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DETERMINANTS OF CASH DISTRIBUTION THROUGH SHARE REPURCHASES IN THE BRAZILIAN MARKET

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ABSTRACT

This study investigates the motivations behind share repurchase programs conducted by managers of Brazilian companies. In Brazil, dividends are still the predominant means of returning cash to shareholders. However, ongoing legal discussions may increase the attractiveness of repurchase announcements, highlighting the need to better understand the determinants influencing such decisions. This work adopts a broader approach than previous studies in the Brazilian context. This comprehensive approach stems from the inclusion of factors not examined in previous studies in Brazil, such as meeting investor demand, and from the analysis of a larger and more recent sample. Thus, the study offers a more complete view of the determinants of share buybacks in the Brazilian context. The research employed descriptive statistics and panel data regressions. The sample consists of financial data from 369 non-financial Brazilian companies between 2010 and 2022. Share repurchases were motivated by the distribution of free cash flow, the signaling of stock undervaluation, dividend complementarity, and investor demand, this last factor being examined for the first time in Brazil. A complementary relationship between dividends and repurchases was identified, contrasting with the substitution pattern seen in other countries. Share repurchase decisions in Brazil reflect multiple strategic motivations, particularly the complementarity with dividends. These findings contribute to a better understanding of payout policies in emerging markets.

Keywords: Dividend policy; Shareholder remuneration; Catering; Undervaluation of shares; Agency costs.

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1 INTRODUCTION

Share repurchases are an important mechanism used by managers to distribute money to shareholders (Arora, 2022). Research on repurchases began to gain more attention when this type of transaction, mainly in places such as the United States and Europe, came to be used more widely, even beginning to compete with dividends as a means of corporate payout (Skinner, 2008; Arora, 2022).

Wang, Yin and Yu (2024) documented that legal changes were major drivers of share repurchases in several countries around the world. While this growth in the volume of repurchased shares stands out in several countries, in Brazil dividends, together with interest on equity (*juros sobre capital próprio*, JSCP), remain dominant. The possible explanations for Brazilian companies continuing to rely predominantly on these forms of remuneration are that: (i) dividends are currently exempt from taxation; (ii) there are legal mechanisms that lead companies to set mandatory dividend payout percentages; and (iii) JSCP carry tax benefits.

In Brazil, over the last decade, there have been discussions about reforms that may bring an end to the tax exemption of dividends and bring restrictions on the payment of JSCP, which tends to make share repurchases more attractive to companies. Although there is currently no relevant debate on the political agenda regarding an end to mandatory dividends, the literature provides evidence that this regulation may cause problems of greater dependence on internal resources for companies (Vancin & Kirch, 2020), which underscores the need to seek solutions for a possible end of this regulation.

It is worth noting that other factors, such as levels of corporate governance, the structure of shareholders' legal rights and the tax burden, may also be affected by the occurrence of legal changes, leading to an entirely new configuration for companies' profit distribution decision. However, the possibility of a future movement in which share repurchase transactions come to be used on a larger scale in Brazil increases the need to better understand their current determinants.

For places where share repurchases are more widely used, it is reported that a company may carry out this type of transaction motivated by reducing agency costs, improving operating performance, conveying information to the market that its shares are undervalued, using a more flexible cash distribution mechanism and meeting investor demand.

In Brazil, there are studies that sought to test some of the hypotheses associated with the share repurchase decision. In general, these works identify free cash flow, share undervaluation and the complementing of dividend payments as the main determinants of repurchases in the Brazilian market (Nascimento, Galdi & Nossa, 2011; Garcia & Lucena, 2017; Castro & Yoshinaga, 2019; Amorim, Camargos & Medrado, 2021).

However, it is observed that, although this literature has advanced in the analysis of these factors, there are no studies that have jointly addressed all the main hypotheses motivating this decision. In particular, no research was identified in the Brazilian context that simultaneously tested the hypotheses of improvement in operating performance and of meeting investor demand. Seeking to fill this gap, this study aims to investigate the share repurchase decision of Brazilian companies from a broader and more integrated approach, covering five distinct motivations identified in the literature. In doing so, the work contributes by incorporating factors still little explored in the country, such as investor demand, and by offering a comparative analysis of the multiple cash distribution strategies adopted by Brazilian companies.

Emerging countries, such as Brazil, are generally characterized by an environment of weak protection of shareholders' rights. In this institutional context, cash distribution plays a central role as a mechanism for building and preserving corporate reputation with investors, being used by companies to mitigate agency problems and to circumvent the limitations imposed by this environment, facilitating access to external sources of financing (La Porta, Lopez-de-Silanes, Shleifer & Vishny, 2000). Given this scenario, the objective of this study is to investigate the determinants of the share repurchase decision of Brazilian companies, considering that this instrument has become established as a relevant form of cash distribution in several countries and shows potential for expansion in the Brazilian market. Thus, the proposed analysis proves to be particularly relevant from the theoretical and empirical perspectives, as it deepens the understanding of earnings distribution policies in emerging markets.

2 THEORETICAL FRAMEWORK

From the standpoint of agency theory, cash distribution policy is often interpreted as a mechanism to reduce the amount of discretionary resources under the control of managers, especially when the company shows high cash generation and, simultaneously, a reduction in its investment opportunities. In this circumstance, maintaining high levels of cash may intensify agency conflicts and encourage investment decisions that do not maximize shareholder value. Thus, share repurchases, like dividends, can act as an instrument of discipline by returning resources to shareholders and limiting the margin of managerial decision over the available cash.

Evidence in the international literature indicates that companies with lower growth and greater cash availability resort to repurchase programs to mitigate agency costs associated with excess cash (Nohel & Tarhan, 1998; Grullon & Michaely, 2004). In markets with weak legal protection for investors, cash distribution is also related to the building of corporate reputation and to the alignment of interests between managers and shareholders, forming part of the set of mechanisms used to reduce agency problems (La Porta, Lopez-de-Silanes, Shleifer & Vishny, 2000).

Operationally, a share repurchase consists of the acquisition, by the company itself, of shares of its own issuance,

typically through programs carried out in the open market, reducing the number of shares outstanding. From the shareholder's point of view, it is a form of cash distribution: investors who choose to sell shares to the company receive funds, while shareholders who remain in the shareholder base come to hold, ceteris paribus, a proportionally larger stake in the share capital.

