FEDERAL UNIVERSITY OF CEARÁ

CONTEXTUS
REVISTA CONTEMPORÂNEA DE ECONOMIA E GESTÃO
Contextus – Contemporary Journal of Economics and Management

ISSN 1678-2089
ISSNe 2178-9258

www.periodicos.ufc.br/contextus

COVID-19 impact on the Brazilian stock market

Impacto do COVID-19 no mercado de ações brasileiro

Impacto del COVID-19 en el mercado de acciones brasileño

https://doi.org/10.19094/contextus.2024.93250

Vitor Gonçalves de Souza
https://orcid.org/0000-0001-9138-1344
Master in Economics from the Brazilian Market Institute (IBMEC)
vitorgsouza@gmail.com

Claudio Henrique da Silveira Barbedo
https://orcid.org/0000-0003-0766-6035
Professor at the Brazilian Capital Market Institute (IBMEC)
PhD in Finance from the Federal University of Rio de Janeiro (UFRJ)
cbarbedo72@gmail.com

Article Information
Uploaded on 05/04/2024
Final version on 25/05/2024
Accepted on 28/05/2024
Published online on 11/06/2024

Interinstitutional Scientific Committee
Editor-in-chief: Diego de Queiroz Machado
Evaluation by the double blind review system (SEER / OJS - version 3)

ABSTRACT

Background: The COVID-19 pandemic caused unprecedented disruptions globally, impacting public health, economies, and financial markets. Governments responded with emergency measures and economic stimulus packages to mitigate the crisis's effects. The rationale behind this study lies in understanding the Brazilian stock market reactions to extreme events and specific interventions, which is crucial for policymakers and investors, especially in emerging markets reliant on stability and foreign capital.

Purpose: This research aims to identify how the Brazilian stock market responded to the uncertainties created by the COVID-19 pandemic and whether the economic stimulus package offered by the Brazilian authorities restored confidence in the market.

Method: Using event study methodology, we examined the impact of COVID-19 on the Brazilian stock market, focusing on different economic sectors, ownership structures, and company factors. Our analysis covers four major events: the declaration of COVID-19 as a Public Health Emergency of International Concern (PHEIC) and a pandemic, as well as two economic stimulus announcements. The sample comprised companies listed on B3 with daily trading in 2019, totaling 150 companies/stocks.

Results: The result suggest that Covid-19 affected the economic sectors in different ways, with the hotels, restaurants, travel and leisure services being the most affected in Brazil. The findings indicate that the declaration of COVID-19 as a pandemic appears to have the greatest impact on stock returns and the return of less leveraged firms was less affected. Regarding stimulus packages, only the announce of the emergency package had a significant positive impact on equity returns.

Conclusions: This research shows that distinct events, positive or negative, have different impact on stocks and markets' performance, mainly regarding to economic sectors, size, ownership, profitability and event windows.

Keywords: Covid-19; event study; capital markets; stimulus package; equity returns.

RESUMO

Contextualização: A pandemia de COVID-19 causou perturbações sem precedentes globalmente, impactando a saúde pública, as economias e os mercados financeiros. Os governos responderam com medidas de emergência e pacotes de estímulo econômico para mitigar os efeitos da crise. A justificativa para este estudo reside em compreender as reações do mercado de ações brasileiro a eventos extremos e intervenções específicas, o que é crucial para formuladores de políticas e investidores, especialmente em mercados emergentes dependentes de estabilidade e capital estrangeiro.

Objetivo: Esta pesquisa tem como objetivo identificar como o mercado de ações brasileiro respondeu às incertezas criadas pela pandemia de COVID-19 e se o pacote de estímulo econômico oferecido pelas autoridades brasileiras restaurou a confiança no mercado.

Método: Utilizando a metodologia de estudo de eventos, examinamos o impacto da COVID-19 no mercado de ações brasileiro, focando em diferentes setores econômicos, estruturas de propriedade e fatores das empresas. Nossa análise abrange quatro eventos principais: a declaração de COVID-19 como Emergência de Saúde Pública de Interesse Internacional (ESPII) e pandemia, bem como dois anúncios de pacotes de estímulo econômico. A amostra incluiu empresas listadas na B3 com negociação diária em 2019, totalizando 150 empresas/ações.

Resultados: Os resultados sugerem que a Covid-19 afetou os setores econômicos de maneiras diferentes, sendo os setores de hotéis, restaurantes, viagens e serviços de lazer os mais afetados no Brasil. As descobertas indicam que a declaração de COVID-19 como pandemia parece ter o maior impacto nos retornos das ações e o retorno das empresas

menos alavancadas foi menos afetado. Em relação aos pacotes de estímulo, apenas o anúncio do pacote de emergência teve um impacto positivo significativo nos retornos das ações.
Conclusões: Esta pesquisa mostra que eventos distintos, positivos ou negativos, têm diferentes impactos nas ações e no desempenho dos mercados, principalmente em relação aos setores econômicos, tamanho, propriedade, lucratividade e janelas de eventos.
Palavras-chave: Covid-19; estudo de eventos; mercados de capitais; pacote de estímulo; retorno das ações.

RESUMEN

Contextualización: La pandemia de COVID-19 causó perturbaciones sin precedentes a nivel mundial, impactando la salud pública, las economías y los mercados financieros. Los gobiernos respondieron con medidas de emergencia y paquetes de estímulo económico para mitigar los efectos de la crisis. La razón detrás de este estudio radica en comprender las reacciones del mercado de valores brasileño a eventos extremos e intervenciones específicas, lo cual es crucial para formuladores de políticas e inversores, especialmente en mercados emergentes dependientes de estabilidad y capital extranjero.
Objetivo: Esta investigación tiene como objetivo identificar cómo respondió el mercado de valores brasileño a las incertidumbres creadas por la pandemia de COVID-19 y si el paquete de estímulo económico ofrecido por las autoridades brasileñas restauró la confianza en el mercado.
Método: Utilizando la metodología de estudio de eventos, examinamos el impacto de COVID-19 en el mercado de valores brasileño, centrándonos en diferentes sectores económicos, estructuras de propiedad y factores empresariales. Nuestro análisis cubre cuatro eventos importantes: la declaración de COVID-19 como Emergencia de Salud Pública de Importancia Internacional (ESPII) y pandemia, así como dos anuncios de estímulos económicos. La muestra comprendió empresas listadas en B3 con operaciones diarias en 2019, totalizando 150 empresas/acciones.
Resultados: Los resultados sugieren que Covid-19 afectó a los sectores económicos de diferentes maneras, siendo los más afectados en Brasil los hoteles, restaurantes, servicios de viajes y ocio. Los hallazgos indican que la declaración de COVID-19 como pandemia parece tener el mayor impacto en los retornos de acciones y que el retorno de las empresas menos apalancadas se vio menos afectado. En cuanto a los paquetes de estímulo, solo el anuncio del paquete de emergencia tuvo un impacto positivo significativo en los retornos de las acciones.
Conclusiones: Esta investigación muestra que eventos distintos, ya sean positivos o negativos, tienen diferentes impactos en las acciones y el rendimiento de los mercados, principalmente en cuanto a sectores económicos, tamaño, propiedad, rentabilidad y ventanas de eventos.
Palabras clave: COVID-19; Covid-19; estudio de eventos; mercados de capitales; paquete de estímulo; retornos de las acciones.

