Bank Mergers and Acquisitions: A Study of Events Regarding the Stock Price in the Hypothesis of Efficient Markets

Vinícius Dalla Vecchia and Ana Paula Etges

Abstract Mergers and Acquisitions (M&A) business strategies are frequently used to increase competitiveness. It is justified by one of the main objectives of these operations, which is to increase scalability and business diversity. Through an analysis of the Study of Events, this article evaluated the impact of the M&A announcement on the performance of the acquiring companies. At acquisition studied between bank and investment broker, it was possible to identify the manner of semi-strong efficiency of the market, while in two mergers involving only acquired and bank acquirers, the hypothesis was rejected, with observation of abnormal returns significant in the period under study. It is suggested for future analyses the study of behavior competing banks' shares during the M&A process, both in the period from the date of announcement and for the period of approval of the operation by the Central Bank, both with longer intervals for the estimation, event and comparison Windows.

Keywords Mergers and acquisitions · Study of events · Efficiency of the market

1 Introduction

The spread of news of events in Brazil and around the world has the power to influence the way people behave, and even to change their plans for the future. In the financial market, the methodology used to understand the repercussions of such events is through Event Testing, which is aimed at checking if the net value of a company has changed due to a certain fact [1]. In other words, the analysis checks whether the normal return expected for a company changes either positively or negatively during the period of study, measuring the effects of the event based on the analysis of the price of its shares. The applicability of this methodology is related to the Efficient Market Hypothesis (EMH), which, in the Semi-Strong form approached in the following paragraphs, would not allow earning abnormal returns (excessive) with the use of technical or fundamentalist analysis, for instance [2].

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The processes of Mergers and Acquisitions (M&A) in the banking industry were the events studied in this paper, due to their vast use as strategies for business growth and competitiveness increase, especially after the Real Plan, in 1994, provided greater economic stability to Brazil [3]. M&A have their motivation in the pursuit of business scalability, in the opportunity to enter new markets, in the lack of internal opportunities of growth, in the diversification of the business line, amongst other factors [4].

The Efficient Market Hypothesis, frequently ignored by novice investors, has proven, for years, to be capable of providing a better understanding of the financial market to investors when it comes to seeking a profitable stock portfolio, especially aiming at the long term. Developed by the American economist Eugene Fama, winner of the Nobel Prize in Economics [5], the theory that a market is efficient is based on the fact that the present price of shares reflects all information known until the moment regarding their value [6], something that has been tested by managers who seek to earn consistent returns above the market index.

According to this theory, an efficient market is the one that provides investors with perfect conditions to invest their money, through company assessment based on factors such as how they produce, how they are managed, the competitors' performance and macroeconomic situation [7]. Such market would reflect each and every available information about the data, considering the investors' rationality, leading to the conclusion that there are neither cheap nor expensive shares. This rationality would result in the impossibility of getting high earnings in the long term, adjusted to the risk the company is linked to [2].

The idea of putting money only in passive investments with low costs is more present for investors who believe markets are efficient and follow the profitability of the benchmark as the Ibovespa index, for example. According to this hypothesis, there would not be the market α, nor the possibility of earning returns above the market through analysis, as all investors would get the same average profitability throughout time. Investors who do not believe in market efficiency frequently mention Warren Buffet, deemed as the greatest investor of all time. Therefore, it would be better to invest in active funds with good managers, as they have the capability to overcome the market in the long run.

The econometric model of Study of Events used in this paper is based on the automatic adjustment of prices as new information is disclosed, considering the investor's rationality. It enables quantifying the difference between the expected returns in the price of securities with the actual performance observed, and where the presence of abnormal returns is perceived, the market efficiency hypothesis is not valid, given that the prices were not automatically adjusted and enabled the investor to get significant earnings above the benchmark. This methodology may be applied to several events that require assessment in face of the context they are inserted into, the most frequent being the announcement of profits by a company, issue of debt, mergers and acquisitions, privatization or nationalization and announcement of dividends, for example [8].

2 Objectives

The main objective of the study was assessing the performance of two companies in the Brazilian stock market close to the dates of three M&A operations. The specific objectives were: (i) carry out linear regressions in order to identify standards; and (ii) check how the market reacted to the announcement of M&A and if there was informational efficiency in the Semi-Strong form.

