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THE IMPACT OF RUMORS ON THE PRICES OF THE MOST TRADED STOCKS ON THE BRAZILIAN STOCK EXCHANGE (B3)

O IMPACTO DOS BOATOS NO PREÇO DAS AÇÕES MAIS NEGOCIADAS NA BOLSA DE VALORES BRASILEIRA (B3)

EL IMPACTO DE LOS RUMORES EN EL PRECIO DE LAS ACCIONES MÁS NEGOCIADAS EN LA BOLSA DE VALORES BRASILEÑA (B3)

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ABSTRACT

This article analyzes the role of information and the dissemination of rumors in the price dynamics of the Brazilian stock market, focusing on the relationship between financial rumors, official announcements, and fluctuations in asset prices. The study is based on an empirical approach applied to stocks listed on B3, selected according to the highest financial trading volume in the period from 2019 to 2023, including PETR4, VALE3, ITUB4, BBDC4, and MGLU3. The research uses historical price series adjusted for corporate events, such as stock splits, as well as records of rumors and official communications released to the market. The theoretical framework discusses concepts related to market efficiency, information asymmetry, and the role of corporate communication in price formation. Methodologically, computational tools are employed for data collection, processing, and integration, as well as descriptive statistical techniques and outlier identification for return analysis. The results indicate that financial rumors are associated with atypical variations in stock prices, especially when they precede official announcements, revealing stronger reactions to rumors of a negative nature. It is concluded that unofficial information exerts a relevant influence on market behavior, reinforcing the importance of informational transparency, regulatory oversight, and critical analysis by investors.

Keywords: Financial Market. Rumors. Information. Volatility. Brazilian Stock Market.

RESUMO

Este artigo analisa o papel da informação e da disseminação de boatos na dinâmica de preços do mercado de ações brasileiro, com foco na relação entre rumores financeiros, comunicados oficiais e oscilações nos preços dos ativos. O estudo baseia-se em uma abordagem empírica aplicada a ações listadas na B3, selecionadas a partir do maior volume financeiro negociado no período de 2019 a 2023, incluindo PETR4, VALE3, ITUB4, BBDC4 e MGLU3. A pesquisa utiliza séries históricas de preços ajustadas por eventos corporativos, como desdobramentos acionários, além de registros de boatos e comunicados oficiais divulgados ao mercado. A fundamentação teórica discute conceitos relacionados à eficiência de mercado, assimetria informacional e ao papel da comunicação corporativa na formação

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de preços. Metodologicamente, empregam-se ferramentas computacionais para coleta, tratamento e integração dos dados, bem como técnicas estatísticas descritivas e identificação de outliers para análise dos retornos. Os resultados indicam que boatos financeiros estão associados a variações atípicas nos preços das ações, sobretudo quando antecedem comunicados oficiais, evidenciando reações mais intensas a rumores de caráter negativo. Conclui-se que a informação não oficial exerce influência relevante sobre o comportamento do mercado, reforçando a importância da transparência informacional, da atuação regulatória e da análise crítica por parte dos investidores.

Palavras-chave: Mercado Financeiro. Boatos. Informação. Volatilidade. Mercado Acionário Brasileiro.

RESUMEN

Este artículo analiza el papel de la información y de la difusión de rumores en la dinámica de precios del mercado accionario brasileño, con énfasis en la relación entre rumores financieros, comunicados oficiales y fluctuaciones en los precios de los activos. El estudio se basa en un enfoque empírico aplicado a acciones listadas en la B3, seleccionadas según el mayor volumen financiero negociado en el período de 2019 a 2023, incluyendo PETR4, VALE3, ITUB4, BBDC4 y MGLU3. La investigación utiliza series históricas de precios ajustadas por eventos corporativos, como desdoblamientos accionarios, además de registros de rumores y comunicados oficiales divulgados al mercado. La fundamentación teórica aborda conceptos relacionados con la eficiencia de mercado, la asimetría informacional y el papel de la comunicación corporativa en la formación de precios. Metodológicamente, se emplean herramientas computacionales para la recolección, el tratamiento y la integración de los datos, así como técnicas estadísticas descriptivas y la identificación de valores atípicos para el análisis de los retornos. Los resultados indican que los rumores financieros se asocian con variaciones atípicas en los precios de las acciones, especialmente cuando anteceden a comunicados oficiales, evidenciando reacciones más intensas ante rumores de carácter negativo. Se concluye que la información no oficial ejerce una influencia relevante sobre el comportamiento del mercado, reforzando la importancia de la transparencia informativa, la actuación regulatoria y el análisis crítico por parte de los inversores.