How to cite this article:
Souza, V. G., & Barbedo, C. H. S.(2024) COVID-19 impact on the Brazilian stock market. *Contextus – Contemporary Journal of Economics and Management*, 22(6), e93250. https://doi.org/10.19094/contextus.2024.93250

1 INTRODUCTION

The coronavirus (COVID-19) outbreak originated in the city of Wuhan, People's Republic of China, on December 31, 2019. Within the first 30 days, China recorded 11,821 cases and 259 deaths (Cavalcante *et al.*, 2020). COVID-19 was also identified in other countries across Asia, Europe, and North America. With the escalation of the disease, on January 30, 2020, the World Health Organization (WHO) declared COVID-19 a Public Health Emergency of International Concern (PHEIC), the highest level of alert by the Organization. Following the outbreak and rapid global spread of COVID-19, reaching over 118,000 cases in 114 countries and 4,291 deaths, the WHO characterized it as a pandemic on March 11, 2020 (World Health Organization [WHO], 2020). From December 31, 2019, to May 16, 2020, a total of 4,425,485 cases and 302,059 confirmed COVID-19 deaths were registered across 216 countries (Cavalcante *et al.*, 2020).

The COVID-19 pandemic was not only an extreme public health situation but also an unprecedented shock to global production, economy, and capital markets (Rahman, Amin & Al Mamun, 2021). Due to a lack of sufficient scientific knowledge about COVID-19 and following WHO guidelines, the initial response of governments in many countries included a series of emergency measures to contain the virus's spread, such as quarantine policies, lockdowns, and closure of non-essential activities (Harjoto, Rossi, Lee & Sergi, 2020; Phan & Narayan, 2020).

Economically, the COVID-19 outbreak led to the worst global recession since 1930, surpassing the Great Depression, the Subprime Crisis, and the Spanish Flu pandemic (Baker *et al.*, 2020). In China, the first country severely affected by the Covid-19 pandemic, the Gross Domestic Product (GDP) in the first quarter of 2020 was 10% lower than that of the fourth quarter of 2019 (Organisation for Economic Co-Operation and Development [OECD], 2020). In other countries, the economic impact of the pandemic was felt more deeply in the second quarter of 2020, with global production levels dropping by around 12.5% compared to the fourth quarter of 2019 (OECD, 2020).

For businesses, the COVID-19 outbreak affected cash flows and investments, leading to changes in stock prices. Investor fear due to economic uncertainty and WHO's declarations of COVID-19 as a PHEIC and later as a pandemic caused financial markets worldwide to plummet (Harjoto *et al.*, 2020). To restore confidence in financial markets and minimize economic effects, central banks and governments worldwide implemented economic stimulus packages and public policy instruments to combat the crisis (Nguyen, Pham, Pham & Pham, 2023; Rahman *et al.* 2021). The objective of this study is to identify how the Brazilian stock market responded to uncertainties created by the COVID-19 pandemic and whether the economic stimulus package offered by Brazilian authorities restored confidence in the market.

Although financial markets initially reacted very negatively to COVID-19, as more information about the crisis became available and after the announcement of government stimulus packages, investors corrected their exaggerated reactions, and the capital market began to gradually recover (Harjoto *et al.*, 2020; Rahman *et al.*, 2021). However, the exact direction and magnitude of the Brazilian stock market's responses to these events are not yet well identified. Thus, this study has four secondary objectives: i) identify the most affected economic sectors; ii) identify the date on average when the highest reaction to the event occurred; iii) assess whether the economic package prompted any reaction in stock prices; iv) identify, on average, which of the 5 company factors (size, debt, liquidity, profitability, volatility) were most important in the position adjustments on each of the studied days.

As of May 16, 2020, Brazil was one of the most severely affected countries by COVID-19 in terms of public health. On that date, it held the 4th position in absolute case numbers confirmed and in 6th place according to confirmed deaths (Cavalcante *et al.*, 2020), the capital market was one of the most affected in the world by the pandemic. From January 31 to March 31, 2020, the IBOVESPA Index experienced a cumulative drop of 35.81%, almost double that of the S&P 500 (19.87%) for the same period (Brazil, Bolsa e Balcão [B3], 2021; Rahman *et al.*, 2021). In the month of March 2020, within just 9 days, the circuit breaker was triggered six times. This research adds to the literature by examining the Brazilian stock market's reactions to extreme negative events and specific economic stimulus events, discussing their direction and magnitude. This study is of particular importance as emerging market countries often rely heavily on foreign capital and economic stability. The results indicate that the pandemic declaration appears to have the greatest impact on stock returns and that, at the initial moment of the pandemic declaration, less leveraged companies experienced higher cumulative abnormal returns. Regarding stimulus packages, only the announcement of the R$200 billion emergency package had a significant positive impact on stock returns. Considering the four events, companies with lower volatility had the lowest cumulative abnormal returns after the pandemic declaration. This suggests that this characteristic of the stocks may have been considered for exiting the market or reducing positions. The work proceeds as follows: Section 2 presents the literature review. Section 3 describes the methodology. Section 4 presents the empirical results and analyses, and the final section presents the main conclusions.

2 THEORETICAL FRAMEWORK

Research on the effects of COVID-19 on the capital markets of different countries has identified varying market reactions. Gunay (2020) reports that China experienced a structural volatility break for Chinese stock returns on January 30, 2020, about three weeks before other heavily

affected countries such as the United States, Italy, Spain, and the United Kingdom. In these countries, the break occurred between February 19 and 21, 2020. Ali, Alan, and Rizvi (2020) highlight that the capital market volatility in the United States, the United Kingdom, and Germany significantly increased from the epidemic period (December 2019 to March 10, 2020) to the pandemic period (post-March 10, 2020).

Liu, Manzoor, Wang, Zhang, and Manzoor (2020) point out that the Chinese stock market experienced a major negative impact after the news of the coronavirus was widely disseminated by international media on January 20, 2020. Huo and Qiu (2020) observed overreactions in the Chinese stock market, both at the industry and company levels, following the Chinese government's announcement of lockdown measures in Wuhan on January 23, 2020, which also contributed to a significant drop in the Chinese stock market. However, subsequent periods saw reversals in stock returns, with China's capital market recovering before other countries (Huo & Qiu, 2020; Liu *et al.*, 2020).

Gerding, Martin, and Nagler (2020) emphasize that capital markets of nations with higher debt-to-GDP ratios were more affected by the pandemic than others. Ru, Yang, and Zou (2020) further demonstrate that financial market reactions to the coronavirus outbreak were more immediate and profound in countries with prior Severe Acute Respiratory Syndrome (SARS) experience, while countries unaffected by SARS only started paying more attention to COVID-19 in March 2020.

