CEO_Photo, the mean and standard deviation were not considered, since the values assigned to this indicator can only be integers, as shown in Table 2. For reference, in the study by Araújo et al. (2021), with only 382 observations, the mean was 0.528, while in this study it was 1.451.

Table 3
Descriptive statistics for the final study sample

Variables	Number of observations	Mean	Standard Deviation	Minimum	Maximum
OD	2,007	0.699	3.299	0.001	130.519
TD	2,007	0.794	0.786	0.026	9.548
STD	2,007	0.369	0.441	0.022	6.715
LTD	2,007	0.425	0.503	0.001	6.369
CEO_Sign	2,007	0.655	0.728	0.000	4.782
CEO_Photo	2,007	1.451	0.905	1.000	5.000
TANG	2,007	0.269	0.219	0.001	0.945
SIZE	2,007	14.783	1.874	3.424	20.711
PROF	2,007	0.063	0.165	-1.579	2.987
RISK	2,007	1.741	1.472	0.007	27.457

Note: *Onerous Debt (OD), Total Debt (TD), Short-Term Debt (STD), Long-Term Debt (LTD), CEO Signature (CEO_Sign), CEO Photo (CEO_Photo), Asset Tangibility (TANG), Company Size (SIZE), Profitability (PROF), and Business Risk (RISK).*
Source: *Prepared by the authors.*

Regarding the control variables, asset tangibility (TANG) is the indicator used by organizations as collateral to obtain loans and financing (Cavalcanti et al., 2018). Thus, the higher the level of tangibility of an organization, the greater its ability to obtain debt. The minimum value of TANG is 0.1%, which indicates low tangibility because fixed assets are small in relation to the total assets of the companies.

With regard to company size (SIZE), the average value of 14.78 indicates that most of the organizations are large, as in the study by Araújo et al. (2021), which showed an average value of 8.27. The profitability (PROF) values indicate that, on average, the organizations are not able to generate sufficient returns on the investments made during the period. The higher the business risk (RISK), the lower the indebtedness, since it shows the risks of the company's operations to third parties (Machado et al., 2010). It can be seen that the minimum value of 0.7% indicates a relatively low risk, which persists throughout the sample, since the average value is 1.741. On the other hand, the maximum value of 27.457 indicates a high level of business risk, and there may be a few companies in this situation.

The correlation coefficients of the variables listed in Table 4 indicate that the dependent variables OD, TD, STD, and LTD have significant correlations of up to 5% between them. This is because they all deal with the same phenomenon, but from different perspectives. The coefficients represent the strength of the linear correlation, and the sign indicates whether it is positive or negative. In relation to these results, this phenomenon also applies to the independent variables CEO_Sign and CEO_Photo, and the control variables TANG, SIZE, PROF and RISK.

It can then be seen that OD is not significantly correlated with the narcissism variables CEO_Sign and CEO_Photo, showing that OD is only related to the variables TD, STD, LTD, SIZE, PROF, and RISK. With regard to TD, there is a negative correlation of 14% with CEO_Sign and 10.6% with CEO_Photo. With regard to STD, there is a negative correlation of 9.6% with CEO_Sign and 14.3% with CEO_Photo. LTD shows a negative correlation of 13.7% with CEO_Sign and 4.1% with CEO_Photo.

Table 4
Variable correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
OD (1)	1.000									
TD (2)	**0.085**	1.000								
LTD (3)	**0.070**	**0.807**	1.000							
STD (4)	**0.071**	**0.855**	**0.385**	1.000						
CEO_Sign (5)	0.002	**-0.143**	**-0.096**	**-0.137**	1.000					
CEO_Photo (6)	-0.029	**-0.106**	**-0.143**	-0.041	**0.099**	1.000				
TANG (7)	0.011	**0.095**	0.031	**0.120**	**-0.061**	0.042	1.000			
SIZE (8)	**-0.060**	**-0.319**	**-0.360**	**-0.182**	**0.171**	**0.399**	-0.036	1.000		
RENT (9)	**-0.068**	**-0.266**	**-0.210**	**-0.232**	**0.089**	**0.073**	**-0.070**	**0.085**	1.000	
RISK (10)	**-0.085**	**-0.298**	**-0.366**	**-0.144**	0.002	0.001	**-0.159**	0.015	**0.066**	1.000

Note: *Onerous Debt (OD), Total Debt (TD), Short-Term Debt (STD), Long-Term Debt (LTD), CEO Signature (CEO_Sign), CEO Photo (CEO_Photo), Asset Tangibility (TANG), Company Size (SIZE), Profitability (PROF), and Business Risk (RISK). The numbers in bold are significant by up to 5%.*
Source: *Prepared by the authors.*

Thus, it can be seen that among the debt variables, OD is the only one that does not have a significant correlation with the independent variables, while the TD, STD, and LTD variables have a negative correlation with the narcissistic personality trait variables.

