BBR
BRAZILIAN BUSINESS REVIEW

ARTICLE

The Effects of Monetary Policies on the Capital Structures of the Firms

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ABSTRACT

The purpose of this paper is to analyze the influence that monetary policies have on the financing decisions of Brazilian corporations. From this purpose, two hypotheses will be derived. The study sample is composed of 220 companies: 84 of consumer goods, 89 of capital assets, and 47 of public utility. The data collected refer to the years from 2009 to 2019, and the methodology used for data analysis is through quantile regressions and panel data models, using the GMM approach. According to the results, it can be concluded—in the light of the market timing theory, in line with the Austrian theory of economic cycles—that the capital structures of firms can be determined by the market moments, as defined by monetary policies, so that such influence is different depending on the sector to which the companies are located in the production chain.

KEYWORDS

Capital structure, Market timing theory, Austrian business cycle theory

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Received: 06/10/2021.
Revised: 02/21/2022.
Accepted: 03/10/2022.
Published Online: 09/12/2022.
DOI: http://dx.doi.org/10.15728/bbr.2022.19.6.1.en

1. INTRODUCTION

Understanding the factors influencing the choices of the capital structure of firms is a matter deeply covered by academic research, and is also a topic of interest to owners, managers and creditors, since the cost of capital can determine the continuity of firms. In this regard, there is the construction of theories that seek to explain what are the determinants of the financing structures of firms among which market timing is observed.

Baker and Wugler (2002), based on works such as those by Taggart (1977), Jalilvand and Harris (1984), Asquith and Mullins (1986), Rajan and Zingales (1995), developed the theory of market timing, according to which the capital structure of a firm is the result of the past accumulation of attempts to take advantage of favorable conditions of the stock market by its managers.

Furthermore, Huang and Ritter (2009) observed the external financing decisions of firms through an equity risk premium. The authors pointed out that companies guarantee a significant part of their investment needs by using a debt when the market risk premium is high, resulting in high indebtedness for consecutive periods.

As studied by Albanez (2012) and Albanez (2015), a gap in the market timing theory is due to market moments in which the costs of third-party capital vary favorably in favor of firms contracting debt. Thus, the author, in her empirical analysis, works with two metrics for the cost of third-party capital, one of which is based on the credit rating of companies and the other on the average cost of onerous liabilities. The results revealed that the higher the cost of debt, the lower the use of debt as a source of financing.

In this regard, an explanation of the variations in the costs of third-party capital can be found in the theory of business cycles of the Austrian school – as presented by Mises and Batson (1953), Mises (1998), Garrison (2001), Hayek (2008), Soto (2009). As stated by the authors, the manipulation of monetary bases and interest rates carried out by Central Banks results in a higher level of investment and indebtedness in firms of which productive projects require more time to be carried out (such as firms of capital assets), compared to companies of which projects require shorter deadlines (such as firms of consumer goods).

As the control of monetary bases is carried out by Central Banks with the financial sector, increases in monetary aggregates flow to the economy through debts obtained by the productive sector from these financial institutions, thus influencing their capital structures, depending on the market timing of the fall in the cost of third-party capital.

In line with the theory of business cycles of the Austrian school, empirical studies on the capital structures of firms – such as those by Eriotis et al. (2002), Serrasqueiro (2011), Javed e Imad (2012) and Mujahid and Akhtar (2014) – found that firms have different capital structures, depending on the type of activity. In addition, other studies - such as those by Brierley and Bunn (2005), Frank and Goyal (2003), Vithessonth et al. (2017) and Alter and Elekdag (2020) – have highlighted the presence of monetary policy effects on the level of leverage of firms within the markets of several countries, such as Germany, Switzerland, Thailand, the UK, the USA, and China.

In Brazil, between 2009 and 2019, the monetary aggregates M1 and M2 increased by approximately 80% and 158%, respectively. During the same period, the Selic rate had a minimum value of 5% and a maximum value of 14.25%. These percentages show an expansionary scenario of monetary policies and their effects on interest rates in the Brazilian economy. That said, in the light of the mentioned theories, the empirical results presented by the literature and

the Brazilian monetary scenario, we have the present issue of research: **What are the impacts of monetary policies on the capital structures of companies in the different sectors listed on the B3 in the last decade?**

Therefore, the purpose of this study is to analyze the influence that monetary policies have on the financing decisions of Brazilian corporations. Thus, the purpose of this paper is to fill an important gap in the finance literature by verifying the behavior of manipulation of the money supply in the levels of indebtedness of entities, both in aggregate terms and by sectors. This analysis is done with methodological and theoretical robustness, by the sum of theories of finance and economics estimated in econometric models tested in other markets of global relevance. In this way, this research will complement the literature that studies the impacts of monetary policies and macroeconomic variables on corporate finance, particularly with regard to the capital structures of publicly traded firms in Brazil.

The study sample is composed of 220 companies: 84 of consumer goods, 89 of capital assets and 47 of public utility. The data collected refer to the years from 2009 to 2019. The methodology used for data analysis is through quantile regressions and panel data models, using the GMM approach, prepared based on the works of Baker and Wurgler (2002), Huang and Ritter (2009), Albanez (2015), Yang et al. (2017) and Alter and Elekdag (2020). As for the results, it was possible to observe that the capital structures of firms can be determined by the market moments, defined by monetary policies, so that such influence is different depending on the sector to which the companies are located in the production chain.

2. THEORETICAL REFERENCE

2.1. Theory of market timing

After research pointing out to the tendency of firms to issue shares when their market value is high compared to their book value, Baker and Wurgler (2002) developed the articulation of the theory of market timing. In this regard, the authors verified the impact of the index market-to-book – a proxy used to measure market timing opportunities perceived by managers – on the level of leverage of firms, as well as whether its effects were persistent enough to explain the changes in the capital structure.

An approach presented by the theory of market timing is directed towards the pricing error of capital markets, in which the opportunity to issue overvalued shares leads firms to finance themselves in greater proportion with their own capital. In this case, based on agency theory, companies issue shares when they assess that they are overvalued, and repurchase them when they see that they are undervalued. Therefore, the index market-to-book index can be used as a proxy for managers' perception of possible measurement errors by the market, being negatively related to debt issuance and positively related to equity issuance (Baker & Wurgler, 2002).

Baker and Wurgler (2002) also explain that short-term impacts of the index market-to-book can be observed on the capital structure, even if entities later seek optimal structures such as those recommended by the trade-off theory. In these cases, the effects of market timing on capital structures will not be persistent in the long-term. The results of the empirical part indicated that high market values reduce leverage in the short-term and that high historical market values are related to low indebtedness, with these effects persisting for several years. Thus, the convergence of these results indicates that the effects were persistent in determining the capital structure, reflecting the accumulation of past attempts at market timing.

Adding to this theory, Huang and Ritter (2009) analyzed the determinants of indebtedness decisions of North-American firms through the Equity Risk Premium (ERP). This variable was more relevant after the market-to-book variable. These authors observed that companies secure most of their investment opportunities by using debt at times when ERP is high, resulting in high indebtedness for consecutive periods.

The authors also observed that firms cover their financial deficits by issuing shares when the cost of equity capital is low. Thus, it was verified that this market risk premium has persistent effects over time on capital structures and that, therefore, these results also contribute to the market timing theory (Huang & Ritter, 2009).

In the construction and testing of this theory, it should be noted that the main approach verified by market timing studies focuses on favorable or unfavorable market moments for the issuance of shares, that is, the focus is on managers' assessment of the cost of equity capital. There may be market moments, however, in which the cost of third-party capital varies favorably in favor of firms contracting debt, and this was the gap explored by Albanez (2015).

In this regard, Albanez (2012), adding to the work of Huang and Ritter (2009), aimed to examine the behavior of market timing in Brazilian public companies, empirically observing the existence and persistence of opportunistic behavior when choosing between different sources of financing. For this, it examined the effects of market timing on the capital structure, relating the leverage levels of these firms to the cost of equity and debt indicators.

