RBGN REVISTA BRASILEIRA DE GESTÃO DE NEGÓCIOS
© FECAP

ISSN 1806-4892
e-ISSN 1983-0807

OPEN ACCESS

Mergers and Acquisitions in Recession Periods

Vinicius Augusto Brunassi Silva[1]
Humberto Gallucci Netto[2]

Received on:
Apr/04/2021
Approved on:
July/25/2022

Responsible editor:
Prof. João Mauricio Boaventura

Evaluation process:
Double Blind Review

Reviewers:
Jordana Marques Kneipp; Felipe Marques

This article is open data

Abstract

Purpose – This paper investigates the returns on M&A transactions for shareholders of acquiring companies in times of crisis in Brazil.

Theoretical framework – Our results are related to previous literature by Brown and Sarma (2007), Malmendier and Tate (2005), and Malmendier and Tate (2008). Our paper contributes to the aforementioned research by relating executives' characteristics to M&A returns in times of crisis.

Design/methodology/approach – We adopt the event study method to calculate abnormal returns and use multiple linear regression and propensity score matching techniques to connect returns to executive and firm variables.

Findings – We found positive average abnormal returns (between 1.8% and 3.3%) for M&A transactions carried out during recession periods in Brazil. In addition, we identify that abnormal returns during periods of crisis and expansion differ substantially. Finally, we show that executives with a graduate level academic background and less time in the company's management are associated with positive abnormal returns during crises.

Practical & social implications of research – This article assesses the existence of abnormal returns in M&A operations by considering three distinct moments of crisis. The study also links abnormal returns to company variables and executive characteristics.

Originality/value – Previous research emphasizes the panorama of acquisition operations, synergies, cross-border acquisitions, and value creation. Therefore, we believe that our paper is pioneering in presenting results on abnormal M&A returns during crisis periods in Brazil.

Keywords: Mergers and Acquisitions (M&A), abnormal return, crisis.

1. FECAP University Center, Department of Finance, São Paulo, SP, Brazil
2. Federal University of São Paulo, Department of Actuarial Sciences, Osasco, SP, Brazil

How to cite:
Silva, V. A. B., & Gallucci-Netto, H., (2022). Mergers and acquisitions in recession periods. *Revista Brasileira de Gestão de Negócios*, *24*(3), p.497-515. https://doi.org/10.7819/rbgn.v24i3.4194

Revista Brasileira de Gestão de Negócios

https://doi.org/10.7819/rbgn.v24i3.4194

1 Introduction

Economic crises can provide opportunities for financially healthy companies to make gains. Firms are able to increase their market share, diversify their investment portfolios, expand their activities to other regions and obtain better financial outcomes through acquisitions of companies and assets at liquidation prices (Acharya et al., 2011; Berger & Bouwman, 2009; Hughes et al., 1999; van Lelyveld & Knot, 2009). Thus, promising investments in times of crisis can provide positive returns.

In this paper, we investigate the returns from mergers and acquisitions (M&A) announcements by considering different crisis periods in Brazil. We aim to answer the following research question: Are there positive average abnormal returns on M&A transactions for shareholders of acquiring companies during economic crisis periods? After calculating the returns in recession periods, our research assesses whether such returns differ, on average, from those obtained in economic expansion scenarios.

This study contributes directly to the existing literature in three main areas. First, the research highlights the existence of abnormal returns for M&A announcements by analyzing three distinct moments of crisis. We consider the years 2003, 2007-2008, and 2014-2016, when there was at least one recessionary quarter in Brazil, following the notes of the Committee for Dating Economic Cycles (*CODACE*), to measure the average cumulative abnormal returns (ACAR) of acquirers around the announcement date of each acquisition.

Recent international studies on M&A in the US and Europe emphasize the outcomes of the 2008 economic-financial crisis. According to Shleifer and Vishny (2010), the crisis originated in the financial segment and took place between 2007 and 2009 due to the collapse of the housing bubble in the US. We consider three crises with explanations of a political, economic and financial nature, where two recessions were of national origin (2003 and 2014-2016) and one was international (2008-2009).

In addition, we relate the abnormal returns obtained in crisis periods with the specific characteristics of firms and executives. M&A studies reveal determining factors for transactions, such as firm size, growth opportunities, operating income, leverage, and liquidity (Brown & Sarma, 2007; Malmendier & Tate, 2005, 2008). Furthermore, previous research shows that some characteristics of the Chief Executive Officer (CEO), such as education, gender, age, length of career, participation on the board of directors and previous experience as an entrepreneur, are important for M&A decisions (Malmendier & Tate, 2005, 2008; Palich & Bagby, 1995). Hence, this paper jointly considers firm and CEO information in the empirical analysis of abnormal returns.

Third, this is the first paper to assess the existence of M&A abnormal returns in Brazil, considering periods of recession and expansion. Research on M&A in Brazil has taken different approaches. There are studies regarding the panorama of acquisition operations (Tanure & Cançado, 2005), synergies and value creation (Camargos & Barbosa, 2009; Simões et al., 2012; Steinberg, 2009), acquisitions abroad (Bortoluzzo et al., 2014), transaction volume (Ferreira & Callado, 2015), merger abandonment and collapse (Sales & Zanini, 2017), corporate governance (Nogueira & Castro, 2020; Silva et al., 2016) and the implications of M&A in the banking industry (Bergmann et al., 2015; Brito et al., 2005; Jordão et al., 2017; Souza & Gartner, 2019). We identified that returns around M&A announcements in crisis periods have not yet been investigated in Brazil and lack an empirical analysis.

We show the existence of positive abnormal returns in crisis periods. Using event windows of three, five, and seven days, we verify that M&A operations provided a positive and statistically significant abnormal return for the acquiring companies' shareholders, ranging from 1.8% to 3.3%, depending on the empirical model specification and the event window. The findings also point to the existence of positive returns for the three crises evaluated in this research (transactions carried out in 2002, 2007-2008, and 2014-2016, according to Comitê de Datação de Ciclos Econômicos, 2020) and reveal that the average cumulative returns for recession periods exceed the returns for expansion periods.

Finally, we find that CEO education (graduate degree) is positively associated with abnormal returns in recession periods, while CEO tenure is negatively associated. This result contributes to those of Beltratti and Paladino (2013), Malmendier and Tate (2005, 2008) and Jenter and Lewellen (2015) by connecting M&A abnormal returns in times of crisis to the characteristics of CEOs.

The paper is organized as follows. The second section describes the literature on value creation in M&A transactions, focusing on recession periods. The third section provides details on our data and empirical strategy. The fourth section presents the results, and the last section concludes the article.

2 Value creation and m&a transactions in recession periods

An acquisition can create value for the acquiring firm through different channels, such as by increasing revenues, reducing costs, increasing operational efficiency with scale gains, through vertical integration, technology transfer, adjusting the level of debt, and reducing agency problems (Fama & Jensen, 1983; Jensen, 1986; Jensen & Meckling, 1976). Regarding access to bank finance, Cornaggia and Li (2019)reveal that target companies benefit from M&A transactions due to reduced financing costs.

There is positive evidence regarding value creation and synergy gains for target companies of M&A transactions. Nonetheless, previous research points out that shareholders of acquiring companies present null or negative average abnormal returns in M&A operations (Agrawal et al., 1992; Alexandridis et al., 2010; Bruner, 2002; Moeller et al., 2005; Mueller, 1997).

The main explanations for the negative returns in M&A transactions point to the private benefits obtained by executives (Grinstein & Hribar, 2004; Harford & Li, 2007; Jensen, 1986; Loderer & Martin, 1990). Some studies discuss the complexity of integration and incompatibility of the organizational culture between the acquirer and target company (Alexandridis et al., 2013; Hayward, 2002; Shrivastava, 1986), as well as excessive manager optimism in M&A investments (Malmendier & Tate, 2008; Roll, 1986), as potential culprits for adverse outcomes.

Most of the aforementioned studies consider M&A transactions in the US and Europe. When other countries and different periods are evaluated, one can see that the results regarding the destruction or creation of value in M&A transactions are inconclusive. For example, Betton et al. (2009) found that shareholders of acquiring companies received a small gain shortly after the announcement of M&A transactions. In addition, research focusing on emerging countries points to value creation for the shareholders of acquiring companies (Chi et al., 2011; Rani et al., 2012; Simões et al., 2012).