3 Methods

The procedures of a study of events may be described in this sequence: definition of the event, sample selection, measurement of the abnormal return (AR), estimate procedure, test procedure, empirical results, interpretations and conclusions [8].

The choice of the assessed companies was due to the magnitude and impact potential in the economic system of the country. Collection of the rate history of the companies and the respective market index was carried out based on the information available in the website of the Brazilian stock exchange [9]. Three events were analyzed: (i) the acquisition of the broker XP Investimentos by Banco Itaú (2017); (ii) the merger of Banco HSBC and Banco Bradesco (2015) and the merger of Banco Unibanco and Banco Itaú (2008).

First, in order to observe if the behavior of the price of a stock has abnormal characteristics, the control return is defined, which is known as the normal return or expected return, obtained from the logarithmic difference of the stock prices, which represent a continuous capitalization of the shares and is the one that better represents the price expectation of the price assets [10]. The formula of the expected return is described by Eq. 1:

$$R_{i,t} = Ln\left(\frac{P_{i,t}}{P_{i,t-1}}\right) \tag{1}$$

where,

$R_{i,t}$ is the expected return rate,

$P_{i,t}$ is the price of the security at time t and

$P_{i,t-1}$ is the price of the security at time $t - 1$.

The expected return was applied to the shares of the three companies under analysis, as well as to the IFNC financial index, which represents with greater assertiveness the behavior of companies in the banking system, being used as reference portfolio. This index is the result of a theoretical portfolio, used as an average performance index for the prices of the assets of financial, pension and insurance industries [9].

In order to assess the impact of the event, the abnormal return (ARi,t) adjusted to the risk was calculated, being comprised of the performance of the company in the observation period, defined as normal return (Ri,t), and deduced from the difference between α and the product of β and (Rmt). The systematic risk β represents the slope of the straight line in the measurement of the abnormal returns of the market portfolio, while α represents the interception of the straight line in the axis of the abnormal return of the asset. The abnormal return is defined as the difference between the return of the index and the return of the asset in the specified date. The formula of the abnormal return is described by Eq. 2:

$$AR_{i,t} = R_{i,t} - (\alpha - \beta R_{mt}) \tag{2}$$

where,

ARit is the abnormal return rate;

Rit is the expected return rate,

α is the constant of the returns of the asset in relation to the benchmark;

β is the sensitivity of the returns of the asset in relation to the benchmark;

Rm,t is the expected return rate of the market portfolio at the time t.

The calculation of the Accumulated Abnormal Return (CAR), useful to understand the risk assumed by investors in face of the possibilities of loss is a sum of the total of abnormal returns identified during the period of the event under analysis [11]. The formula of the accumulated abnormal return is described by Eq. 3:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it} \tag{3}$$

where:

$CAR_i(t_1, t_2)$ is the accumulated abnormal return rate and,

$\sum_{t=t_1}^{t_2} AR_{it}$ is the sum of the abnormal returns.

Regarding the periods in the study, the estimate window represents the standardization of the actual return of the assets and of the market index, independently of the happening of the event. The event window comprises the calculation of the expected returns, including the date when the studied event occurred, based on the market α and β, making it possible to identify if the announcement of an event was anticipated or leaked (period −10 to 0) and how long it took for the information of the event to be absorbed by the market (period 0 to 10). The comparison window, given after the date of the event, enables an analysis on the impact of the happening through time (Fig. 1).

Using the statistic model of linear regression analysis [12], the value of the abnormal return was adjusted to the standard error of the regression, allowing to check if the investors of the mentioned companies could obtain abnormal returns in

the M&A period with abnormal returns that indicate or not that the event studied impacted the share price, considering the class these companies are inserted into. The hypotheses tested are presented below, aiming at checking if the informational efficiency, in its Semi- Strong form, is present in the events:

– H0: the event did not present significant abnormal returns
– H1: the event presented significant abnormal returns.

Thus, in face of any relevant information publicly disclosed, the price of the assets would be adjusted instantly. Upon the occurrence of significant abnormal returns in relation to the market return, the market inefficiency would be identified.

