EFFECTS OF ANALYST CONSENSUS RECOMMENDATIONS ABOUT STOCK PRICES: A STUDY IN THE BRAZILIAN MARKET[1]

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ABSTRACT

Objective: This article investigated whether disclosure of financial analysts' recommendations affects equally stocks traded on the São Paulo Stock Market.

Background: Rational investors, when making their decisions, consider countless information. Some of these are made by financial analysts, whom play a critical role on the volatility of asset prices. This phenomenon was observed by Stickel (1995) and Womack (1996). However, the Efficient Market Hypothesis safeguards a distinct thought. it endorses that no investor, appropriating information, is able to achieve surplus gains. Thus, the non-consensus of the empirical works puts this issue as a theoretical axis still under construction in the literature.

Method: The methodological procedures used was based on the study of the event, including the analysis of a set of eighteen stocks traded in the Brazilian market.

Results: Among the findings, an inconsistent behavior was observed between the average gains provided by the assets and the opinions issued by the experts. after the date a change in the recomendation occured., the average abnormal daily returns were predominantly negative whereas analysts' orientations pointed to the purchase of assets. This trend was maintained in the analyzes developed from the windows (3, 7 and 11 days) and the average daily returns per stock. However, it was found that the largest fraction of the abnormal returns were not significant. There was support for the hypothesis that the Brazilian stock market manifests itself in a similar way after the disclosure of consensual recommendations by analysts.

Contributions: Academic insights allow us to expand the discussion about how asset prices position themselves after the disclosure of expert information.This provides subsidies on what data investors should consider in the acts of investment decisions.

keywords: Consensus recommendations. Abnormal returns. Brazilian market.

1 INTRODUCTION

When composing portfolios or developing trading strategies, investors are rational and make their decisions based on the information that the financial market provides them. The atores (brokerage firm and analysts, for example) often release recommendations for the buy or sell, which are perceived as sources of investment value. According to Arun, Shankaran and Jayadev (2016), such recommendations are increasingly gaining notoriety. Thus, the publicizing of accounting information and the financial analysts recommendation play a critical role on the volatility of asset prices.

However, the Efficient Market Hypothesis emphasizes that no investor, by appropriating information, is able to achieve surplus earnings. Based on this premise, Ljungqvist, Marston and Wilhelm (2006) claimed that the analysts' recommendations did not allow the obtaining of abnormal returns. These theorists found that bolder recommendations from analysts or favorable recommendations changes would not increase the bank's likelihood of winning a subscription mandate. The empirical trial of Sachin and Anupam (2017) recorded similar findings.

Therefore, some papers have tested the aforementioned hypothesis. Studies have assessed how the recommendations of analysts influences stock prices. Stickel (1995) and Womack (1996), for example, showed, after change of the analysts' recommendation, significant abnormal returns. However, Barber, Lehavy, Mcnichols and Trueman (2001) have argued that the strategy of buying assets highly recommended by the analysts and the sales of those with less favorable recommendations allowed the achievement of surplus returns. Green (2006) also pointed the presence of abnormal returns in his study. The author reported that for recommendations of *upgrades* and *downgrades* the average gains ranged from 1.02% to 1.50%, and were limited to the temporal spaces closest to the event (up to two days). Murg, Pachler and Zeitlberger (2014) ensured that only in the abrupt changes of recommendations make it possible to diagnose the existence of abnormal returns. Therefore, there is, in the literature, contradictions about the impact of the analysts' recommendations about the prices of the assets.

In the light of the above, this article aim`s to investigate if the disclosure of the recommendations of financial analysts affects equally the shares traded on the Bolsa de Valores de São Paulo (BOVESPA). For this purpose, it was used the methodology of the study event with eighteen shares traded in the Brazilian market. Thus, this essay is justified by the academic *insights* offered by the discussion on examining how asset prices behave after the disclosure of expert information.

2 THEORETICAL FOUNDATIONS

Fama (1970) presented the Efficient Market Hypothesis. Essentially, this theory proved that no investor is able to achieve excessive returns, based on the use of information. This phenomenon was supported by the fact that the stock price instantly incorporates the relevant information that influences it. Theoretically, the author categorized the market from how efficient it was towards the information. Three emerged subgroups. The first, labeled *weak form*, pointed a capital market that reflects all historical price information. This leads the stock prices to follow a random distribution, which makes the process of estimating expected returns even more complex. In the *semi strong form*, the stock prices adjust to publicly available information to investors. However, empirical reflections have focused on how quickly the market reacted to the publicity of new information. In addition, the *strong form* revealed that asset prices incorporate any and all information, including those of a private nature. Certain group of investors have privileged information, and may use them to obtain benefits.