Palabras clave: Mercado Financiero. Rumores. Información. Volatilidad. Mercado Accionario Brasileño.

1 INTRODUCTION

The dynamics of the stock market are influenced by several elements, with information being one of the most impactful. When investors decide to buy or sell assets, they rely on forecasts of the future performance of companies, based on technical or fundamental analysis or assumptions. In this volatile and competitive context, the speed with which information propagates can quickly change the direction of prices, generating a situation where agile and accurate access to information becomes crucial (MÜLLER, 2006).

However, not all information circulating on the market is confirmed or official. A considerable part of the flow of information is made up of rumors, unconfirmed or manipulated information that, even if speculative, impacts investors' choices. According to Allport and Postman (1946), rumors arise when interest in the subject is high and reliable sources of information are scarce or not readily available. In the financial sector, this information gap is commonly filled by rumors that provoke speculative movements, causing unusual fluctuations in stock values.

The occurrence of rumors in the financial market is not something new. At the beginning of the twentieth century, researchers such as Knapp (1944) and Prasad (1935) examined the psychology of rumors, monitoring their dissemination and social repercussions. In the era of the networked society (CASTELLS, 1999), characterized by the rapid circulation and decentralization of information, rumors gain strength and impact a much larger number of participants in a shorter period of time. In the stock market, this rapid spread directly impacts the dynamics of prices, particularly when rumors are disseminated by media that give credibility to the news, even if it is not confirmed (KAPFERER, 1993).

This intensifies the disparity in access to information between investors, benefiting some to the detriment of others. According to Carvalho and Mattos (2008), inequality in the distribution of information is one of the main issues of the contemporary financial market, since it compromises transparency and equity among those involved. In addition, the delay of the companies and entities responsible for responding to rumors can cause them to be interpreted as true by investors, impacting the stock values and the reputation of the companies involved.

Given this scenario, it is necessary to understand how rumors relate to the dynamics of prices in the Brazilian stock market. The analysis of this phenomenon allows us to identify patterns of market behavior, assess the intensity and duration of reactions to unofficial

information, and understand the role of corporate communications in stabilizing or amplifying the observed fluctuations.

Thus, the main objective of this article is to analyze the influence of the dissemination of financial rumors on the price dynamics of shares traded on B3, based on an empirical study based on historical price series, official announcements and rumors records associated with selected companies. It seeks to identify whether the occurrence of rumors is associated with atypical variations in stock returns, as well as to examine the behavior of the market before and after the disclosure of formal clarifications.

Finally, this study aims to contribute to the understanding of the role of information in the formation of asset prices, highlighting the relevance of corporate transparency, communication with the market and critical analysis of available information. By empirically investigating the relationship between rumors and price fluctuations, the work offers subsidies for discussions on regulation, financial education, and practices that can mitigate the negative effects of disinformation on the Brazilian stock market.

2 THEORETICAL BASIS

The analysis of the impact of rumors on the dynamics of prices in the financial market requires a theoretical basis focused on the role of information in the formation of asset prices. In organized markets, such as the stock market, information is a fundamental element for investors' decision-making, influencing expectations, risk perceptions and trading strategies. In this context, the economic literature offers important contributions to the understanding of how formal and informal information affect price behavior.

2.1 MARKET INFORMATION AND EFFICIENCY

The Efficient Markets Hypothesis, formulated by Fama (1970), establishes that asset prices reflect, to a greater or lesser extent, the information available in the market. According to this perspective, new relevant information would be quickly incorporated into prices, reducing the possibility of abnormal gains in a systematic way.

However, the hypothesis of efficiency depends on the quality, availability and interpretation of the information. In contexts in which incomplete, inaccurate or unconfirmed information circulates, such as rumors, the price formation process may present temporary distortions. Thus, although markets tend to be efficient in the long run, in the short run there may be excessive or inappropriate reactions to certain informational stimuli.

2.2 INFORMATIONAL ASYMMETRY AND MARKET IMPERFECTIONS

Informational asymmetry represents one of the main limitations to the fully efficient functioning of markets. Akerlof (1970) demonstrated that inequality in access to information can generate suboptimal decisions and distortions in prices. In the financial market, this asymmetry manifests itself when different agents have different levels of information or ability to interpret the available data.