In particular, Alexandridis et al. (2017) reveal that acquiring firms obtained positive abnormal returns after the 2008 economic-financial crisis in the US. The research shows that the crisis was essential for improving corporate governance in M&A operations. This improvement culminated in the advancement of internal control mechanisms, the evolution of risk management processes, and progress in compensation criteria for executives involved in the operations.

Some studies emphasize the ramifications of M&A transactions in more than one country. Bris and Cabolis (2008) and Martynova and Renneboog (2008) indicate that the level of investor protection in the acquiring firm's country is pivotal for value creation. Otto et al. (2021) find short-term positive abnormal returns for M&A announcements in developed and emerging countries, and they show higher returns from international operations for acquirers in developed markets.

Albuquerque et al. (2019) use M&A information from companies in 64 countries and present significant spillovers related to business conduct. They show that international mergers and acquisitions promote improvements in corporate governance when the acquiring firm's country has higher investor protection. Zámborský et al. (2021) reveal that the quality level of the regulatory environment is related to the motivation for carrying out M&As.

Notably, the previous literature accentuates abnormal gains for acquiring companies in times of crisis, when the firms can adequately exploit the crisis period to acquire other companies. For example, Berger and Bouwman (2009) argue that healthy firms can carry out M&A operations to improve their profitability and market share in recessions.

Economic turmoil can trigger changes in agents' perspectives and propagate increases in uncertainty (Gort, 1969). The increase in the level of uncertainty, in turn, contributes to the emergence of discrepant assessments and prices involving assets traded in the market. M&A opportunities appear in that the divergent values assigned by agents can signal opportunities for gains.

Firms that signal operational problems and reduced value in times of crisis can become the target of acquisitions by larger and liquid companies. Hughes et al. (1999), Emmons et al. (2004), van Lelyveld and Knot (2009), Hankir et al. (2009), and Acharya et al. (2011) show that acquisitions in times of crisis can provide positive abnormal returns, as there may be diversification benefits, increased market power and gains from stock purchases in a period of lower prices.

Malmendier and Tate (2008) show a positive relationship between CEO overconfidence and the probability of carrying out M&A transactions. Regarding the relationship between gender and investments, Jianakoplos and Bernasek (1998) point to greater risk aversion on the part of women in financial decisions, and Barber and

Odean (2001) argue that men carry out more operations in the equity market than women. Finally, Hryshko et al. (2011) show that risk aversion is also a characteristic of older individuals.

Recent studies on M&A in Brazil elucidate, respectively, the role of ownership structure and the relevance of M&A operations in times of a heated market. Nogueira and Castro (2020) show that the possibility of reducing control plays a fundamental role in M&A operations. Such transactions are less likely to occur with a concentrated ownership structure, especially with family controlling shareholders or state representatives. Souza and Gartner (2019) emphasize the M&A operations of banks in Brazil in times of a heated market and point to positive abnormal returns for rival competing banks.

We consider the previous literature to investigate the relationship between abnormal returns in M&A transactions and crisis periods, taking CEO education, tenure, previous experience as an entrepreneur, gender, and age into account. Our research follows that of Malmendier and Tate (2005, 2008) and uses the CEO's length of experience and participation as chairman of the board of directors as variables in the empirical analysis.

3 Data and empirical strategy

Our sample of M&A transactions comes from the *ANBIMA* (Brazilian Association of Financial and Capital Market Entities) database, which includes M&As announced between 2002 and 2017. To proceed with the empirical model, we exclude acquiring companies that: i) are not listed on the B3, i.e., there is no public financial statements data; ii) belong to the financial sector; and iii) do not have enough information to calculate the cumulative abnormal return. Table 1 details the selection of M&A transactions for our sample.

Table 2 displays the number of transactions and the value of transactions per year (Appendix A – Supplementary Data 1 – Excel). One can see that the sample includes 279 operations (with 1,795 M&As carried out in the period) and R$ 469 billion in transaction value. In all years of the sample period, the number of transactions whose buyer was not listed on the B3 was bigger than the number of transactions whose buyer was listed. In terms of value, this was higher for transactions with buyers listed on the B3, indicating that they were responsible for larger M&As.

Table 1
Final sample of mergers and acquisitions

Total number of mergers and acquisitions from 2003 to 2017	**1,796**
Exclusions from sample:	
Acquiring firm is not listed on the B3	1,431
Mergers and acquisitions in the financial sector	70
There is insufficient daily return data from the acquiring firm to calculate the cumulative return	16
Total	**279**

One can see that the energy industry sector saw the highest number of transactions between 2002 and 2017, with 145 transactions, followed by the financial and IT/telecoms sectors with 144 and 135 transactions, respectively.

In terms of the value of the operations, the financial industry accounted for the greatest amounts, followed by the technology/telecoms and food and beverage sectors. Table 3 presents the ten most expressive transactions (value in R$ billion) that took place throughout the sample period and the ten largest in crisis times. The financial sector (merger between Itaú and Unibanco) leads in terms of the value of operations, and it is also possible to observe substantial participation of the IT/telecoms sector.

The final sample comprises 36 companies with only one acquisition and one firm with 16 transactions. The average number of acquisitions per firm in the period is 3.05, while the median equals 2.

We collected the shares' closing price and the financial statement variables for each firm from Economatica. We obtained CEO information from the Brazilian Securities and Exchange Commission (*CVM*) website. For this, we consulted the Reference Form (section 12.5) and the IAN report (information before 2008). The variables are tenure, education, previous experience as an entrepreneur, gender, age, time as an executive of the acquiring firm, participation as chairman of the board of directors, and experience in the government.

We use the event study method to assess the M&A abnormal returns during crisis periods. Thus, we study whether the M&A announcements create value for the acquiring company's shareholders in different crisis periods.

Brown and Warner (1980) explain that event studies verify how observed asset returns deviate from predicted returns on days close to a specific event. The return that is considered normal is the return that

Table 2
Description of M&A Transactions in Brazil from 2002 to 2017

Year	Full M&A Data (no exclusions)		M&A Sample	
	Number of transactions	Total amount (R$ billion)	Number of transactions	Total amount (R$ billion)
2002	24	27.57	6	13.00
2003	33	23.53	4	2.17
2004	41	103.20	12	5.16
2005	53	44.64	12	11.76
2006	77	131.70	18	70.79
2007	147	129.13	31	48.55
2008	103	220.31	26	21.32
2009	97	117.97	29	48.59
2010	146	184.84	26	58.99
2011	179	142.72	11	41.66
2012	179	122.52	26	15.99
2013	178	164.60	22	57.46
2014	146	192.71	12	33.01
2015	111	109.55	11	8.13
2016	137	179.09	12	10.70
2017	144	138.40	21	22.21
Total	**1795**	**2032.47**	**279**	**469**

Source: Own elaboration.

Table 3
Largest M&A transactions for the entire sample period and recession years

Transaction	Industry	Amount (R$ billion)	Year
Merger between Itaú and Unibanco	Financial	106.92	2008
Merger between Ambev and Interbrew	Food and beverage	80.22	2004
Acquisition of Inco by Vale do Rio Doce	Steel	42.56	2006
Merger between BM&F and Bovespa	Financial	34.26	2008
Acquisition of Banco Real by Santander	Financial	31.41	2007
Incorporation of Portugal Telecom by Oi	Technology/Telecoms	28.70	2013
Acquisition of Portugal Telecom assets by Altice	Technology/Telecoms	23.86	2014
Acquisition of GVT by Telefônica	Technology/Telecoms	23.50	2014
Telemar's corporate restructuring	Technology/Telecoms	20.75	2011
Acquisition of Brasilcel by Telefônica	Technology/Telecoms	18.18	2010
Largest transactions in crisis years			
Merger between Itaú and Unibanco	Financial	106.92	2008
Merger between BM&F and Bovespa	Financial	34.26	2008
Acquisition of Portugal Telecom assets by Altice	Technology/Telecoms	23.86	2014
Acquisition of GVT by Telefônica	Technology/Telecoms	23.50	2014
Acquisition of HSBC by Bradesco	Financial	17.85	2015
Acquisition of Nova Transportadora do Sudeste by Brookfield Asset Management	Oil and Gas	16.73	2016
Acquisition of control of OGX by creditors	Oil and Gas	13.80	2014
Merger between ALL and Rumo	Transportation and logistics	13.53	2014
Merger between Cetip and BM&FBovespa	Financial	11.96	2016
Acquisition of Bertin by JBS	Food and beverage	11.58	2009

Source: Own elaboration.

the asset would present if the event did not occur and can be calculated through an asset pricing model. It is possible to use average-adjusted returns, market-adjusted returns, and risk- and market-adjusted returns to measure normal returns.

