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The Influence of the Level of Intangibility in the Maturity of the Debts of the Companies Listed in [B]^3

ABSTRACT

Objective: to analyze if intangible assets influence the determination of debt maturity and understand how these two variables relate to publicly traded companies listed in [B]^3(*Brasil, Bolsa, Balcão*).
Method: econometric regression techniques with panel data were used, with the estimation made by means of fixed effects, according to the adequacy to the variables presented by the tests performed. The sample consists of 145 companies, analyzed from 2010 to 2016.
Originality/relevance: the study stands out for analyzing the influence that intangible assets have on the debt maturity of companies.
Results: the degree of intangibility of companies positively influences the debt maturity through the Market-to-Book and negatively influences by the ratio of intangible assets to non-current assets, at a significance level of 5%. This relationship occurred because the Market-to-Book considers market values, while the other measure uses balance sheet data.
Theoretical/Methodological contributions: in addition to verifying Myers's (1977) theory of underinvestment, the results showed that debt maturity decisions involve intangible assets, demonstrating the way the market views these in relation to the abnormal cash flows that these assets are capable of to generate.

Keywords: Intangible assets; Maturity of debts; Market-to-book; Level of the intangibility.

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1 INTRODUCTION

Since the Modigliani and Miller (1958; 1963) propositions about capital structure, several researches have emerged with the intention to find out which factors impact the choice of a given structure and whether or not there is an optimal composition capable of increasing companies' market value. However, in order to achieve this optimal structure, in addition to the proportion of third party and own resources, it is essential to know what is the adequate maturity of debt, as the degree of indebtedness and its maturity are complementary financial policies in Latin America (Terra, 2009).

Thus, it is important to know when the company's cash flow will remunerate creditors (Nakamura, Jucá & Bastos, 2011). In addition, it is up to companies to shape their debt maturities so that the problem of agency between creditors and shareholders can be minimized, in order to avoid underinvestment, so that debt maturity occurs before the opportunity for major growth investments (Myers, 1977). If it occurs after that opportunity, that debt reduces the value of the company. Thus, the priority of cash flow for these equity holders may diminish managers' incentive to invest in positive NPV (net present value) investments, if it is lower than the cost of debt (Myers 1977).

Shareholders are interested in the value of the company. Therefore, with the rise of intangible assets in the early 1980s due to technological developments and fierce competition between firms, several exploits on this type of asset have emerged in the attempt to relate it to the significant increase in market value of firms. at this historical moment (Colauto et al, 2009).

Thus, national and international studies have investigated the relationship between intangible assets and the creation of value for the company in the market. At the national level, Perez and Famá (2006) analyzed the impact of not accounted intangible assets on the company's performance, verifying if they influence the creation of shareholder value. As a result, they found significant differences in the performance of intensive tangible companies and intensive intangibles and concluded that intensive intangible companies created more shareholder value (Perez & Famá, 2006; 2015).

In turn, Sveiby (1997) claims that, due to the lack of collateral for these assets, financial institutions are opposed to granting loans to finance them. Thus, companies that own these assets have, in their capital structure, a higher proportion of their own resources, and, because they preferentially depend on shareholders to maintain these investments, they need to have control over the agency conflict by managing the term of their activities. debts (Myers, 1977). Thus, by complementing the decisions regarding the choice of capital structure, it is essential to study which factors influence the choice of debt maturity, since it is through it that the company seeks an optimal capital composition that maximizes its value.

The debt maturity decision is justified only to the extent that it has an impact on the shareholder wealth and on the company's value (Martins and Terra, 2015). Since intangible assets are capable of influencing the company's value, they become essential instruments to justify the choice of a certain debt maturity. Given this fact, the following research problem arises: what influence does the level of intangibility have on the maturity of debts in the companies listed in [B]^3? In this scenario, the objective is to verify the relationship between the level of intangibility and the maturity of debts in companies listed on the Brazilian stock exchange, in the period from 2010 to 2016.

This study is justified by understanding that human capital, that is, people with skills, and all other intangible assets are essential to maintain competitiveness among organizations and influence their success. For this reason, human capital is an important determinant in the productivity process, as companies that invest in training, in training, among others, achieve greater productivity, which makes them remain in the market, as demonstrated in a survey conducted by Black and Lynch (1996).