4 Results

Based on the returns found in the estimate window, linear regression was applied for identification of the factors α, β, standard error and R^2, which explain the interrelation between the prices analyzed. One of the events analyzed was the merger of Banco Unibanco and Banco Itaú in the year 2008, which formed the largest financial conglomerate in the South Hemisphere, with a market value of R$ 51.7 billion, standing among the 20 largest in the world. Such association resulted in a Brazilian bank with economic capacity to compete with the largest in the world, turning the company into a powerful booster of national development [13].

Despite an expressive outlier identified 15 days before the zero date in the estimate window, with price variation of 19.00% for the index and 20.89% for the share, the regression of the returns of the historical returns of Itaú in face of IFNC in the merger with Unibanco has proven to be appropriate, as shown in Fig. 2.

An initial abnormal return of −0.03% was observed in the parameter α coming from the regression, a risk below the market represented by the value of 97.38% (lower than one) of parameter β, standard error of 1.38% and, at last, 89.48% of behavior explanation of the shares being explained by the index through the parameter

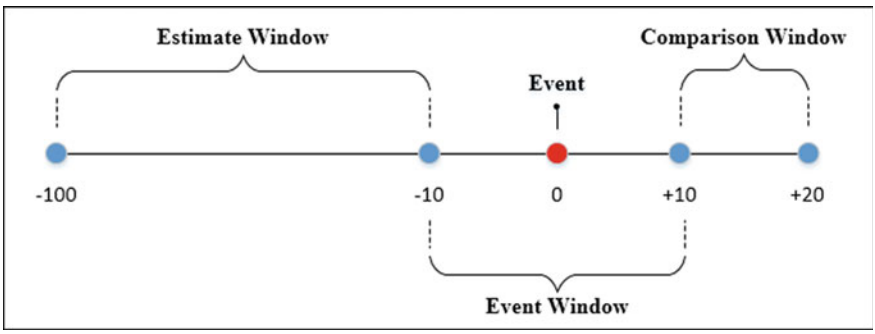

Fig. 1 Periods observed. *Source* Author

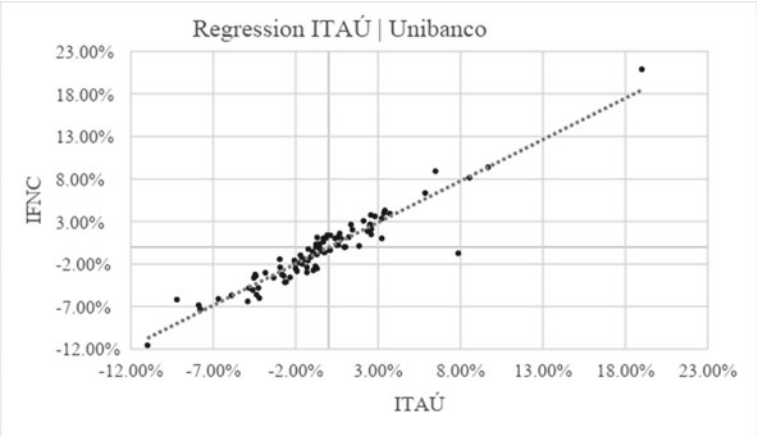

Fig. 2 Regression of the returns in relation to IFNC (Itaú | Unibanco). *Source* Author

R^2. The accumulated abnormal returns were statistically significant in four dates. Three occurrences took place in the pre-event period on the dates −6, −5 and −3. The fourth occurrence took place in the zero date.

Figure 3 contains the event day (11.03.2008) and the analyzed interval, IFNC index, Itaú bank quotation, the variations of both and the abnormal return (AR) calculated with the regression parameters. The t-studant statistic was used to understand if the AR are significant and finally the accumulated abnormal returns (CAR).