Some studies have analyzed the effects on capital markets in terms of COVID-19 infected cases and deaths, with results varying over time and depending on the outbreak stage. Al-Awadhi, Alsaifi, Al-Awadhi, and Alhammadi (2020) suggest that the growth of both daily infected cases and daily death counts caused by COVID-19 negatively affected the Shanghai and Hong Kong stock markets from January 10 to March 16, 2020. It was also observed that market returns began to increase as the growth of both cases (infected and deaths) started to decrease. Ashraf (2020) examined data from 64 countries (developed and emerging) during the period from January 22 to April 17, 2020, and found that financial markets reacted strongly with negative returns to the growth of confirmed cases, while the impact of the growth in the number of deaths was not statistically significant.

Harjoto *et al.* (2020), using a sample of 23 developed countries and 53 emerging countries during the period from January 14 to August 20, 2020, pointed out that an increase in daily cases and mortality rates negatively affects the daily returns of stock markets, while also increasing volatility and daily trading volume.

Several studies have examined the impact of COVID-19 on the stock performance of different economic sectors, with the majority focused on the Chinese market. Al-Awadhi *et al.* (2020) examined the impact of COVID-19 on different sectors in the Shanghai stock exchange. They noted that returns from the technology information and pharmaceutical manufacturing sectors had significantly better performance than the market, while returns from sectors like beverages, air transport, water transport, and road transport had significantly worse performance than the market.

He, Sun, Zhang, and Li (2020) examined the response of Chinese stocks to the implementation of the lockdown in Wuhan on January 23, 2020, and found that companies operating in the transportation, mining, electricity, heating, and environmental sectors were negatively affected by the pandemic, while those in the manufacturing, information technology, education, and healthcare sectors responded positively. The authors also observed that Chinese state-owned companies were heavily impacted by the COVID-19 crisis, unlike private companies.

Xiong, Wu, Hou, and Zhang (2020) analyzed the relationship between specific company characteristics and the reactions of China's capital market to the implementation of the lockdown in Wuhan on January 23, 2020. They found that firms with larger scale, better profitability, growth opportunities, higher combined leverage, and fewer fixed assets suffered less adverse impact than identical firms.

Gu, Ying, Zhang, and Tao (2020) investigated the impact of COVID-19 on companies from December 31, 2019, to March 31, 2020, based on electricity usage in China. They found that the manufacturing industry experienced the greatest negative effect, while sectors like construction, information transfer, IT services and software, and medical and social services were positively impacted. The authors also noted that state-owned and foreign companies were less affected than private enterprises, with smaller firms suffering more than larger ones.

Caldas, Silva, Silva, and Cruz (2021) analyzed the average monthly return and trading volume of 55 productive sectors on B3 from January 2 to May 12, 2020. They observed that sectors like equipment and services, iron and steel artifacts, various chemicals, heavy construction, consulting engineering, machinery and equipment, weapons and ammunition, wires and fabrics, hospitality, pharmaceuticals, equipment, gas, and various materials experienced a smaller impact, while others experienced greater declines in their returns and trading volumes. The authors also discovered that the increase in infections in Brazil from April 2020 did not significantly reflect in higher impacts on stock returns, indicating market adjustment starting from April 2020.

Mazur, Dang, and Vega (2020) investigated the effect of COVID-19 on the behavior of the American stock market during the month of March 2020. They observed that stocks related to natural gas, food, healthcare, and software exhibited high positive returns, while stocks in sectors such as oil, real estate, entertainment, and hospitality experienced a sharp decline.

Rahman *et al.* (2021) analyzed how the Australian capital market responded to uncertainties created by COVID-19, evaluating two negative events (declaration of Enhanced Social Protection Index on January 30, 2020, and

declaration of pandemic on March 11, 2020) and two positive events (announcement by the Australian Prime Minister of a 66.4 billion Australian dollar stimulus package on March 22, 2020, and approval by the Australian government of a 130 billion Australian dollar job maintenance package on April 8, 2020). They observed that declaring COVID-19 a pandemic had a greater negative impact on stock returns than the declaration of the Enhanced Social Protection Index. Regarding the two positive events, the market reacted positively only to the job maintenance package. The authors also found that smaller, less profitable, and lower value portfolios suffered more during the pandemic, with size and liquidity considered significant vectors of abnormal returns.

3 METHODOLOGY

3.1 Research Method

In this study, the event study methodology followed by multiple linear regression will be applied to examine the impact of the COVID-19 pandemic on the Brazilian stock market. Following Campbell, Lo, and Mackinley (1997), abnormal returns will be measured using the Market Model. Thus, the calculation of the expected return rate is given by:

$$E(R_{i,t}) = \alpha_i + \beta_i R_{i,M_{i,t}} \quad (1)$$

The calculation of the average abnormal return rate is determined by:

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{i,M_{i,t}}) \quad (2)$$

Finally, the calculation of the cumulative abnormal return rate is:

$$CAR_{i(t_1,t_2)} = \sum_{t_2}^{t=t_1} AR_{i,t} \quad (3)$$

Where $R_{i,t}$ is the return of stock *i* on trading day *t*; $R_{i,M_{i,t}}$ is the market return rate; α_i and β_i are estimated parameters of a Market Model where the realized return of an individual stock is regressed against market index returns in the pre-event period (estimation period). $AR_{i,t}$ is the average abnormal return rate of stock *i* on trading day *t*, obtained by subtracting the expected return from the actual return. $CAR_{i(t_1,t_2)}$ is the cumulative abnormal return rate of stock *i* in the event window (t_1, t_2).

To establish the company factors important for the market's reaction to the COVID-19 pandemic, we estimate the following regression model using obtained CARs:

$$CAR_{i(t_1,t_2)} = \gamma_0 + \gamma_1 \text{size} + \gamma_2 \text{leverage} + \gamma_3 \text{liquidity} + \gamma_4 \text{profitability} + \gamma_5 \text{volatility} + \varepsilon_i \quad (4)$$

Where $CAR_{i(t_1,t_2)}$ is the cumulative abnormal return for different window periods. The independent variables are company-specific characteristics chosen from the literature (Krüger, 2015; Rahman *et al.*, 2021) and according to data availability. Volatility was included as it is market information and because professional managers select low-volatility stocks as portfolio assembly criteria.

3.2 Sample and Event Window

The sample comprised companies listed on B3 with daily trading in 2019, totaling 150 companies/stocks. Observations from banking, insurance, and other financial sectors were excluded due to sector-specific characteristics, as were companies with missing data in the period. The analyzed sectors are: industrial goods; communications; cyclical consumption; non-cyclical consumption; real estate exploration (remaining companies from the financial sector classification); basic materials; oil, gas, and biofuels; healthcare; information technology; utilities. Following Rahman *et al.* (2021), for obtaining company factors, total assets (size), total debt/total assets (leverage), cash and short-term investment/total assets (liquidity), ROA (profitability), and return (volatility) were selected for each company.

In sectoral analysis, January 30, 2020 (WHO declaration of PHEIC) and March 11, 2020 (WHO declaration of pandemic) were chosen as event occurrence dates. To enhance forecasting accuracy as much as possible, we selected the 180 trading days prior to each event date as the estimation period. According to He *et al.* (2020), we adopted a 5-day trading window around the event date as the event window period.