In addition, the intangible assets are present throughout the manufacturing process of products or services offered by the institution, as well as brand, reputation, and others, and companies start to focus on intangible assets in order to increase value creation. In this sense, understanding the influence on debt maturity can help companies create strategies with their intangible assets to raise funds with the desired maturity and to maximize their market value. Therefore, it is important to understand if this type of asset has an impact on the decision of the maturity of the resources acquired from creditors and what is their view regarding these assets.

2 LITERATURE REVIEW

2.1 Intangibility and Forms of Financing

From the decade of the 1980s, intangible assets were already studied due to the importance they started to present to society as a whole (Colauto et al., 2009). Globalization and technological innovations were determining factors for institutional changes in the world economy. As a result, there was a transition from the industrial economy to the knowledge economy, so that intangible assets took the place of tangibles in terms of obtaining competitive advantages (Liszbinski, Kronbauer, Macagnan, & Patias, 2014).

In this regard, Perez and Famá (2015) state that intangible assets contribute to the competitive advantages among companies due to their uniqueness, as they make them more competitive and unique. Regarding tangible assets, any company is capable of owning them, but brands, people, formulations, patents and other intangible assets are unique and specific (Kayo, 2002).

However, Accounting does not record all intangible assets, due to the difficulty in safely measuring their cost and their effects (Antunes & Leite, 2008). Therefore, they may not represent the effective market value of a company, because it makes a difference when comparing its book value with its market value (market value), which can be presented when dividing. market value at book value. This proxy measures the degree of intangibility of companies, indicating the proportion of intangibles to their total value (Colauto et al., 2009; Kayo et al., 2006; Lev, 2001; Nascimento et al., 2012; Perez & Famá, 2006).

Proposed by Stewart (1998) and Luthy (1998), this proxy is considered a fast, easy and rational method. Colauto et al. (2009) and Kayo (2002) showed that it is a relative measure that can be interpreted as follows: the greater the degree of intangibility, the greater the relative participation of intangible assets in the company's investment structure. Vasconcelos et al. (2013) stated that the subtraction between the market value and the value of assets recorded in equity results in the value of intangible assets, so that the greater this result, the greater the degree of intangibility.

Another measure used in this study to measure the level of intangibility of companies is the representativeness of intangible assets in relation to non-current assets. This proxy is based on the investigation by Parente, Luca and Vasconcelos (2015), based on Moura et al. (2011) and Santos, Silva and Gallon (2011). Unlike the Market-to-Book, this measure considers intangibles that are recorded in the balance sheet of companies.

Research such as that of Bah and Dumontier (2001), Lima et al. (2016) and Titman and Wessels (1988) showed that the financing for intangible assets is done, predominantly, with own resources, reason why they present low level of leverage. This fact can be explained by the evidence that the risk of these assets is greater and, consequently, their cost of capital and their discount rate are higher than the tangible ones (Lev, 2001). This is because there is a high degree of uncertainty regarding the future benefits to be received in relation to intangibles.

Likewise, Sveiby (1997) argues that financial institutions are against granting loans to finance intangible assets due to the lack of collateral, since tangible assets can be compared to similar ones in the market, whereas Most intangibles, because they are exclusive and unique, have no alternative uses. Jucá, Campos, Bastos and Mendes (2016) and Rampini and Viswanathan (2013) stated that guarantees are fundamental in determining the capital structure. However, valuable intangible assets, such as the Coca-Cola brand, often generate substantial cash flows and, therefore, are able to finance themselves with debt for their ability to generate them (Lim, Macias, & Moeller, 2019).

In addition, Medrado, Cella, Pereira and Dantas (2016) assessed the association between the level of intangibility of assets and the market value of companies' shares, the results of which showed the relevance of intangible assets to market value, demonstrating that they are capable of generating above-average profits. Regarding performance, Ferla, Muller and Klann (2019) found influence of the degree of intangibility on the performance of Latin American companies, with greater evidence in Argentine companies and with inconclusive results for Brazil.