Grossman and Stiglitz (1980) argue that perfectly efficient markets are unfeasible, because obtaining information involves costs. Thus, not all agents have access to the same information at the same time, which opens space for imperfections and temporary movements of inefficiency.

In this context, rumors can be understood as unverified information that circulates in the market and affects expectations, especially when there is no immediate position from companies or regulatory bodies. The absence of official clarification increases uncertainty and enhances investor reactions.

2.3 RUMOURS AND PRICE BEHAVIOUR

Financial rumors can influence the market by changing perceptions of risk and return associated with certain assets. Even without confirmation, rumors may lead investors to anticipate future movements, causing price fluctuations before the release of official information.

The literature points out that negative information tends to produce more intense reactions in the market, since losses are perceived more sensitively by investors. Thus, negative rumors can intensify price declines or increase volatility, while positive rumors tend to produce more limited or short-lived effects.

In the Brazilian stock market, this phenomenon is often observed through the disclosure of clarification notices to the market, in which companies take a position on information that has previously circulated unofficially. The price reaction before and after these announcements provides relevant clues about the impact of the rumors on market dynamics.

2.4 CORPORATE COMMUNICATION AND REDUCTION OF UNCERTAINTY

The disclosure of material facts and official communications is one of the main mechanisms for reducing informational asymmetry. By clarifying rumors or confirming

relevant information, companies contribute to the most appropriate formation of investors' expectations.

However, the time between the circulation of a rumor and the release of an official statement can be enough to generate significant fluctuations in asset prices. In this way, corporate communication plays a central role in containing speculative movements and restoring informational balance.

2.5 THEORETICAL FOUNDATION AND RELATIONSHIP WITH EMPIRICAL STUDY

Based on these theoretical assumptions, this study empirically analyzes the relationship between financial rumors, official announcements and variations in the prices of shares traded on B3. The reasoning presented supports the hypothesis that unconfirmed information can generate atypical movements in the market, especially in contexts of high informational uncertainty.

Thus, the analysis of market data, associated with the registration of rumors and announcements, allows us to evaluate how informational imperfections are reflected in price dynamics, contributing to the understanding of the functioning of the Brazilian stock market.

3 METHODOLOGY

The present research is characterized as an empirical study of applied nature, with a quantitative and exploratory approach, whose objective was to analyze the influence of the dissemination of financial rumors on the price fluctuations of shares traded in the Brazilian stock market. The method adopted is based on multiple case studies, focusing on the companies with the highest financial volume traded on the B3 spot market in the period from 2019 to 2023.

3.1 SAMPLE DELIMITATION

Initially, B3's historical spot market quotations were collected, covering the time interval between January 2019 and December 2023. From this data, a Python script was developed to identify the five stocks with the highest financial volume traded in the analyzed period. As a result of this procedure, the following companies were selected: Petrobras (PETR4), Vale (VALE3), Itaú Unibanco (ITUB4), Bradesco (BBDC4) and Magazine Luiza (MGLU3).

The choice of this time frame is justified because it covers a period marked by high informational instability, including relevant events such as the Covid-19 pandemic, political

and economic changes in the country, and intensification of the use of digital media as a source of information for investors.

3.2 COMPUTATIONAL TOOLS AND DEVELOPMENT ENVIRONMENT

For the execution of the data collection, treatment and analysis procedures, the Python programming language was used, due to its wide application in data analysis and finance. The development environment adopted was Google Colab, chosen because it allows code execution without the need for local configuration, in addition to facilitating the reproduction and validation of results.

The main libraries employed were:

- **pandas**: for manipulation, cleaning and organization of data;
- **numpy**: for statistical calculations;
- **matplotlib**: for the construction of general Figures and, specifically, for the plotting of the boxplots used in the scatter analysis;
- **Seaborn**: applied in the construction of distribution curves (density estimation), allowing a smoothed visualization of the behavior of returns.

3.3 PROCESSING OF PRICING DATA AND CORPORATE ADJUSTMENTS

During the analysis of the historical series, it was identified the occurrence of shareholder splits in some companies in the sample, which could compromise the comparability of prices over time. In this way, manual adjustments were made to the data to ensure the consistency of the analyses.