The literature also highlights that this instrument may be chosen because it offers greater flexibility in relation to dividends, since it does not necessarily generate the same expectation of maintenance over time, allowing adjustments according to cash availability and investment needs (Brav, Graham, Harvey & Michaely, 2005; Skinner, 2008; Iyer, Feng & Rao, 2017). In addition, repurchase programs may be used as a form of communication with the market when management believes that the shares are undervalued, even though the reaction of investors may vary according to the informational context (Wansley, Lane & Sarkar, 1989; Ikenberry, Lakonishok & Vermaelen, 2000). In Brazil, empirical studies have discussed these motivations and explored determinants associated with cash/cash flow and with the form of earnings distribution, contributing to the understanding of the use of repurchases in the domestic market (Nascimento, Galdi & Nossa, 2011; Garcia & Lucena, 2017; Amorim, Camargos & Medrado, 2021; Castro & Yoshinaga, 2019).

The use of repurchases aimed at reducing agency costs may occur in situations in which companies, especially those with strong cash generation, begin to face reductions in their growth opportunities (Grullon & Michaely, 2004). At a certain point, these companies start to repurchase their shares in order to limit the amounts of resources available in the hands of managers, thereby avoiding potential agency problems related to an inappropriate use of this money. This explanation is called the free cash flow hypothesis (Grullon & Michaely, 2004).

Repurchases motivated by undervaluation, in turn, occur when managers, who hold privileged information about the company's prospects, believe that current share prices are lower than they should be. In this way, the announcement of share repurchase programs would serve to convey positive information to a less informed market (Wansley, Lane & Sarkar, 1989; Ikenberry, Lakonishok & Vermaelen, 2000; Ma, Li & Wang, 2024). However, investors may act skeptically regarding the transmission of this information, so that an abnormal appreciation in share prices is not always initially observed (Ikenberry et al., 2000).

Share repurchases may also be part of a restructuring package, with companies, especially low-growth ones, selling their poorly performing assets and using the repurchase mechanism to distribute the cash generated and avoid agency costs (Nohel & Tarhan, 1998). The sale of these assets would then bring an improvement in the efficiency of the company's operations, thereby causing a positive relationship to be observed between share repurchases and operating performance (Nohel & Tarhan, 1998; Chen & Liu, 2023).

Regarding the flexibility of repurchases, it is reported that managers, when they intend to deliver cash to shareholders, see share repurchases as a more flexible means compared with the payment of dividends (Brav, Graham, Harvey & Michaely, 2005). While for dividends there is an expectation, on the part of investors, that they will always be maintained or increased, in the case of repurchases this view does not exist. Thus, managers may prefer to use repurchases, and thereby have greater freedom over time to make adjustments, rather than start paying or increasing dividends and have difficulty reversing this later (Iyer, Feng & Rao, 2017).

The other explanation for repurchases, one of the most recent found in the literature, is that managers choose to distribute cash, by repurchasing shares or paying dividends, according to the wishes of investors. In this view, extending the catering theory of dividends (Baker & Wurgler, 2004), when investors are interested in receiving dividends, they tend to pay more for the shares of dividend-paying companies, encouraging managers of non-paying companies to start paying. At times when the demand for dividends is low, in turn, cash would be distributed in the form of share repurchases (Jiang, Kim, Lie & Yang, 2013).

In Brazil, there are also works that investigated the motivations that influenced companies to repurchase shares (Nascimento, Galdi & Nossa, 2011; Garcia & Lucena, 2017; Castro & Yoshinaga, 2019; Amorim, Camargos & Medrado, 2021). In general, these studies addressed some of the main explanations for the share repurchase decision. The results of these works confirmed some patterns similar to those found in studies from other countries, such as the distribution of free cash flow and the undervaluation of shares being motivators for the use of repurchases. It was also identified that share repurchases complemented dividends instead of replacing them, unlike what would be expected according to the flexibility hypothesis, which may be explained by the legal particularities of Brazil, which do not provide incentives for a substitution of dividends by share repurchases.

Although these studies bring important insights into repurchases in Brazil, no studies were found that investigated the hypotheses of improvement in operating performance and of meeting investor demand. Accordingly, this study sought to bring a broader approach, covering the main explanations for the repurchase decision found in the literature, and with more recent data.

Based on the patterns of the results of previous studies, some hypotheses can be formulated, which summarize the expected behavior of the repurchase decision in the companies belonging to the sample. The patterns of results can be seen in Chart 1 below.

Chart 1 – Patterns of Expected Results for the Development of the Hypotheses

Variables	Expected Relationship
Greater volume of available cash and Share Repurchases	Positive
Undervalued shares and Repurchase Volume	Positive
Share Repurchases and Distribution of Money to Shareholders	Positive
Share Repurchases and Operating Performance	Positive
Share Repurchases and Demand for Dividends	Positive

Source: Prepared by the authors.

That said, this study sought to test the following hypotheses:

H1: To avoid agency costs, companies with a greater volume of available cash tend to repurchase more shares.

H2: Companies with undervalued shares are prone to having a greater volume of repurchases.

H3: Companies repurchase shares to distribute money to their shareholders as a complement to the payment of dividends and JSCP.

H4: Companies that repurchase more shares come to show an improvement in their operating performance over the years.

H5: The volume of repurchased shares is greater at times when investors' demand for dividends is high.

For the first hypothesis, it will be tested whether companies with greater volumes of cash tend to repurchase more shares. In the second hypothesis, it will be tested whether, in companies with undervalued shares, there is a greater propensity to repurchase shares. In the third hypothesis, it will be tested whether companies repurchase shares to distribute money to their shareholders, as a way of complementing the payment of dividends and JSCP. In the fourth hypothesis, it will be tested whether, as pointed out by authors in international studies, Brazilian companies repurchase shares as part of a restructuring package, which consists of the sale of assets and is accompanied by a consequent improvement in operating performance. For the fifth hypothesis, in turn, taking into account that repurchases may be used as a complement to the payment of dividends in Brazil, a relationship inverse to that observed in studies from outside the country is expected, with companies repurchasing more at times of greater investor demand for dividends.

The next section details the sample of companies chosen and the research methods applied.

3 RESEARCH METHOD

The research was carried out by collecting data on 369 non-financial Brazilian companies with shares listed on B3. The collection covered data from the period between 2010 and 2022 and included only companies with financial information for at least 5 years of this period. The interval was chosen because 2010 is the first year in which Economatica®, the database used for data collection, makes available the information on companies' capital reduction, which is the account in which share repurchases are recorded.