At the same time, Pecking Order Theory maintains that more profitable companies have a lower level of leverage, since they prefer, in the first place, to finance their investments with their own resources. As intangible assets can generate higher than normal profits, it is concluded that companies with a higher level of intangibility are less indebted (Sunder & Myers, 1999).

Jun and Jen (2003) created the trade-off model for debt maturity, which considers the benefits (lower financing costs) with the costs (refinancing risk and interest rate risk) of the short-term debt. Thus, having the same level of leverage, companies that prefer short-term debt are more exposed to refinancing risk, as they will be more vulnerable to macro and microeconomic conditions when refinancing debt (Jun & Jen, 2003).

However, according to Brito, Corrar and Batistella (2007), the Brazilian market has the following peculiarities that directly influence companies' financing decisions: restricted capital market, high concentration of share control, strong restriction on third party capital sources long-term, high interest rates. For them, all of this makes financing costs very significant, which means that companies have low levels of indebtedness.

Futhermore, debt costs are not only a function of the borrower's risk, but also of the nature of the source of financing. An important feature is that certain long-term credit lines are geared towards specific investments and have a lower financial cost compared to short-term credit lines where the credit risk to the lender is usually lower (Brito, Corrar & Batistella, 2007).

2.2 Capital Structure and Debt Maturity

In search of answers that explain what governs the financing policies in companies, Modigliani and Miller (1958) developed studies on the capital structure, to know if the way a project is financed will increase the market value of the company's shares. Through equations and examples, they came to the proposition that the market value of any company depends on

the quality of the investments made, and not on its capital structure (Modigliani & Miller, 1958). For these authors, leveraged companies cannot be better than unleveraged companies, as both have the same opportunities to raise funds. However, these hypotheses were based on the balance of a capital market under perfect conditions. Following this reasoning, they opposed the ideas of Durand (1952), a believer in traditional theory, which establishes an optimal combination of debt and equity, so that the firm's value is maximized.

After criticism received, Modigliani and Miller (1963) revised their proposals and considered the tax benefits related to indebtedness, which means that it would be more advantageous to raise funds from third parties than equity, because, with this strategy, there would be a higher level of savings tax.

Since then, several studies (Brito, Serrano, & Franco, 2018; Costa, Gartner, & Granemann, 2015; Silva, Nakamura, & Nakamura, 2017) tried to explain the factors that would lead the company to reach the optimal capital structure or what would be the determinants of the capital structure. However, making decisions about the choice of financing for a company depends not only on the choice of the level of indebtedness, but also on the maturity of the debts to enable the achievement of the firm's objectives. Thus, it is essential to know how much and when the company's future cash flow will remunerate the owners of that capital (Nakamura et al., 2011).

Theories that seek to explain the choices about debt maturity are signaling, liquidity risk, asset maturity and agency theory (Nakamura, Jucá, & Bastos, 2011). Regarding liquidity risk, Diamond (1991) developed a model that made it possible to conclude that this type of risk is related to short-term debt, and can be represented by financial leverage, which measures the degree of use of debts and preferred shares of a company. Thus, if a company obtains financing and if its ability to generate profits is greater than the cost of capital from third parties, then the remainder of this difference is the result of leverage.

Therefore, according to Diamond (1991), less indebted companies have a low level of liquidity risk and a lower debt maturity. Liquidity risk can be understood as one in which solvent companies are unable to refinance their debts due to momentary liquidity problems. So, companies that prefer short-term debt are more exposed to refinancing risk.

According to Silva, Kayo and Lima (2017), most studies that study the factors that are determinants of the capital structure do not consider that leverage can be related to the maturity of debts. In this way, they believe that both decisions can be made together and that one complements the other. Terra (2009) found that the degree of indebtedness and its maturity are complementary financial policies in Latin America.

With regard to the agency's theory, Myers (1977) argues that underinvestment can be resolved with fundraising in the short term, so that debt maturity occurs before making major growth investments, to avoid reducing the value from the company.

Thus, it is essential for companies with higher levels of intangibility to have, in their capital structure, a higher proportion of short-term debt, since they have investments in assets that are capable of making them more competitive and more profitable. In this sense, based on the theories contextualized under the focus of debt maturity, we have the following hypothesis of this study:

H1: The level of intangibility of companies listed in [B][3] is negatively related to debt maturity.