4.2 Inferential Statistics

Before estimating the OLS models, tests were performed to select the data panel, given that the sample consists of data from 2011 to 2020. The tests were for the analysis between pooled and fixed effects (Chow test), analysis between random effects and fixed effects (Hausman test), and also, to confirm the results, the analysis test between pooled and random effects (Breusch-Pagan LM test). The results showed that the ideal models for the data set are those with panel data and fixed effects. In addition, the variance inflation factor (VIF) test was performed between the variables in each model, indicating that there were no problems with multicollinearity, as the average and highest VIF were 1.03 and 1.04, respectively. To test for heteroscedasticity, the Breusch-Pagan (Cook-Weisberg) test was performed, which resulted in heteroscedastic errors, so to control for heteroscedasticity, standard errors were used that are robust to heteroscedasticity in panels with fixed effects.

Table 5 shows the results of the eight regressions that were run, including the two proxies for CEO narcissism and the four dependent variables representing company indebtedness.

Regarding onerous debt, the results of OD1 and OD2 indicate that the greater the narcissistic personality traits of the CEOs, the greater the indebtedness. However, these equations do not show significance for the variables related to narcissism. In addition, equations OD1 and OD2 have a low R^2 value, indicating that there is not enough explanatory power, which was already expected given the lack of significant correlation between OD and the variables CEO_Sign and CEO_Photo, shown in Table 4.

Table 5
Regression results considering the two proxies for CEO narcissism

	Dependent variables							
	OD1	***OD2***	***TD1***	***TD2***	***STD1***	***STD2***	***LTD1***	***LTD2***
CEO_Sign	0.213		0.042**		0.027*		0.015	
	(1.36)		(2.34)		(1.83)		(1.51)	
CEO_Photo		0.047		0.022**		0.007		0.014**
		(1.59)		(2.15)		(0.96)		(2.55)

Table 5
Cont.

	Dependent variables							
	OD1	***OD2***	***TD1***	***TD2***	***STD1***	***STD2***	***LTD1***	***LTD2***
TANG	-1.615*	-1.679*	0.081	0.068**	-0.130	-0.138	0.214	0.209
	(-1.70)	(-1.77)	(0.40)	(0.34)	(-0.52)	(-0.55)	(0.99)	(0.97)
SIZE	-0.677**	-0.661**	-0.251***	-0.250***	-0.075**	-0.171**	-0.079**	-0.079**
	(-2.33)	(-2.28)	(-2.76)	(-2.76)	(-2.19)	(-2.17)	(-2.18)	(-2.20)
PROF	-1.324**	-1.322**	-0.440**	-0.439**	-0.129	-0.129	-0.311*	-0.311*
	(-2.00)	(-2.00)	(-2.07)	(2.06)	(-1.23)	(-1.22)	(-1.71)	(-1.70)
RISK	-0.115***	-0.117**	-0.078***	-0.078***	-0.068***	-0.069***	-0.009***	-0.009
	(-3.41)	(-3.45)	(-4.14)	(-4.13)	(-3.63)	(-3.62)	(-1.04)	(-1.07)
Constant	11.291*	11.141**	4.616***	4.602***	3.064**	3.047**	1.553***	1.556***
	(2.53)	(2.50)	(3.38)	(3.38)	(2.59)	(2.58)	(2.89)	(2.90)
Obs.	*2.007*	2.007	*2.007*	*2.007*	*2.007*	*2.2007*	*2.007*	*2.007*
Prob>F	*0.0163*	*0.0162*	*0.0009*	*0.0010*	*0.0004*	*0.0002*	*0.1185*	*0.0484*
R^2	***2.13***	***2.21***	***16.43***	***17.00***	***20.92***	***21.22***	***7.03***	***7.52***

Note: *CEO Signature (CEO_Sign), CEO Photo (CEO_Photo), Asset Tangibility (TANG), Company Size (SIZE), Profitability (PROF), Business Risk (RISK), Onerous Debt Burden (OD), Total Debt (TD), Short-Term Debt (STD), and Long-Term Debt (LTD).*
, **, * = significant at 10, 5, and 1%, respectively.*
Source: *Prepared by the authors.*