Date	IFNC	ITUB4	IFNC_VAR	ITUB4_VAR	AR	T-stat	Significant?	CAR
11.17.2008	1.812,97	6,69	-0,19%	-0,15%	0,07%	0,05227228	No	9,12%
11.14.2008	1.816,45	6,7	-1,49%	-1,33%	0,15%	0,111453008	No	9,05%
11.13.2008	1.843,76	6,79	8,16%	8,77%	0,86%	0,622639483	No	8,89%
11.12.2008	1.699,31	6,22	-7,56%	-7,13%	0,26%	0,192192125	No	8,03%
11.11.2008	1.832,81	6,68	-0,12%	-1,04%	-0,89%	-0,647195508	No	7,77%
11.10.2008	1.835,00	6,75	0,93%	3,16%	2,29%	1,658765211	No	8,66%
11.07.2008	1.817,93	6,54	2,88%	3,58%	0,81%	0,588880264	No	6,38%
11.06.2008	1.766,34	6,31	-5,52%	-6,30%	-0,88%	-0,641090689	No	5,56%
11.05.2008	1.866,62	6,72	-8,76%	-9,23%	-0,67%	-0,487409768	No	6,45%
11.04.2008	2.037,43	7,37	6,47%	4,72%	-1,54%	-1,120939128	No	7,12%
11.03.2008	**1.909,76**	**7,03**	**7,25%**	**15,18%**	8,15%	**5,91853056**	**Yes**	8,66%
10.31.2008	1.776,21	6,04	-0,88%	-2,29%	-1,40%	-1,017349483	No	0,51%
10.30.2008	1.791,88	6,18	10,44%	10,03%	-0,10%	-0,069273344	No	1,91%
10.29.2008	1.614,29	5,59	8,33%	12,36%	4,29%	3,112342096	Yes	2,01%
10.28.2008	1.485,32	4,94	11,39%	8,44%	-2,61%	-1,894121975	No	-2,28%
10.27.2008	1.325,48	4,54	-3,97%	0,00%	3,90%	2,832711725	Yes	0,33%
10.24.2008	1.379,18	4,54	-8,22%	-11,24%	-3,20%	-2,323500704	Yes	-3,57%
10.23.2008	1.497,31	5,08	-7,76%	-8,67%	-1,08%	-0,781997584	No	-0,37%
10.22.2008	1.618,12	5,54	-12,85%	-12,86%	-0,31%	-0,224033906	No	0,70%
10.21.2008	1.839,97	6,3	-1,82%	-1,73%	0,08%	0,055049289	No	1,01%
10.20.2008	1.873,76	6,41	6,20%	6,94%	0,94%	0,680682396	No	0,94%

Fig. 3 Merger of Unibanco with Banco Itaú. *Source* Author

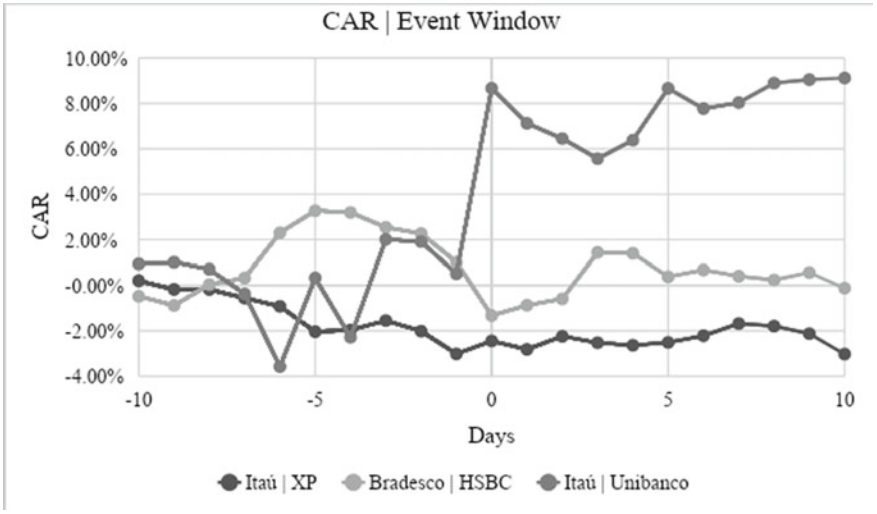

Fig. 4 CAR of the event window. *Source* Author

These calculations were also applied to the comparison and estimate windows to support the method, in the 3 events analyzed.

Figure 4 shows the behavior of the shares in the period observed, with a sharp rise in the accumulated returns from the date −6 until the zero date. From the center of the event, there was a stabilization in the positive sense of the performance of the company.