3 RESEARCH METHOD

3.1 Sample

The population of this research contains all 443 publicly traded companies listed in [B] 3, which belong to 10 different sectors of activity, according to the classification on the website of the Brazilian stock exchange. Of these, 116 companies belonging to the financial sector were excluded, due to the specificities existing in relation to the capital structure and its chart of accounts, and another 4 securitization companies out of the 11 included in the group others (which does not have a specific classification). The other companies were considered to be port, electricity and vehicle rental companies, resulting in 323 companies in the sample.

The data used are available in the Economática® database and in the financial statements of the companies found on the CVM website (Comissão de Valores Mobiliários), from 2010 to 2016.

The final sample is composed of 145 companies, as those that did not have the necessary information for calculating the variables were excluded during the entire period of analysis.

3.2 Variables

The dependent variable of this study is the debt maturity. The proxy used follows the model of Tarantin and Valle (2015), and measures the average payment period for the debts of the companies, so that each proportion of the debt is weighted by its maturity in years. Thus, a measure of time is reached that corresponds to the maturity of the debts. In the explanatory notes, it is possible to find the schedule for the payment of debts. In most financial reports, these schedules are segregated with payments in up to "5 years or more", starting from the balance sheet date.

In this sense, debts with a maturity of 5 years or more were weighted with a weight of 5 years in the calculation. The average term of debt maturity varied from 1 to 5 years, and the closer to the final value, the greater the maturity.

Despite the bias of adopting weight 5 for "5 years or more", Tarantin and Valle (2015) understand that this proxy better represents the reality of companies when compared to those that use only the classification of current and non-current. The debts considered were loans and financing, debentures and financial leases, current and non-current.

The independent variables comprise both the intentional variable, which is the level of intangibility, and the control variables. The intentional variable was measured both by the Market-to-Book and by the ratio between intangible assets and non-current assets. It is expected that there will be a negative relationship between the level of intangibility and the maturity of debts.

The control variables were based on studies already carried out, which found significance in their relationship with the maturity of debts. In this study, the variables size, asset maturity and leverage were assumed, whose arguments for their use are set out below.

a) Size

TThe theory says that the larger the size of the company, the greater the debt maturity (Gomes & Leal, 2001; Myers, 1977). Nakamura, Jucá and Bastos (2011) tested this variable and found it to be significant at the 5% level. However, in relation to the sign presented, it was different from that established by the theory. Martins and Terra (2015) and Silva, Kayo and Lima (2017) obtained a significant and positive relationship, according to the theory. In this study, it is assumed that there is a positive relationship between the size of the company and the debt maturity.

b) Maturity of assets

Myers (1977) suggests the relationship between the maturity of assets and debt in order to reduce the problems of underinvestment. This reduces agency costs between shareholders and creditors, as it ensures that debt payments will be planned. In addition, when debt maturity is less than that of assets, the company may not have enough cash to pay debts when they fall due. Likewise, if the debt is more mature, the cash flow of the assets may end while the company still has debts to pay. Thus, it is assumed that the greater the maturity of the assets, the greater the maturity of the debts. Silva, Kayo and Lima (2017) found a positive and significant relationship of these variables at the level of 1%, according to the theory presented.

c) Leverage

As presented in the theoretical framework about Diamond (1991) theory, a positive relationship between this variable and debt maturity is expected.

Table 1 shows the details of the variables used in this study.