In the case of Magazine Luiza, two developments were identified: one of 1:8 in 2019 and another of 1:4 in 2020. Bradesco, on the other hand, showed a split of 1:1.2 in 2019, followed by three splits of 1:1.1 in subsequent years. The shares of Petrobras, Vale and Itaú Unibanco did not show relevant developments in the period.

With this, two databases were built:

1. One without unfolding adjustments;
2. Another with the adjustments applied, the latter being used in the final analyses.

3.4 COLLECTION AND ORGANIZATION OF RUMORS AND COMMUNICATIONS

In parallel with the collection of market data, official notices to the market issued by the companies analyzed were raised, especially those related to B3's inquiries about

unconfirmed information disclosed in the media. From these communications, financial rumors were identified and cataloged, as well as their respective dates, themes and positions of the companies (confirmation, denial or ambiguous response).

This information was structured in a MySQL database, which allowed it to associate rumors, official announcements and market data. The database was modeled in such a way as to allow the same rumor to be related to different statements, including on dates after its initial circulation.

3.5 INTEGRATION OF DATABASES AND TEMPORAL TREATMENT

The integration between the price data and the rumor records was carried out through the merge technique, using the left join strategy. Two distinct analytical sets were constructed:

- One based on the date of the rumor;
- Another based on the date of release of the official statement.

During this process, it was identified that 76 occurrences had different dates for the rumor and for the announcement. To deal with cases of absence of market data on the exact date of the event, the criterion of using the next available trading date was adopted, ensuring the continuity of the analysis.

3.6 STATISTICAL ANALYSIS AND IDENTIFICATION OF *OUTLIERS*

The analysis of the impacts of the rumors focused on the daily returns of the shares, calculated from adjusted prices. To identify abnormal variations associated with the spread of rumors, the outlier detection methodology based on the interquartile range (IQR) was applied.

Initially, the returns were ordered and defined the first quartile (Q1) and the third quartile (Q3). The interquartile range was calculated as the difference between Q3 and Q1, and *outliers were considered to* be values lower than Q1 − 1.5 × the IQR or higher than Q3 + 1.5 × the IQR. This statistical metric underlies the Figures presented in the results, where the boxplot (generated via matplotlib) illustrates the dispersion and extreme points, while the distribution curve (generated via seaborn) shows the density of the returns.

3.7 METHODOLOGICAL SYNTHESIS

From these procedures, it was possible to systematically analyze the relationship between financial rumors, official announcements and fluctuations in stock prices. The

methodology adopted ensures statistical consistency, data traceability and alignment between the research objectives and the results presented, allowing the evaluation of the role of unofficial information in the dynamics of the Brazilian stock market.

4 RESULTS

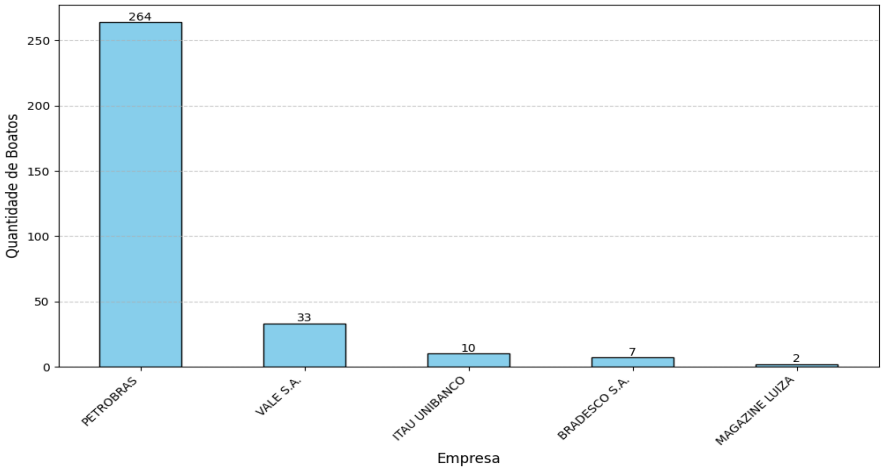
4.1 GENERAL ANALYSIS OF RUMORS AND *OUTLIERS*

The analysis of the results begins with an overview of the financial rumors identified in the period from 2019 to 2023 and their possible effects on the behavior of the prices of the shares analyzed. As described in the methodology, the rumors were identified based on official clarification notices released to the market (B3, 2024), allowing each informational event to be associated with a specific date.