Mackinlay (1997) explains that average cumulative abnormal returns (ACAR) are the difference between the observed and the expected or normal return that a given asset presents for the occurrence of an event. In this paper, we opted for the approach proposed by Campbell et al. (1997), considering four stages: i) event definition; ii) selection criteria; iii) measurement of normal and abnormal returns; and iv) presentation and interpretation of statistical tests.

Using the market model, we calculate the abnormal returns (ACAR) around the acquisition announcement date. We adopt the Ibovespa Index as the proxy variable for market return. Equation 1 presents the market model, where $E\left(R_{i,t}\right)$ is the return of stock i on day t, and $E\left(R_{M,t}\right)$ is the return of the Ibovespa on day t.

$$E\left(R_{i,t}\right) = \beta_0 + \beta_1 E\left(R_{M,t}\right) \quad (1)$$

We calculate the market model coefficients considering 200 days and stop the estimation window 11 days before the event announcement date. We adopt three-, five-, and seven-day event windows to calculate cumulative abnormal returns (Wang & Yin, 2018). Unfortunately, we lost a few observations due to the low level of liquidity of some stocks. To calculate the abnormal returns for each event, a minimum number of two days of stock return is required for the three-day window, four days of return for the five-day window, and five days of return for the seven-day window.

Finally, to evaluate the relationship between crisis periods and M&A abnormal returns, we ran multiple regressions (ordinary least squares) at the transaction level, where the following model was estimated (Equation 2):

$$CAR_i = \beta_0 + \beta_1 Crisis + \beta_2 \ln\left(transaction\,value\right)_i + \beta_3 Acquirer\,controls_{i,t-1} + \delta_i + \gamma_j + \varepsilon_i \quad (2)$$

The variable CAR_i represents the acquirer's cumulative abnormal return for three-, five-, and seven-day event windows. Our variable of interest is Crisis, a dummy variable that equals 1 for transactions made in the recession years of 2003, 2007-2008, and 2014-2016 (Comitê de Datação de Ciclos Econômicos, 2020). We pick the transaction value to control for the deal heterogeneity. Our empirical investigation follows Wang and Yin (2018) and presents the same control variables for the acquirer firm one year before the acquisition. We use different specifications for Equation 1 (three-day, five-day, and seven-day ACAR), considering sector and company fixed effects. All the regressions' standard errors are corrected for heteroscedasticity.

We control for different firm and CEO characteristics to consistently verify the existence of such returns. For example, firms with higher liquidity levels are, ceteris paribus, more likely to take advantage of takeover opportunities in recessions. Thus, we consider a range of acquirer firm variables as controls to study the relationship between crises and abnormal returns. Harford (2002) shows that companies with higher cash reserves are more likely to acquire other firms and points to market liquidity as the main explanatory factor for M&A waves. The previous empirical analyses also considered the deal size (transaction value) in the empirical model. According to Alexandridis et al. (2017), the size of the transaction can be pivotal for value creation (or destruction).

In addition, the empirical investigation uses other variables for control purposes, such as company size, leverage, return, growth opportunities, investment, and level of corporate governance. We use the studies of Malmendier and Tate (2005, 2008), Brown and Sarma (2007), and Silva et al. (2016) to choose and define proxies representing the CEOs' characteristics. These studies provide information on overconfidence in M&A operations, the probability of carrying out M&A transactions, and the relationship between value creation in M&A and corporate governance.

The final approach of our empirical analysis involves the relationship between M&A abnormal returns for acquirers in crisis periods and CEO characteristics. Previous studies indicate that the decision maker's traits are related to M&A investments. For example, Malmendier and Tate (2005) report that executives with both a degree in finance and a graduate degree are less likely to carry out M&A transactions. Palich and Bagby (1995), Arabsheibani et al. (2000), and Barros and Silveira (2008) argue that entrepreneurs may be overconfident and are more likely to participate in risky investment situations.

The control variables for the acquiring firm are: total asset value, book-to-market, leverage, cash, net income divided by total assets, investment in capital goods (CAPEX) divided by total assets, fixed assets divided by

total assets, growth in net operating income between two years, a dummy variable equaling 1 if the acquiring company is listed on the Novo Mercado or Level 2 on the B3 and another dummy equaling 1 if the acquiring company is traded in the US. We also control for the industry and firm fixed effects.

Therefore, we first explore the relationship between crisis periods and the cumulative abnormal returns of the acquirers in M&A transactions. Then, we assess the relationship between the cumulative abnormal returns and the characteristics of the CEO (education, gender, participation on the board of directors, participation in the government, and acting as an entrepreneur). Table 4 shows the definition of the variables used in our empirical model.

Table 5 shows the descriptive statistics and the correlation matrix for the empirical variable specification (Appendix A - Supplementary Data 4 - Stata Do-file).

The variables representing the characteristics of the CEO were analyzed together with the crisis periods (interaction between CEO features and crisis periods). The empirical approach to analyzing CEO characteristics in M&A operations follows that of Malmendier and Tate (2005) and Malmendier et al. (2011). Thus, we consider the following specification (Equation 3):

$$CAR_i = \beta_0 + \beta_1 Crisis^* Graduate_i + \beta_2 Crisis^* Finance\_degree_i + \beta_3 Crisis^* Man_i + \beta_4 Crisis^* Chairman\_Board_i + \beta_5 Crisis^* Government_i + \beta_6 Crisis^* Entrepreneur_i + \beta_7 Crisis^* Age_i + \beta_8 Crisis^* Tenure_i + \delta_i + \gamma_j + \varepsilon_i \quad (3)$$

Finally, we determine the difference between the averages for the cumulative abnormal returns of the acquirer through the ATT (average treatment effects on the treated) for moments of crisis and expansion in the economy. We apply the PSM technique by neighborhood (propensity score matching – nearest neighbor matching)

Table 4
Definition of Variables

ACAR	Cumulative abnormal return for the three-day, five-day, and seven-day windows.
Crisis	Dummy equaling 1 for acquisitions made in crisis years and 0 otherwise. The crisis years are 2003, 2008, 2009, 2014, 2015 and 2016.
ln(transaction)	Logarithm of the transaction amount.
ln(assets)	Logarithm of the book value of assets.
Book-to-market	Book value of assets divided by market value.
Leverage	Total debt divided by asset value.
Cash	Current assets minus inventory divided by asset value.
ROA	Net income divided by total assets.
CAPEX/assets	CAPEX divided by asset value.
PPE/assets	Fixed assets divided by asset value.
Sales growth	Change in net operating income between two years.
Governance level	Dummy equaling 1 if the firm is listed on the Novo Mercado or Level 2 and 0 otherwise.
ADR	Dummy equaling 1 if the firm share is traded in the US and 0 otherwise.
Sector dummy	Binary variables that group firms from the same sector. We use the NAICS sector classification.
Firm dummy	Dummy variable for each firm.
CEO Characteristics	
Graduate	Dummy equaling 1 if the CEO of the acquiring company has a graduate degree and 0 otherwise.
Finance degree	Dummy equaling 1 if the CEO of the acquiring company has a degree in a business-related course or engineering and 0 otherwise.
Male	Dummy equaling 1 if the CEO of the acquiring company is male and 0 otherwise.
Chairman of the board of directors	Dummy equaling 1 if the CEO of the acquiring company is the chairman of the board of directors and 0 otherwise.
Government	Dummy equaling 1 if the CEO of the acquiring company has worked in the government and 0 otherwise.
Entrepreneur	Dummy equaling 1 if the CEO of the acquiring company is an entrepreneur and 0 otherwise.
CEO age	Age in years of the firm's CEO at the date of acquisition.
CEO tenure	The number of years the CEO has been in the position.

Source: Own elaboration.