Albanez (2012), in his empirical analysis, used two samples: the first was composed of 235 companies, analyzed in the period 2000-2011; the second was composed of 75 companies with credit ratings assigned by risk rating agencies, analyzed in the period 2005-2011. Two proxies were used for the cost of debt, one based on the average cost of onerous liabilities and the other based on the credit rating of firms (the latter being tested only for the second sample). The calculation of the first proxy is formalized as follows:

$$Kd_{liq} = \frac{Fin.exp\ x\ 0.66}{Average\ interest - bearing\ liabilities} \quad (1)$$

Where:
Kd_{liq}: cost indicator of third-party capital, net of taxes;
Fin.exp X 0.66: financial expense net of taxes in t, considering the tax rate of 34% (25% of Income Tax and 9% of Social Contribution);
Average interest – bearing liabilities: arithmetic mean of onerous liabilities at t and t-1;
Interest-bearing liabilities: financing, debentures and financial leasing of short and long-term. (Albanez, 2012, p. 146)

This is one of the most common methods for estimating the cost of third-party capital, measuring the average cost of onerous liability through the information contained in the balance sheet, being, therefore, an ex-post cost measure when considering historical debt values and financial expenses. The other third-party cost of capital indicator was collected through credit ratings (obtained from the Bloomberg database), at the end of each year, of the 75 Brazilian companies

active on B3 with data available for the study. Securities with ratings AAA, AA, A and BBB were considered to be of higher quality and lower risk of default. The other bonds were considered speculative because they present a high risk in relation to other bonds (Albanez, 2012).

By inserting these variables into the models, the results obtained indicated that the higher the cost of debt, the lower the leverage, and the higher the cost of equity, the higher the level of indebtedness. Thus, the authors observed that the proxies for the cost of capital emerged as the most significant variables, exerting a strong influence on the determination of the capital structures of firms. Therefore, the results obtained by Albanez (2015) corroborate the market timing theory, demonstrating that firms observed the costs of different sources of funds, thus seeking to reduce their capital costs.

In more recent research, Alter and Elekdag (2020) investigated the hypothesis of a relationship between US monetary policy and the growth of corporate leverage in emerging countries. Using panel VAR modeling, for a sample of 800,000 firms, the authors confirmed that North-American monetary policy is associated with faster growth in the leverage of firms. The impact is more pronounced for companies that are financially constrained and whose domestic monetary policy is more in line with that of the United States.

Thus, the results presented by Alter and Elekdag (2020) suggest that global financial conditions affect the leverage growth of companies in emerging countries, influencing their interest rates. The authors also state that, while increased corporate leverage may be accompanied by productive investment and economic growth, these results appear to validate concerns that some loans may have been overly allocated to riskier companies during these episodes.

2.2. Austrian Theory of Business Cycles

Hayek (2008) defends that decisions between savings and investment in an economy should be made by an interest rate conducted only by the market and explains that the market is sensitive to the interest control carried out by Central Banks. Likewise, investment and consumption represent dichotomous functions of resources. In a full-employment economic situation, resources are allocated to both utilities, obtaining the maximum benefit from this trade-off.

Thus, Garrison (2001) uses the Production Possibilities Frontier (PPF) to highlight the definition of scarcity when demonstrating theories about capital and interest. "Investment" consists of the sum of net investment (which allows the economy to grow) and the investment needed to replace obsolete, depreciated or exhausted capital. Positive net investment denotes the growth of the economy. In this regard, as shown in Figure 1, the PPF expands year after year, from point A to point B, enabling increasing rates of consumption and investment. In this case, the expansion of the PPF denotes sustainable economic growth.

The level of PPF growth requires several factors. A variation in savings – which triggers a movement in the initial PPF from point A to point A`, as shown in Figure 2 – changes the way PPF develops. Looking to the future, consider that a population becomes more economical. Necessarily, it will decrease current consumption, increasing savings. This increase in saving enables a higher level of investment, so that the economy expands at a higher rate, with B`>B.

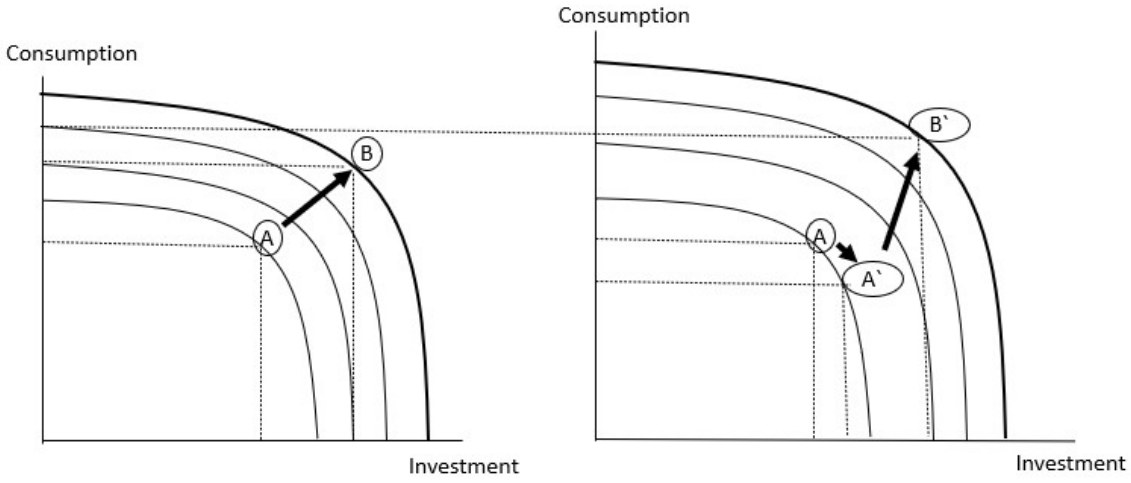

Figure 1. Growth of the production possibility frontier
Source: Garrison (2001)

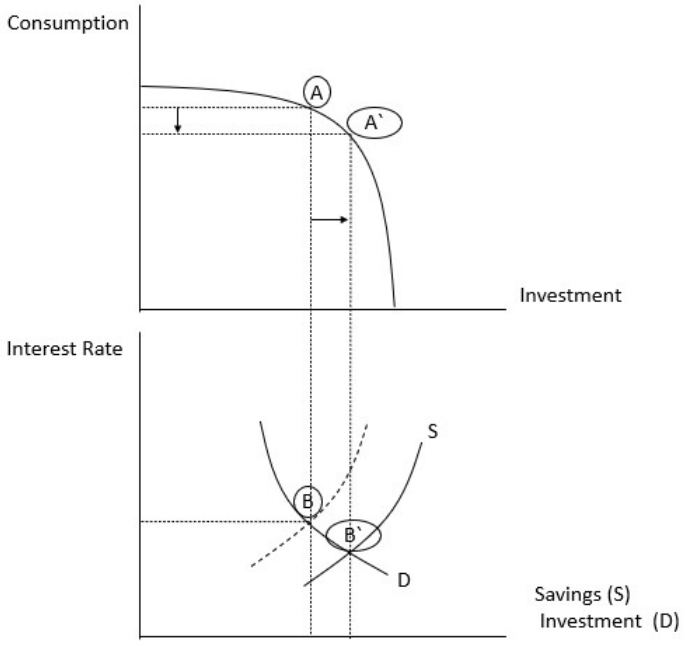

Figure 2. Frontier of production possibilities and the credit market.
Source: Garrison (2001).

As also shown in the model of Solow (1956), if there is no increase in savings, investment and consumption expand at a lower rate. That is, at a first moment, investment grows in opposition to consumption. Subsequently, due to higher initial investment, consumption and investment expand at a higher growth rate. Thus, the reduction in consumption at the beginning of the period (savings) enabled a higher level of future consumption.

Authors such as Mises and Batson (1953), Hayek (2008) and Soto (2009) use the structure of the credit market when theorizing about the relationship between interest rates, investments and savings. Thus, if agents change their time preferences, becoming more fond of long-term, there

is an increase in their savings, leading to a drop in the interest rate. Therefore, there is greater incentive for entrepreneurs to invest in more projects. In this regard, *ceteris paribus*, savings/investment are the determinants for legitimate economic growth, in which the balance between investment (D) and savings (S) generates the value of the interest rate in a market economy.

In this case, as shown in Figure 2, the reduction in consumption and the increase in savings move the value of the interest rate to a lower level (B>B`). A lower interest rate grants a new break-even point in the market. The economy moves along the length of the PPF, seeking, at the present time, a lower level of consumption and a higher level of investment.

Therefore, the credit market shows how the interest rate provides a synchronism between investment and savings. PPF, on the other hand, shows how the trade-off is limited between investment and consumption. That is, movements along the PPF necessarily result in opposite movements between investment and consumption. Therefore, adjustments to the market prices of inputs, wages, and final products allow the economy to operate to the extent of its PPF.

According to Keynes (2017), in turn, reductions in consumer spending result in an excess of inventories, causing production cuts and layoffs, which generates a decrease in income and expenses. In this spiral, the economy would enter a recession and entrepreneurs would incur less investment.