In all, the collection resulted in the identification of 280 different rumors, which unfolded into 316 occurrences over the analyzed period. In 24.05% of these cases (76 occurrences), there was a temporal difference between the date of the rumor and the date of formal clarification. This temporal hiatus creates an environment of ambiguity, a fundamental condition for the circulation of rumors, as classically postulated by Allport and Postman (1947), where uncertainty feeds speculation. However, the distribution of these events did not occur homogeneously among the companies in the sample, as illustrated in the following Figure.

Figure 1

Number of Occurrences of Rumors by Company



Source: Prepared by the authors (2025).

The analysis of Figure 1 reveals a significant concentration of rumors at Petrobras, which accounted for 264 occurrences, representing the vast majority of the sample. Vale appears in second place, with 33 occurrences, while financial institutions (Itaú Unibanco and Bradesco) and the retail sector (Magazine Luiza) had a significantly lower incidence. This disparity suggests that companies with greater political exposure and state influence, such as Petrobras, tend to be more frequent targets of speculation than companies in heavily regulated private sectors, such as banking.

Regarding the impact on prices, the analysis of daily returns allowed us to identify a total of 14 *outliers*, 11 of which were detected by the date of the rumor and 3 by the date of the statement. From this group, there was a predominance of negative reactions: 8 negative *outliers* were recorded against 6 positive ones. This quantitative asymmetry indicates that downward movements tend to be more frequent in periods of uncertainty, corroborating DiFonzo and Bordia's (2007) typology of alarmist rumors, which tend to provoke defensive and immediate reactions on the part of investors.

In general, it was found that the occurrence of rumors was associated with an increase in the dispersion of returns, especially in the days close to the circulation of unconfirmed information. In several cases, the *outliers* were identified before the release of official statements. This behavior suggests that the market reacted in advance to the presence of rumors, a phenomenon that dialogues with Grossman and Stiglitz's (1980) critique of the impossibility of perfectly efficient markets, since informed agents seek to anticipate movements before the information becomes public and free.

It was also observed that *negative outliers* were more frequent and had greater magnitude when compared to positive *outliers*. This dynamic reflects aspects of the psychology of rumor described by Knapp (1944), where fear and uncertainty tend to amplify the perception of risk.

After the release of the official statements, in part of the events analyzed, the returns showed a reversal or reduction in volatility, indicating a process of reaccommodation of the market in the face of the clarification of the information. However, this reaction did not occur uniformly in all cases, varying according to the company and the context of the rumor.

These general results provide an initial overview of the market's behavior in the face of the circulation of financial rumors and establish the basis for the individualized analysis by company, presented in the following subsection.

4.2 ANALYSIS OF RESULTS BY COMPANY (PETR4, VALE3, ITUB4, BBDC4, MGLU3)

4.2.1 Petrobras (PETR4)

Petrobras was among the stocks with the highest financial volume traded in the period analyzed, which makes it particularly sensitive to the circulation of information and the formation of expectations in the market. As Müller (2006) points out, in volatile contexts, the speed of information propagation is decisive for the direction of prices. In the data set examined, rumor events associated with the company were identified, which motivated the disclosure of official clarification notices to the market.

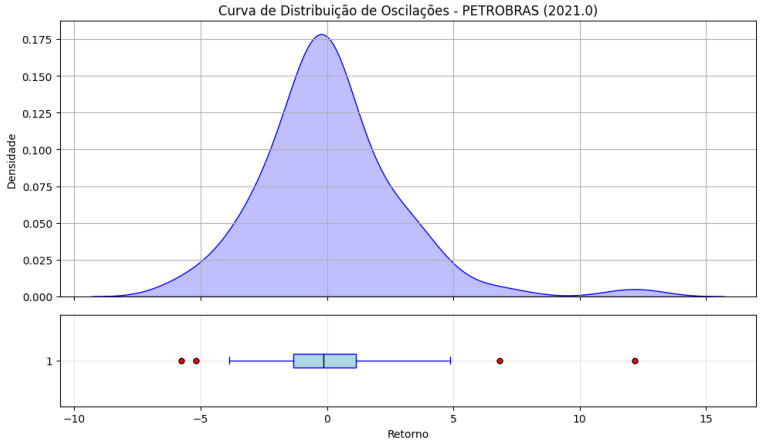
Petrobras had the highest exposure to rumors in the sample, accounting for 264 occurrences of rumors in the period. The analysis of the daily returns of PETR4 showed the occurrence of atypical variations, resulting in the identification of 10 *outliers* considering only the date of the rumor.