Table 5
Descriptive Statistics

Panel A

Variables	Mean	Median	SD	Minimum	Maximum
Transaction value (R$ millions)	1762.34	527.36	4134.24	20.00	42561.5
Assets (R$ millions)	35.46	12.43	72.59	0.19	615.96
Book-to-market	1.92	1.33	2.01	0.09	19.89
Leverage	0.08	0.06	0.07	0	0.37
Cash	0.31	0.28	0.16	0.07	0.87
ROA	0.05	0.05	0.08	-0.27	0.73
CAPEX/assets	0.09	0.08	0.08	-0.39	0.55
PPE/assets	0.33	0.34	0.21	0.00	0.80
Sales growth	0.28	0.15	0.87	-3.90	10.06
Graduate	0.47	0.00	0.49	0.00	1.00
Finance degree	0.80	1.00	0.44	0.00	1.00
Male	0.98	1.00	0.13	0.00	1.00
Chairman of the board of directors	0.25	0.00	0.43	0.00	1.00
Government	0.61	1.00	0.48	0.00	1.00
Entrepreneur	0.08	0.00	0.28	0.00	1.00
CEO age	52.48	52.27	10.27	33.00	83.01
CEO tenure	3.72	2.28	3.97	0.83	31.00

Panel B

Correlation Matrix

	ln (transaction)	*ln* (assets)	Book-to-market	Leverage	Cash	ROA	CAPEX/ assets	PPE/ assets	Sales growth	Governance level
ln (assets)	0.21									
	0.00									
Book-to-market	0.05	0.09								
	-0.35	-0.11								
Leverage	0.00	-0.14	0.35							
	-0.95	-0.02	0.00							
Cash	-0.09	-0.10	-0.02	-0.09						
	-0.11	-0.08	-0.65	-0.11						
ROA	0.07	0.08	-0.39	-0.28	0.04					
	-0.18	-0.15	0.00	0.00	-0.45					
CAPEX/assets	-0.02	0.10	-0.22	-0.05	-0.04	0.00				
	-0.70	-0.09	0.00	-0.38	-0.47	-0.96				
PPE/assets	0.09	0.28	-0.09	0.08	-0.52	0.09	0.22			
	-0.13	0.00	-0.12	-0.14	0.00	-0.11	0.00			
Sales growth	-0.07	-0.10	-0.08	-0.05	0.09	-0.03	0.52	-0.07		
	-0.20	-0.07	-0.17	-0.40	-0.11	-0.56	0.00	-0.19		
Governance level	0.05	0.02	-0.01	-0.10	-0.01	0.04	-0.01	0.12	0.02	
	-0.39	-0.67	-0.76	-0.07	-0.77	-0.43	-0.43	-0.04	-0.64	
ADR	0.02	0.12	0.01	-0.05	0.04	-0.09	-0.01	0.12	0.07	0.45
	-0.70	-0.03	-0.76	-0.38	-0.44	-0.13	(0.13	-0.04	-0.20	0.00

Source: Own elaboration.

to compare the averages for similar companies in terms of size, leverage, cash level, and industry.

4 Results

Figure 1 illustrates the annual average cumulative abnormal returns for three-day, five-day, and seven-day windows from 2002 to 2017 (Appendix A – Supplementary Data 4 – Stata Do-file). We can note the abnormal return peaks for the years identified as crises (Comitê de Datação de Ciclos Econômicos, 2020). In addition, Table 6 corroborates the results presented in Figure 1 through the descriptive statistics of the cumulative abnormal returns. The reported ACAR refer to the seven-day window, where the crisis years have an average cumulative abnormal return of 2.4%, which is statistically significant and non-zero. The results are similar for the three-day and five-day event windows (Appendix A – Supplementary Data 4 – Stata Do-file).

Figure 2 presents the cumulative abnormal returns between the 20 days before the merger or acquisition announcement and the 20 days after the announcement

Table 6
Annual Abnormal Return for the Sample Period

Year	Mean	Median	SD	Minimum	Maximum	Number of transactions
2002	-0.001	-0.018	0.066	-0.061	0.111	6
2003	0.047	0.066	0.087	-0.075	0.132	4
2004	-0.011	0.000	0.044	-0.093	0.052	12
2005	0.004	-0.011	0.053	-0.108	0.075	12
2006	-0.016	-0.012	0.044	-0.096	0.069	18
2007	0.003	-0.006	0.057	-0.115	0.188	31
2008	0.042**	0.022	0.091	-0.079	0.342	24
2009	0.024	0.011	0.093	-0.083	0.381	27
2010	-0.003	-0.005	0.041	-0.106	0.071	28
2011	-0.036	-0.006	0.107	-0.348	0.051	12
2012	0.006	0.004	0.040	-0.072	0.062	27
2013	-0.005	0.001	0.065	-0.183	0.106	22
2014	0.005	0.006	0.042	-0.078	0.097	12
2015	0.006	0.005	0.040	-0.086	0.061	12
2016	0.022	0.015	0.055	-0.040	0.135	12
2017	-0.003	0.000	0.031	-0.052	0.073	20
Years of crisis	0.024***	0.010	0.076	-0.086	0.381	91
Years of expansion	-0.004	-0.002	0.055	-0.348	0.188	188

Note: Own elaboration. ***, ** and * represent statistical significance at the 1%, 5%, and 10% levels, respectively, for the t-test, in which the null hypothesis establishes a mean equal to zero.

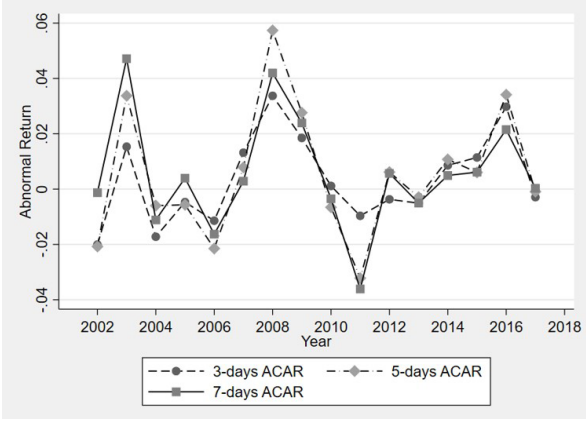

Figure 1. Abnormal Returns by Year
Note: Own elaboration.

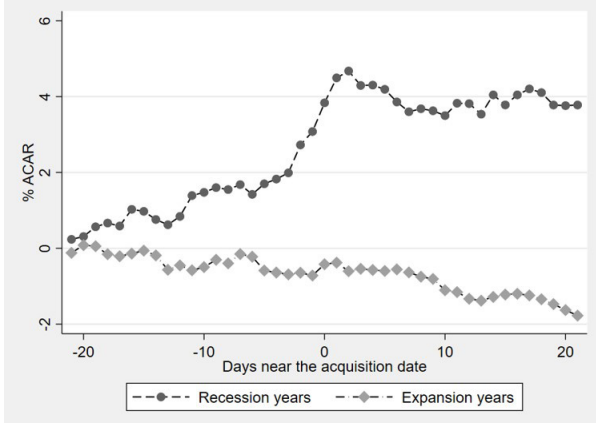

Figure 2. Cumulative Abnormal Returns
Note: Own elaboration

for the five-day ACAR event window (the result is similar for the other windows). It seems that the market anticipates the announcement during the crisis years and an abnormal return of 3% is accumulated on the previous day. Cumulative return peaks at 4.6% and stabilizes around 3%. However, mergers and acquisitions do not seem to impact shareholders of acquiring companies in years when there is no crisis, as the cumulative abnormal return remains around -1%.

Table 7 shows the main result of this paper. Even controlling for the transaction size (value), firm variables and firm and sector heterogeneity (fixed effects), the crisis period variable has a positive and statistically significant correlation with the average abnormal return calculated for three-day, five-day, and seven-day windows. The average abnormal returns in times of crisis range from 1.8% to 3.3%, considering the windows mentioned above (Appendix A – Supplementary Data 5 – Stata Do-file).