In analyzing company factors, we focused on 2 negative and 2 positive events. The dates for negative events were also January 30, 2020, and March 11, 2020. The dates for positive events were March 16, 2020 (Minister of Economy announcement of a R$147 billion package) and April 1, 2020 (Minister of Economy announcement of a R$200 billion emergency package) (Andrade, 2020; Rodrigues, 2020). We also selected the 180 trading days before each event date as the estimation period. As per Rahman *et al.* (2021), to reduce the effect of overlapping events, we restricted the estimation to 5 business days before and after the event date.

4 ANALYSIS AND DISCUSSION OF RESULTS

4.1 Presentation by Economic Sectors

Tables 1-2 show the impact of the COVID-19 pandemic on the market value of 10 sectors in Brazil at two distinct moments. As seen in Table 1, on January 30, 2020, the abnormal stock returns (CARs) of all sectors decreased, according to the event window (0, 0). However, it's worth noting that the results for communications, cyclical consumption, information technology, and utilities were not statistically significant at the 10% level, so it's not possible to assert that the abnormal return is different from zero. Of the sectors with significant results, the sector least impacted on the ESPII declaration day was basic materials, with a drop of -0.97%. This sector comprises companies like Vale

(mining), Usiminas (steel and metallurgy), Braskem (chemicals), and Suzano (wood and paper). The most affected sectors were industrial goods and real estate exploration, with reductions of -2.30% and -2.25%, respectively. This outcome is likely due to production declines and reduced domestic and external demand. The industrial goods sector includes many transportation companies, including airlines (Azul and Gol), which were heavily affected by the pandemic.

Table 1
Result of the impact of COVID-19 in Brazil on 10 industrial sectors on the event of January 30, 2020.

Event Window	(-20, 0)	(-10, 0)	(-5, 0)	(0, 0)	(0, +5)	(0, +10)	(0, +20)
Industrial goods	5.18%***	-3.35%***	-2.76%***	-2.30%**	-1.30%***	-3.49%***	-6.20%***
Communications	11.88%***	5.90%***	1.54%***	-1.74%	-1.98%	1.59%***	5.15%***
Cyclical consumption	2.51%***	-2.41%***	-1.34%***	-1.97%	-3.15%***	-5.58%*	-8.70%
Non-cyclical consumption	0.53%***	-4.43%***	-5.67%***	-1.60%***	-1.16%***	-1.84%***	-0.43%***
Real estate exploration	-2.15%***	-4.29%***	-4.40%***	-2.25%***	-5.35%***	-6.17%	-8.53%***
Basic materials	0.43%***	-5.27%***	-7.57%***	-0.97%***	-0.08%***	-0.91%***	-2.98%***
Oil, Gas and Biofuels	4.34%***	-3.17%***	-2.48%***	-1.00%***	-0.87%***	-2.12%***	-5.74%***
Health	2.62%***	-2.26%***	-3.49%***	-1.47%***	-1.25%***	-4.60%***	-5.23%***
Information Technology	-11.18%***	-9.24%***	-12.84%	-3.67%	-12.79%***	-14.31%***	-20.21%
Public Utilities	2.50%***	0.56%***	-0.12%***	-1.38%	-1.80%***	-2.35%***	1.76%***

Source: developed by the authors.
Note: This table displays the average cumulative abnormal returns (CAR) for different event windows. *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.1.

Table 2
Result of the impact of COVID-19 on 10 industrial sectors in Brazil on the event of March 11, 2020.

Event Window	(-20, 0)	(-10, 0)	(-5, 0)	(0, 0)	(0, +5)	(0, +10)	(0, +20)
Industrial goods	-8.79%***	-8.45%***	-4.04%***	0.03%***	-20.67%***	-14.57%***	-17.36%***
Communications	12.51%***	6.69%***	7.71%***	5.43%***	-2.71%***	-14.21%	-12.24%
Cyclical consumption	-6.98%***	-6.21%***	-2.04%***	0.82%***	-24.11%***	-17.97%***	-23.73%
Non-cyclical consumption	-4.78%***	-9.38%***	-5.96%***	-1.81%***	-6.89%***	3.45%***	1.85%***
Real estate exploration	-10.18%***	-8.89%***	-6.07%***	-1.61%***	-24.25%***	-9.73%***	-18.05%***
Basic materials	-3.09%***	-3.20%***	-1.48%***	-2.01%***	-11.12%***	-9.57%***	-8.77%***
Oil, Gas and Biofuels	-16.31%***	-10.87%***	-8.76%***	0.93%***	-12.73%***	-9.42%***	4.22%***
Health	-9.64%***	-6.12%***	-7.66%***	-1.39%***	-15.35%***	-9.45%***	-8.46%***
Information Technology	-21.25%	-22.17%	-15.13%	0.10%***	-31.86%	-11.37%	-14.64%
Public Utilities	2.26%***	0.01%***	-1.76%***	-1.52%***	-10.17%***	-19.20%***	-12.89%***

Source: developed by the authors.
Note: This table displays the average cumulative abnormal returns (CAR) for different event windows. *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.1.

Another noteworthy point is that the returns of companies in 8 out of the 10 analyzed sectors continued to decline during the event window period. The only exceptions were the communications sector, which started to grow from the period (0, +10) and achieved a positive return of 5.15% in the window (0, +20), and the utility sector, which had a positive result of 1.76% in the event window (0, +20). The communications sector consists of companies like Telefônica Brasil (Vivo), TIM Brasil, and Oi, and a possible explanation for their positive outcome is that they might be less vulnerable to the COVID-19 pandemic due to unique sector characteristics.

In Table 2, on March 11, 2020, the effect on abnormal stock returns across the 10 sectors was diverse. Non-cyclical consumption, real estate exploration, basic materials, healthcare, and utilities sectors fell on the pandemic declaration day in the (0, 0) window, with declines of -1.81%, -1.61%, -2.01%, -1.39%, and -1.52%, respectively; industrial goods and information technology were insignificantly affected, with values of 0.03% and 0.10%, respectively; communications, cyclical consumption, oil, gas, and biofuels showed positive performance, with increases of 5.43%, 0.82%, and 0.93%, respectively. Notably, the results for all sectors were statistically significant at the 1% level.

In the period following the pandemic declaration event, in the event window (0, +5), all sectors experienced substantial declines in their returns. The two exceptions were information technology, for which results were not statistically significant at the 10% significance level, and communications, which fell only by -2.71%. Among the sectors with significant results, real estate exploration, cyclical consumption, industrial goods, and healthcare experienced the most substantial declines, with reductions of -31.86%, -24.25%, -24.11%, -20.67%, and -15.35%, respectively. These outcomes are likely linked to

government-imposed restrictions and economic difficulties that accompanied the pandemic declaration, significantly impacting employment, consumption, and production. The negative performances of information technology and healthcare in the Brazilian market, both on the January 30, 2020, and March 11, 2020 events, contrast with those observed in China by He *et al.* (2020) and Gu *et al.* (2020), and in the US by Mazur *et al.* (2020), where both sectors demonstrated positive returns in response to the COVID-19 outbreak. Given that these sectors included stocks of organizations directly related to essential inputs during a pandemic, such as pharmacy companies (RaiaDrogasil) and health plans (Intermedica), or those affected by increased demand for remote work, study, and entertainment, such as computer (Positivo Tec) and software (Totvs) companies, positive effects were expected.