The magnitude of these swings illustrates the asset's sensitivity, for example, on February 23, 2021, amid rumors about internal problems and political statements, the stock recorded a positive atypical return of 12.16%. On the other hand, on May 24, 2022, the circulation of news about the 30% reduction in gas supply coincided with an abrupt drop of -12.70%. This data confirms that the market's reaction to the presence of unconfirmed information can generate extreme volatility in both directions, often before the release of official statements.

To illustrate the dispersion of returns in times of high informational instability, the following Figure presents the distribution curve and the boxplot for the year 2021.

Figure 2

Petrobras Distribution Curve in 2021 by Rumor Disclosure Date



Source: Prepared by the authors (2025).

The visualization above shows the symmetry of the main curve, indicating that most of the returns were concentrated near zero. However, the boxplot at the bottom clearly highlights the presence of *outliers* (red dots) far from the average, including the +12.16% extreme event mentioned earlier. This Figureically demonstrates how specific rumors break the asset's pattern of normality.

Regarding the direction of the general movements, there was a higher frequency of negative *outliers* compared to positive ones. These episodes were associated with periods of greater informational uncertainty, in which the absence of immediate clarification coincided with sharper downward movements in share prices.

After the release of the official statements, a reduction in the intensity of oscillations or partial reversal movements of returns was observed in several events. However, this dynamic did not manifest itself uniformly, varying according to the context of the rumor and the period analyzed.

In general, the results for Petrobras indicate that the circulation of rumors was associated with episodes of greater volatility and the occurrence of atypical returns, especially in moments prior to the company's official positioning. This evidence reinforces the importance of corporate communication in reducing informational asymmetry, as discussed by Carvalho and Mattos (2008), being essential for transparency and stabilization of price behavior.

4.2.2 Vale (VALE3)

Vale was the second company with the highest incidence of rumors in the sample, totaling 33 occurrences in the period from 2019 to 2023. The predominant themes revolved around the consequences of the Brumadinho tragedy, such as fines and reparation agreements, as well as speculation about illicit practices.

Analysis of daily returns by date of rumor release revealed distinct volatility dynamics over the years. The years 2019, 2020 and 2021 were marked by high dispersion in returns, with emphasis on 2021, which had the highest volatility in the series (ranging between -8% and +8%).

Unlike what was observed at Petrobras, the application of the interquartile range (IQR) method to the date of the rumor identified only one *outlier* in the entire period analyzed. This event occurred on July 25, 2023, when the stock recorded a positive return of 3.09%, associated with rumors about the sale of a slice of the base metals unit. This result contradicts

the expectation of a predominance of negative impacts, showing that, in the case of Vale, the market reacted in an extreme way only punctually and in a positive direction.

Regarding the date of the official announcements, the analysis revealed a scenario of extreme volatility in 2021, where returns ranged from -20% to +20%, with a positive central trend. In the following years, there was a reduction in this instability, with 2023 showing low volatility. It is important to note that no *outlier* was detected considering the date of release of the official statements.

In short, although Vale has been a frequent target of rumors, the absence of multiple *outliers* suggests that, in most cases, the oscillations caused by this information remained within the expected ranges of variation for the asset. This may indicate a greater efficiency in the absorption of this information by the market or an institutional credibility that cushions the impact of alarmist rumors (KAPFERER, 1993).

4.2.3 Itaú Unibanco (ITUB4)

Itaú Unibanco had a total of 10 occurrences of rumors in the period analyzed, with a significant concentration in 2019 (6 occurrences). There was a relevant reduction in the circulation of rumors in subsequent years, with a total absence of records in 2021 and 2022, and only one isolated case in 2023. The most recurring themes involved allegations of corruption, asset acquisition, and market manipulation.

The analysis of daily returns revealed distinct volatility behaviors. The year 2020, marked by the pandemic, presented the greatest instability, with the distribution curve of returns on the date of the rumor oscillating between -10% and +20% and a positive peak density

However, contrary to what was observed at Petrobras, the application of the statistical method of the interquartile range (IQR) did not identify any *outlier* for Itaú Unibanco, both on the dates of disclosure of the rumors and on the dates of the official announcements. This suggests that despite the momentary volatility seen in 2020, the price swings associated with rumors have mostly remained within the statistical patterns expected for the asset. This scenario is in line with Fama's (1970) assumptions about market efficiency, where mature and highly regulated assets tend to present more consistent price adjustments in the face of new information.