Table 7
ACAR, crises and firm characteristics

	Results					
	ACAR – 3 days	**ACAR – 3 days**	**ACAR – 5 days**	**ACAR – 5 days**	**ACAR – 7 days**	**ACAR – 7 days**
Crisis	**0.023****	**0.018****	**0.033*****	**0.029*****	**0.023****	**0.026***
	(0.010)	**(0.009)**	**(0.010)**	**(0.011)**	**(0.010)**	**(0.013)**
ln(transaction)	0.001	-0.000	0.002	0.001	-0.001	-0.003
	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)
ln(assets)	-0.002	-0.005	-0.005	**-0.016****	-0.005	-0.013
	(0.003)	(0.007)	(0.003)	**(0.008)**	(0.004)	(0.010)
Book-to-market	0.002	0.001	**0.006****	0.006	**0.010****	**0.008***
	(0.003)	(0.003)	**(0.003)**	(0.004)	**(0.004)**	**(0.004)**
Leverage	-0.015	0.024	-0.000	-0.067	-0.036	-0.077
	(0.071)	(0.100)	(0.078)	(0.166)	(0.087)	(0.193)
Cash	0.003	0.009	0.025	0.035	0.023	0.032
	(0.024)	(0.060)	(0.018)	(0.066)	(0.022)	(0.065)
ROA	-0.005	0.005	0.075	0.007	0.109**	0.086
	(0.053)	(0.084)	(0.057)	(0.130)	(0.052)	(0.153)
CAPEX/assets	0.081	0.102	0.081	0.137*	0.065	0.092
	(0.068)	(0.080)	(0.068)	(0.080)	(0.075)	(0.087)
PPE/assets	0.013	0.036	0.020	0.031	0.025	0.052
	(0.017)	(0.037)	(0.020)	(0.041)	(0.022)	(0.045)
Sales growth	-0.008	-0.009	**-0.009***	**-0.015***	**-0.012****	**-0.015***
	(0.005)	(0.008)	**(0.005)**	**(0.008)**	**(0.006)**	**(0.007)**
Governance level	-0.010	**0.046***	-0.005	0.034	-0.009	0.037
	(0.009)	**(0.023)**	(0.012)	(0.031)	(0.010)	(0.039)
ADR	-0.006	-0.000	0.009	0.022	0.005	0.019
	(0.005)	(0.018)	(0.007)	(0.024)	(0.014)	(0.035)
Constant	-0.002	0.021	0.017	0.128	0.084	0.146
	(0.059)	(0.099)	(0.071)	(0.113)	(0.059)	(0.163)
Sector						
fixed effects	Yes	No	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes	No	Yes
Observations	266	266	277	277	279	279
Prob > F	0.00	0.00	0.00	0.00	0.00	0.00
Adjusted R^2	0.11	0.31	0.13	0.21	0.11	0.17

Note: Own elaboration. The symbols *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively. Standard errors are shown in parentheses.

Our results contribute to the literature by pointing out the existence of average abnormal returns during different crisis periods. They are in line with those of Hughes et al. (1999), Emmons et al. (2004), van Lelyveld and Knot (2009), Hankir et al. (2009), and Acharya et al. (2011). Unlike Beltratti and Paladino (2013), who did not find statistically significant results for abnormal returns in M&A transactions between financial institutions during the 2008 crisis, we provide evidence of abnormal stock returns for non-financial firms during the crises.

In Table 7, we show that only two control variables are statistically significant in more than one regression. Firms with a higher book value of assets relative to market value (book-to-market) are generally mature and have less potential for organic growth, so an acquisition is an opportunity to consolidate the industry and increase future revenue. In addition, firms in which operating income grew in the years before the M&A event may present a greater opportunity for organic growth without the need for an acquisition. Therefore, the market might negatively view the operation.

Table 8 shows the relationship between the characteristics of CEOs and the average abnormal returns obtained by the shareholders of the acquiring firms in crisis periods (Appendix A – Supplementary Data 5 – Stata Do-file).

Table 8
ACAR, crises, and CEO characteristics

	Results					
	ACAR – 3 days	**ACAR – 3 days**	**ACAR – 5 days**	**ACAR – 5 days**	**ACAR – 7 days**	**ACAR – 7 days**
Crisis*Graduate	**0.032****	0.022	**0.040*****	**0.042*****	**0.045*****	**0.054*****
	(0.013)	(0.015)	**(0.012)**	**(0.013)**	**(0.012)**	**(0.014)**
Crisis*Finance_degree	-0.031	-0.063	-0.029	-0.059	-0.065	-0.070
	(0.049)	(0.061)	(0.051)	(0.064)	(0.042)	(0.062)
Crisis*Male	**0.048****	0.014	**0.068*****	0.037	**0.088*****	**0.071****
	(0.023)	(0.034)	**(0.024)**	(0.033)	**(0.022)**	**(0.033)**
Crisis*Chairman of the board of directors	0.001	0.007	0.020	0.021	0.020	0.027
	(0.021)	(0.024)	(0.015)	(0.021)	(0.015)	(0.022)
Crisis*Government	-0.001	0.010	-0.010	-0.017	-0.009	-0.013
	(0.015)	(0.016)	(0.013)	(0.022)	(0.012)	(0.026)
Crisis*Entrepreneur	0.035	-0.023	-0.015	-0.045	-0.069	-0.076
	(0.063)	(0.052)	(0.053)	(0.055)	(0.044)	(0.054)
Crisis*CEO age	0.000	0.001	-0.000	0.001	0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Crisis*CEO tenure	**-0.005****	-0.002	**-0.005*****	**-0.004****	**-0.006*****	**-0.006****
	(0.002)	(0.002)	**(0.002)**	**(0.002)**	**(0.002)**	**(0.002)**
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Sector						
fixed effects	Yes	No	Yes	No	Yes	No
Firm						
fixed effects	No	Yes	No	Yes	No	Yes
Observations	266	266	277	277	279	279
Prob > F	0.00	0.00	0.00	0.00	0.00	0.00
Adjusted R^2	0.18	0.31	0.16	0.22	0.16	0.20

Note: Own elaboration. The symbols *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively. Standard errors are shown in parentheses.

One can find a positive relationship between CEOs with a graduate degree and the average cumulative abnormal returns for all event windows. Thus, the results highlight that those executives with graduate degrees provided superior returns in times of crisis. Abnormal returns range from 3.2% to 5.4%.

According to Malmendier and Tate (2005), CEOs with finance and graduate degrees are less likely to carry out M&A transactions. In our study, however, we found that CEOs with graduate degrees provided higher average abnormal returns when participating in M&A in times of crisis. As noted, abnormal returns in times of crisis can come from diversification benefits, increased market power, and gains from buying stocks that are considered to be cheap. CEOs with a stronger academic background may be better able to evaluate good projects in times of crisis. However, CEOs with a stronger academic background are also hired by companies with better operational, financial, and management conditions. Thus, even controlling for the company's operating, economic, and fixed-effect characteristics, it is possible to argue that the result attributed to the CEO's background may also capture other aspects that change over time and are not part of the controls used in the regression.

Table 8 also shows a negative and statistically significant relationship between CEO tenure (the period in which the CEO had been in charge of the company at the time of the transaction) and the average cumulative abnormal return. The results oscillate between -0.2% and -0.6%. Similarly, Malmendier and Tate (2005) show a negative relationship between the executive's participation as CEO in the firm and the probability of carrying out an M&A. One possible explanation involves an entrenchment problem, in which CEOs with longer tenures are more comfortable with conservative projects and, therefore, are less likely to carry out M&A transactions, especially in

times of crisis. When they participate in M&A operations in times of crisis, the results clarify that such executives tend to destroy value. We chose not to interpret the sign of the gender variable coefficient, as the number of women who acted as CEOs in M&A transactions is tiny and may direct the result found.

Next, our empirical investigation emphasizes the existence of a difference in the average abnormal returns in moments of crisis and in moments of expansion. For this, we adopt the PSM technique by neighborhood (propensity score matching - nearest neighbor matching) to compare the averages for similar companies in terms of size, leverage, cash level, and sector of activity. Table 9 presents the results (Appendix A – Supplementary Data 5 – Stata Do-file).

One can note that in moments of crisis the shareholders of the acquiring companies earned an average return greater than 2.4% (average returns in moments of expansion were negative). Thus, the returns calculated in moments of expansion seem to follow the results indicated by the literature (Alexandridis et al., 2013; Grinstein & Hribar, 2004; Harford & Li, 2007; Loderer & Martin, 1990; Roll, 1986), while the returns obtained in times of crisis are, on average, positive.

In Table 10, we present the differences in the characteristics of firms and executives that provided positive and negative average abnormal returns in crisis periods (Appendix A – Supplementary Data 5 – Stata Do-file).

We can see that firms with a positive average abnormal return have a higher book-to-market index and a lower CAPEX/assets ratio. Regarding the CEO's features, the result is similar to what was presented previously.