From this sample, data from periods in which the company reported negative shareholders' equity were excluded. After that, the winsorization procedure was carried out, applying a 1% replacement to the observations at each extreme. Regarding the intertemporal treatment of monetary values, the information was extracted and used in nominal terms, with the caveat that the platform allows, in some configurations, adjusted series to be obtained, although such adjustment is not the default in all extractions. Even so, it should be noted that the potential effect of general variations in the price level is attenuated by the fact that the main variables of the study are constructed, for the most part, in the form of ratios and logarithmic transformations, in addition to the use of year fixed-effects controls in the models, which absorb macroeconomic shocks common to the firms in each period analyzed.

To carry out the tests, it was necessary to build different regression models. In the first group of models, the hypotheses of agency cost reduction, share undervaluation and investor demand were tested. For these regressions, the dependent variables were either Share Repurchases (Rec), which corresponds to the total amount disbursed by the company on share repurchases in the period divided by total assets, or, in the case of the logistic regression, Repurchaser (Rec Dummy), which is a dummy variable that takes the value 1 for the period in which the company carried out share repurchases or 0 otherwise.

The empirical tests of this study are organized into three blocks. The first block brings together the models focused on the determinants of share repurchases associated with the hypotheses of agency cost reduction (H1), share under-

valuation (H2) and meeting investor demand (H5), using as dependent variables both the volume of repurchases (Rec) and, alternatively, the repurchase decision (Rec Dummy). The second block examines the flexibility/adjustment dimension of the cash distribution policy by means of a model with Capex as the dependent variable (Equation 4), making it possible to discuss whether repurchases and payout behave as instruments of substitution or of joint use, in line with the hypothesis of complementarity between repurchases and dividends/JSCP (H3). Finally, the third block tests the hypothesis of improvement in operating performance (H4) by means of models with ROA as the dependent variable, considering repurchases in the current period and with lags (Equations 5 to 7).

The Share Repurchases variable was used in the works of Lee and Suh (2011), Chasiotis, Georgantopoulos and Eriotis (2021), Nascimento et al. (2011), Amorim et al. (2021) and Arora (2022), and the Repurchaser dummy variable was adopted by studies such as von Eije and Megginson (2008), Jiang et al. (2013), Kulchania (2013), Garcia and Lucena (2017), Wesson, Smit, Kidd and Hamman (2018), Chazi, Theodossiou and Zantout (2018), Moin, Guney and El Kalak (2020) and Amorim et al. (2021).

As for the independent variables, to test the hypothesis of agency cost reduction, the variables chosen were Free Cash Flow (FCL), which was also employed in the studies of Jiang et al. (2013), Kulchania (2013), Bonaimé et al. (2014), Garcia and Lucena (2017), Chasiotis et al. (2021) and Amorim et al. (2021), and Cash, which was also used by Lee and Suh (2011), Jiang et al. (2013), Kulchania (2013), Bonaimé et al. (2014), Rapp et al. (2014), Moin et al. (2020), Chasiotis et al. (2021) and Arora (2022). Both variables had their values scaled by the company's total assets. It is expected that companies with more available cash have a greater probability of carrying out repurchases and that they repurchase shares in greater volume, since, all else being equal, they tend to need to distribute their cash to avoid related agency costs.

To test the undervaluation hypothesis, the variables Market-to-book (MB) and Stock Return (RA) were adopted, both considering the period prior to the repurchases. In previous works, Market-to-book was used by von Eije and Megginson (2008), Lee and Suh (2011), Nascimento et al. (2011), Andriosopoulos and Hoque (2013), Jiang et al. (2013), Kulchania (2013), Garcia and Lucena (2017), Wesson et al. (2018), Chazi et al. (2018), Moin et al. (2020), Amorim et al. (2021) and Arora (2022), while Stock Return was used by Lee, Ejara and Gleason (2010), Lee and Suh (2011), Jiang et al. (2013), Kulchania (2013) and Wesson et al. (2018). Considering that, when they believe that the companies' shares are undervalued, managers tend to make repurchase announcements, a negative relationship is expected between the two variables and share repurchases. It should be noted that MB and RA are used as alternative proxies in distinct specifications (Equations 1 and 2), not being included simultaneously in the same model, so as to facilitate interpretation and provide a robustness test for the undervaluation hypothesis (H2).

Regarding the hypothesis of meeting investor demand, von Eije and Megginson (2008), Jiang et al. (2013) and Kulchania (2013) made use of the dividend premium variable, originally developed by Baker and Wurgler (2004), to measure investors' demand for dividends. This variable, which is a market-level variable, is calculated as the difference between the natural logarithm of the average Market-to-book ratio of paying and non-paying companies. For this work, however, some adaptations were made.

These adaptations were necessary because of the mandatory dividend regulation, since there may be companies in Brazil that pay dividends only to comply with the regulation, making the original calculation of the variable unsuitable for this context. Thus, two alternatives were adopted to measure the dividend premium.

The first is a dummy variable (Dividend premium, PIDIV), which takes the value 1 in the periods in which the Dividend Index (IDIV) outperformed the Ibovespa and 0 otherwise. While the IDIV is a theoretical portfolio that contains the assets of the large dividend payers, the Ibovespa, which is the main stock index in Brazil, represents the performance of the market in general. Thus, the PIDIV variable was constructed with the aim of identifying the periods in which there is greater investor demand for the assets of the companies that pay more dividends.

The second way of measuring the dividend premium was by adapting the original calculation, replacing the separation between paying and non-paying companies with the separation between those that pay above the mandatory level and those that pay an equal or lower percentage. The percentage of 25% of payout was considered a standard for mandatory dividends, since this is a percentage adopted by the vast majority of companies (approximately 86%, according to a survey carried out by the authors).

In the works of von Eije and Megginson (2008), Jiang et al. (2013) and Kulchania (2013), negative relationships were found between the dividend premium and share repurchases, that is, on average companies chose to pay dividends at times of high demand and to repurchase shares in periods of low demand for dividends, denoting a substitution effect between the two forms of payment. Since a complementary relationship between dividends and share repurchases has been observed in Brazil (Nascimento et al., 2011; Amorim et al., 2021), the dividend premium is expected to have a positive impact on the share repurchases of the companies in the sample.