From the approach of the macroeconomics of capital, there is a mistake in Keynes'(2017) theory when he disregards the entire structure of production subdivided into stages, analyzing only the aggregate in the short term. A lower interest rate derived from an increase in savings encourages long-term projects, such as industrial construction or the development of new products.

In the preparation of Böhm-Bawerk (1890) and Menger (2012), capital goods have heterogeneous characteristics. The production structure is composed of final consumer goods (first-order goods) and capital goods (higher-order goods), relating to the different stages of production through different levels of complementarity.

In Figure 3, the AC leg illustrates the temporal extension, quantified by the number of stages, considering that the number of stages fluctuates in direct function with the time of the production chain. The BC leg shows the total produced of consumer goods. The hypotenuse AB represents the production function. The several stages of production into which the AC leg is subdivided constitute capital goods, quantified in measures of value.

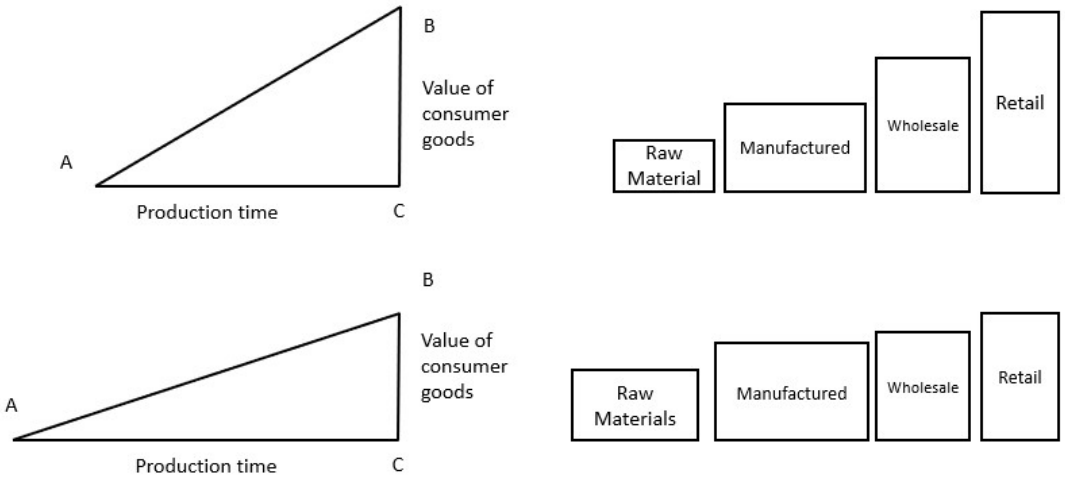

Figure 3. Hayekian Triangle
Source: Hayek (2008)

A key point for the theory of cycles is the mutual correspondence between the plans of producers and consumers and the plans of investors and savers (Hayek, 2008). Thus, the triangle illustrates the trade-off recognized by Böhm-Bawerk (1890) and Menger (2012), in which investments grow at a given moment to the detriment of consumption and in the absence of idle resources. Therefore, for Hayek (2008), the time axis of the triangle is expanded by investments that demand an application of resources that spend more time in execution.

Ceteris paribus, changes in intertemporal preferences will change the shape of the triangle as a consequence of the oscillation in the predilection to save, reducing cyclical expansions. Once the reformulation of the productive chain is completed, the equivalent level of consumption will be higher, since, to be maintained, the new production structure will demand greater expenditure on capital goods compared to those disbursed previously (Hayek, 2008).

As shown in Figure 4, in an economic situation of growth, the triangle increases its size simultaneously with the increase of the production possibilities frontier.

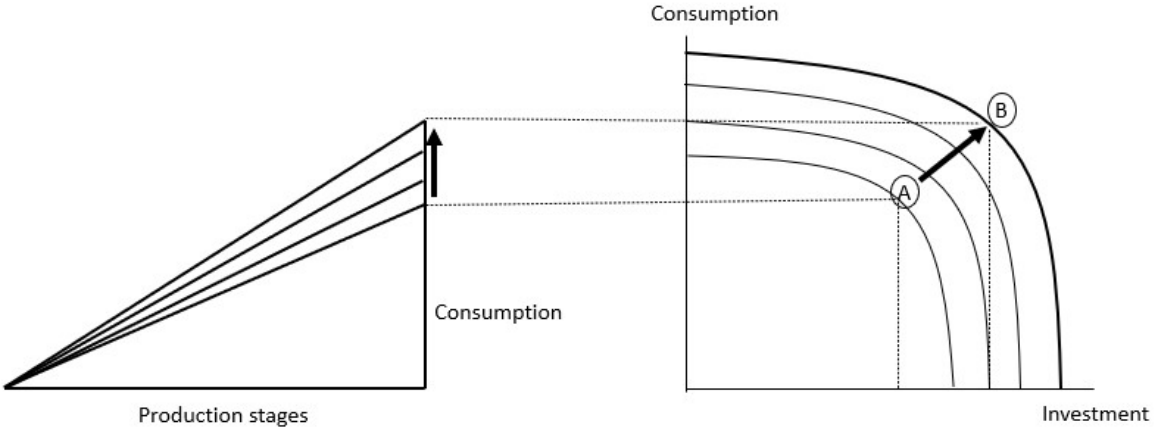

Figure 4. Expansion of the frontier of production possibilities and Hayek's Triangle.
Source: Garrison (2001)

An increase in savings generates two consequences acting on the capital structure in a complementary way: i) consequence arising from demand - the lower demand for consumer goods discourages investments in the last stages of production, shortening the vertical part of Hayek's triangle (2008); and ii) consequence of the discount rate - a lower interest rate encourages investments in the preliminary stages of production, extending the horizontal part of Hayek's triangle (2008). Figure 5 illustrates this situation.

At a first moment, greater savings have consequences for the intensity of investment and the formation of capital in its temporal form. As provided by Hayek (2008), the triangle shows that capital promotion is reduced in the last stages of production (retail warehouses, for example), while capital formation increases in the preliminary stages (mineral exploration, for example). In this case, in the production chain, there is a greater interest directed towards the future, which is in line with the savings that made this reformulation possible. That is, individuals are saving in the present with a view to increasing consumption in the future.

As shown by the PPF and the Hayek's Triangle (2008) (Figure 6), consumption reduces, at first, from point A to point A`. Due to the investments made, however, by the reduction of interest derived from the increase in savings, the consumption growth rate exceeds the previous

one, in order to provide the economy with a higher level of consumption in the future, passing, in a second moment, from the A` to point B`. That is, consumption reduces at the same time that the economy shapes itself to a higher growth rate, so that consumption grows at a higher rate than the previous one, surpassing the previously projected growth course.

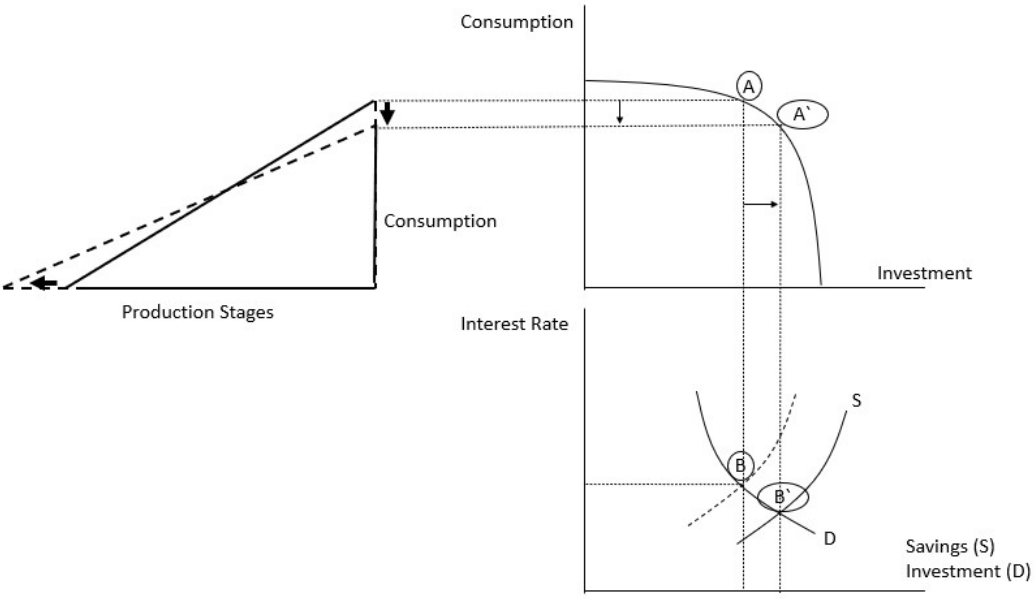

Figure 5. Savings effects on PPF, the credit market and the Hayek's Triangle.
Source: Garrison (2001)