Our results contribute to two complementary strands of the literature. First, they contribute to the work of Berger and Bouwman (2009) by showing positive

Table 9
Mean differences for cumulative abnormal returns, firm and CEO characteristics, considering periods of crisis and expansion

	Crisis	Expansion	Difference	t-stat	ATT	t-stat
	Mean	Mean				
Variables						
ACAR – 3 days	0.021	-0.003	0.024	3.88***	0.023	2.66**
ACAR – 5 days	0.031	-0.004	0.035	4.59***	0.032	3.06***
ACAR – 7 days	0.025	-0.004	0.029	3.56***	0.019	1.70*
ln(transaction)	20.02	20.13	-0.11	0.59		
ln(assets)	15.97	16.30	-0.33	1.62		
Book-to-market	2.20	1.78	0.42	1.63		
Leverage	0.08	0.07	0.01	1.31		
Cash	0.33	0.30	0.03	1.16		
ROA	0.04	0.06	-0.02	2.16**		
CAPEX/assets	0.09	0.09	0.00	0.41		
PPE/assets	0.29	0.35	-0.06	2.16**		
Sales growth	0.30	0.28	0.02	0.18		
Governance level	0.20	0.29	-0.09	1.69*		
ADR	0.05	0.10	-0.05	1.28		
CEO Characteristics						
Graduate	0.44	0.48	-0.04	0.69	-0.06	0.74
Finance degree	0.78	0.81	-0.03	0.68	0.06	0.74
Male	0.97	0.99	-0.02	1.31	-0.02	0.82
Chairman of the board of directors	0.29	0.23	0.05	0.93	0.03	0.42
Government	0.68	0.59	0.09	1.55	0.06	0.77
Entrepreneur	0.17	0.05	0.12	3.31***	0.05	0.93
CEO age	52.67	52.40	0.27	0.19	1.45	0.80
CEO tenure	4.18	3.51	0.67	1.32	1.28	2.37**
Observations	91	188				

Note: Own elaboration. The symbols *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively. We calculate the average effect for treated (ATT) based on the propensity score matching (PSM) for the variables size, leverage, cash level and sector.

Table 10
Difference in variables for firms with positive and negative ACAR in crisis years

	Positive	Negative	Difference	t-stat
	Mean	Mean		
Variables				
ln(transaction)	20.02	20.01	0.01	0.03
ln(assets)	15.88	16.08	-0.19	0.72
Book-to-market	2.63	1.57	1.06	1.98*
Leverage	0.08	0.09	0.00	0.41
Cash	0.34	0.31	0.02	0.67
ROA	0.04	0.04	0.00	0.02
CAPEX/assets	0.07	0.11	-0.04	1.80*
PPE/assets	0.29	0.29	0.00	0.02
Sales growth	0.20	0.44	-0.25	0.94
Governance level	0.22	0.16	0.06	0.70
ADR	0.07	0.03	0.05	0.96
CEO Characteristics				
Graduate	0.53	0.30	0.23	2.30**
Finance degree	0.81	0.73	0.08	0.85
Man	0.94	1.00	-0.06	1.46
Chairman of the board of directors	0.26	0.32	-0.06	0.66
Government	0.63	0.75	-0.12	1.27
Entrepreneur	0.12	0.21	0.08	1.08
CEO age	52.36	53.11	-0.75	0.32
CEO tenure	3.53	5.11	-1.58	1.70*
Observations	54	37		

Note: Own elaboration. The symbols *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

abnormal returns in recession periods. In addition, our findings contribute to the work of Alexandridis et al. (2017) by elucidating differences in returns during crises and expansion periods. Hughes et al. (1999), Emmons et al. (2004), van Lelyveld and Knot (2009), Hankir et al. (2009), and Acharya et al. (2011) show that acquisitions in times of crisis can provide positive abnormal returns for shareholders of acquiring companies. Our results shed light on returns in times of crisis by revealing positive abnormal results in three different moments of crisis with explanations of a political, economic and financial nature of both national and international origin.

Second, we provide important contributions to the literature that connects CEO characteristics with M&A operations. By showing that CEOs with a graduate level education and the period in which the CEO had been in charge of the company at the time of the transaction are relevant to M&A operations in times of crisis, we add to the findings of Morck et al. (1990), Datta et al. (2001), Malmendier and Tate (2005) and Jenter and Lewellen (2015).

Morck et al. (1990) point out that negative returns occur in M&A when managers present poor performance in periods before the operation. Datta et al. (2001) emphasize a positive relationship between the executive compensation structure and the stock price at moments close to and after the M&A announcement. Malmendier and Tate (2005) show that executives with a degree in finance and a postgraduate degree are less likely to carry out M&As, while Jenter and Lewellen (2015) reveal that CEOs' retirement timing preferences affect their probability of engaging in takeover bids. Thus, our study presents new findings by illustrating the role of CEO education and tenure in the market's assessment of M&A announcements in times of crisis.

5 Final remarks

This paper analyzes abnormal returns for M&A announcements in recession periods. We find that shareholders of acquiring companies obtained positive average abnormal returns in crises and that these average

returns are superior to the returns obtained in expansion periods.

Our results suggest positive average abnormal returns for M&A during times of crisis for acquiring firms in which CEOs have graduate degrees.

Beyond the academic relevance, this paper also provides practical insights. Many executives may fail to explore investment opportunities in times of crisis, perhaps because of the simple fear of investing at adverse times. We point out that it is possible to make suitable investments in times of crisis, and shareholders' perceptions are similar.

The empirical analyses seek to present correlations (using controls) between abnormal returns and variables at the firm and CEO levels. It is noteworthy, therefore, that we do not address causality relationships in this paper. Even pioneering articles on the subject, such as that of Malmendier and Tate (2005), present limitations regarding endogeneity problems in the choice of investments. Hence, future studies could explore exogenous shocks to evaluate different causal implications for the topic.

We should also mention that the study has limitations that could be explored in future papers. First, we only analyze M&A operations of publicly-traded acquiring companies, as the calculation of abnormal returns demands publicly-available information. The number of M&A transactions with privately-held companies is considerable, and there is still a lot of opportunity for studies focusing on these firms. Second, our reported results come from short-term event windows. Other studies could evaluate M&A results in crisis periods, considering larger event windows. Third, the characteristics of the Brazilian capital market and the firms in our database make it possible to use single-factor models to construct the normal return, such as the market model. Future research could use data from other countries (or several countries) to assess normal returns using multifactor models.

Future research could also analyze different notes for moments of crisis. This research follows the notes of the Committee for Dating Economic Cycles (*CODACE*), but naturally it is possible to find different ways to define moments of crisis. Finally, future research could include evaluating M&A operations in the context of the SARS-COVID 19 pandemic. Interesting results could be obtained locally and internationally.

References

ACHARYA, V. V., SHIN, H. S., & YORULMAZER, T. (2011). Crisis resolution and bank liquidity. *Review of Financial Studies*, *24*(6), 2166-2205. http://dx.doi.org/10.1093/rfs/hhq073.

AGRAWAL, A., JAFFE, J. F., & MANDELKER, G. N. (1992). The post-merger performance of acquiring firms: A re-examination of an anomaly. *The Journal of Finance*, *47*(4), 1605-1621. http://dx.doi.org/10.1111/j.1540-6261.1992.tb04674.x.

ALBUQUERQUE, R., BRANDÃO-MARQUES, L., FERREIRA, M., & MATOS, P. (2019). International corporate governance spillovers: Evidence from cross-border mergers and acquisitions. *Review of Financial Studies*, *32*(2), 738-770. http://dx.doi.org/10.1093/rfs/hhy053.

ALEXANDRIDIS, G., ANTYPAS, N., & TRAVLOS, N. (2017). Value creation from M&As: New evidence. *Journal of Corporate Finance*, *45*(C), 632-650. http://dx.doi.org/10.1016/j.jcorpfin.2017.05.010.

ALEXANDRIDIS, G., FULLER, K. P., TERHAAR, L., & TRAVLOS, N. G. (2013). Deal size, acquisition premia and shareholder gains. *Journal of Corporate Finance*, *20*(C), 1-13. http://dx.doi.org/10.1016/j.jcorpfin.2012.10.006.

ALEXANDRIDIS, G., PETMEZAS, D., & TRAVLOS, N. G. (2010). Gains from mergers and acquisitions around the world: New evidence. *Financial Management*, *39*(4), 1671-1695. http://dx.doi.org/10.1111/j.1755-053X.2010.01126.x.