4.2.4 Bradesco (BBDC4)

Bradesco recorded a moderate volume of rumors, totaling 7 occurrences distributed between 2020 and 2023. The main topics speculated involved investments, going public and acquiring shares.

The analysis of volatility by date of the rumor highlighted the year 2020 as a period of extreme swings, with returns ranging in a wide range from -25% to +30% and a positive central trend. On the other hand, the years 2021 and 2023 showed low to moderate volatility.

As in the case of Itaú, the statistical analysis did not result in the identification of *outliers* for Bradesco, either by the date of the rumor or by the date of the statement. This result differs from the pattern observed in companies in the *commodities sector* (such as Petrobras and Vale), reinforcing the perception that the banking sector, heavily regulated and institutionally consolidated, tends to absorb rumors without generating statistically abnormal price reactions, even in years of greater systemic uncertainty such as 2020.

4.2.5 Magazine Luiza (MGLU3)

Magazine Luiza had the lowest incidence of rumors in the sample, with only 2 occurrences of rumors identified in the entire period (one in 2021 and another in 2023). This scarcity limits the construction of robust distribution curves, configuring themselves as "single value" events in the annual analysis.

Due to the small sample size, the interquartile range (IQR) method did not detect statistical *outliers*, a methodological limitation inherent in the analysis of scarce data (MCKINNEY, 2023). However, the analysis of absolute returns reveals significant movements that deserve to be highlighted. On the date of disclosure of the rumor, in 2021, the stock recorded a positive return of +9.35%.

Even more relevant was the behavior observed on the date of the official statement in 2023, when the stock presented an extremely high return of approximately +24.43%. Although not technically classified as *an outlier* due to the sample limitation of the methodology applied to this specific case, this event demonstrates that, when they occur, rumors and announcements associated with the retailer have the potential to generate intense volatility and euphoric reactions in the market.

5 DISCUSSION

The analysis of the results shows that rumors play a relevant role in the price dynamics of the Brazilian stock market, especially in contexts of high informational uncertainty. From the identification of *outliers* in daily returns and the association of these events with the dates of disclosure of rumors and official announcements, it becomes possible to discuss how unconfirmed information influences investor behavior. This scenario reflects the classic problem of "quality uncertainty" described by Akerlof (1970), where the asymmetry of information between economic agents contributes to distortions in the formation of prices.

In general, the results indicate that the most intense effects on prices occur, mostly, on the date of circulation of the rumor, and not at the time of the company's official statement. This finding suggests that the market reacts in advance to informal information, corroborating the criticism of Grossman and Stiglitz (1980) about the impossibility of perfectly efficient markets: as obtaining official information has a cost, in this case, the waiting time, investors use rumors as immediate *proxies* to arbitrage prices and reduce uncertainties. Such behavior reinforces the existence of persistent informational asymmetries, in which rumors function as imperfect substitutes for official information.

The predominance of *negative outliers* over positive ones is also noteworthy. Although positive rumors have been identified, the data indicate that negative information tends to provoke more intense reactions. This asymmetry dialogues directly with the typology proposed by DiFonzo and Bordia (2007), specifically with regard to alarmist rumors, which mobilize the attention of agents more aggressively than rumors of hope ("*wish rumors*").

These rumors, often driven by fear and threat perception, find fertile ground in times of uncertainty. Knapp (1944), in his pioneering studies on the psychology of rumors, already highlighted that narratives of hostility or fear tend to spread more quickly in social groups under tension. In the case of Petrobras, the recurrence of negative *outliers* associated with themes such as political intervention confirms that these narratives have a greater potential for viralization and impact on prices, in line with the psychological reaction of defense in the face of financial threats (PRASAD, 1935).

Vale showed a different behavior: although it was the second company with the highest volume of rumors (33 occurrences), it recorded only one *outlier* identified by the date of disclosure of the rumor. This low incidence of extreme reactions, proportionally to the volume of news, may indicate a more cautious market, possibly influenced by the recent history of corporate crises, such as the Brumadinho dam collapse. The absence of *outliers* by date of

communication suggests that the firm's institutional responses were, in general, sufficient to contain volatility, fulfilling the role of reducing informational conflicts pointed out by Carvalho and Mattos (2008).