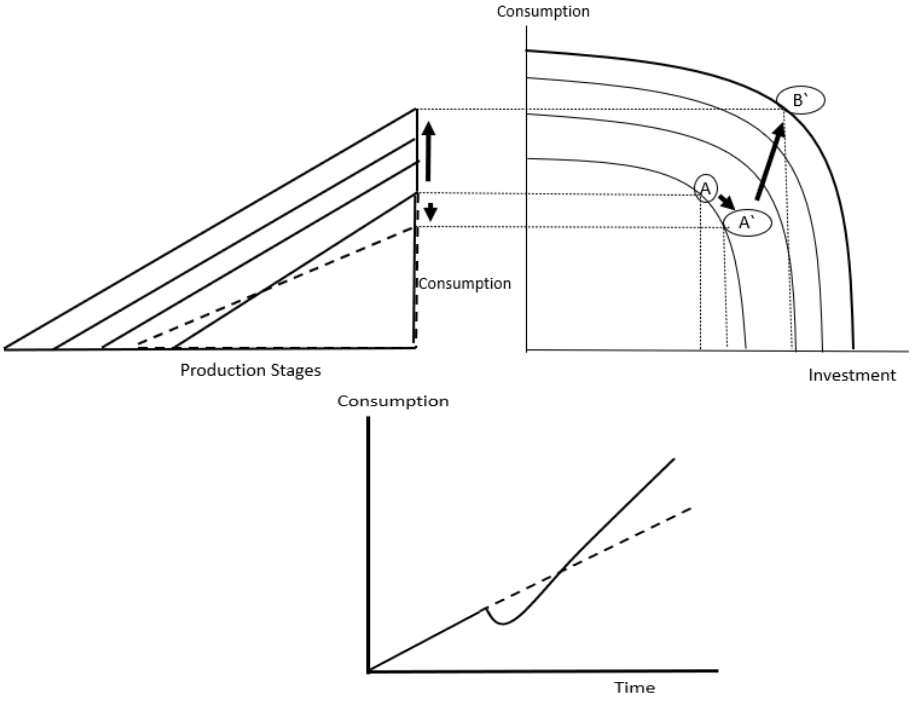

Figure 6. Effects of savings on HGS and Hayek's Triangle (second stage).
Source: Garrison (2001)

When Central Banks, in turn, increase the monetary base in circulation, the growth of the money supply flows into the economy through the credit markets, as if it were savings (Mises, 1998). That is, the supply of borrowing resources moves to the right regardless of any growth in savings. Figure 7 shows, on the supply side, the antagonistic paths of investment and savings when the Central Bank adds monetary base to the credit market (+ΔM).

As a result of a lower interest rate, individuals tend to consume more and save less. This new monetary base causes an imbalance that, in the initial moments, is hidden by the growth of more credit (Soto, 2009). Thus, this increase in the monetary base in the credit markets develops a mismatch between investment and savings.

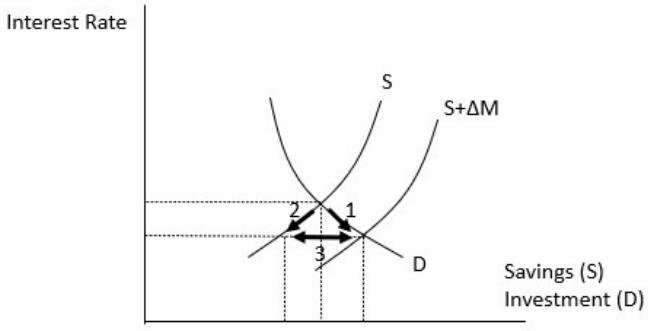

Figure 7. Effects of credit expansion on the credit market.
Source: Garrison (2001)

As shown in Figure 8, investors, taking advantage of lower interest rates to obtain loans, move along their demand curve, as illustrated by arrow (1). Savers, reacting to a lesser stimulus to accumulate savings, move along their unchanged (S) curve, as illustrated by arrow (2). The divergence between investment and savings is camouflaged by the new money offers, which, per se, do not reflect new resources, as shown by arrow (3).

Thus, these credit conditions encourage greater investments, generating a clockwise movement through the extension of the PPF (arrow 1). As wage earners are consuming more due to the trade-off between consumption and savings, there is a counterclockwise shift in the extension of the PPF (arrow 2). This contrast between investment and savings leads to a conflict between investors and consumers. Analyzing the dimension of investment (arrow 1) and the dimension of consumption (arrow 2), it is observed that the increase in credit has an economic result at a point beyond the limits of the PPF (arrow 3).

The low interest rate, consistent with a more forward-looking orientation, encourages investment in the early stages of the production chain. But without sufficient resources saved, a considerable part of these investments will not be completed. In addition, the increase in consumer demand drives part of the resources to the final stages of the production chain, reducing more emphatically the means of meeting the resulting capital structure (Mises, 1998).

The dynamics of this cycle generates both excessive investments (bad investments) and consumptions in addition to a natural rate (overconsumption), as shown in the PPF diagram and in the elongation of the Hayekian triangle (Figure 9). Disagreement between investors and consumers drives the economy beyond the limits of the PPF. Lower interest rates lead to investment. On the other hand, the limitations of resources present themselves as an impediment for economic production to reach the point beyond the PPF limits. According to Hayek (2008), these temporarily disconnected production chain triangles convert economic growth into a depression, and presumably into a crisis, thus generating economic cycles.

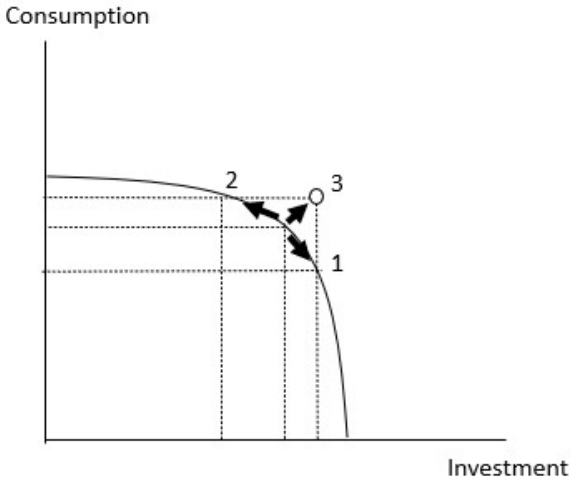

Figure 8. Effects of credit expansion on the frontier of production possibilities.
Source: Garrison (2001)

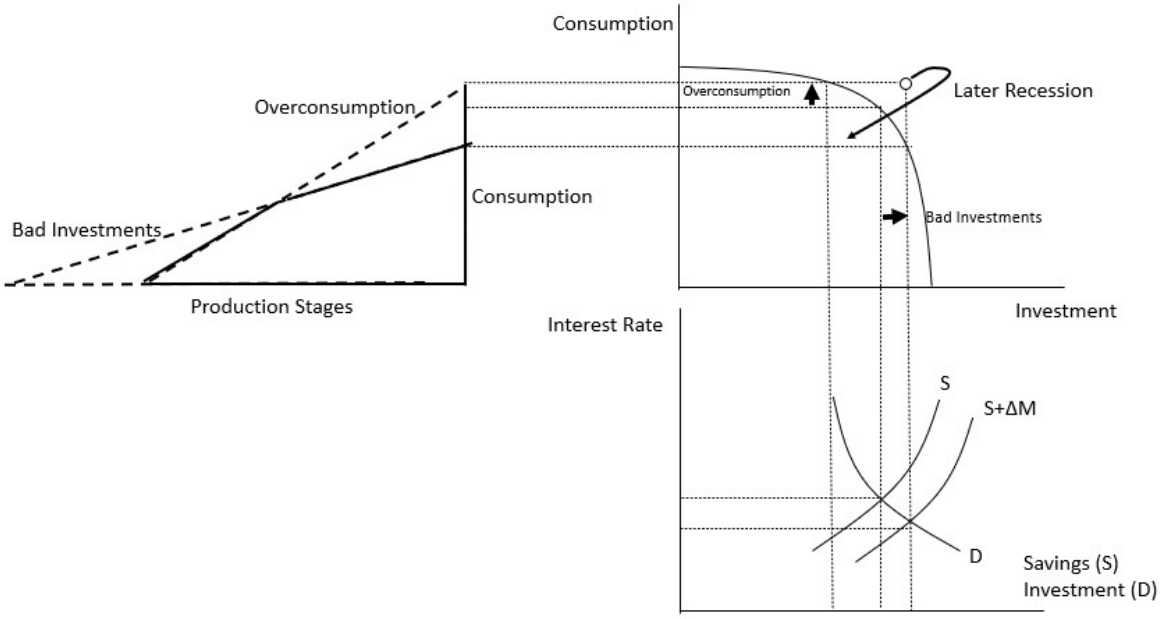

Figure 9. Effects of credit expansion on the PPF and on the Hayek's Triangle.
Source: Garrison (2001)

Thus, at the beginning of the economic cycle, the expansion of the monetary base encourages production; however, it generates distortions in the allocation of resources due to the temporal differences of the productive sectors. At the end of the economic cycle, with the economy in depuration, the decrease in the interest rate delays the productive recovery due to the continuous temporal disagreement of investments in the production chain. Therefore, the Austrian school also deals with the non-neutrality of currency, so that the expansion of the monetary base affects firms in different ways, depending on the sector and phase of the economic cycle in which the economy is present. That is, according to the neo-Keynesian view, the monetary policies carried out by the Central Banks play a positive role for economic development, while, for the Austrians, these monetary policies are the ones that maximize or cause economic crises.