As independent control variables, the following variables were chosen: Indebtedness (Endiv; debt over shareholders' equity), Size (Tam; natural logarithm of revenues), Profitability (ROA; net operating profit over total assets), Investment Opportunities (OP; change in revenue), Life Cycle (RETE; accumulated retained earnings over shareholders' equity) and Dividends paid in the previous year (DP; dividends over net income). These variables were chosen because they were the main ones used in the works reviewed.

From this set of variables, three different models were built with the aim of testing the same hypotheses (agency cost reduction, undervaluation and meeting investor demand), as represented in the equations below. In the models of

the first block, the hypothesis of agency cost reduction (H1) is operationalized by proxies for the availability of resources (Free Cash Flow, FCL, and/or Cash, scaled by total assets). The hypothesis of share undervaluation (H2) is tested by means of alternative proxies, always lagged by one period: (i) Market-to-book (MB), as a valuation measure, and (ii) Stock Return (RA), as an alternative proxy for the price condition in the previous period. The hypothesis of meeting investor demand (H5) is measured by dividend premium proxies (PIDIV and PD), constructed as described above. Equation (1) presents a baseline specification with FCL and MB; Equation (2) presents an alternative robustness specification replacing FCL with Cash and MB with RA; and Equation (3) uses the binary dependent variable (Rec Dummy) and is estimated by logistic regression, with the aim of analyzing the probability of occurrence of a repurchase. In all specifications, control variables and year and sector fixed-effects controls are included.

$$Rec_{it} = \beta_0 + \beta_1 FCL_{it} + \beta_2 MB_{it-1} + \beta_3 PIDIV_{t-1} + \beta_4 Endiv_{it} + \beta_5 Tam_{it} + \beta_6 ROA_{it} + \beta_7 OP_{it} + \beta_8 RETE_{it} + \beta_9 DP_{it-1} + \varepsilon_{it} \quad (1)$$

$$Rec_{it} = \beta_0 + \beta_1 Caixa_{it} + \beta_2 RA_{it-1} + \beta_3 PIDIV_{t-1} + \beta_4 Endiv_{it} + \beta_5 Tam_{it} + \beta_6 ROA_{it} + \beta_7 OP_{it} + \beta_8 RETE_{it} + \beta_9 DP_{it-1} + \varepsilon_{it} \quad (2)$$

$$Rec\ Dummy_{it} = \beta_0 + \beta_1 FCL_{it} + \beta_2 MB_{it-1} + \beta_3 PIDIV_{t-1} + \beta_4 Endiv_{it} + \beta_5 Tam_{it} + \beta_6 ROA_{it} + \beta_7 OP_{it} + \beta_8 RETE_{it} + \beta_9 DP_{it-1} + \varepsilon_{it} \quad (3)$$

Fixed-effects regression was adopted for the three models, with the use of year and sector fixed-effects controls. While for the first two models the estimation was performed by the ordinary least squares regression method, for the third model, which has a categorical dependent variable, the logistic regression technique was employed.

To test the hypothesis of the flexibility of share repurchases, in turn, it was necessary to apply another model, which was built on the basis of the work of Iyer et al. (2017). In this model, Capex, which represents capital expenditures, is the dependent variable and Share Repurchases and Payout (P) are the main independent variables. Also taking as a basis the model proposed by Iyer et al. (2017), the following control variables were selected: Size, Indebtedness, Market-to-book, Cash, Life Cycle and Tangibility (Tang).

It is important to emphasize that, in this study, the flexibility analysis is conducted on the basis of the behavior of the cash distribution policy in the face of investment needs, using Capex as a proxy for investment. Thus, Equation (4), based on Iyer et al. (2017), makes it possible to assess whether repurchases and payout tend to be adjusted when there is variation in capital expenditures, contributing to the discussion on substitution versus complementarity between forms of cash distribution. In the Brazilian context, this evidence is directly informative for hypothesis H3, since it helps to interpret whether repurchases are used as a complement to the payment of dividends and JSCP, rather than as a substitution mechanism.

Thus, the model used to test the hypothesis of the flexibility of repurchases is represented by the following equation:

$$Capex_{it} = \beta_0 + \beta_1 Rec_{it} + \beta_2 P_{it} + \beta_3 Tam_{it} + \beta_4 Endiv_{it} + \beta_5 MB_{it} + \beta_6 Caixa_{it} + \beta_7 RETE_{it} + \beta_8 Tang_{it} + \varepsilon_{it} \quad (4)$$

The model was estimated using the ordinary least squares regression method, also including year and sector fixed-effects controls. In the work of Iyer et al. (2017), it was identified that only Share Repurchases had a significant relationship with the Capex of companies, that is, due to the flexibility of this form of payment, managers chose to use it to adjust the distribution of cash in companies according to the variation in the need for resources for investments. Considering that, according to what has been reported by previous works, Brazilian companies have used dividends and share repurchases in a complementary way, the same behavior is not expected to be found in this study.

In addition, the distinction between investment and operating performance in the empirical design adopted is highlighted. Capex is used as the dependent variable only in the flexibility model (Equation 4), as it represents capital expenditures and, therefore, a proxy for investment needs. In the operating performance models, in turn, performance is measured by ROA (dependent variable), while Capex is included exclusively as a control variable, with the aim of isolating the relationship between share repurchases and operating profitability in Equations (5) to (7).

Finally, to test the hypothesis of improvement in operating performance, three models were developed, which have the purpose of assessing whether the company's performance is affected by carrying out share repurchases at different points in time. The choice of the model and of the variables was made on the basis of the works of Kim and Park (2021)

and Chao and Huang (2022), with ROA being the dependent variable, representing operating performance, Share Repurchases the main independent variable, and Size, Indebtedness, Market-to-book, FCL, Life Cycle, Investment Opportunities and Capex the independent control variables.