In the cases of Itaú Unibanco and Bradesco banks, there was a reduced amount of rumors and the absence of *outliers* directly associated with these rumors. This may be related to the greater predictability of the banking sector, strong regulation, and the perception of institutional soundness of these companies. Even so, relevant variations in the formats of return distributions indicate that, even without extreme events, rumors influence expectations and contribute to price adjustments.

Magazine Luiza, in turn, had the lowest number of rumors, which limits the identification of more robust statistical patterns, a common restriction in data analyses with small samples (MCKINNEY, 2023). However, the scarcity of rumors itself suggests that the company was less exposed to speculative narratives in the period analyzed, or that its institutional communication was effective in mitigating the spread of unverified information.

In aggregate, the results reinforce the criticism of the Efficient Markets of Fame Hypothesis (1970), by demonstrating that unofficial information, which theoretically should be irrelevant noise in an efficient market, generates significant abnormal returns. The analysis also shows that the response of companies, although relevant, is not always immediate or sufficient to neutralize the effects of rumors, especially in the "network society" described by Castells (1999), where the accelerated circulation of decentralized information challenges traditional channels of corporate communication.

Thus, the discussion of the findings points to the need for more proactive corporate communication strategies, as well as to the strengthening of regulatory and educational mechanisms that help investors in the critical evaluation of information. Rumors, far from being mere noise, are structuring elements of the informational dynamics of the contemporary financial market, requiring from the investor a keen critical capacity to navigate between fact and speculation (KAPFERER, 1993).

6 FINAL CONSIDERATIONS

This article aimed to analyze the role of information, rumors and technology in the dynamics of the Brazilian financial market, with emphasis on how unconfirmed rumors influence the volatility and behavior of stock prices traded on B3. From the empirical observation of historical series of adjusted prices and the identification of *outliers* associated

with informational events, we sought to understand how the market reacts to the circulation of informal information in comparison to the official communications of companies.

The results obtained empirically confirm that the market prices the rumor before official confirmation, especially in scenarios of high volatility. The majority identification of *outliers* in the dates of circulation of the rumors, to the detriment of the dates of the official statements, demonstrates that the price adjustment occurs, predominantly, at the time of speculation. This behavior shows that investors use informal information as *proxies* of reality, reacting promptly to the signals available in the informational environment before institutional validation occurs.

The individual analysis of the companies showed that the impact of the rumors does not manifest itself homogeneously. Companies with greater exposure to political factors or recurring narratives showed greater sensitivity to rumors, reflected in the frequency and magnitude of the *outliers* identified. On the other hand, companies associated with more regulated sectors or perceived as institutionally sound showed a lower incidence of extreme variations, although they are not immune to the influence of informal information.

Another relevant finding refers to the predominance of *negative outliers* in relation to positive ones. This pattern reinforces the idea that negative information, even when not confirmed, tends to provoke more intense reactions in the market, amplifying declines and increasing volatility. Such behavior is associated with informational asymmetry and the difficulty of investors in distinguishing, in real time, official information from rumors, especially in digital environments characterized by the rapid dissemination of content.

The performance of companies through official communications has proven to be important to reduce informational uncertainty, although its effects are not always immediate or sufficient to completely neutralize the oscillations generated by rumors. In some cases, price accommodation was observed after the clarifications, while in others volatility persisted, indicating that the market response depends on the context of the rumor, the credibility of the source and the general market conditions in the period analyzed.

Thus, the findings of this study contribute to the understanding that the contemporary financial market does not operate exclusively based on economic fundamentals and formal information. The circulation of rumors and narratives plays a structuring role in the formation of investor expectations and price dynamics, especially in an environment marked by the intensification of the use of digital technologies and the expansion of communication channels.

As limitations, it is noteworthy that the analysis focused on a specific set of companies and in a given period, which restricts the generalization of the results. In addition, the study did not seek to measure direct causality, but to identify associations between informational events and price behaviors. Future research could broaden the sample, incorporate other statistical methodologies, analyze different markets, or explore the role of specific digital platforms in spreading rumors.

Finally, this work shows that, in a highly connected market, rumors are not mere passing noises, but vectors of price anticipation. The market's ability to react intensely to the date of the rumor, often ignoring the date of the official statement, imposes on companies the challenge of monitoring and responding to these narratives in real time, under penalty of seeing their assets priced based on alarmist distortions even before they can present the facts.

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