Regarding total debt (TD), in equation TD1, CEO_Sign and PROF have a significance of 5% and SIZE and RISK have a significance of 1%, while in equation TD2, CEO_Photo, TANG and PROF have a significance of 5 % and SIZE and RISK have a significance of 1%. Looking at the R^2 values of these equations, it can be seen that they have a high explanatory power compared to the R^2 of equations OD1 and OD2. The results of equations TD1 and TD2 indicate that the greater the narcissistic traits of the CEOs, the greater the indebtedness of the companies they lead. These results can be explained by the inflated self-image trait of narcissists, who, according to Guedes (2017), describe their performance compared to the actual performance of the organization reported by the accounting.

In the debt equation STD1, SIZE is 5% significant and RISK is 1% significant. The R^2 value of this equation indicates that it is one of the regressions with the greatest explanatory power compared to the other equations shown in Table 5. The result of this regression indicates that the greater the narcissistic traits of the CEOs, the greater the indebtedness of the organizations. In equation STD2, indebtedness has no significance with the variables CEO_Photo, TANG and PROF, although it has the highest R^2 value.

Regarding equation LTD1, there is no significance between indebtedness and the narcissism variable CEO_Sign; in equation LTD2, there is 5% significance with CEO_Photo and SIZE, and 1% significance with RISK. The results of these regressions indicate that the greater the narcissistic traits of the CEOs, the greater the indebtedness, but only for the equations relating to total and long-term debt, TD1, TD2 and LTD2, did the two measures of narcissistic traits prove to be significant.

Table 6 shows the results of the eight regressions considering the dummy variables of the narcissism proxies and the four dependent variables representing company indebtedness. To create the dummy variables, the narcissism variables CEO_Sign and CEO_Photo were transformed into variables that take the value of 1 (one) when the CEO's index is higher than the median, and 0 (zero) when the index is lower than the group median. In this way, those classified in group 1 were considered to have many narcissistic personality traits, while those classified in group 0 had few narcissistic personality traits.

Table 6
Results of the regressions considering the dummies of the narcissism proxies

	Dependent variables							
	OD1	***OD2***	***TD1***	***TD2***	***STD1***	***STD2***	***LTD1***	***LTD2***
CEO_Sign	0.215		0.071**		0.054*		0.017	
	(1.03)		(2.11)		(1.92)		(1.19)	
CEO_Photo		0.085		0.047**		0.013		0.034***
		(1.39)		(2.05)		(0.79)		(2.65)
TANG	-1.650*	-1.674*	0.078**	0.071**	-0.131	-0.137	0.212**	0.211
	(-1.74)	(-1.77)	(0.39)	(0.35)	(0.53)	(-0.55)	(0.98)	(0.98)
SIZE	-0.667**	-0.659**	-0.251***	-0.249***	-0.173**	-0.170**	-0.078**	-0.079**
	(-2.29)	(-2.27)	(-2.78)	(-2.76)	(-2.21)	(-2.17)	(-2.17)	(-2.20)
PROF	-1.321**	-1.323**	-0.439**	-0.439**	-0.129	-0.129	-0.311*	-0.311*
	(-2.00)	(-2.00)	(-2.06)	(-2.06)	(-1.23)	(-1.22)	(-1.71)	(-1.70)
RISK	-0.115***	-0.116***	-0.077***	-0.078***	-0.068***	-0.069**	-0.009	-0.009
	(-3.42)	(-3.44)	(-4.15)	(-4.13)	(-3.64)	(-3.62)	(-1.03)	(-1.06)
Constant	11.171**	11.155**	4.604***	4.614***	3.060***	3.050**	1.545***	1.567***
	(2.50)	(2.49)	(3.41)	(3.38)	(2.62)	(2.58)	(2.89)	(2.91)
Obs.	*2.007*	*2.007*	*2.007*	*2.2007*	*2.007*	*2.007*	*2.007*	*2.007*
Prob>F	*0.0166*	*0.0163*	*0.0009*	*0.0010*	*0.0002*	*0.0002*	*0.1278*	*0.0421*
R^2	***2.17***	***2.21***	***16.39***	***16.98***	***21.07***	***21.21***	***7.07***	***7.50***