The models built to verify whether there is a relationship between share repurchases and the operating performance of the companies in the sample are presented below:

$$ROA_{it} = \beta_0 + \beta_1 Rec_{it} + \beta_2 Tam_{it} + \beta_3 Endiv_{it} + \beta_4 MB_{it} + \beta_5 FCL_{it} + \beta_6 RETE_{it} + \beta_7 OP_{it} + \beta_8 Capex_{it} + \varepsilon_{it} \quad (5)$$

$$ROA_{it} = \beta_0 + \beta_1 Rec_{it-1} + \beta_2 Tam_{it} + \beta_3 Endiv_{it} + \beta_4 MB_{it} + \beta_5 FCL_{it} + \beta_6 RETE_{it} + \beta_7 OP_{it} + \beta_8 Capex_{it} + \varepsilon_{it} \quad (6)$$

$$ROA_{it} = \beta_0 + \beta_1 Rec_{it-2} + \beta_2 Tam_{it} + \beta_3 Endiv_{it} + \beta_4 MB_{it} + \beta_5 FCL_{it} + \beta_6 RETE_{it} + \beta_7 OP_{it} + \beta_8 Capex_{it} + \varepsilon_{it} \quad (7)$$

Each of these models was estimated by the ordinary least squares regression method and all of them include year and sector fixed-effects controls. The models have the same variables; the only difference between them is that the hypothesis of improvement in operating performance is tested taking into account share repurchases, respectively, in the current period, in the previous year and two years earlier.

In previous works, Kim and Park (2021) found a relationship between operating performance and share repurchases from two years earlier for companies in South Korea, while Chao and Huang (2022) identified an improvement one quarter after repurchases were carried out in companies in Taiwan. For Brazil, as previously reported, no works were found that addressed this topic. The results of this work are presented in the next section.

4 RESULTS AND DISCUSSION

This section highlights and discusses the results of the tests relating to the five hypotheses addressed in this study; some descriptive statistics on the data set used are also presented. Regarding the variables present in this study, Table 1 presents some descriptive statistics that help to summarize the data.

Table 1: Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Coef. of Variation	Minimum	Maximum
Share repurchases	3,432	0.0017	0.0072	4.2869	-	0.0583
Free Cash Flow	3,400	-0.0319	0.3130	-9.8111	-2.4427	0.3468
Cash	3,421	0.1083	0.1686	1.5562	0.0000	0.9677
Market-to-book	2,540	2.3087	2.7686	1.1992	-0.1174	18.8633
Stock return (%)	2,456	20.9892	59.7186	2.8452	-71.0678	277.5531
Indebtedness (%)	3,430	114.1779	172.9020	1.5143	-	1,179.4660
Size	2,575	14.5306	1.9336	0.1331	8.0064	19.9217
Profitability (%)	3,427	-0.5825	29.7933	-51.1489	-226.6016	29.3359
Investment Opportunities	3,094	0.0900	0.3199	3.5562	-1.3314	1.2086
Life cycle	3,431	-0.8536	5.9317	-6.9487	-47.5258	0.9813
Capex	3,400	0.1736	7.9457	45.7632	-103.5861	445.3542

Variable	Obs.	Mean	Std. Dev.	Coef. of Variation	Minimum	Maximum
Payout	3,041	0.4443	0.6946	1.5634	-	4.5468
Tangibility	3,430	0.2188	0.2217	1.0131	-	0.9546

Source: Prepared by the authors.

In general, with the descriptive statistics in Table 1, some characteristics regarding the profile of the companies can be seen. These companies had, on average, negative profitability and free cash flow during the period covered, but obtained positive annual returns on the value of their shares. Also on average, the companies showed a capital structure with a greater share of debt in relation to equity. It is worth noting that these are only average values, and that the high variability of the data shows that the companies are quite distinct from one another, with profitability, Capex, free cash flow, life cycle and share repurchases being, in absolute numbers, the variables with the highest coefficient of variation.

While the companies' cash represented on average 10.83% of their assets, the amounts disbursed on share repurchases represented only 0.17%. However, when only companies in periods in which they made repurchases are considered, the value rises to 1.02%, that is, although share repurchases represent a low value relative to the total sample, the values are significant for the companies that use this mechanism.

Regarding the models built to test the hypotheses of this study, Table 2 presents the results for the first model, which sought to test the hypotheses of free cash flow, share undervaluation and meeting investor demand.

Table 2: Results of the first model

Dependent variable: Share repurchases	Coefficients (z-statistic)					
Independent variables:	**Regression 1**	**Regression 2**	**Regression 3**	**Regression 4**	**Regression 5**	**Regression 6**
Free Cash Flow	0.007866	0.008342	0.007521	0.007589	0.008489	0.007939
	(3.1)***	(3.21)***	(2.6)***	(2.94)***	(3.17)***	(2.59)***
Market-to-book	0.000005	-0.000049	-0.000186	0.000001	-0.000038	-0.000141
	(0.06)	(-0.44)	(-1.89)*	(0.01)	(-0.33)	(-1.77)*
Dividend premium (PIDIV)	0.000671	0.000664	0.000785			
	(0.8)	(0.79)	(1.02)			
Dividend premium (PD)				0.019787	0.019243	0.022040
				(1.66)*	(1.66)*	(2)**
Indebtedness		0.000000	0.000001		0.000000	0.000001
		(0.13)	(0.8)		(0)	(0.52)
Size		0.000189	0.000270		0.000133	0.000195
		(1.55)	(1.96)**		(1.15)	(1.58)
Profitability		0.000036	0.000061		0.000026	0.000055
		(1.32)	(2.27)**		(0.96)	(2.33)**
Investment Opportunities		-0.000215	-0.000566		0.000003	-0.000130
		(-0.33)	(-0.64)		(0)	(-0.13)
Life cycle		0.000005	0.000021		0.000007	0.000010
		(0.13)	(0.57)		(0.2)	(0.28)
Previous Payout			-0.000216			-0.000134
			(-1.5)			(-0.92)
Constant	0.001404	-0.001403	-0.002505	-0.003276	-0.005109	-0.006610
	(1.43)	(-0.62)	(-1.05)	(-0.96)	(-1.3)	(-1.69)*

Dependent variable: Share repurchases	Coefficients (z-statistic)					
Independent variables:	**Regression 1**	**Regression 2**	**Regression 3**	**Regression 4**	**Regression 5**	**Regression 6**
Number of Observations	2,521	2,393	2,176	2,320	2,197	1,985
Model significance (Prob > chi2)	0.00	0.00	0.00	0.00	0.00	0.00
R^2	0.1144	0.1177	0.0746	0.1459	0.1513	0.1414
Homoscedasticity of residuals (Breusch-Pagan)	0.00	0.00	0.00	0.00	0.00	0.00
Absence of multicollinearity (Mean VIF)	1.01	1.25	1.23	1.01	1.26	1.24
Absence of autocorrelation (Wooldridge test)	0.5581	0.3906	0.9321	0.7842	0.5341	0.6971
Normality of residuals (Shapiro-Francia)	0.00	0.00	0.00	0.00	0.00	0.00

Note: Significant at the level of 10%*; 5%** and 1%***

Source: Prepared by the authors.