Table 1

Variables dependent, independent and control variables used in the study

Dependent Variable				
Variable	Description / Formula			Source
Debt Maturity (DM)	Sum of each debt installment weighted with its maturity in years, where DC corresponds to current debt, divided by total debt (DT) $DM = \frac{(DCx1) + (2ºyearx2) + (3ºyearx3) + (4ºyearx4) + (5ºyearx5)}{DT}$			Tarantin & Valle (2015)
Independent variables				
Variable	Description	Formula	Expected relationship (DM)	Source
Intangibility (Market-to-Book)(MTB)	Measured by total market value of shares (VM) divided by average book equity (E)	$MTB = \frac{MV}{E}$	-	Medrado et al. (2016)
Intang2 (IN2)	Measured by the ratio between the value of intangible assets (IA)and noncurrent assets (NA)	$IN2 = \frac{IA}{NA}$	-	Parente, Luca & Vasconcelos (2015)
Size (SIZE)	Measured by natural log of total assets (TA)	$SIZE = Ln(TA)$	+	Nakamura, Jucá & Bastos (2011)
Asset Maturity (AM)	Measured by noncurrent assets (NA) divided by total assets (TA)	$AM = \frac{NA}{TA}$	+	Silva, Kayo & Lima (2017)
Leverage (LEV)	Total net debt (TD) divided by total net debt plus average equity (E)	$LEV = \frac{TD}{TD + E}$	+	Martins & Terra (2014)

3.3 Econometric Model

To test the presented hypothesis, a model of multiple linear regression was specified by the method of ordinary least squares (OLS or OLS), using the software Stata®. The sample was composed of different companies in a time series, from 2010 to 2016, to be analyzed. Therefore, the methodology with panel data was used.

Two regressions were performed with the dependent variable maturity of debts, one using the intentional independent level of Market-to-Book intangibility and the other with intangible assets in relation to non-current assets. The proposed model is presented below:

$$MATDit = \alpha + \beta 1\ NIit + \beta 2\ TAMit + \beta 3\ MATAit + \beta 4\ ALAVit + \mu \quad (1),$$

where: DMit is debt maturity; α is the intercept of the line; β are the angular coefficients; ILit is the intentional variable intangibility level measured by both the Market-to-Book (MTB) and the ratio between intangible assets and noncurrent assets (IN2). SIZEit, AMit, LEVit are the independent variables size, asset maturity and leverage, respectively. μ is the error term. Already i represents the company and t the period analyzed.

3.4 Validation of Regression Assumptions

Validation of the regression assumptions was performed by testing to verify the following problems: residual autocorrelation, heteroscedasticity, multicollinearity, and normality of the residuals.

Table 2 shows the correlations between the variables analyzed by Spearman's correlation coefficient, which expresses the degree or strength of the correlation, with a variation between -1 and +1. An association is considered strong if it is greater than or equal to the 0.70 modulus (Gil, 1999).

Table 2

Correlation matrix between variables

	DM	MTB	LEV	SIZE	AM	IN2
DM	1.0000					
MTB	0.0060	1.0000				
LEV	0.1333	0.0780	1.0000			
SIZE	0.4901	-0.0800	0.1662	1.0000		
AM	0.4646	-0.0936	0.1585	0.2811	1.0000	
IN2	0.1535	0.0723	0.0010	0.0855	0.1978	1.0000

Based on the values in Table 2, there was a weak and positive correlation between the MTB variables and debt maturity. Likewise, IN2 also showed a weak correlation. The independent variables, in general, showed a low correlation between them. Thus, according to Gil's logic (1999), there are no multicollinearity problems. For confirmation, the VIF (variance inflation factor) statistic was performed. In practice, there is multicollinearity if the VIF values are greater than 5 (Fávero et al., 2009). The VIF values, in Table 3, are, on average, 1.07 and 1.06, respectively, for models 1 and 2. With these averages, it is concluded that there is a low intercorrelation between the variables.

Table 3

VIF statistic for models 1 and 2

MODEL 1	MTB	SIZE	LEV	AM	MEAN VIF
VIF	1.05	1.10	1.04	1.11	1.07
1/VIF	0.955973	0.907210	0.964394	0.903801	
MODEL 2	IN2	SIZE	LEV	AM	MEAN VIF
VIF	1.04	1.08	1.01	1.11	1.06
1/VIF	0.958474	0.927776	0.994444	0.898062	

To verify the existence of serial autocorrelation, the Wooldridge test was performed. According to Table 4, at a level of 5% of statistical significance, there are serial

autocorrelation problems. Similarly, the Wald test pointed to the existence of heteroscedasticity.

Table 4
Wooldridge and Wald Tests

Tests	MTB	IN2
Wooldridge (Statistic)	81.681	39.971
Wooldridge (p-value)	0.0000	0.0000
Wald (Statistic)	60145.93	54606.06
Wald (p-value)	0.0000	0.0000

To correct these problems of serial autocorrelation and heteroscedasticity, in panel data, the estimated regressions in this study consider the standard errors robust. After the regression estimation, through normality graphs, it was verified the existence of normal distribution of the residues.