Using the same methodology applied above, for the case of the acquisition of XP by Itaú, there were three significant abnormal returns in the event window, with an adjustment in the so far trend of low price of the stock, reversed on the zero date, after absorption of the information. For the case of the merger of HSBC with Bradesco, there were also cases of significant abnormal returns, all happening before the zero date of the event, evincing a strong rising trend from the date −5. Such behavior may be explained by the dimension of the events, which generated great expectations in the investors since the announcement of the merger, being rejected the H0 hypothesis, given the presence of significant abnormal returns. Figure 4 shows the three CAR in the same interval of days for comparison purposes in the event window, being possible to note a more abrupt variation in the abnormal returns in events two and three.

It is possible to see, in the comparison window, by Fig. 5, that the events one and two did not present significant changes in the accumulated abnormal returns. Meanwhile, the event three presented a significant abnormal return on the date 14, which may be seen by the table of appendix two at the end of the article.

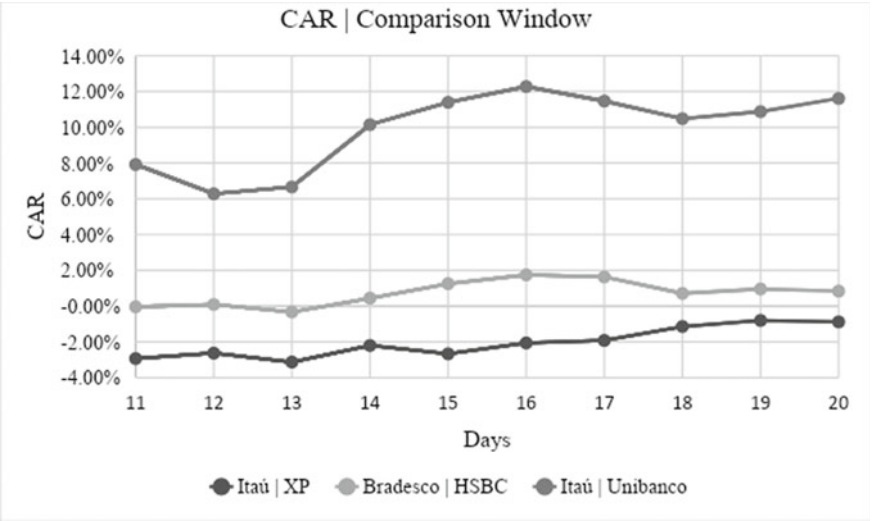

Fig. 5 CAR of the comparison window. *Source* Author

5 Conclusion

The present study has assessed the effects of the announcement of M&A in the price of the shares of two of the largest Brazilian banks, using the procedure of Study of Events to identify abnormal returns obtained in the period. By means of statistic regressions for identification of standards, it was possible to understand how the market reacted to the announcements, with confirmation of the hypothesis of market efficiency only for the case of acquisition of XP Investimentos by Itaú, denying the possibility of obtaining abnormal returns (excessive) with the use of public information on the event. For both mergers, represented by events two and three, the hypothesis of an efficient market in the Semi-Strong form was rejected, given they presented significant abnormal returns. The event two presented a market β above one, which indicates a higher risk than the investment to the benchmark, a fact in contrast with the event three, which presented a market β below one and also a more significant abnormal return, with a variation of $+10.67\%$ in the interval of the days -10 to 20, indicating it is the best investment option. It was also noted, for the three events, that on the last comparison date, the CAR had a positive improvement, evincing that the purchase of shares after the date of the announcement of the M&A can be a valid strategy for those who believe in the inefficiency of the market and look for returns above the market average.

A limitation of this study is the need of further assessment comprising longer periods for the estimate, event and comparison windows, aiming at capturing more precisely the behavior of these companies. This paper suggests, for future analysis, the study of the behavior of shares of competitor banks during the M&A process,

both in the period of the date of announcement, as well as in the period of approval of the operation by the Central Bank.

So far, there is no consensus in literature regarding the position of the market during such events, therefore research on the subject is important to help investors to design a strategy that fits better their profile and understand how such operations affect the behavior of companies in the industry.

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