Based on the first model, six regressions were built. Regressions 1 and 4 included only the main independent variables, and the control variables were added in the others. All regressions had year and sector fixed-effects controls and all obtained statistical significance. Due to the existence of heteroscedasticity of the residuals, as identified by the Breusch-Pagan test, correction by the robust model was necessary for all regressions. The regressions showed acceptable multicollinearity and met the assumption of absence of autocorrelation of the residuals. However, as identified by the Shapiro-Francia test, the residuals do not have a normal distribution, which means that the considerations about the results are limited only to the companies in the sample.

In the six regressions, statistically significant and positive relationships between share repurchases and free cash flow stand out. These results support H1, that is, the Brazilian companies in the sample showed a tendency to repurchase more shares when they had a greater volume of free cash flow available. For the share undervaluation hypothesis (H2), there was weak support, since the market-to-book variable was statistically significant considering 10% significance and only in regressions 3 and 6.

For the hypothesis of meeting investor demand (H5), support was also found considering some of the configurations of the model. In regressions 4, 5 and 6, it was identified that the Dividend premium (PD) variable showed a statistically significant and positive relationship with share repurchases. The same relationship was not identified for the other regressions, which used the PIDIV dummy variable. Regarding the control variables, only size and profitability were statistically significant in at least one regression.

Also to test the hypotheses of free cash flow, share undervaluation and meeting investor demand, the second model was built, which involved the replacement of some variables in comparison with the first model. These results are highlighted in Table 3.

Table 3: Results of the second model

Dependent variable: Share repurchases	Coefficients (z-statistic)					
Independent variables:	**Regression 1**	**Regression 2**	**Regression 3**	**Regression 4**	**Regression 5**	**Regression 6**
Cash	0.000501	0.000120	0.000699	0.000261	-0.000125	0.000219
	(0.28)	(0.05)	(0.34)	(0.15)	(-0.06)	(0.11)
Previous stock return	-0.000001	-0.000002	-0.000003	0.000000	-0.000001	-0.000002
	(-0.33)	(-0.98)	(-1.3)	(-0.19)	(-0.57)	(-0.78)
Dividend premium (PIDIV)	0.000433	0.000373	0.000609			
	(0.53)	(0.47)	(0.83)			

Dependent variable: Share repurchases	Coefficients (z-statistic)					
Independent variables:	**Regression 1**	**Regression 2**	**Regression 3**	**Regression 4**	**Regression 5**	**Regression 6**
Dividend premium (PD)				0.015483	0.014716	0.017249
				(1.31)	(1.29)	(1.61)
Indebtedness		0.000000	0.000001		0.000000	0.000001
		(0.19)	(0.62)		(0.05)	(0.41)
Size		0.000242	0.000250		0.000158	0.000176
		(2.06)**	(1.81)*		(1.37)	(1.4)
Profitability		0.000062	0.000082		0.000053	0.000076
		(2.24)**	(2.96)***		(1.93)*	(2.94)***
Investment Opportunities		-0.001064	-0.001284		-0.000775	-0.000919
		(-1.87)*	(-1.57)		(-1.28)	(-1.05)
Life cycle		0.000018	0.000031		0.000021	0.000028
		(0.46)	(0.77)		(0.55)	(0.7)
Previous Payout			-0.000226			-0.000152
			(-1.52)			(-1.01)
Constant	0.001438		-0.002347	-0.002046	-0.004061	-0.005191
	(1.63)		(-0.99)	(-0.61)	(-0.99)	(-1.31)
Number of Observations	2,446	2,279	2,067	2,256	2,096	1,889
Model significance (Prob > chi2)	0.00	0.00	0.00	0.00	0.00	0.00
R^2	0.0675	0.0726	0.0716	0.1482	0.1473	0.1402
Homoscedasticity of residuals (Breusch-Pagan)	0.00	0.00	0.00	0.00	0.00	0.00
Absence of multicollinearity (Mean VIF)	1.00	1.17	1.15	1.07	1.19	1.17
Absence of autocorrelation (Wooldridge test)	0.7161	0.5453	0.6332	0.9997	0.7618	0.3949
Normality of residuals (Shapiro-Francia)	0.00	0.00	0.00	0.00	0.00	0.00

Note: Significant at the level of 10%*; 5%** and 1%***

Source: Prepared by the authors.

The second model was also divided into six regressions. The considerations made for the first model, regarding fixed-effects controls, statistical significance of the model and regression assumptions, also apply to the second. The differences between the two were the replacement of free cash flow with cash and of market-to-book with previous stock return.

These two variables were not statistically significant in any regression; thus, the results of the second model do not provide support for H1 and H2. The same occurred for the dividend premium variable, which did not show statistical significance in any of the regressions. Regarding the control variables, size, profitability and investment opportunities were statistically significant in at least one of the regressions.

For the same three hypotheses tested in the first and second models (free cash flow, share undervaluation and meeting investor demand), a logistic regression model was built. The results of this third model are shown in Table 4.

Table 4: Results of the third model (logistic regression)