2.3. Research Hypotheses

Considering the theoretical framework presented by the sum of market timing theories and the theory of business cycles of the Austrian school, together with the reported empirical evidence, two research hypotheses are established. The first hypothesis tested was:

- **H1:** Monetary policies are relevant to explain the leverage of the aggregate of Brazilian firms listed on B3.

Still taking into account the Austrian economists, monetary policies exert different influences on companies, depending on their sector in the production chain. Therefore, the second hypothesis tested was:

- **H2:** Monetary policies have a greater impact on the indebtedness of firms, depending on the production sector.

3. METHODS

3.1. Sample

The sample consisted of companies listed on B3, with annual data available during the period from 2009 to 2019, according to classifications presented by Economática®, and which presented the necessary data for this paper. The initial database (675 non-financial companies) was made up of all firms from all sectors that already had negotiations carried out in the analyzed period. The financial sector was excluded due to its accounting differences in the charts of accounts in relation to the other sectors, in addition to being the sector corresponding to the transmission channels of monetary policies between BACEN and the productive sector.

After excluding companies from other sectors that did not contain the historical series of variables necessary to meet the objectives outlined, the final sample totaled 220 companies, representing 32.59% of the initial universe (Table 1).

This period is justified by the post-2009 global crisis, during which BACEN adopted expansionary monetary policies as anti-crisis measures. In addition, in that period, there was a process of convergence of accounting standards. This provides greater standardization of accounting information in the time frame used.

As there is a significant number of public sector companies in the Brazilian market (predominantly in the electricity sector), it was decided to analyze the data beyond what was described by the Austrian school. Therefore, public utility firms are added to the consumer goods and capital goods sectors, which are used as a control group in the construction of sectoral dummies.

3.2. Variables of study

Based on the work of Baker and Wurgler (2002), Huang and Ritter (2009), Albanez (2015), Yang et al. (2017) and Alter and Elekdag (2020), Table 2 is presented, which describes the relationship between the variables surveyed to test the hypotheses.

Table 1
Economic sectors of B3.

Consumer goods	Quantity	Total
Cyclical Consumption	66	
Non-Cyclical Consumption	18	
Total		84
Capital goods	Quantity	
Industrial goods	51	
Basic Materials	30	
Oil and Gas	8	
Total		89
Public Utility	Quantity	
Others	8	
Public Utility	39	
Total		47
Total		220

Source: Economática®.

For accounting and financial information, data were collected on the B3 website and on the Economática® platform. All monetary variableswere collected at the Central Bank of Brazil (BACEN).

3.3. Quantile Regression Model (QR).

In the first stage of data collection, this study uses the econometric technique of quantile regression (QR) to verify the specific behavior of monetary policy proxies (M1, M2, Selic, SelicHp and TJLP) on firms' leverage. The QR allows verifying sample behaviors evidenced by specific partitions of the sample under analysis. In this sense, the QR has advantages over the multiple linear regression model with estimation using the Ordinary Least Squares Method (OLS).

In this context, among the advantages, Koenker and Bassett (1978) state that the QR does not presuppose the need for a Gaussian distribution of the data under analysis. Another advantage is the fact that this econometric modeling is more robust in the presence of outliers. There is also that the QR can be evidenced from a linear programming model, which provides greater ease in relation to the estimation of the parameters of the proposed model. Also, according to the authors, multiple linear regression models demand assumptions linked to the variance of residuals and sensitivity to outliers. Faced with such adversities, QR is able to provide more robust parameters.

It is also necessary to highlight that the QR presents the possibility of characterizing the non-homogeneous conditional distribution of the response variable when analyzed in relation to the predictors used. The use of the bootstrap resampling method to estimate the parameters of the proposed model is capable of correcting possible inconsistencies caused by other methods of inference of parameters (Koenker, 2004).

Table 2
Description of the variables used to test the hypotheses.

Attribute	Acronym	Proxy	Sign Expected
Dependent Variables			
Leverage	*Lev*	Interest-bearing liabilities / Owners' Equity	
Variables of Interest			
Rate of change of M1	*ΔM1*	$(M1_{t+1} - M1_t) / M1_t$	Positive
Rate of change of M2	*ΔM2*	$(M2_{t+1} - M2_t) / M2_t$	Positive
Rate of change of Selic	*ΔSelic*	$(Selic_{t+1} - Selic_t) / Selic_t$	Negative
Selic smoothed by HP filter	SelicHP	*Selic – HP da Selic*	Negative
Variation rate of TJLP	*ΔTJLP*	$(TJLP_{t+1} - TJLP_t) / TJLP_t$	Negative
Control Variables			
Size	*Tam*	*Ln* (Net Operating Revenue)	Positive
Tangibility	*Tang*	Fixed / Assets	Positive
Profitability	*Rent*	Return on Assets (ROA)	Positive
Market-to-Book	*M/B*	Asset at Market-Value / Asset at Book-Value	Negative
Liquidity	*LC*	Current Assets / Current Liabilities	Negative
Exchange	*ΔDol*	$(Dolar_{t+1} - Dolar_t) / Dolar_t$	Positive/ negative

Source: self-preparation
Notes: i) M1 (Restricted Methods of Payment) = paper money held by the public, plus demand deposits; ii) M2 (Extended Payment Methods) = M1, plus special interest-bearing deposits, plus savings deposits, plus securities issued by depository institutions; iii) TJLP (long-term interest rate).

In this model, the *Dummy3* (years of recession and economic expansion) was incorporated into the model. In the GMM models, according to equations 2 and 3, this variable was not incorporated because, with its absence, the variables of interest showed greater statistical significance. Such behavior can be explained due to the need for systemic GMM regressive models to require a high number of degrees of freedom for the estimation of the models.

Due to the robustness in the presence of outliers, in the QR models all data collected in the quantiles of 0.25, 0.5 and 0.75 were used. In the GMM models, the outliers in the dependent and control variables were treated through winsorization at the level of 1%, as performed by Vithessonth Schwaninger and Müller (2017).

3.4. Generalized Method of Moments (GMM)

For Barros et al. (2020), the generic solution to any endogeneity problem is the use of instrumental variables external to the model. In cases where the researcher does not have such variables, the estimation methods for panel based on the Generalized Method of Moments (GMM) are presented as effective and viable alternatives to mitigate or even eliminate endogeneity problems. This is because this model starts from the assumption of sequential exogeneity of the regressors.