4 PRESENTATION AND DISCUSSION OF RESULTS

4.1 Presentation of Results

Table 5 shows the descriptive statistics for the variables. According to her analysis, on average, corporate debt maturity is 2.61 years. Considering that the proxy used allows the maturity to reach up to 5 years, this average can be considered low. According to Tarantin and Valle (2015), this demonstrates the lack of long-term loans and financing, since the proxy considers, for the weighting of debt maturities after 5 years, the value 5. Thus, the closer to this value, the greater the maturity. This average converges with that found by those authors, whose value was 2.52 years.

The analyzed companies had an average indebtedness of 30.10% and an intangibility level measured by the Market-to-Book of 1.93. Mazzioni et al. (2014) analyzed this level of intangibility in publicly traded companies in Brazil, Russia, India, China and South Africa (BRICS block) and all had an average level above 1.70. Only China achieved a level above 2.81. As a result, Brazil, compared to the other BRICS countries, presented, on average, the market value corresponding to almost twice its book value, which demonstrates that the part related to intangibles, such as trademarks and patents, is quite significant in the companies listed in [B][3] analyzed in this study.

Table 5
Descriptive statistics of variables

Variables	Mean	Standard deviation	Minimum	Maximum
DM	2.6105	0.9283	0	5
MTB	1.9294	2.0711	-6.4456	19.6954
IN2	0.2784	0.4420	0	10.9627
LEV	0.3010	0.5212	-4.1992	10.1752
AM	0.5895	0.2024	0.01299	0.9770
SIZE	22.0697	1.6446	15.4062	27.5258

Tests were made to determine which model is most suitable for estimating regression. The first test was done by Breusch and Pagan's LM. According to table 6, at a 5% significance level, there are statistical differences between the sample companies. Thus, for both regression models of this study, the null hypothesis was rejected and the model with random effects was indicated as the most appropriate.

To decide between the model with fixed or random effects, the Hausman test was performed, whose data are presented in Table 6.

Table 6
Breusch and Pagan´s LM and Hausman Tests

Tests	MTB	IN2
Breusch and Pagan´s LM (Statistic)	479.00	447.33
Breusch and Pagan´s LM (p-value)	0.0000	0.0000
Hausman (Statistic)	22.01	29.69
Hausman (p-value)	0.0089	0.0005

According to Table 6, the null hypothesis was rejected at a significance level of 5%. Therefore, the fixed effects model was used because it was the most appropriate.

The results of the regressions with fixed effects, considering the robust standardized errors clustered for each company, are shown in Tables 7 and 8. For time control, the years 2010 and 2016 were removed from the regression due to problems of heteroscedasticity.

Table 7
Model results with MTB

Panel A			
Variable	Coefficient	Standard Deviation	P-value
MTB	0.0387	0.0193	0.047
LEV	0.0317	0.0641	0.621
AM	0.0008	0.4580	0.999
SIZE	0.1232	0.1332	0.356
Control year 2011	0.0661	0.0628	0.294
Control year 2012	0.1469	0.0652	0.026
Control year 2013	0.2083	0.0641	0.001
Control year 2014	0.1933	0.0698	0.006
Control year 2015	0.0392	0.0600	0.514
Panel B			
Additional Information		Values	
R^2 within		0.0405	
R^2 between		0.2967	
R^2 overall		0.2080	
Prob > F		0.0003	

Table 8
Model results with IN2

Panel A			
Variable	Coefficient	Standard Deviation	P-value
IN2	-0.0471	0.0232	0.044
LEV	0.0286	0.0887	0.747
AM	0.0251	0.5529	0.964
SIZE	0.1509	0.1594	0.346
Control year 2011	0.0611	0.0649	0.348
Control year 2012	0.1498	0.0652	0.023
Control year 2013	0.2073	0.0659	0.002
Control year 2014	0.1746	0.0729	0.018
Control year 2015	0.0024	0.0648	0.970
Panel B			
Additional Information		Valores	
R^2 within		0.0366	
R^2 between		0.3584	
R^2 overall		0.2470	
Prob > F		0.0012	

4.2 Discussion of Results

From these results, it was verified, by the p-value, that the degree of Market-to-Book intangibility showed a statistically significant relationship with the variable debt maturity at a 95% confidence level. With the inclusion of variables for time control in the regression, the relevance of the years in the survey was confirmed, so that 2012, 2013 and 2014 were significant at a level of 5%.