Dependent variable: Repurchaser (dummy)	Coefficients (z-statistic)					
Independent variables:	**Regression 1**	**Regression 2**	**Regression 3**	**Regression 4**	**Regression 5**	**Regression 6**
Free Cash Flow	1.055769	0.130189	0.004054	0.873807	-0.182270	-0.383093
	(2.06)**	(0.18)	(0.01)	(1.62)	(-0.24)	(-0.47)
Market-to-book	0.008254	-0.061832	-0.076259	0.012902	-0.048701	-0.061790
	(0.49)	(-2.39)**	(-2.78)***	(0.76)	(-1.92)*	(-2.31)**
Dividend premium (PIDIV)	0.708025	0.685990	0.715320			
	(2.69)***	(2.5)**	(2.52)**			
Dividend premium (PD)				7.512175	7.388507	8.442565
				(2.25)**	(2.08)**	(2.27)**
Indebtedness		0.000349	0.000601		0.000264	0.000507
		(0.73)	(1.17)		(0.53)	(0.95)
Size		0.246329	0.272060		0.238141	0.264239
		(7.43)***	(7.62)***		(6.97)***	(7.17)***
Profitability		0.010371	0.014638		0.009395	0.013962
		(1.14)	(1.46)		(0.98)	(1.31)
Investment Opportunities		-0.062944	-0.073655		-0.191663	-0.225865
		(-0.27)	(-0.29)		(-0.78)	(-0.83)
Life cycle		0.206414	0.223420		0.190588	0.201973
		(1.61)	(1.49)		(1.52)	(1.39)
Previous Payout			-0.068465			-0.034098
			(-0.75)			(-0.38)
Constant	-1.793847	-5.352821	-5.700810	-3.588885	-7.005526	-7.627291
	(-5.46)***	(-8.73)***	(-8.81)***	(-3.61)***	(-5.83)***	(-6.02)***
Sensitivity	0.38%	7.50%	9.19%	0.22%	6.00%	7.77%
Specificity	100.00%	98.46%	98.19%	99.95%	98.86%	98.60%
Correctly classified	79.41%	79.19%	79.04%	80.04%	79.84%	79.75%
Number of Observations	2,521	2,393	2,176	2,320	2,197	1,985
Model significance (Prob > chi2)	0.00	0.00	0.00	0.00	0.00	0.00
Pseudo R^2	0.0955	0.1354	0.1407	0.0951	0.1322	0.1366
Homoscedasticity of residuals (Breusch-Pagan)	0.01	0.00	0.00	0.01	0.00	0.00
Absence of multicollinearity (Mean VIF)	1.01	1.25	1.23	1.01	1.26	1.24
Absence of autocorrelation (Wooldridge test)	0.0001	0.0001	0.0046	0.0000	0.0000	0.0013

Note: Significant at the level of 10%*; 5%** and 1%***

Source: Prepared by the authors.

According to Table 4, it can be seen that the probability of a company repurchasing its shares is positively related to free cash flow and the dividend premium, and negatively related to the market-to-book ratio. The dividend premium was the variable with the most stable result, since among the three it was the only one statistically significant in all configurations of the model, considering both PIDIV and PD as the form of measurement. The figures of this model indicate that companies tend to repurchase their shares when they need to distribute available free cash flow, when managers believe that the shares are undervalued and at times of greater demand for dividends (manifested by the higher dividend premium), supporting the three hypotheses tested (H1, H2 and H5). Size was the only control variable with statistical significance in at least one regression.

Although the model demonstrated a high capacity to correctly classify the observations (between 79.04% and 80.04%), low sensitivity was observed (between 0.22% and 9.19%), that is, the model worked well to classify companies in periods in which there were no share repurchases (high specificity), but the same did not occur in the classification of companies in periods in which repurchase transactions took place.

In the models already presented, the same hypotheses were tested (free cash flow, share undervaluation and meeting investor demand). To test the other two, it was necessary to build two other models. Table 5 presents the results of the fourth model, which was used to test the hypothesis of the flexibility of share repurchases.

Table 5: Results of the flexibility model

Dependent variable: CAPEX	**Coefficients (z-statistic)**				
Independent variables:	**Regression 1**	**Regression 2**	**Regression 3**	**Regression 4**	**Regression 5**
Share repurchases	-0.016081	-0.266460	-0.268004	-0.262472	-0.243635
	(-0.08)	(-1.74)*	(-1.75)*	(-1.71)*	(-1.63)
Payout	-0.000941	-0.002277	-0.002280	-0.002153	-0.002541
	(-0.86)	(-2.02)**	(-2.02)**	(-1.91)*	(-2.27)**
Size		0.007658	0.007518	0.007685	0.006411
		(5.48)***	(4.68)***	(4.8)***	(4.68)***
Indebtedness		-0.000002	-0.000004	-0.000004	0.000000
		(-0.32)	(-0.38)	(-0.42)	(0.04)
Market-to-book			0.000208	0.000226	0.001063
			(0.26)	(0.28)	(1.83)*
Cash				-0.018817	-0.009674
				(-1.04)	(-0.54)
Life cycle					0.000924
					(1.42)
Tangibility					0.067572
					(4.54)***
Constant	0.045566	-1.186478	-0.044140	-0.044780	-0.045783
	(5.81)***	(-3.87)***	(-1.75)*	(-1.76)*	(-2.01)**
Number of Observations	3,107	2,317	2,317	2,311	2,311
Model significance (Prob > F)	0.00	0.00	0.00	0.00	0.00
R^2	0.1005	0.1410	0.1405	0.1410	0.2143
Homoscedasticity of residuals (Breusch-Pagan)	0.70	0.26	0.27	0.42	0.00

Absence of multicollinearity (Mean VIF)	1.00	1.02	1.09	1.08	1.18
Absence of autocorrelation (Wooldridge test)	0.0003	0.0000	0.0000	0.0000	0.0000
Normality of residuals (Shapiro-Francia)	0.00	0.00	0.00	0.00	0.00

Note: Significant at the level of 10%*; 5%** and 1%***

Source: Prepared by the authors.

Unlike the previous models, the fourth model had Capex as the dependent variable. Both share repurchases and the payment of dividends were statistically significant in at least three of the five regressions and showed a negative relationship. Thus, these results show that, when companies need to modify their investment levels, they tend to use both forms of cash distribution. These relationships contrast with the results reported by Iyer et al. (2017), who identified that, for reasons of flexibility, only share repurchases were adjusted to meet the variations in the need for capital expenditures.

Accordingly, the results of the fourth model indicate that the managers of Brazilian companies, unlike those in other countries, use share repurchases and the payment of dividends in a complementary way (support for H3), that is, similarly to what was identified by Nascimento et al. (2011), Garcia and Lucena (2017) and Amorim et al. (2021), share repurchases are not seen as a flexible means of replacing dividends in Brazil.

The fact that there is an increase in repurchases at times of higher dividend premium, as pointed out earlier, also reinforces the hypothesis that repurchases are used in a way that is complementary to dividends for the companies in the sample.

As for the hypothesis of improvement in operating performance, a model was built that had ROA as the dependent variable. Table 6 presents the results of this fifth model.