ARABSHEIBANI, G., DE MEZA, D., MALONEY, J., & PEARSON, B. (2000). And a vision appeared unto them of a great profit: Evidence of self-deception among the self-employed. *Economics Letters*, *67*(1), 35-41. http://dx.doi.org/10.1016/S0165-1765(99)00242-6.

BARBER, B. M., & ODEAN, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *The Quarterly Journal of Economics*, *116*(1), 261-292. http://dx.doi.org/10.1162/003355301556400.

BARROS, L. A. B. C., & SILVEIRA, A. D. M. (2008). Excesso de confiança, otimismo gerencial e os determinantes da estrutura de capital. *Revista Brasileira*

de Finanças, *6*(3), 293-335. http://dx.doi.org/10.12660/rbfin.v6n3.2008.1343.

BELTRATTI, A., & PALADINO, G. (2013). Is M&A different during a crisis? Evidence from the European banking sector. *Journal of Banking & Finance*, *37*(12), 5394-5405. http://dx.doi.org/10.1016/j.jbankfin.2013.02.004.

BERGER, A., & BOUWMAN, C. (2009). Bank liquidity creation. *Review of Financial Studies*, *22*(9), 3779-3837. http://dx.doi.org/10.1093/rfs/hhn104.

BERGMANN, D. R., SAVOIA, J. R. F., SOUZA, B. M., & MARIZ, F. (2015). Avaliação dos processos de fusões e aquisições no setor bancário brasileiro por meio de estudo de eventos. *Revista Brasileira de Gestão de Negócios*, *56*(17), 1105-1115.

BETTON, S., ECKBO, B. E., & THORBURN, K. S. (2009). Corporate takeovers. In E. Espen Eckbo (Ed.), *Handbook of corporate finance: Empirical corporate finance* (pp. 291-416). Amsterdam: Elsevier North-Holland.

BORTOLUZZO, A. B., GARCIA, M. P. S., BOEHE, D. M., & SHENG, H. H. (2014). Desempenho de fusões e aquisições cross border: Análise empírica do caso brasileiro. *Revista de Administração de Empresas*, *54*(6), 659-671. http://dx.doi.org/10.1590/S0034-759020140606.

BRIS, A., & CABOLIS, C. (2008). The value of investor protection: Firm evidence from cross-border mergers. *The Review of Financial Studies*, *21*(2), 605-648. https://doi.org/10.1093/rfs/hhm089.

BRITO, G. A. S., BATISTELLA, F. D., & FAMÁ, R. (2005). Fusões e aquisições no setor bancário: Avaliação empírica do efeito sobre o valor das ações. *Revista de Administração da Universidade de São Paulo*, *40*(4), 353-360.

BROWN, R., & SARMA, N. (2007). *CEO* overconfidence, *CEO* dominance and corporate acquisitions. *Journal of Economics and Business*, *59*(5), 358-379. http://dx.doi.org/10.1016/j.jeconbus.2007.04.002.

BROWN, S. J., & WARNER, J. B. (1980). Measuring security price performance. *Journal of Financial Economics*, *8*(3), 205-258. http://dx.doi.org/10.1016/0304-405X(80)90002-1.

BRUNER, R. F. (2002). Does M&A pay? A survey of evidence for the decision-maker. *Journal of Applied Finance*, *12*(1), 48-68.

CAMARGOS, M. A., & BARBOSA, F. V. (2009). Fusões e aquisições de empresas brasileiras: Criação de valor e sinergias operacionais. *Revista de Administração de Empresas*, *49*(2), 206-220. http://dx.doi.org/10.1590/S0034-75902009000200007.

CAMPBELL, J. Y., LO, A. W., & MACKINLAY, A. C. (1997). *The econometrics of financial markets* (2nd ed.). New Jersey: Princeton University Press. http://dx.doi.org/10.1515/9781400830213.

CHI, J., SUN, Q., & YOUNG, M. (2011). Performance and characteristics of acquiring firms in the Chinese stock markets. *Emerging Markets Review*, *12*(2), 152-170. http://dx.doi.org/10.1016/j.ememar.2010.12.003.

Comitê de Datação de Ciclos Econômicos – CODACE. (2020). *Comunicado de datação de ciclos mensais brasileiros – Jun/2020*. Recuperado de https://portalibre.fgv.br/sites/default/files/2020-06/comunicado-do-comite-de-datacao-de-ciclos-economicos-29_06_2020-1.pdf

CORNAGGIA, J., & LI, J. Y. (2019). The value of access to finance: Evidence from M&A. *Journal of Financial Economics*, *131*(1), 232-250. http://dx.doi.org/10.1016/j.jfineco.2018.09.003.

DATTA, S., ISKANDAR-DATTA, M., & RAMAN, K. (2001). Executive compensation and corporate acquisition decisions. *The Journal of Finance*, *56*(6), 2299-2336. http://dx.doi.org/10.1111/0022-1082.00406.

EMMONS, W. R., GILBERT, R. A., & YEAGER, T.J., (2004), Reducing the risk at small community banks: Is it size or geographic diversification that matters?. *Journal of Financial Services Research*, *25*(2/3), 259-281.

FAMA, E. F., & JENSEN, M. C. (1983). Separation of ownership and control. *The Journal of Law & Economics*, *26*(2), 301-327. http://dx.doi.org/10.1086/467037.

FERREIRA, T. S. V., & CALLADO, A. L. C. (2015). Fusões e aquisições no Brasil: Reflexões acerca da evolução do volume de transações. *Pensamento Contemporâneo em*

Administração, *9*(2), 70-83. http://dx.doi.org/10.12712/rpca.v9i2.463.

GORT, M. (1969). An economic disturbance theory of mergers. *The Quarterly Journal of Economics*, *83*(4), 624-642. http://dx.doi.org/10.2307/1885453.

GRINSTEIN, Y., & HRIBAR, P. (2004). *CEO* compensation and incentives: Evidence from M&A bonuses. *Journal of Financial Economics*, *73*(1), 119-143. http://dx.doi.org/10.1016/j.jfineco.2003.06.002.

HANKIR, Y., RAUCH, C., & UMBER, M. P. (2009). Bank M&A: A market power story? *Journal of Banking & Finance*, *35*(9), 2341-2354. http://dx.doi.org/10.1016/j.jbankfin.2011.01.030.

HARFORD, J. (2002). Corporate cash reserves and acquisitions. *The Journal of Finance*, *54*(6), 1969-1997. http://dx.doi.org/10.1111/0022-1082.00179.

HARFORD, J., & LI, K. (2007). Decoupling *CEO* wealth and firm performance: The case of acquiring *CEO*s. *The Journal of Finance*, *62*(2), 917-949. http://dx.doi.org/10.1111/j.1540-6261.2007.01227.x.

HAYWARD, M. L. (2002). When do firms learn from their acquisition experience? Evidence from 1990 to 1995. *Strategic Management Journal*, *23*(1), 21-39. http://dx.doi.org/10.1002/smj.207.

HRYSHKO, D., LUENGO-PRADO, M. J., & SØRENSEN, B. E. (2011). Childhood determinants of risk aversion: The long shadow of compulsory education. *Quantitative Economics*, *2*(1), 37-72. http://dx.doi.org/10.3982/QE2.

HUGHES, J. P., LANG, W. W., MESTER, L. J., & MOON, C.-G. (1999). The dollars and sense of bank consolidation. *Journal of Banking & Finance*, *23*(2-4), 291-324. http://dx.doi.org/10.1016/S0378-4266(98)00088-0.

JENSEN, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, *76*(2), 323-329.

JENSEN, M. C., & MECKLING, W. H. (1976). Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics*, *3*(4), 305-360. http://dx.doi.org/10.1016/0304-405X(76)90026-X.

JENTER, D., & LEWELLEN, K. (2015). CEO preferences and acquisitions. *The Journal of Finance*, *70*(6), 2813-2852. http://dx.doi.org/10.1111/jofi.12283.

JIANAKOPLOS, N. A., & BERNASEK, A. (1998). Are women more risk averse? *Economic Inquiry*, *36*(4), 620-630. http://dx.doi.org/10.1111/j.1465-7295.1998.tb01740.x.