Several empirical studies (Stickel, 1995, Womack, 1996, Barber *et al.*, 2001, Green, 2006, Murg *et al.*, 2014) have contributed to the enrichment and discussion about the efficient market theory. Until then, there was a consensus about the actual existence or non-existence abnormal returns arising out of the information disseminated in the market.

2.2 Empirical Studies

According to Stickel (1995) and Womack (1996), based on analysts' recommendations, it is possible to draw up a profitable investment strategies since excessive returns are tangible. The results revealed that the recommendations influence stock prices. Therefore, favourable changes on analysts' recommendations generate positive returns at the moment of the announcement. Otherwise, they lead to negative returns similar evidence, on the Shanghai stock exchange, were also found in the empirical work of Kong, Lin, Liu and Tan (2016). For them, institutional investors gain abnormal returns through trade reactions to analysts' recommendations. By examining 16,957 changes of recommendations between 1988 and 1991, Stickel (1995) added that, in the short term, price fluctuations were resulted from the following elements: strength of recommendation, magnitude of change of recommendation, analyst credibility, contemporaneous earnings forecast revisions, brokerage and company sizes recommended. However, Womack (1996) stated that, post-recommendation, the changes in stock prices extend up to: one month, for the upgrades cases (bolder strategies), and six months for downgrades (more cautious strategies).

Barber et al. (2001) evaluated how much, on average, the prices undergo changes due to the consensual recommendations of the analysts. For this purpose, more than 4,300 analysts collected 360,000 recommendations between 1985 and 1996. The data derived from the Zacks database. In short, the findings indicate that investors prefer to buy shares in firms whose consensus recommendations are more favorable. Analogously, the preference for the sale would occur at a time when the recommendations are less favorable. The authors evidenced the highly recommended assets outweigh the less favorably recommended, per month, by 102 percentage points. In addition, they ensure that it is salutary to execute strategies that combine the purchase of assets highly recommended by analysts and the sale of those with less favorable recommendations. This would generate, on average, an abnormal gross return of 75 percentage points per month. However, they emphasized that this return may be reduced if investors do not operate after a change in analysts' consensus recommendations.

Ljungqvist et al. (2006) investigated whether analysts' behavior impacted the probability of banks gaining subscription mandates. A sample of 16,625 debt and equity offerings was used, between 1993 and 2002. No empirical evidence was found to support the hypothesis that more daring recommendations from analysts or favorable changes of recommendations would increase the bank's likelihood of winning a subscription mandate. This finding confronts, to some extent, the postulates of Barber et al. (2001).

Green (2006) examined whether early access to the recommendations brokerage clients had, were able to trigger incremental investment values. The data indicated that, after the recommendation of upgrades, the two days average incomes were 1.02%. Similarly, the downgrades reflected average returns of 1.50%. He therefore endorsed Womack's (1996) notes. In the short term, the opportunities for surplus earnings have proliferated for up to two hours, counted from the publication of the new recommendation of the analyst. Theorist recommends that calendar-based strategies can daily provide positive abnormal returns for up to 10 percentage points.

Complementing Stickel's (1995) study, Sorescu and Subrahmanyam (2006) stated that it was substantial to assess the relationship between peculiarities inherent to analysts (years of experience and image of the brokerage firm which had a link) and price reactions to the recommendations of these professionals. The findings pointed out that, in the long term, the changes of recommendations of experienced analysts surpassed those pronounced by individuals with lower expertise. These differences reveal market inefficiency. In addition, there are indications that investors are more sensitive to recommendations with dramatic and emphatic tones, projected by less experienced analysts compared to those whose is more restrained and which are elaborated by more experienced analysts.

Finally, Murg et al. (2014) looked at the effect of analysts' recommendations on behavior, in the short term, of assets traded on the Austrian capital market. They found that abrupt changes in recommendations provide dramatic abnormal returns. For example, getting out of a sell recommendation to a buy recommendation has recorded excessive gains of around 1,232%. On the other hand, pure recommendations (buy or sell) also showed abnormal returns, but at lower levels: 0.436% and -0.672%, respectively. In addition, it was observed that on the day of the event, the magnitude of the abnormal returns is related to the size of the company. Result resembles the evidence from the study by Stickel (1995). In a similar work, Arun et al. (2016) mesuared the impact referred to on the Indian stock market. They revealed that analysts are more likely to disclose buy recommendations. However, the success of the predictive capacity does not surpass 50% of the cases.