Despite the overall decline in the Brazilian stock market in the days following the pandemic declaration, two sectors defied the trend, exhibiting a strong recovery in response to the COVID-19 outbreak. Non-cyclical consumption and oil, gas, and biofuels sectors, from the (0, +10) and (0, +20) event windows, respectively, started to show positive returns, at 3.45% and 4.22%, respectively. Examples of companies in the non-cyclical consumption sector are Ambev (beverages), Brasilagro (agriculture), and Camil (processed foods), while Petrobras and Cosan are examples of oil, gas, and biofuels stocks. These results, apart from being unexpected, contrast with the negative returns obtained by Xiong *et al.* (2020) for food and beverage retail sectors in the Chinese market and by Mazur *et al.* (2020) for the American oil sector.

To discuss in greater depth the impact of COVID-19 on sectors that are more vulnerable to the virus, we highlight transportation from the industrial goods sector and segregate real estate construction, educational services, and hotels and restaurants & travel and leisure from the cyclical consumption sector. Tables 3-4 show the impact of COVID-19 on the market value of the newly segregated sectors for the two selected events.

Table 3
Result of the impact of COVID-19 on the average cumulative abnormal returns in 5 industrial sectors on the event of January 30, 2020.

Event Window	Transportation	Cyclical consumption	Construction	Hotels and Restorants & Travel and Leisure	Educational Services
(-30, 0)	6.53%***	7.60%***	21.41%***	0.54%***	9.52%***
(-20, 0)	1.58%***	1.82%***	3.75%***	-5.69%***	9.23%***
(-10, 0)	-4.14%***	-2.23%***	-3.56%***	-6.88%***	4.73%***
(-5, 0)	-1.40%***	-1.11%***	-1.85%***	-5.05%***	2.64%***
(0, 0)	-1.35%***	-1.54%***	-2.60%***	-3.26%*	-0.73%***
(0, +5)	-1.99%***	-3.34%***	-4.35%***	-2.38%***	1.08%***
(0, +10)	-5.39%***	-4.80%*	-8.75%	-5.10%*	0.76%***
(0, +20)	-11.31%*	-6.62%***	-11.81%***	-14.02%*	-3.85%***
(0, +30)	-26.80%**	-15.03%***	-20.18%***	-47.37%*	-22.77%*

Source: developed by the authors.
Note: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.1.

In Table 3, the stock returns of the 4 newly addressed sectors for the event on January 30, 2020, were negative. Hotels and restaurants & travel and leisure and real estate construction had the worst results in the event windows (0,0) and (0, +20). In the (0, +30) window, hotels and restaurants & travel and leisure and transportation presented the worst abnormal returns, with -47.37% and -26.80%, respectively. These sectors were the ones that were most impacted in advance by the crisis, and the result aligns with the observations made by Shen, Fu, Pan, Yu, and Chen (2020) and Xiong *et al.* (2020) in the Chinese capital market.

Table 4
Result of the impact of COVID-19 on the average cumulative abnormal returns in 5 industrial sectors on the event of March 11, 2020.

Event Window	Transportation	Cyclical consumption	Construction	Hotels and Restorants & Travel and Leisure	Educational Services
(-30, 0)	-17.11%***	-10.36%***	-15.92%***	-27.56%*	-6.88%***
(-20, 0)	-12.89%***	-4.86%***	-6.29%***	-21.22%*	-7.24%***
(-10, 0)	-10.84%***	-5.94%***	-2.82%***	-20.52%*	-5.98%***
(-5, 0)	-4.51%***	-2.20%***	0.01%***	-7.98%***	-2.97%***
(0, 0)	-1.31%***	0.29%***	2.84%***	-3.56%***	0.77%***
(0, +5)	-19.76%***	-20.17%	-23.04%***	-51.11%*	-24.24%*
(0, +10)	-1.02%***	-14.64%***	-18.70%***	-33.92%*	-21.31%*
(0, +20)	-9.89%***	-19.46%***	-29.80%***	-30.94%*	-25.90%*
(0, +30)	-8.37%***	-11.07%***	-24.82%***	-20.81%*	-24.30%*

Source: developed by the authors.
Note: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.1.

In Table 4, it can be seen that on the event of March 11, 2020, the transportation and hotels and restaurants & travel and leisure sectors showed negative results, -1.31% and -3.56%, respectively. The latter was the most affected sector in Brazil due to the COVID-19 outbreak, experiencing a drop of -51.11% in the (0, +5) event window. Real estate construction and educational services had positive performance on the event day, with returns of 2.84% and 0.77%, respectively. This positive outcome was also observed by Gu *et al.* (2020) and He *et al.* (2020) in the Chinese capital market. However, it is noted in the subsequent event windows that both sectors were also significantly affected, starting to exhibit negative returns. The resurgence of the pandemic and the adoption of policies such as quarantine, lockdown, travel restrictions, social distancing, and closure of non-essential activities impacted the economy and investor sentiment, which in turn reflected in stock prices.

To delve deeper into the underlying mechanism of the COVID-19 impact on the Brazilian stock market, we conducted an analysis on companies with different ownership structures. We examined the effects on the returns of private and mixed economy companies, as firms with distinct capital types often possess varying abilities to cope with external shocks (Chaney, Faccio & Parsley, 2011). Table 5 illustrates the COVID-19 impact on the market value of private and publicly owned companies for the two selected events. The results suggest that both private and mixed economy companies responded negatively to the COVID-19 outbreak in Brazil, showing returns of -1.79% and -1.60%, respectively, on January 30, 2020, and returns of -0.24% and -1.22%, respectively, on March 11, 2020. It's noteworthy that the -1.60% result for mixed economy companies lacked statistical significance.

Table 5
Result of the impact of COVID-19 on companies with different capital ownership characteristics.

Event Window	01/30/2020		03/11/2020	
	Private Company	Mixed company	Private Company	Mixed company
(-5, 0)	-3.13%	-0.61%***	-3.67%**	-3.43%***
(0, 0)	-1.79%***	-1.60%	-0.24%***	-1.22%***
(0, +5)	-2.25%	-1.63%***	-17.59%***	-14.50%***

Source: developed by the authors.
Note: This table displays the cumulative average abnormal returns (CAR) for different event windows, where *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.1.

4.2 Presentation by Company Factors

Table 6 displays the CARs of the analyzed companies for different events and event window periods. We found statistically significant negative CARs for both negative events, particularly in the event windows (0,0), (-1,1), and (-5,5) (Panel A). The numbers indicate that the declaration of COVID-19 as a pandemic (the second negative event) seems to have a greater impact on stock returns compared to news reflecting the declaration of COVID-19 as a Public Health Emergency of International Concern (PHEIC) (the first negative impact). For instance, the average CAR for the (-3,3) event window is -2.07% and -9.19% for the first and second events, respectively, and for the (-5,5) event window, it's -3.39% and -20.73%, respectively. This result is similar to Rahman *et al.* (2021) in the Australian market and corroborates what was also observed in the analysis by economic sectors.