Thus, according to the variables already specified – and considering, in general, the works of Frank and Goyal (2003), Brierley and Bunn (2005), Baker and Wurgler (2002), Huang and Ritter (2009), Yang et al. (2017) and Alter and Elekdag (2020), and, specifically, the work of Albanez (2015) for the Brazilian market -, the results were estimated through regression with panel data by the Generalized Method of Moments (GMM), testing hypotheses 1 and 2, as follows:

$$Lev_{i,t} = \beta 0_i + \lambda Lev_{i,t-1} + \beta_1 \Delta Mn_{t-1} + \beta_2 Tam_{i,t-1} + \beta_3 Tang_{i,t-1} + \beta_4 ROA_{i,t-1} + \beta_5 \frac{M}{B}_{i,t-1} + \beta_6 Liq_{i,t-1} + \beta_7 Dummy1_{i,t} + \beta_8 Dummy2_{i,t} + \beta_9 Dummy1I_{i,t} + \beta_{10} Dummy2I_{i,t} + \beta_{11} \Delta Dol_{i,t-1} + u_{it} \quad (2)$$

$$Lev_{i,t} = \beta 0_i + \lambda Lev_{i,t-1} + \beta_1 \Delta Interests_{t-1} + \beta_2 Tam_{i,t-1} + \beta_3 Tang_{i,t-1} + \beta_4 ROA_{i,t-1} + \beta_5 \frac{M}{B}_{i,t-1} + \beta_6 Liq_{i,t-1} + \beta_7 Dummy1_{i,t} + \beta_8 Dummy2_{i,t} + \beta_9 Dummy1I_{i,t} + \beta_{10} Dummy2I_{i,t} + \beta_{11} \Delta Dol_{i,t-1} + u_{it} \quad (3)$$

Where:
$Lev_{i,t}$ = indicator of leverage;
$\beta 0_i$ = intercept of each company *i*;
ΔMn = change in monetary aggregates over time (M1 and M2). Estimated parameters to answer hypothesis 1;
$\Delta interests$ = change in interest rates over time (Selic, SelicHP and TJLP). Estimated parameters to answer hypothesis 1;
λ= estimated persistence coefficient for the dependent and lagged variable used as a regressor;
Tam = proxy for the size of firms;
Tang = proxy for asset tangibility;
ROA = return on assets;
M/B = indicator of *market-to-book*;
Liq = indicators of liquidity;
ΔDol= exchange rate variation;
Dummy = variables *dummies* related to the sectors of consumer goods (*Dummy1*) and capital goods (*Dummy 2*);
DummyI = interaction between variables *dummies* of sectors and *proxies* of monetary policy ($Mn_t * Dummy_{i,t}$; and $Interests_t * Dummy_{i,t}$). Estimated parameters to answer hypothesis 2;
$u_{it} = a_i + \varepsilon_{it}$; a_i is the individual effect and ε_{it} is the term random error;
i= i-th company;
t = t-th period of time.

The variables *dummy* (represent the sectors in which each company is inserted, according to the classifications presented by Economática®. The quantification and the qualification of the heterogeneity of responses to different sectors are relevant to improve understanding of how the monetary policies may affect capital structures and corporate investments. Thus, seeking greater robustness in this analysis, the variables *dummies* will also be used in interaction with the monetary policy variables. Such interaction is represented by expressions: i) $Mnt * Dummy_{i,t}$ and ii $Juros_t * Dummy_{i,t}$). These variables will be responsible for demonstrating whether monetary policies impact sectors in different ways, as advocated by the Austrian school, and thus defined in hypothesis 2.

4. RESULTS AND DISCUSSION

In this first step, as shown in Table 3, the results of the 0.5 quantile were presented due to the better estimation of the parameters when compared to the 0.25 and 0.75 quantiles. In these results, when the sample aggregate is observed, one can observe the presence of statistical significance for two monetary policy proxies (SELIC and SELICHP). It is also observed the presence of statistical significance in three proxies of monetary policies (M1, M2 and SELIC) in their interactions with the sectoral dummies. It should also be noted the presence of control variables (LC and DUMMY3) with significant parameters in all models estimated at quantile 0.5.

Subsequently, for the GMM modeling, the data was processed through 1% winsorization. As can be seen in Tables 4 and 5, through the autocorrelation test of Arellano and Bond (1991), compliance with the assumption of non-existence of second-order autocorrelation was verified for all variables. Regarding the proposed instruments, the analysis of their feasibility was based on the Hansen test, due to its greater robustness. Thus, the Hansen test showed, for all models, the non-rejection of its null hypothesis, thus assuming the adequacy of the instruments used in the proposed model.

Regarding the choice between the GMM in differences and GMM-Systemic approaches, it appears that the Dif-Hansen test showed, for all the proposed models, the non-rejection of its null hypothesis, assuming the suitability of the GMM- Systemic as an approach to obtain the estimated parameters. Finally, the global significance of the models evidenced in this research is verified through the Wald test, which points to the rejection of its null hypothesis, assuming the existence of global significance of the proposed model. Once the adjustment assumptions of the GMM approach are met, the results obtained by its use can be analyzed, as follows.

The results in Table 4 allow us to verify that the monetary policy proxy M1 has a positive and significant influence on the leverage of the firms in the sample. This variable contributes to the market timing theory (Baker & Wurgler, 2002; Huang & Ritter, 2009; Albanez, 2015; Alter & Elekdag, 2020), demonstrating that changes in the M1 monetary aggregate have a direct and positive relationship with the structure of capital of companies, so that increases in this aggregate tend to cause an increase in the level of indebtedness of companies.

As for the dummies variables proposed to verify the effects of monetary policies on indebtedness in different sectors, it is observed that both variables – DUMMY1 (consumer goods) and DUMMY2 (capital goods) – have a negative influence on leverage, that is,it appears that companies in these sectors tend to exhibit lower leverage ratios compared to the rest of the sample. Therefore, as the rest of the sample is made up of public utility companies, there is an indication that this sector has the highest indebtedness for the analyzed sample.

Table 3
Results of quantile regressions.

QR 0.50		QR 0.50		QR 0.50		QR 0.50		QR 0.50	
ΔM1	0.5860	***ΔM2***	-0.5763	***ΔSELIC***	**-0.1315****	***SELICHP***	**-1.9553****	***ΔTJLP***	0.1633
	(0.1235)		(0.1372)		**(0.0186)**		**(0.0399)**		(0.4574)
LOGTAM	0.0038	***LOGTAM***	0.0039	***LOGTAM***	0.0048	***LOGTAM***	0.0030	***LOGTAM***	0.0039
	(0.3429)		(0.2952)		(0.2268)		(0.4630)		(0.3385)
TANG	0.0344	***TANG***	-0.0043	***TANG***	-0.0057	***TANG***	0.0255	***TANG***	0.0180
	(0.3338)		(0.8973)		(0.8742)		(0.4839)		(0.6186)
ROA	-0.0465	***ROA***	**-0.0475***	***ROA***	-0.0410	***ROA***	**-0.0519***	***ROA***	-0.0427
	(0.1254)		**(0.0969)**		(0.1779)		**(0.0946)**		(0.1678)
MB	-0.0048	***MB***	**-0.0050***	***MB***	-0.0044	***MB***	**-0.0054***	***MB***	-0.0045
	(0.1079)		**(0.0784)**		(0.1414)		**(0.0803)**		(0.1423)
LC	**0.0298*****	***LC***	**0.0267*****	***LC***	**0.0209****	***LC***	**0.0305*****	***LC***	**0.0283*****
	(0.0000)		**(0.0000)**		**(0.0015)**		**(0.0000)**		**(0.0000)**
DUMMY1	**-0.0759****	***DUMMY1***	**-0.1462*****	***DUMMY1***	-0.0372	***DUMMY1***	**-0.0429***	***DUMMY1***	**-0.0389***
	(0.0235)		**(0.0054)**		(0.1068)		**(0.0621)**		**(0.0899)**
DUMMY2	-0.0536	***DUMMY2***	**-0.1814*****	***DUMMY2***	-0.0170	***DUMMY2***	-0.0214	***DUMMY2***	-0.0184
	(0.1097)		**(0.0005)**		(0.4647)		(0.3533)		(0.4232)
DUMMY1I	**0.7377***	***DUMMY1I***	**1.0676****	***DUMMY1I***	**-0.1179***	***DUMMY1I***	-1.8676	***DUMMY1I***	-0.0428
	(0.0791)		**(0.0234)**		**(0.0882)**		(0.1004)		(0.8193)
DUMMY2I	0.6227	***DUMMY2I***	**1.6143*****	***DUMMY2I***	0.0340	***DUMMY2I***	-1.3486	***DUMMY2I***	-0.2074
	(0.1327)		**(0.0005)**		(0.6188)		(0.2292)		(0.2602)
ΔDOL	-0.0869	***ΔDOL***	-0.0477	***ΔDOL***	**-0.1444****	***ΔDOL***	**-0.1041****	***ΔDOL***	-0.0785
	(0.1503)		(0.2173)		**(0.0012)**		**(0.0214)**		(0.3436)
DUMMY3	**-0.1236*****	***DUMMY3***	**-0.1053*****	***DUMMY3***	**-0.1169*****	***DUMMY3***	**-0.1384*****	***DUMMY3***	**-0.1319*****
	(0.0000)		**(0.0000)**		**(0.0000)**		**(0.0000)**		**(0.0007)**
CONSTANT	0.0107	***CONSTANT***	0.0402	***CONSTANT***	-0.0048	***CONSTANT***	0.0026	***CONSTANT***	-0.0152
	(0.8764)		(0.5861)		(0.9404)		(0.9686)		(0.8172)

Source: Research data.
The statistical significance of the tests are represented by the following symbology: *10%; **5%; ***1%.