3 METHODOLOGICAL PROCEDURES

The method used was an event study. For Aizenman, Jinjarak, Lee and Park (2015), this technique is useful for examining the reactions of markets to the publicity of news. The study of the event allows to highlight the Market Efficiency Theory, postulated by Fama (1970), and which argues that no investor appropriates surplus returns, given that stock prices incorporate, fully and instantaneously, all information relating to an asset. The scope of this methodology is based on the abnormal gains, on the date of the event or in adjacent periods of time, which are verified against expectations of return of shares. Within this context, the objective is to investigate whether the disclosure of consensual recommendations by financial analysts equally affects shares traded on the São Paulo Stock Exchange. The choice for this type of recommendation is based on the study of Barber et al. (2001).

$$H_0: AR_{it} = 0$$

The AR_{it} variable shows the abnormal return evidenced in the stock price i, and resulting from the event analyzed at time t. Initially, the consensus recommendations of analysts were captured about eighteen traded assets on the São Paulo Stock Exchange (BM & FBOVESPA). At this stage, the purpose was to identify, for each asset, the most recent change in analysts' consensus recommendation, based on a 12-month period (maximum ceiling of May 16, 2017). The dates on which these recommendation changes occurred marked the events to be studied (day zero). For example, if for an action j the day 03 of March of the current year pointed the last change of recommendation, then that date became a reference for the investigation of the event. Based on this preliminary information, a set of nominal closing prices of each of the eighteen shares was collected. There were 153 trading days (labeled window estimation), prior to the date of the event, totaling 2754 observations. The delimitation of the sample obeyed two criteria: a) actions should be submitted at least a quota of one hundred observations regarding closing prices, prior to the date of the event; b) and should be in force during the period covered by the work. In addition, the collections were executed in the Bloomberg database.

the subsequent stage comprised the calculations of daily stock returns (Rit), which were extracted from the logarithm of the ratio between closing prices, in national currency, of the action i on the dates t (Pi, t) and t-1 (Pi, t-1). The choice for a logarithmic function (equation 1) is based on the work of Soares, Rostagno and Soares (2002). For the authors, the use of the logarithmic formula for apprehending returns causes them to behave very close to the normal distribution. This validates the use of parametric tests.

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

Obtaining the abnormal returns was the next stage. For that, it was necessary to apprehend the returns that the shares could offer, if the event had not occurred (expected returns). In this study, we used the single factor model, derived from the Capital Assets Pricing Model (CAPM), which

establishes a linear relationship between the returns of the stock *i* (R_{it}) and the returns of the market portfolio (R_{mt}). The work of Mackinlay (1997) justifies the choice. Equation 2 illustrates the model. In addition, the market return (R_{mt}) was obtained in a way analogous to the daily returns of the shares, with the replacement of closing prices by the São Paulo Stock Exchange Index (IBOVESPA). This represents an index resulting from a theoretical portfolio of assets and was used as a proxy for the market portfolio.

$$E(R_{it}) = 6_i + \beta_i R_{mt} \tag{2}$$

Abnormal returns symbolize the residuals ($\hat{u}_{it}$) of the above-mentioned regression. It depicts the subtraction between the real and estimated returns, as shown in equation 3.

$$AR_{it} = R_{it} - E(R_{it} \mid R_{mt}) = R_{it} - [6_i + \beta_i R_{mt}] = \hat{u}_{it} \tag{3}$$

In addition, cumulative abnormal returns were captured for three janela around the date of the event. The jenela of 3 days (-1, +1), 7 days (-3, +3) and 11 days (-5, +5) were considered. This procedure is based on the study of Mackinlay (1997) and whose purpose was to examine, within the window of the event, if market reactions have spread for a few days. Finally, the test t was used to ascertain the statistical significance of the abnormal returns. This enabled evaluate how abnormal the returns on the event date distance themselves f rom zero.

4 RESULT'S INTRODUCTION AND ANALYSIS

The tables 1 and 2 illustrate, respectively, the average abnormal daily returns for the set of eighteen shares and the cumulative average abnormal returns for the three selected janelas. It is noted that, on the dates after the event (+1 to +5), there was a supremacy of negative abnormal returns. This indicates that the predictions of return were higher than the real gains (there were prediction errors). However, this empirical evidence was inconsistent with most of the analysts' recommendations. Approximately 88% of the analysts' opinions pointed to recommendations to buy, with higher or lower intensity. According to Arun et al. (2016), this stance is common within the stock market. These directions would represent as effective if, and only if, the abnormal returns found to be positive, since the actual return on the asset would exceed the forecasts of expected returns by investors. In addition, at 5% level, there is statistical evidence that the information disclosed similarly affects the stock market, because none of the average abnormal daily returns was significant.