According to the coefficient presented, the relationship between Market-to-Book and debt maturity is positive. The hypothesis of this research is that more intangible companies have lower debt maturity. Thus, the result found opposes with the expected relationship.

The Market-to-Book is a relative measure that indicates that the greater the degree of intangibility, the greater the relative share of intangible assets in the company's investment structure. When greater than 1, the degree of intangibility shows that the market is valuing something that is not being registered and captured by market accounting or that it may be, but in an incomplete way (Vasconcelos et al., 2013). If the measure is less than 1, it indicates that the market does not recognize what is accounted for. The average presented by the descriptive statistics is approximately 1.93 times the book value. This difference, according to Gilio (2010), corresponds to investments in brands, in research and development and in human capital, which, added to goodwill, generate value for the company. This index represents that the agents participating in the market create perspectives of good results for the company in the long run.

An important feature of the Brazilian market, according to Brito, Corrar and Batistella (2007), is the fact that certain long-term credit lines are focused on specific investments and have a lower financial cost when compared to short-term credit lines, where the credit risk to the lender is usually lower. By rejecting the research hypothesis, this feature of Brazil justifies this result, demonstrating that long-term credit lines are restricted and usually directed to financing specific investments, which in this case are intangible, which generate expectations in the market such as trademarks and patents, research and development.

Thus, by raising funds from third parties in the long term and investing in intangibles that generate future expectations, the level of intangibility, as it increases the company's growth expectations and, consequently, the price of its shares.

In addition, Martins and Terra (2015) pointed out that one of the reasons for long-term fundraising may be because they are companies that operate in a less developed financial market when compared to the US market. For this reason, they may suffer greater liquidity risk. According to Diamond (1991), companies with greater liquidity risks have the incentive to acquire debts, preferably those with greater maturity.

The other variables were not statistically significant, but showed a positive relationship with the maturity of debts. In relation to the maturity of the assets, the relationship found converges with that of Silva, Kayo and Lima (2017), demonstrating that the greater the maturity of the assets, the greater will be the debt, since Myers (1977) suggests the relationship between these deadlines in order to reduce underinvestment problems. This reduces agency costs between shareholders and creditors, as it ensures that debt payments are planned.

Likewise, the size corroborates the relationship found by Martins and Terra (2015) and Silva, Kayo and Lima (2017), in which larger companies have lower agency costs, as the monitoring of external analysts is greater because they have easy access to the capital market (Ozkan, 2002).

The relationship of the leverage with debt maturity is in line with Diamond (1991), since more indebted companies prefer long-term debt in order to reduce the frequency of debt service, as they are more subject to liquidity risk.

The model with Intang2, shown in Table 8, demonstrated that only the intangibility intentional variable was statistically significant at a level of 5%. In the same way that the regression with Market-to-Book demonstrated the significance of the years when they were inserted in the model, in this, too, they were significant at a level of 5%. Regarding the coefficient, Intang2 was shown to be negatively correlated with the maturity of debts, unlike the Market-to-Book. This means that the more intangible assets the company has in relation to its non-current assets, the lower the debt maturity.

The proxy used for the Intang2 intentional variable considers the proportion of intangible assets in relation to non-current assets. Unlike Market-to-Book, it considers the degree of intangibility of assets that are recognized in accounting. Thus, when considering these assets, the research hypothesis was accepted, and the higher this level of intangibility, the lower the debt maturity.

This result showed that companies with more intangible assets registered in the balance sheet make more use of short-term debt in order to minimize the problem of underinvestment. Moreover, considering the singularities of the Brazilian market cited in the literature review, this result demonstrates the strong restriction of long-term third party capital sources in Brazil.