Table 6
Cumulative abnormal return for 4 selected events in Brazil.

Event Window	(0, 0)	(-1, 1)	(-2, 2)	(-3, 3)	(-4, 4)	(-5, 5)
Panel A: Negative Events						
01/30/2020	-1.78%***	-2.89%***	-1.58%	-2.07%	-2.04%	-3.39%**
03/11/2020	-0.31%**	-2.36%*	-5.96%	-9.19%***	-13.97%***	-20.73%***
Panel B: Positive Events						
03/16/2020	-2.29%	-6.10%	-16.86%***	-13.81%***	-11.99%**	-16.52%***
04/01/2020	-2.08%**	-5.38%	-7.52%**	-6.35%**	-1.43%***	3.85%***

Source: developed by the authors.
Note: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.1.

In Panel B, we find a statistically significant negative average CAR for the first positive event, except for the event windows (0,0) and (-1,1), which did not show statistical significance at the 10% significance level. The average CAR for the event windows (-3,3) and (-5,5) was -13.81% and -16.52%, respectively. One possible explanation for this result is that economic agents interpreted the stimulus package of R$147.3 billion as insufficient, incapable of reducing the uncertainty associated with the pandemic and boosting investor confidence. However, the announcement of the emergency package of R$200 billion (the second positive event) had a significant positive impact on stock returns for the event window (-5.5).

The literature indicates that companies with different sizes and profitability exhibit anomalous return behavior in relation to extreme events. For instance, smaller and less profitable companies are less likely to survive adverse events due to operational inefficiencies and poor performance (Gull, Mushtaq, Nguyen & Tran, 2024; Lanfear, Lioui & Siebert, 2019; Rahman *et al.*, 2021). Following the arguments of this literature, Table 7 presents average CARs for portfolios of larger and smaller, as well as more and less profitable companies, considering market equity value and return on equity (ROE). Each portfolio consists of 38 stocks, with the corresponding Q2 element included in both halves of the dataset for Q1 and Q3 calculation.

Table 7 indicates that CARs are statistically significant for all event windows of the larger and more profitable portfolios, while for the smaller and less profitable portfolios, they are mostly statistically significant, except for the (0,0) and (-1,1) event windows on January 30, 2020, and for the (-5,5) event windows on March 11, 2020, for size-based portfolios. The signs of the average CARs align with the results presented in Table 6.

Table 7
Cumulative average abnormal returns of portfolios classified by size and ROE.

Event Window	(0, 0)	(-1, 1)	(-2, 2)	(-3, 3)	(-4, 4)	(-5, 5)
Panel A: Negative Events						
01/30/2020						
Larger	-0.88%***	-0.83%***	0.16%***	-0.36%***	-0.68%***	-1.61%***
Smaller	-3.24%	-6.46%	-4.94%***	-5.76%***	-4.70%***	-6.62%***
More profitable	-1.43%***	-2.54%***	-0.34%***	-1.08%***	0.47%***	-0.98%***
Less profitable	-2.14%	-4.26%***	-4.25%***	-4.77%**	-5.88%	-7.09%***
03/11/2020						
Larger	-1.12%***	-2.50%***	-1.28%***	-4.61%***	-4.68%***	-6.00%***
Smaller	0.62%***	0.22%***	-9.38%***	-10.03%***	-18.15%***	-28.65%
More profitable	-0.78%***	-2.68%***	-6.30%***	-9.43%***	-12.89%***	-18.59%***
Less profitable	0.10%***	-1.98%***	-6.82%***	-10.66%***	-18.93%***	-30.21%***
Panel B: Positive Events						
03/16/2020						
Larger	-2.35%***	0.19%***	-5.02%***	-2.92%***	-0.12%***	-1.17%***
Smaller	0.19%***	-11.23%*	-23.13%	-21.96%***	-21.90%***	-29.04%**
More profitable	-2.63%***	-4.82%***	-14.5%***	-13.75%***	-11.90%***	-15.6%***
Less profitable	-2.44%***	-9.61%***	-24.83%*	-20.73%***	-18.72%***	-24.58%***
04/01/2020						
Larger	-0.88%***	-1.16%***	-2.80%***	-1.66%***	0.74%***	2.97%***
Smaller	-1.99%***	-6.33%***	-8.06%***	-5.54%***	-1.22%***	5.71%***
More profitable	-0.81%***	-3.80%***	-5.74%***	-4.33%***	-0.38%***	3.52%***
Less profitable	-2.33%***	-6.93%***	-10.05%***	-8.15%***	-2.60%***	6.02%***

Source: developed by the authors.
Note: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.1.

Table 8 presents the determinants of the cumulative abnormal return based on the CARs from the event window (0,0) for each of the 4 selected events. The CAR results of all analyzed companies were used. The presence of collinearity was ruled out through Variance Inflation Factor (VIF) analysis, as no variable had a VIF greater than 10. The Breusch-Pagan test was conducted to verify the homoscedasticity of residuals, and this hypothesis was rejected with 95% confidence. Therefore, the robust regression method was adopted. The results suggest that the size variable was not statistically significant in any scenario. One possible explanation for this is that for negative events, larger and more profitable companies performed better, and only for positive events, the smaller and less profitable ones stood out.

In Model 1, we identify a direct relationship with liquidity, indicating that companies with higher abnormal returns on the event of the PHEIC declaration by the WHO were more liquid companies. In Model 2, the results suggest an inverse relationship of CARs with leverage and a direct relationship with volatility, indicating that less leveraged and more volatile companies exhibited higher abnormal returns.

In Model 3, leverage and profitability are inversely related to CARs, indicating that less leveraged, more volatile, and less profitable companies exhibited higher abnormal returns on the positive event of March 16, 2020. These results are in line with the event of March 11. In Model 4, companies with higher leverage showed greater abnormal returns.

Finally, to assess whether the stimulus package offered by Brazilian authorities restored market confidence, we introduced the dummy variable "package" in Model 5. The "package" variable has a statistically significant inverse impact on cross-sectional CARs as it mitigates risk.

Table 8
Determinants of cumulative abnormal return.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	01/30/2020	03/11/2020	03/16/2020	04/01/2020	4 grouped events
Size	-1.72E-11	1.97E-11	4.92E-11	6.00E-11	2.79E-11
	(0.362)	(0.531)	(0.493)	(0.241)	(0.378)
Leverage	-0.000006	-0.000369**	-0.000463*	0.000461**	-0.000094
	(0.949)	(0.027)	(0.085)	(0.040)	(0.373)
Liquidity	1.48E-09***	-6.84E-10	9.41E-10	1.47E-09	8.04E-10
	(0.000)	(0.428)	(0.573)	(0.129)	(0.252)
Profitability	0.000437	-0.000277	-0.000784*	0.000482	-0.000035
	(0.277)	(0.552)	(0.074)	(0.175)	(0.882)
Volatility	-0.000127	0.000553*	0.000594**	0.000335	0.000339**
	(0.238)	(0.056)	(0.046)	(0.218)	(0.014)
Package					-0.012369***
					(0.001)
Constant	-0.015551***	-0.013091	-0.035139**	-0.053171***	-0.023054***
R-squared	0,1221	0,1154	0,0846	0,1069	0,0497

Source: developed by the authors.
Note: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.1.