Table: daily average abnormal returns

Period	Average	Minimum	Maximum	Standard Deviation	Test t	Significance	H₀
-5	0,000615	-0,013021	0,022629	0,006929	0,377	0,711	Not rejected
-4	0,000159	-0,016735	0,026462	0,007871	0,086	0,933	Not rejected
-3	-0,004221	-0,074901	0,004424	0,017953	- 0,997	0,333	Not rejected
-2	0,003504	-0,003256	0,036660	0,008718	1,705	0,106	Not rejected
-1	0,002619	-0,006712	0,039054	0,009942	1,118	0,279	Not rejected
0	-0,007260	-0,100493	0,025735	0,026120	- 1,179	0,255	Not rejected
+1	0,002427	-0,010622	0,022876	0,006989	1,473	0,159	Not rejected
+2	-0,000545	-0,026977	0,011545	0,007881	- 0,293	0,773	Not rejected
+3	-0,000928	-0,014316	0,009297	0,004818	- 0,817	0,425	Not rejected
+4	-0,000668	-0,007061	0,009480	0,004335	- 0,654	0,522	Not rejected
+5	0,001383	-0,007922	0,011542	0,004511	1,301	0,211	Not rejected

Source: Research Data

Regarding the janelas of 3, 7 and 11 days, it is also possible to verify that the recommendations of the analysts, essentially, focused on the buy end up not aligning with the market evidence. Examining the interstices, negative cumulative average abnormal returns were perceived. Contrary, in the case of the signal, including evidence from studies by Murg et al. (2014). These observations

would best fit the notes on the sale of shares, since investors are expected to have lower cumulative real returns than those forecast for a given period. However, cumulative average abnormal returns were not significant at 5% level. This legitimates the theory of Fama (1970), since the surplus returns were not verified.

Table: daily average abnormal returns

Period	Average	Minimum	Maximum	Standard Deviation	Statistic t	Significance	H_0
(-1, +1)	-0,00221	-0,09231	0,05777	0,03135	- 0,300	0,768	Not rejected
(-3, +3)	-0,00440	-0,09448	0,03674	0,02648	- 0,706	0,490	Not rejected
(-5, +5)	-0,00291	-0,08352	0,04481	0,02631	- 0,470	0,644	Not rejected

Source: Research Data

In addition, by investigating the average abnormal daily returns, taking stocks by stocks, it is noted that only six observations (gray outlines) were significant at 5% (t-value higher than 1.96). From a set of 198 data, a little over 3% of the evidence supported the existence of abnormal returns, highlighting the previously postulated conclusions. It counterposes, therefore, to the studies of Stickel (1995), Womack (1996) and Barber et al. (2001). Table 3 shows these results. In addition, it was found that four observations were negative. This indicated that the forecasts returns were higher than the real gains. In this case, the analyst is expected to recommend the sale of the asset. On the other hand, two observations were positive, revealing that real returns outweighed the earnings forecast. Investors have earned more than they expected. In this case, a good analyst should recommend buying the asset. It should also be noted that, from the few findings of significant surplus returns, the largest portion (4 observations) focused on the date of the event. This is close to the evidence of Murg et al. (2014). There were indications that the rare cases of abnormal returns, when they occur, do not transpose the effective date of the event (day zero). It reinforces the idea of Fama (1970), where information on the market quickly tends to be incorporated into prices.

Regarding the relation between significant abnormal returns and the recommendations of the analysts, an irregularity was found. For example, for stocks 1, 9 and 16, after the indications of analysts to make purchases, real returns were expected to outweigh the predicted returns. However, this phenomenon was not observed. Negative abnormal returns were diagnosed, pointing out undesirable results by investors. On the other hand, the stock 3 marked a case of success. It was indicated the purchase of shares of this company, and, at the date of the event, was detected positive abnormal returns. According to Bodie, Kane and Marcus (2014), this misalignment may be the result of the optimism employed by analysts in writing their assessments about business prospects. This conception is also shared by Arun et al. (2016).