Table 4
Results of proxies ΔM1 and ΔM2.

DEPENDENT VARIABLE: LEV			
Systemic GMM		*Systemic GMM*	
Δ LEV$_{,t-1}$	***-0.1553****	***ΔLEV***$_{,t-1}$	*-0.0199*
	(0.0760)		*(0.308)*
ΔM1	***1.3317****	***ΔM2***	-1.6025
	(0.0990)		(0.165)
LOGTAM	***-1.9058****	***LOGTAM***	***-1.8789*****
	(0.076)		***(0.0160)***
TANG	0.1328	***TANG***	0.0607
	(0.689)		(0.889)
ROA	***-1.0751****	***ROA***	-0.5362
	(0.0940)		(0.228)
MB	0.0407	***MB***	0.1065
	(0.677)		(0.210)
LC	***0.3299*****	***LC***	***0.3010****
	(0.0270)		***(0.095)***
DUMMY1	-0.1566	***DUMMY1***	***-0.4118*****
	(0.4210)		***(0.025)***
DUMMY2	-0.0137	***DUMMY2***	***-0.4638*****
	(0.948)		***(0.002)***
DUMMY1I	-0.4498	***DUMMY1I***	1.7279
	(0.762)		(0.183)
DUMMY2I	-1.7613	***DUMMY2I***	***2.7178*****
	(0.283)		***(0.018)***
ΔDOL	**0.3266***	***ΔDOL***	0.1805
	(0.066)		(0.273)
CONSTANT	**4.9366***	***CONSTANT***	***4.8923*****
	(0.079)		***(0.018)***
AR(1)	**-2.39****	AR(1)	**-3.07*****
AR(2)	-1.64	AR(2)	-1.25
Sargan Test	**353.67*****	Sargan Test	**210.49*****
Hansen Test	168.64	Hansen Test	108.16
Test of Dif. Hansen	4.33	Test of Dif. Hansen	1.46
Test of Wald	**21.59****	Test of Wald	**36.77*****
No. of observations	1839	No. of observations	1839
No. of Groups	217	No. of Groups	217
No. of Instruments	169	No. of Instruments	117

Source: Research data.
Notes: AR(1) and AR(2) – verification of the existence of first and second order autocorrelation between the error terms; Sargan and Hansen tests verify the assumption of exogeneity of the instruments; Dif-Hansen – validity of the GMM-Systemic approach. The statistical significance of the tests are represented by the following symbology: *10%; **5%; ***1%.

Thus, it is observed that public utility companies (made up mainly of the electricity sector) demand a greater amount of resources when studying the effects of monetary policies on the capital structures of Brazilian firms. This may highlight the relevance of this sector when carrying out monetary policies in Brazil. This result, which shows the differences in capital structure depending on the sector, is added to the results presented by Frank and Goyal (2009), Eriotis et al. (2002), Mujahid and Akhtar (2014), Serrasqueiro (2011) and Javed and Imad (2012)

In addition to this, the interaction between the dummy representative of the sector of capital goods (DUMMY2) and the monetary policy proxy M2 pointed to a positive and significant influence on the leverage of companies that make up this sector in the sample studied. This finding allows us to infer that the monetary policy proxy M2 significantly impacts the leverage of companies in that sector. Nevertheless, the interaction between the representative dummy of the consumer goods sector (DUMMY1) and the monetary policy proxy M2 did not show statistical significance.

This result empirically contributes to the theory of business cycles of the Austrian school (Mises, 1998; Hayek, 2008; Garrison, 2001; Soto, 2009), since it allows us to infer that last-order firms (capital goods), as they have a productive structure resulting from investments with a longer realization period, they are influenced by monetary policies differently from first-rate firms (consumer goods). As for the control variables, it appears that only the tangibility and market-to-book variables presented significant parameters.

The results presented in Table 5 allow us to verify that the monetary policy variables SELICHP and TJLP have a negative and significant influence on the leverage of the sampled firms, so that reductions in interest rates generate increases in indebtedness levels. These proxies contribute to the market timing theory, demonstrating that variations in short and long-term interest rates have a direct and negative relationship with the capital structure of companies, so that decreases in these rates tend to cause increases in the level of indebtedness of firms.

It is important to note that SELICHP and TJLP proxies were not considered in the works of Baker and Wurgler (2002), Huang and Ritter (2009), Albanez (2015) and Alter and Elekdag (2020). Therefore, from the point of view of the market timing theory, the inclusion of these variables in the models contributes to studies on the capital structures of firms.

The interaction between the dummies representing the sectors and the long-term interest rate (TJLP) indicated a significant influence on the leverage of the companies that make up the sample studied. This result empirically contributes to the Austrian school's theory of business cycles (Mises, 1998; Hayek, 2008; Garrison, 2001; Soto, 2009), since it allows us to infer that this proxy of monetary policy impacts the leverage of companies in different ways, depending on the sector they are inserted in.

That said, both results contribute to the methodological robustness of this research, since, through two econometric models (RQ and GMM), it is possible to verify the significance of the proposed proxies to analyze the capital structure of firms, both in the aggregate and by sectors.

And, once again, the dummies referring to the consumer goods and capital sectors had a negative and significant influence on leverage, demonstrating the greater indebtedness of the public utility sector. The control variables that significantly impacted the companies' leverage were size, liquidity, and exchange rate.

Table 5
Results of proxies ΔSELIC, SELICHP and ΔTJLP.

DEPENDENT VARIABLE: LEV					
Systemic GMM		*Systemic GMM*		*Systemic GMM*	
ΔLEV$_{,t-1}$	-0.0194	***ΔLEV***$_{,t-1}$	*-0.0196*	***ΔLEV***$_{,t-1}$	*-0.0209*
	(0.324)		*(0.333)*		*(0.324)*
ΔSELIC	-0.2312	***SELICHP***	***-3.8933****	***ΔTJLP***	***-0.9512*****
	(0.225)		***(0.029)***		***(0.000)***
LOGTAM	***-2.1920****	***LOGTAM***	***-2.0490*****	***LOGTAM***	***-2.0304*****
	(0.011)		***(0.007)***		***(0.008)***
TANG	0.3024	***TANG***	0.2191	***TANG***	0.2315
	(0.462)		(0.566)		(0.565)
ROA	-0.6566	***ROA***	-0.5977	***ROA***	-0.5837
	(0.146)		(0.154)		(0.151)
MB	0.1116	***MB***	0.0948	***MB***	0.0945
	(0.222)		(0.243)		(0.250)
LC	***0.3222****	***LC***	***0.3167****	***LC***	***0.3215****
	(0.079)		***(0.069)***		***(0.070)***
DUMMY1	***-0.2891****	***DUMMY1***	***-0.2804*****	***DUMMY1***	***-0.2843****
	(0.064)		***(0.040)***		***(0.071)***
DUMMY2	***-0.2399****	***DUMMY2***	***-0.2441****	***DUMMY2***	***-0.2618*****
	(0.078)		***(0.053)***		***(0.050)***
DUMMY1I	0.1188	***DUMMY1I***	2.6531	***DUMMY1I***	***0.8697****
	(0.669)		(0.442)		***(0.097)***
DUMMY2I	0.2854	***DUMMY2I***	2.8468	***DUMMY2I***	***0.8976****
	(0.188)		(0.323)		***(0.082)***
ΔDOL	0.2440	***ΔDOL***	0.1864	***ΔDOL***	***0.2835*****
	(0.129)		(0.254)		***(0.019)***
CONSTANT	***4.4867*****	***CONSTANT***	***5.1594*****	***CONSTANT***	***5.1092*****
	(0.013)		***(0.009)***		***(0.010)***
AR(1)	**-3.08*****	AR(1)	**-3.07*****	AR(1)	**-3.07*****
AR(2)	-1.30	AR(2)	-1.23	AR(2)	-1.21
Sargan Test	**207.60*****	Sargan Test	**209.72*****	Sargan Test	**210.40*****
Hansen Test	113.40	Hansen Test	109.04	Hansen Test	105.33
Test of Dif. Hansen	7.04	Test of Dif. Hansen	2.18	Test of Dif. Hansen	0.73
Test of Wald	**20.19***	Test of Wald	**25.36****	Test of Wald	**48.89*****
No. of observations	1839	No. of observations	1839	No. of observations	1839
No. of Groups	217	No. of Groups	217	No. of Groups	217
No. of Instruments	117	No. of Instruments	117	No. of Instruments	117

Source: Research data.
Notes: AR(1) and AR(2) – verification of the existence of first and second order autocorrelation between the error terms; Sargan and Hansen tests verify the assumption of exogeneity of the instruments; Dif-Hansen – validity of the GMM-Systemic approach. The statistical significance of the tests are represented by the following symbology: *10%; **5%; ***1%.