4.3 Discussion

Regarding the effects of COVID-19 on the returns of private and mixed-economy companies, the results indicate that both types of companies responded negatively to the COVID-19 outbreak in Brazil. In March, private companies exhibited less negative performance on the day of the event. However, this performance did not persist in the subsequent windows. This finding differs from what was observed by He *et al.* (2020) in the Chinese market, where private companies outperformed public ones.

Concerning the cumulative abnormal return for negative events, the intensity of losses is much higher (and statistically significant) on the day of the declaration of COVID-19 as a pandemic. Considering positive events, only the second event exerted a significant positive impact on stock returns, with an average CAR of 3.85% for the window of event (-5,5). This outcome can be attributed to a more comprehensive and focused stimulus package, which included assistance for informal low-income workers through the R$600 emergency aid, in addition to job maintenance measures from the previous package. Credit lines for companies and resource transfers to states and municipalities for healthcare actions were also made available.

Furthermore, even in the negative event of January 2020, it is observed that larger and more profitable companies were less affected. However, on March 11, 2020, this trend shifts from the (-2,2) window onwards. This result suggests that smaller and less profitable portfolios are more vulnerable to a global pandemic situation, aligning with the findings of Rahman *et al.* (2021) in the Australian market. Concerning positive events, it is noted that the positive returns of smaller and less profitable companies were better than those of larger and more profitable ones on April 1, 2020 (the second positive event) within the (-5,5) event window. This implies that economic agents interpreted the announcement by the Minister of Economy of the R$200 billion emergency package as reducing uncertainty and mitigating the negative effects of the pandemic, especially for smaller and less profitable companies, which are more vulnerable and affected by adverse events. Evaluating these different effects contributes to the understanding of regulatory authorities such as the Brazilian Securities and Exchange Commission, the Central Bank of Brazil, and the Ministry of Economy, enabling them to grasp how investors in the stock market interpret economic measures.

Regarding the determinants of abnormal cumulative returns, on the day of the pandemic's greatest impact on the Brazilian market, the result suggests an inverse relationship between CARs and leverage. The "size" variable does not appear to be significant in explaining cumulative returns in any of the events evaluated. This result differs from that found by Rahman et al. (2021) in the Australian market, where the "size" variable showed a statistically significant negative impact. Considering the four events, companies with lower volatility presented the smallest abnormal cumulative returns after the pandemic declaration. This suggests that this characteristic of the stocks may have been considered for exiting the market or reducing positions. The "package" variable reduces market risk, exerting an inverse impact on abnormal cumulative returns.

5 CONCLUSIONS

This study aimed to identify how the Brazilian stock market responded to uncertainties created by the declaration of emergency and pandemic and whether the economic stimulus package offered by Brazilian authorities restored confidence in the market.

The results show that on January 30, 2020, the stock returns (CARs) of all analyzed sectors declined. The sector

least impacted on the day of the ESPII declaration was basic materials. The most affected sectors were industrial goods and real estate exploration. The returns of companies in 8 out of the 10 analyzed sectors continued to decline in subsequent event windows. The only exceptions were the communications and utility sectors, which started to grow in later windows. It was observed that on March 11, 2020, the effect on stock returns in the 10 sectors was diverse. The non-cyclical consumption, real estate exploration, basic materials, health, and utility sectors fell on the day of the pandemic declaration; industrial goods and information technology were not significantly affected; communications, cyclical consumption, oil, gas, and biofuels performed positively.

The evidence suggests that the declaration of COVID-19 as a pandemic (the second negative event) seems to have a more significant impact on stock returns compared to news reflecting the declaration of COVID-19 as ESPII (the first negative impact).

Both private and mixed-economy companies responded negatively to the COVID-19 outbreak in Brazil in the two analyzed events on January 30, 2020, and March 11, 2020. It can be inferred that there was not a significant difference in performance between them.

Analyzing the two positive events, the results indicate that only the announcement of the R$200 billion emergency package (the second positive event) had a significant positive impact on stock returns. This outcome can be attributed to a more comprehensive and focused stimulus package, which extended assistance to low-income informal workers through the R$600 emergency aid, in addition to credit lines for companies and job maintenance measures from the previous package.

It was observed that on January 30, 2020, cross-sectional CARs responded positively to liquidity, indicating that companies with higher liquidity exhibited higher abnormal returns. On the event of March 11, 2020, the day with the greatest impact on the market, it was observed that leverage and volatility have, respectively, an inverse and direct impact, indicating that economic agents holding shares of less leveraged and more volatile companies achieved the highest cumulative returns. Finally, analyzing the 4 grouped events, we found that the "package" variable has a statistically significant inverse impact on cross-sectional CARs, indicating that government measures were positive for reducing risk in the market.

This research adds to the literature by examining the Brazilian stock market's reactions to extreme negative events and specific economic stimulus events, discussing their direction and magnitude. This study is of particular importance as emerging market countries often rely heavily on foreign capital and economic stability. We emphasize that our results cannot be generalized as we only considered companies listed on B3. For future studies, it is recommended to conduct an intraday analysis of the COVID-19 crisis in March 2020, a period in which the circuit breaker was triggered six times in just nine days.

REFERENCES

Al-Awadhi, A. M., Alsaifi, K., Al-Awadhi, A., & Alhammadi, S. (2020). Death and contagious infectious diseases: Impact of the COVID-19 virus on stock market returns. *Journal of Behavioral and Experimental Finance*, 27, 100326. https://doi.org/10.1016/j.jbef.2020.100326

Ali, M., Alam, N., & Rizvi, S. (2020). Coronavirus (COVID-19) – An epidemic or pandemic for financial markets. *Journal of Behavioral and Experimental Finance*, 100341. https://doi.org/10.1016/j.jbef.2020.100341

Andrade, H. (2020). *Governo detalha pacote de R$ 200 bi para manter empregos e ajudar estados.* https://economia.uol.com.br/noticias/redacao/2020/04/01/governo-anuncia-pacote-de-r-200-bi-para-manutencao-da-saude-e-empregos.htm.

Ashraf, B. N. (2020). Stock markets' reaction to COVID-19: cases or fatalities? *Research in International Business and Finance*, 54, 101249. https://doi.org/10.1016/j.ribaf.2020.101249

Baker, S., Bloom, N., Davis, S., Kost, K., Sammon, M., & Viratyosin, T. (2020). The unprecedented stock market reaction to COVID-19. *Rev. Asset Pricing Stud.*, 10(4), 742-758. https://doi.org/10.1093/rapstu/raaa008

Brasil, Bolsa e Balcão – B3. (2021). *Market data e Índices 2021.* http://www.b3.com.br/pt_br/market-data-e-indices/servicos-de-dados/market-data/cotacoes/indices.htm.