Table 6: Results of the operating performance model

Dependent variable: ROA	**Coefficients (z-statistic)**		
Independent variables:	**Regression 1**	**Regression 2**	**Regression 3**
Share repurchases	27.320210		
	(1.05)		
Share repurchases t-1		-7.892384	
		(-0.34)	
Share repurchases t-2			-0.892512
			(-0.05)
Size	1.067569	1.122261	1.095896
	(4.24)***	(4.34)***	(4.65)***
Indebtedness	-0.012754	-0.012779	-0.012756
	(-5.54)***	(-5.44)***	(-5.43)***
Market-to-book	0.681127	0.670104	0.650576
	(5.45)***	(5.33)***	(5.09)***
Free Cash Flow	25.426040	26.625240	27.146270
	(8.49)***	(7.85)***	(7.18)***
Life cycle	0.180519	0.162609	0.163058
	(1.27)	(1.12)	(1.09)
Investment Opportunities	4.674214	4.580758	4.634365
	(5.57)***	(5.19)***	(5.31)***

Dependent variable: ROA	Coefficients (z-statistic)		
Independent variables:	**Regression 1**	**Regression 2**	**Regression 3**
Capex	17.174880	20.027280	19.654470
	(2.69)***	(3.91)***	(3.79)***
Constant	-12.918220	-13.887610	-13.432600
	(-3.67)***	(-3.72)***	(-3.87)***
Number of Observations	2,490	2,438	2,387
Model significance (Prob > F)	0.00	0.00	0.00
R^2	0.4494	0.4415	0.4325
Homoscedasticity of residuals (Breusch-Pagan)	0.00	0.00	0.00
Absence of multicollinearity (Mean VIF)	1.32	1.33	1.33
Absence of autocorrelation (Wooldridge test)	0.00	0.00	0.00
Normality of residuals (Shapiro-Francia)	0.00	0.00	0.00

Note: Significant at the level of 10%*; 5%** and 1%***

Source: Prepared by the authors.

This model comprised three regressions, in which the relationships between operating performance (ROA) and share repurchases carried out at three distinct points in time (current year, previous year and two years earlier) were tested. Unlike the results reported by Nohel and Tarhan (1998), Lie (2005) and Chao and Huang (2022), no improvement was found in the operating performance of companies after share repurchases were carried out. These results do not provide support for H4, that is, a possible use of share repurchases as part of a restructuring of companies, which would be intended to dispose of low-performing assets, was not identified.

In general, the results of the tests carried out in this section suggest that the repurchase decision, although with several points in common with those found in developed markets, also reflects economic and legal particularities of Brazil. For the companies in the sample, share repurchases are motivated by the need to distribute available free cash flow, to inform the market that the company's share prices are undervalued, to complement the payment of dividends and to meet investors' need for cash. It can also be seen that larger, more profitable companies with fewer investment opportunities have a greater tendency to repurchase shares. This denotes a combination of different factors that influence this important financial decision.

Managers, once attentive to the need to distribute cash and avoid agency problems, use repurchases as a mechanism to manage extra volumes of cash, as pointed out by several of the studies cited earlier. In addition, the perception that repurchases also serve as a way of signaling to the market the undervaluation of shares is relevant especially in a market such as that of Brazil, since in environments marked by more pronounced asymmetric information, repurchases can act as a relevant communication tool, conveying management's confidence regarding the future of the company.

Unlike what is observed in research with companies from other countries, in Brazil share repurchases are not used as a flexible means of replacing dividends, but rather as a complementary payment strategy. This divergence can be attributed to the regulatory particularities of the Brazilian market, which impose distinct conditions regarding the profit distribution decision. The combination of repurchases and dividends can also be interpreted as a response to the needs of investors. Especially in scenarios with limited investment opportunities and greater demand for cash from shareholders, companies may opt for this strategy and return capital to their owners, meeting investors' more immediate desire for remuneration.

Of the five hypotheses tested, only H4 received no support from the results of this research, with no statistically significant relationship being observed between share repurchases and a possible improvement in the operating performance of companies.

Therefore, this work contributes to the understanding of the dynamics of cash distribution in Brazil, offering insights that differ from those found in other countries. By recognizing repurchases as a mechanism of financial management and communication with the market, companies can amplify their positive effects, adapting their decisions as the economic and legal environments evolve.

5 FINAL CONSIDERATIONS

The decision to distribute cash, especially in environments marked by weak protection of shareholders' rights, is an important element that affects the company's reputation in the market. In Brazil, the choice has mostly been to use the payment of dividends and JSCP to deliver money to shareholders, but discussions about legal changes have been gaining ground. In this context, share repurchases, which are already one of the main corporate payout mechanisms in several countries, may show greater growth potential.

This work aimed to investigate the main motivations that lead Brazilian companies to repurchase their shares. To this end, based on a sample of non-financial companies, the techniques of ordinary least squares regression and logistic regression were employed.

The results obtained in this research showed that, considering the companies covered in the study, share repurchases have been carried out as a way of avoiding agency costs through the distribution of free cash flow, to signal to the market that the companies' shares are undervalued, to complement the payment of dividends and JSCP and to meet investors' demand for cash. Thus, four of the five hypotheses tested were supported by the results of this work. The only hypothesis for which no support was found was that of improvement in operating performance, even considering three distinct points in time (shares repurchased in the current period, one year earlier and two years earlier).

These results were in line with previous studies carried out in Brazil, which already pointed to the distribution of free cash flow, the undervaluation of shares and the complementing of dividends as the main determinants of repurchases, and additionally bring evidence of the motive of meeting investor demand for the Brazilian context, with companies repurchasing in greater volume to complement dividends in periods of greater demand, manifested by the premium that, at certain times, shareholders place on the share prices of large dividend payers.

As in the other studies with Brazilian companies, this work also highlighted a difference in the use of share repurchases, with this mechanism serving to complement the payment of dividends and not to replace it, the latter being the behavior observed in works from several countries, since in other places share repurchases are seen as a more flexible way of distributing cash.

As a limitation of this research, it can be mentioned that, because the focus was on the determinants in general, some more specific approaches were not carried out. Examples are Grullon and Michaely (2004), who, regarding the free cash flow hypothesis, evaluated the market response to verify whether there was a decline in the risks and cost of capital of companies after the repurchases, or Ikenberry, Lakonishok and Vermaelen (1995), who, to test the undervaluation hypothesis, examined the short-term and long-term variation in share prices. Thus, the suggestion remains for future works that investigate specifically any of the hypotheses addressed in this study.

Also for future studies, should a change in the legal environment that brings less incentive for the use of dividends be confirmed, the recommendation remains to carry out research that analyzes possible changes regarding the determinants of share repurchases in the Brazilian market. For example, some questions that may be asked are whether companies have begun to see share repurchases as a more flexible means of distributing cash, and whether repurchase announcements have been used as part of a restructuring of assets, leading to an improvement in the company's operating performance.

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