4.1. Answers to hypotheses

Based on the results presented, one can see the statistical relevance of the proxies M1 (monetary aggregate 1), SELICHP (filtered Selic rate) and TJLP (long-term interest rate) to explain the level of indebtedness of the firms in the sample. Therefore, contributing empirically to the theories of market timing, hypothesis 1 is not rejected, showing the relevance of monetary policies to explain the leverage of the aggregate of the firms in the sample. The statistical relevance of the sector dummies (consumer goods and capital goods) was also observed, in interaction with the variables M2 and TJLP, to explain the leverage level of firms. Therefore, as an empirical contribution to the theory of business cycles of the Austrian school, hypothesis 2 was not rejected, which demonstrates that monetary policies tend to influence the indebtedness of firms in different ways, depending on their sector in the production chain.

5. FINAL CONSIDERATIONS

This article had the purpose of analyzing the influence that monetary policies exert on the financing decisions of Brazilian corporations. Thus, firstly, it is important to highlight the relevance of the proposed proxies. Adding to the econometric models presented by Baker and Wurgler (2002), Huang and Ritter (2009), Albanez (2015) and Alter and Elekdag (2020), the relevance of the M1 monetary aggregate, the filtered Selic rate (SELICHP) and the long-term interest rate (TJLP). In addition, the relevance of M2 and TJLP proxies in interaction with sector dummies was also observed.

Due to these results, it can be concluded, for Hypothesis 1, that monetary policies had a significant influence on the capital structure of the aggregate of the companies studied, which empirically adds up to the market timing theory. It can also be concluded, for hypothesis 2, that monetary policies influence companies' indebtedness in different ways, depending on their production sector, empirically adding to the Austrian theory of business cycles.

Therefore, in response to the research problem, after the results of the tested hypotheses, this research argues that: **the capital structures of firms can be determined by market timings defined by monetary policies, so that such influence is different, depending on the sector of the production chain in which the companies are located**.

Regarding the limitations of thisstudy, the sample size is observed. The Brazilian stock market is still in its infancy, creating a limitation in the number of companies that present the necessary data for the estimations. This limitation prevented the time series from being divided to better describe the cycles, as described by the Austrian school, since systemic GMM regressive models require a high number of degrees of freedom to estimate the models. In addition, the sample is made up of a group of companies that do not statistically represent all Brazilian companies. Thus, the results obtained and the conclusions presented are limited to this sample studied.

That said, we suggest expanding the sample, as well as applying the models in other markets. Furthermore, a study with a time horizon covering the 2001, 2008, and 2020 crises will greatly contribute to a better identification of cycles and a better understanding of how debt structures behave in the face of monetary policies over time.

REFERENCES

Albanez, T. (2012). *Efeitos do market timing sobre a estrutura de capital de companhias abertas brasileiras* [Doctoral dissertation, Universidade de São Paulo].

Albanez, T. (2015). Impact of the cost of capital on the financing decisions of Brazilian companies. *International Journal of Managerial Finance*, *11*(3), 285-307. https://doi.org/10.1108/IJMF-02-2014-0026

Alter, A., & Elekdag, S. (2020). Emerging market corporate leverage and global financial conditions. *Journal of Corporate Finance*, *62*, 101590. https://doi.org/10.1016/j.jcorpfin.2020.101590

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The review of economic studies, 58*(2), 277-297. https://doi.org/10.2307/2297968

Asquith, P., & Mullins, D. W., Jr. (1986). Equity issues and offering dilution. *Journal of financial economics*, *15*(1-2), 61-89. https://doi.org/10.1016/0304-405X(86)90050-4

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *The Journal of Finance*, *57*(1), 1-32. https://doi.org/10.1111/1540-6261.00414

Barros, L. A., Bergmann, D. R., Castro, F. H., & Silveira, A. D. M. D. (2020). Endogeneidade em regressões com dados em painel: Um guia metodológico para pesquisa em finanças corporativas. *Revista Brasileira de Gestão de Negócios*, *22*(spe), 437-461.

Böhm-Bawerk, E. (1890). *Capital and interest: A critical history of economical theory* (Vol. 1). Macmillan and Company.

Brierley, P., & Bunn, P. (2005). The determination of UK Corporate Capital Gearing. *Bank of England, Quarterly Bulletin, Autumn*, 45(3).

Eriotis, N. P., Frangouli, Z., & Ventoura-Neokosmides, Z. (2002). Profit margin and capital structure: An empirical relationship. *Journal of Applied Business Research*, *18*(2), 85-88. https://doi.org/10.19030/jabr.v18i2.2118

Frank, M. Z., & Goyal, V. K. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics*, *67*(2), 217-248. https://doi.org/10.1016/S0304-405X(02)00252-0

Garrison, R. W. (2001). *Time and money: The macroeconomics of capital structure*. Routledge.

Hayek, F. A. (2008). *Monetary Theory and the Trade Cycle*. Ludwig von Mises Institute.

Huang, R., & Ritter, J. R. (2009). Testing theories of capital structure and estimating the speed of adjustment. *Journal of Financial and Quantitative analysis*, *44*(2), 237-271. http://doi.org/10.2139/ssrn.938564

Jalilvand, A., & Harris, R. S. (1984). Corporate behavior in adjusting to capital structure and dividend targets: An econometric study. *The Journal of Finance*, *39*(1), 127-145. https://doi.org/10.1111/j.1540-6261.1984.tb03864.x

Javed, A. Y., & Imad, Q. (2012). A decomposition analysis of capital structure: evidence from Pakistan's manufacturing sector. *The Lahore Journal of Economics*, *17*(1), 1-31. http://dx.doi.org/10.35536/lje.2012.v17.i1.a1

Keynes, J. M. (2017). *Teoria geral do emprego, do juro e da moeda*. Editora Saraiva.

Koenker, R., & Bassett, G., Jr. (1978). Regression quantiles. *Econometrica: Journal of the Econometric Society*, *46*(1), 33-50. https://doi.org/10.2307/1913643

Koenker, R. (2004). Quantile regression for longitudinal data. Journal of Multivariate Analysis, *91*(1), 74-89. https://doi.org/10.1016/j.jmva.2004.05.006

Menger, C. (2012). *Principios de economía política*. Bubok.

Mises, L. V. (1998) *Human Action: A Treatise On Economics*. Ludwig von Mises Institute.

Mises, L. V., & Batson, H. E. (1953). *The theory of money and credit* (Vol. 2). Yale University Press.

Mujahid, M., & Akhtar, K. (2014). Impact of capital structure on firms financial performance and shareholders wealth: Textile Sector of Pakistan. *International Journal of Learning & Development*, *4*(2), 27-33. https://doi.org/10.5296/ijld.v4i2.5511

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance*, *50*(5), 1421-1460. https://doi.org/10.1111/j.1540-6261.1995.tb05184.x

Serrasqueiro, Z. (2011). Are capital structure decisions of service SMEs different? Empirical evidence from Portugal. *Management Research Review*, *34*(1), 34-57. https://doi.org/10.1108/01409171111096469

Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, *70*(1), 65-94. https://doi.org/10.2307/1884513

Soto, J. H. de. (2009). *Dinero, crédito bancario y ciclos económicos*. Unión Editorial.

Taggart, R. A., Jr. (1977). A model of corporate financing decisions. *The Journal of Finance*, *32*(5), 1467-1484. https://doi.org/10.1111/j.1540-6261.1977.tb03348.x

Vithessonthi, C., Schwaninger, M., & Müller, M. O. (2017). Monetary policy, bank lending and corporate investment. *International Review of Financial Analysis*, *50*, 129-142. https://doi.org/10.1016/j.irfa.2017.02.007

Yang, X., Han, L., Li, W., Yin, X., & Tian, L. (2017). Monetary policy, cash holding and corporate investment: Evidence from China. *China Economic Review*, *46*, 110-122. https://doi.org/10.1016/j.chieco.2017.09.001

AUTHOR CONTRIBUTIONS

OVC – Main contribution with problem definition, hypotheses development, literature review, results, analyzes and conclusions. **WML** – Main contribution with problem definition, development of hypotheses, method, results and conclusions.

CONFLICT OF INTEREST

The authors state that there is no conflict of interest.