Similar to model 1 of table 7, in this model, the control variables were positively related to debt maturity, demonstrating the fulfillment of the theories presented.

5 FINAL CONSIDERATIONS

This study analyzed the significance and relationship between the level of intangibility and debt maturity. For this, was used a sample of 145 companies listed in [B]^3, from 2010 to 2016, which provided information available in explanatory notes on debt maturity. In addition, only companies that had intangible assets, in their equity composition, were considered.

Existing theories present possible justifications for the relationship between the variable debt maturity and intangibility. The Market-to-Book was used to measure the level of intangibility, as well as the ratio of intangible assets to non-current assets to represent the intangibility present in the company's composition. The results showed that the degree of intangibility represented by both the Market-to-Book and the proportion of intangible assets in relation to non-current assets, has a significant influence at 5% on the maturity of debts, considering the control variables.

By analyzing the relationship between intangibility and debt maturity, when considering brands, research and development and human capital, which are more difficult to measure and recorded in accounting, the relationship was positive, contrary to the theory but confirming the market specificities in which long-term credit facilities are restricted and usually directed to financing specific investments. In considering the intangibles recorded in the balance sheet, they were negatively related to debt maturity, confirming Myers's (1977) theory of underinvestment and the strong constraint on long-term third-party capital sources in Brazil.

This research is relevant because it shows that companies that are overvalued in their market value, either due to trademarks and patents, or research and development, have a higher proportion of debt with maturity closer to the limit of the model used. This

demonstrates that the financial market sees them with good eyes and places more mature debts at their disposal. The opposite result found, through the values recorded by accounting in intangible assets, is not enough for companies to be able to have access to more mature debts, as they are restricted. One reason for this result is that the amounts recorded in balance sheets can be managed and manipulated.

Thus, this study contributes to the theme investigated by demonstrating that the level of intangibility that companies have is able to influence the maturity of their debts. In addition, by using market values and book values, it was possible to contribute to the literature on the distance between these values, showing that intangible assets are reflected in a company's market value and, therefore, are important and observed by shareholders and creditors for their ability to generate cash flows.

The biggest limitation in this study was to establish a proxy to measure the maturity of debts that represents the real situation of companies instead of simply considering the classification of current and non-current debts. Thus, the proxy used sought to represent this reality, but it presents a bias when considering that debts with maturities greater than 5 years were weighted with a value of 5, then varying from 1 to 5 years.

As a suggestion for future research, it is recommended to extend the sample compared to other countries and, also, the time series, as well as the use of other measures that represent the level of intangibility and other proxies that represent the maturity of debts.

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A Influência do Nível de Intangibilidade na Maturidade das Dívidas das Empresas Listadas na [B]³

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RESUMO

***Objetivo**: analisar se os ativos intangíveis influenciam a determinação da maturidade das dívidas e compreender a forma com que essas duas variáveis se relacionam em empresas de capital aberto listadas na [B]³ (Brasil, Bolsa, Balcão).*
***Método:** foram usadas técnicas econométricas de regressão com dados em painel, com a estimativa feita por meio de efeitos fixos, conforme a adequação às variáveis apresentada pelos testes realizados. A amostra consiste de 145 companhias, analisadas no período de 2010 a 2016.*
***Originalidade/relevância:** o estudo destaca-se por analisar a influência que os ativos intangíveis têm sobre a maturidade das dívidas das empresas.*
***Resultados:** o grau de intangibilidade das empresas influencia positivamente a maturidade das dívidas mediante o Market-to-Book e influencia negativamente pela proporção do ativo intangível em relação ao ativo não circulante, em um nível de 5% de significância. Essa relação ocorreu porque o Market-to-Book considera valores de mercado, enquanto a outra medida utiliza dados do balanço patrimonial.*
***Contribuições teóricas/metodológicas**: além de verificar a teoria de Myers (1977) sobre o subinvestimento, os resultados mostraram que as decisões de maturidade das dívidas envolvem os ativos intangíveis demonstrando a forma que o mercado enxerga essas firmas em relação aos fluxos de caixa anormais que esses ativos são capazes de gerar.*

***Palavras-chave**: Ativos intangíveis; Maturidade das dívidas; Market-to-Book; Nível de intangibilidade.*

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