JORDÃO, R. V. D., MELO, V. L. T., PEREIRA, F. C. M., & DE CARVALHO, R. B. (2017). Capital intelectual em fusões & aquisições: Um estudo de caso em uma instituição financeira de classe mundial. *Revista de Administração da Universidade de São Paulo*, *52*(3), 268-284.

LODERER, C., & MARTIN, K. (1990). Corporate acquisitions by listed firms: The experience of a comprehensive sample. *Financial Management*, *19*(4), 17-33. http://dx.doi.org/10.2307/3665607.

MACKINLAY, A. C. (1997). Event studies in economics and finance. *Journal of Economic Literature*, *35*(1), 13-39.

MALMENDIER, U., & TATE, G. (2005). *CEO* overconfidence and corporate investment. *The Journal of Finance*, *60*(6), 2661-2700. http://dx.doi.org/10.1111/j.1540-6261.2005.00813.x.

MALMENDIER, U., & TATE, G. (2008). Who makes acquisitions? *CEO* overconfidence and the market's reaction. *Journal of Financial Economics*, *89*(1), 20-43. http://dx.doi.org/10.1016/j.jfineco.2007.07.002.

MALMENDIER, U., TATE, G., & YAN, J. O. N. (2011). Overconfidence and early-life experiences : The effect of managerial traits on corporate financial policies. *The Journal of Finance*, *66*(5), 1687-1733. http://dx.doi.org/10.1111/j.1540-6261.2011.01685.x.

MARTYNOVA, M., & RENNEBOOG, L. (2008). A century of corporate takeovers: What have we learned and where do we stand?. *Journal of Banking & Finance*, *32*(10), 2148-2177.

MOELLER, S. B., SCHLINGEMANN, F. P., & STULZ, R. M. (2005). Wealth destruction on a massive scale? A study of acquiring-firm returns in the recent merger wave. *The Journal of Finance*, *60*(2), 757-782. http://dx.doi.org/10.1111/j.1540-6261.2005.00745.x.

MORCK, R. M., SHLEIFER, A., & VISHNY, R. (1990). Do managerial objectives drive bad acquisitions? *The Journal of Finance*, *45*(1), 31-48. http://dx.doi.org/10.1111/j.1540-6261.1990.tb05079.x.

MUELLER, D. C. (1997). Merger policy in the United States: A reconsideration. *Review of Industrial Organization*, *12*(5-6), 655-685. http://dx.doi.org/10.1023/A:1007797626160.

NOGUEIRA, N. V., & CASTRO, L. R. K. (2020). Effects of ownership structure on the mergers and acquisitions decisions in Brazilian firms. *RAUSP Management Journal*, *55*(2), 227-245. http://dx.doi.org/10.1108/RAUSP-11-2018-0124.

OTTO, F., SAMPAIO, J. O., & SILVA, V. A. B. (2021). Domestic and cross-border effect of acquisition announcements: A short-term study for developed and emerging countries. *Finance Research Letters*, *38*, 101501. http://dx.doi.org/10.1016/j.frl.2020.101501.

PALICH, L. E., & BAGBY, D. R. (1995). Using cognitive theory to explain entrepreneurial risk-taking: Challenging conventional wisdom. *Journal of Business Venturing*, *10*(6), 425-438. http://dx.doi.org/10.1016/0883-9026(95)00082-J.

RANI, N., YADAV, S. S., & JAIN, P. K. (2012). The impact of domestic mergers and acquisitions on acquirer shareholders' wealth in India. *Global Journal of Flexible Systems Management*, *13*(4), 179-193. http://dx.doi.org/10.1007/s40171-013-0022-0.

ROLL, R. (1986). The Hubris hypothesis of corporate takeovers. *The Journal of Business*, *59*(2), 197-216. http://dx.doi.org/10.1086/296325.

SALES, A. C., & ZANINI, M. T. F. (2017). Investigando o fracasso em negociações de F&A: A perspectiva de negociadores no Brasil. *Revista de Administração*, *52*(4), 467-478. http://dx.doi.org/10.1016/j.rausp.2016.11.002.

SHLEIFER, A., & VISHNY, R. W. (2010). Unstable banking. *Journal of Financial Economics*, *97*(3), 306-318. http://dx.doi.org/10.1016/j.jfineco.2009.10.007.

SHRIVASTAVA, P. (1986). Postmerger integration. *The Journal of Business Strategy*, *7*(1), 65-76. http://dx.doi.org/10.1108/eb039143.

SILVA, E. S., KAYO, E. K., & NARDI, R. Y. S. (2016). Governança corporativa e criação de valor em aquisições. *Revista de Gestão*, *23*(3), 222-232. http://dx.doi.org/10.1016/j.rege.2016.06.004.

SIMÕES, M. D., MACEDO-SOARES, T. D. L., KLOTZLE, M. C., & PINTO, A. C. F. (2012). Assessment of market efficiency in Argentina, Brazil and Chile: An event study of mergers and acquisitions. *Brazilian Administration Review*, *9*(2), 229-245. http://dx.doi.org/10.1590/S1807-76922012000200007.

SOUZA, J. G. M., & GARTNER, I. R. (2019). Market reaction to bank merger and acquisition events in Brazil: An analysis of the effects of market waves. *Revista Contabilidade & Finanças*, *30*(80), 234-251. http://dx.doi.org/10.1590/1808-057x201806320.

STEINBERG, F. (2009). *Governança corporativa e ganhos de sinergia de fusões e aquisições no Brasil* [Dissertação de mestrado]. Universidade Federal do Rio de Janeiro, Rio de Janeiro.

TANURE, B., & CANÇADO, V. L. (2005). Fusões e aquisições: Aprendendo com a experiência brasileira. *Revista de Administração de Empresas*, *45*(2), 10-22. http://dx.doi.org/10.1590/S0034-75902005000200002.

VAN LELYVELD, I., & KNOT, K. (2009). Do financial conglomerates create or destroy value? Evidence for the EU. *Journal of Banking & Finance*, *33*(12), 2312-2321. http://dx.doi.org/10.1016/j.jbankfin.2009.06.007.

WANG, Y., & YIN, S. (2018). *CEO* educational background and acquisition targets selection. *Journal of Corporate Finance*, *52*(C), 238-259. http://dx.doi.org/10.1016/j.jcorpfin.2018.08.013.

ZÁMBORSKÝ, P., YAN, Z. J., SBAÏ, E., & LARSEN, M. (2021). Cross-border M&A motives and home country institutions: Role of regulatory quality and dynamics in the Asia-Pacific Region. *Journal of Risk and Financial Management*, *14*(10), 468. http://dx.doi.org/10.3390/jrfm14100468.

Supplementary Material

Supplementary material accompanies this paper.
Supplementary Data 1 – Excel. All M&As transactions between2002-2017.
Supplementary Data 2 – DTA File. Database used for regressions.
Supplementary Data 3 – DTA File. Database used for graphs.
Supplementary Data 4 – DTA File. Database used for graphs.
Supplementary Data 5 – Stata Dofile. Script to run regressions and graphs.

This material is available as part of the online article from: https://doi.org/10.7910/DVN/JHD0QO

Financial support:
There are no funding agencies to report.

Open Science:
Gallucci Netto, Humberto; Brunassi, Vinicus, 2022, "Supplementary Data - Fusões e Aquisições em Períodos de Recessão", https://doi.org/10.7910/DVN/JHD0QO, Harvard Dataverse, V1.

Conflicts of interest:
The authors have no conflict of interest to declare.

Plagiarism analysis:
RBGN performs plagiarism analysis on all its articles at the time of submission and after approval of the manuscript using the iThenticate tool.

Authors:
1. Vinicius Augusto Brunassi Silva, PhD, EAESP-FGV, São Paulo, Brazil.
E-mail: vinicius.brunassi@fecap.br
2. Humberto Gallucci Netto, PhD, EAESP-FGV, São Paulo, Brazil.
E-mail: humberto.gallucci@unifesp.br

Authors' contributions:
1st author: Definition of research problem; Development of hypotheses or research questions (empirical studies); Development of theoretical propositions (theoretical work); Definition of methodological procedures; Literature review; Analysis and interpretation of data; Critical revision of the manuscript; Manuscript writing.
2nd author: Definition of research problem; Development of hypotheses or research questions (empirical studies); Development of theoretical propositions (theoretical work); Definition of methodological procedures; Data collection; Statistical analysis; Analysis and interpretation of data; Critical revision of the manuscript.