Caldas, A., Silva, E., Silva, A., Júnior, & Cruz, U. (2021). The effects of Covid-19 on the performance of the shares of B3's sectors. *Contextus - Contemporary Journal of Economics and Management*, 19(2), 15-28. https://doi.org/10.19094/contextus.2021.60146

Campbell, J., Lo, A., & Mackinlay, A. (1997). *The econometrics of financial markets*. Princeton University Press.

Cavalcante, J., Cardoso-dos-Santos, A., Bremm, J., Lobo, A., Macário, E., Oliveira, W., & França, G. (2020). COVID-19 no Brasil: evolução da epidemia até a semana epidemiológica 20 de 2020. *Epidemiol. Serv. Saúde*, 29(4), e2020376. https://doi.org/10.5123/s1679-49742020000400010

Chaney, P., Faccio, M., & Parsley, D. (2011). The quality of accounting information in politically connected firms. *Journal of Accounting and Economics*, 51(1), 58-76. https://doi.org/10.1016/j.jacceco.2010.07.003

Gerding, F., Martin, T., & Nagler, F. (2020). *The value of fiscal capacity in the face of a rare disaster.* Bocconi University, Working Paper No. 3572839.

Gu, X., Ying, S., Zhang, W., & Tao, Y. (2020). How do firms respond to COVID-19? First evidence from Suzhou, China. *Emerging Markets Finance and Trade*, 56(10), 2181-2197. https://doi.org/10.1080/1540496X.2020.1789455

Gull, A. A., Mushtaq, R., Nguyen, D. K., & Tran, P. T. (2024). COVID-19 adaptive strategy and SMEs' access to finance. *Applied Economics*, 56(22), 2615-2628. https://doi.org/10.1080/00036846.2023.2193721

Gunay, S. A. (2020). *New Form of Financial Contagion: COVID-19 and Stock Market Responses.* American University of the Middle East, Working Paper No. 3584243.

Harjoto, M. A., Rossi, F., Lee, R., & Sergi, B. S. (2020). How Do Equity Markets React to COVID-19? Evidence from Emerging and Developed Countries. *Journal of Economics and Business*, 105966. https://doi.org/10.1016/j.jeconbus.2020.105966

He, P., Sun, Y., Zhang, Y., & Li, T. (2020). COVID-19's Impact on Stock Prices Across Different Sectors – An Event Study Based on the Chinese Stock Market. *Emerging Markets Finance and Trade*, 56(10), 2198-2212. https://doi.org/10.1080/1540496X.2020.1785865

Huo, X., & Qiu, Z. (2020). How does China's stock market react to the announcement of the COVID-19 pandemic lockdown? *Economic and Political Studies*, 8(4), 436-461. https://doi.org/10.1080/20954816.2020.1780695

Krüger, P. (2015). Corporate goodness and shareholder wealth. *Journal of Financial Economics*, 115(2), 304-329.

Lanfear, M., Lioui, A., & Siebert, M. (2019). Market anomalies and disaster risk: Evidence from extreme weather events. *Journal of Financial Markets*, 46, 100477. https://doi.org/10.1016/j.finmar.2018.10.003

Liu, H., Manzoor, A., Wang, C., Zhang, L., & Manzoor, Z. (2020). The COVID-19 Outbreak and Affected Countries Stock Markets Response. *International Journal of Environmental Research and Public Health*, 17(8), 2800. https://doi.org/10.3390/ijerph17082800

Mazur, M., Dang, M., & Vega, M. (2020). COVID-19 and the March 2020 Stock Market Crash. Evidence from S&P1500. *Finance Research Letters*, 101690. https://doi.org/10.1016/j.frl.2020.101690

Nguyen, H., Pham, A. V., Pham, M. D. M., & Pham, M. H. (2023). Business resilience: lessons from government responses to the global COVID-19 crisis. *International Business Review*, 32(5). https://doi.org/10.1016/j.ibusrev.2023.102166

Organisation for Economic Co-Operation and Development – OECD. (2020). *OECD Economic Outlook*, 2020(1): Preliminary version, n. 107, OECD Publishing, Paris. https://doi.org/10.1787/16097408

Phan, H. D., & Narayan, P. K. (2020). Country responses and the reaction of the stock market to COVID-19 – A preliminary exposition. *Emerging Markets Finance and Trade*, 56(10), 2138-2150. https://doi.org/10.1080/1540496X.2020.1784719

Rahman, M., Amin, A., & Al Mamun, M. (2021). The COVID-19 Outbreak and Stock Market Reactions: Evidence from Australia. *Finance Research Letters*, 38, 2021. https://doi.org/10.1016/j.frl.2020.101832

Rodrigues, D. (2020). *Guedes anuncia pacote de R$ 147 bilhões para combater pandemia de covid-19.* https://www.poder360.com.br/economia/guedes-anuncia-pacote-de-r-147-bilhoes-para-combater-pandemia-de-covid-19.

Ru, H., Yang, E., & Zou, K. (2020). *What do we learn from SARS-CoV-1 to SARS-CoV-2: Evidence from global stock markets.* Nanyang Technological University, Working Paper No. 3569330.

Shen, H., Fu, M., Pan, H., Yu, Z., & Chen, Y. (2020) The impact of the COVID-19 pandemic on firm performance. *Emerging Markets Finance and Trade*, 56(10), 2213-2230. https://doi.org/10.1080/1540496X.2020.1785863

World Health Organization – WHO. (2020). *WHO Director-Gernal's opening remarks at the media briefing on COVID-19.* Geneva: World Health Organization. https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020.

Xiong, H., Wu, Z., Hou, F., & Zhang, J. (2020) Which Firm-specific Characteristics Affect the Market Reaction of Chinese Listed Companies to the COVID-19 Pandemic? *Emerging Markets Finance and Trade*, 56(10), 2231-2242. https://doi.org/10.1080/1540496X.2020.1787151

CONTEXTUS
REVISTA CONTEMPORÂNEA DE ECONOMIA E GESTÃO

UNIVERSIDADE FEDERAL DO CEARÁ
FACULDADE DE ECONOMIA, ADMINISTRAÇÃO ATUÁRIA E CONTABILIDADE

CONTEXTUS
CONTEMPORARY JOURNAL OF ECONOMICS AND MANAGEMENT.
ISSN 1678-2089
ISSNe 2178-9258
1. Economics, Administration and Accounting - Journal
2. Federal University of Ceará. Faculty of Economics, Administration, Actuaries and Accounting

FACULTY OF ECONOMICS, ADMINISTRATION, ACTUARIES AND ACCOUNTING
University Av. – 2486, Benfica
60020-180, Fortaleza-CE
BOARD: Carlos Adriano Santos Gomes Gordiano
José Carlos Lázaro da Silva Filho

Website: www.periodicos.ufc.br/contextus
E-mail: revistacontextus@ufc.br