Note: *CEO Signature (CEO_Sign), CEO Photo (CEO_Photo), Asset Tangibility (TANG), Company Size (SIZE), Profitability (PROF), Business Risk (RISK), Onerous Debt (OD), Total Debt (TD), Short-Term Debt (STD), and Long-Term Debt (LTD).*
, **, * = significant at 10, 5, and 1%, respectively.*
Source: *Prepared by the authors.*

It can be seen that the results found in Table 5 are repeated in Table 6, i.e. all the regressions indicate that CEOs with high narcissistic personality traits have a positive influence on the indebtedness of organizations. However, equations OD1, OD2, STD2 and LTD1 did not show significance with the narcissistic trait variables; therefore, they are not able to confirm the research hypothesis.

As for equations TD1, TD2, STD1 and LTD2, since they are significant in relation to the independent variables, they confirm the hypothesis of the study and provide evidence suggesting that CEOs with greater narcissistic traits are associated with an increase in the total, short-term and long-term debt of companies. Consistent with these findings, Lubit (2002) suggests that the characteristics of CEOs with narcissistic traits can lead companies into bankruptcy. In another study of US companies, Góis (2017) found similar evidence that narcissism is positively associated with fraud and earnings management, as well as confirming that corporate reputation inhibits the traits that cause a reduction in information quality.

In this sense, there is evidence that, whether in Brazil or in the United States, CEOs with more narcissistic traits make decisions that do not benefit the interests of the organizations, increasing debt, managing results and reducing the quality of information, confirming what is suggested by upper echelons theory. According to Hambrick and Mason (1984), this theory serves as a basis for studies that analyze the influence of the observable and psychological characteristics of CEOs on organizational results. From this, it can be seen that CEOs with narcissistic traits make risky and bold decisions, which explains the fact that the companies they lead are susceptible to high levels of debt. Therefore, the results of this study confirm this by showing that the higher the narcissistic traits of the CEOs, the higher the indebtedness of the organizations, which is also consistent with other research on narcissism. In fact, Patel and Cooper (2014) comment that companies led by more narcissistic CEOs take greater risks, especially in times of crisis, because they are less afraid of being punished or fired.

The best way to solve the problem that this personality trait causes to the capital structure of the organization is to implement corporate governance (Rijsenbilt & Commandeur, 2013). Governance will be responsible for monitoring the CEO's behavior in order to observe his or her actions, and thus intervene when necessary to prevent his or her personality trait from harming the organization.

5. CONCLUDING REMARKS

The objective of this study was to investigate the influence of CEOs' narcissistic personality traits on the indebtedness of Brazilian non-financial companies listed on the B3. In the literature, it is common to find discussions about the behavior of narcissistic CEOs, who act for their own benefit and make risky decisions that can jeopardize the results of organizations.

The results of this study provide empirical evidence to suggest that CEOs with higher narcissistic traits are associated with an increase in companies' total, short-term and long-term debt. However, there does not appear to be a significant impact of CEO narcissistic traits on companies' onerous debt, and thus there is no fiscal benefit for organizations.

These findings are important because they broaden our understanding of how leaders' narcissistic personality traits can affect the financial health of companies. This can be valuable to academics, business professionals and policymakers by providing a more complete picture of the factors that shape corporate financial decisions. Bad debt decisions can lead to cash flow problems, loss of investor confidence, and even corporate bankruptcy. Therefore, research in this area can help identify patterns and trends that warn of possible financial crises and allow for the implementation of preventative measures and more effective risk management strategies.

To date, few studies have examined in detail how leaders' personality traits can affect firms' financial decisions. By examining this relationship, this study fills a gap in the knowledge about how personality traits, especially narcissism, play a crucial role in shaping the capital structure of companies.

A suggestion for future research is to investigate why the short-term debt (STD) variable in this study rejected the research hypothesis despite having the greatest explanatory power among the debt variables, in addition to considering Ting et al.'s (2015) findings that overconfident CEOs tend to choose short-term debt.

A limitation of this study was the collection of data on narcissism proxies, as some companies listed on the B3 do not disclose relevant reports. Therefore, future research could add more narcissism proxies and other ways of calculating indebtedness, as well as further investigating the underlying psychological mechanisms that link narcissistic traits to leverage patterns. Increasing the number of observations could also provide more detailed results on the influence of narcissism on corporate debt. In addition, understanding how narcissism affects CEOs' financial decisions and how this varies in different situations could enrich the analysis.

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