Table 3: Average abnormal daily returns per stock

Period	Stock 1 AR	Test t	Stock 2 AR	Test t	Stock 3 AR	Test t	Stock 4 AR	Test t	Stock 5 AR	Test t	Stock 6 AR	Test t	Stock 7 AR	Test t	Stock 8 AR	Test t	Stock 9 AR	Test t
	*R: buy		*R: strong buy		*R: buy		*R: buy		*R: buy		*R: buy		*R: Sell		*R: buy		*R: buy	
-5	-0,0001	-0,023	0,0028	0,538	-0,0023	-0,287	-0,0130	-1,009	0,0004	0,055	0,0012	0,113	-0,0040	-0,209	0,0000	-0,008	0,0226	1,934
-4	0,0000	0,000	-0,0040	-0,767	-0,0026	-0,328	-0,0040	-0,312	0,0004	0,055	0,0026	0,250	0,0265	1,390	0,0011	0,193	-0,0167	-1,430
-3	0,0030	0,688	-0,0042	-0,810	0,0031	0,388	-0,0101	-0,780	0,0004	0,058	-0,0005	-0,047	-0,0749	-3,933	0,0007	0,117	-0,0040	-0,342
-2	0,0027	0,635	0,0021	0,398	-0,0033	-0,408	0,0032	0,249	0,0004	0,055	0,0033	0,315	0,0367	1,925	0,0023	0,391	0,0051	0,438
-1	-0,0009	-0,208	-0,0004	-0,082	0,0130	1,624	0,0053	0,413	0,0004	0,055	-0,0023	-0,220	0,0391	2,051	0,0007	0,117	0,0042	0,362
0	-0,0085	-1,975	0,0009	0,176	0,0257	3,225	-0,0091	-0,704	0,0004	0,058	-0,0017	-0,160	-0,0042	-0,218	-0,0050	-0,862	-0,1005	-8,590
+1	-0,0040	-0,932	-0,0003	-0,053	0,0131	1,644	-0,0013	-0,103	0,0004	0,055	0,0073	0,686	0,0229	1,201	0,0038	0,648	0,0039	0,337
+2	0,0039	0,895	-0,0018	-0,343	-0,0085	-1,061	0,0115	0,895	0,0004	0,056	0,0037	0,346	-0,0270	-1,417	-0,0049	-0,846	0,0021	0,182
+3	0,0025	0,588	-0,0006	-0,109	-0,0064	-0,808	0,0093	0,721	0,0004	0,056	0,0025	0,236	-0,0143	-0,752	0,0004	0,067	-0,0054	-0,463
+4	0,0006	0,143	0,0002	0,042	0,0095	1,188	-0,0071	-0,547	0,0004	0,057	0,0036	0,343	-0,0067	-0,351	-0,0017	-0,294	-0,0065	-0,554
+5	0,0013	0,290	-0,0002	-0,045	0,0035	0,438	0,0026	0,201	0,0004	0,054	0,0006	0,053	-0,0079	-0,416	0,0076	1,292	0,0115	0,987

Period	Stock 10 AR	Test t	Stock 11 AR	Test t	Stock 12 AR	Test t	Stock 13 AR	Test t	Stock 14 AR	Test t	Stock 15 AR	Test t	Stock 16 AR	Test t	Stock 17 AR	Test t	Stock 18 AR	Test t
	*R: buy		*R: buy		*R: strong buy		*R: strong sell		*R: buy		*R: buy		*R: buy		*R: strong buy		*R: buy	
-5	-0,0007	-0,061	-0,0018	-0,348	-0,0008	-0,136	0,0010	0,120	-,0006	-0,087	-0,0012	-0,179	0,0099	1,244	0,0003	0,031	-0,0025	-0,207
-4	0,0034	0,305	0,0003	0,060	0,0001	0,023	-0,0001	-0,010	-,0004	-0,051	-0,0037	-0,541	-0,0003	-0,035	0,0003	0,031	-0,0002	-0,013
-3	0,0037	0,327	0,0005	0,102	0,0014	0,241	0,0003	0,043	0,0000	-0,006	0,0044	0,642	-0,0003	-0,035	0,0003	0,027	0,0002	0,018
-2	0,0014	0,124	-0,0008	-0,146	-0,0002	-0,036	0,0006	0,069	-,0003	-0,034	0,0039	0,564	0,0083	1,044	0,0002	0,025	-0,0026	-0,219
-1	-0,0005	-0,048	-0,0001	-0,012	-0,0007	-0,120	0,0007	0,086	-,0002	-0,025	-0,0018	-0,267	-0,0067	-0,845	0,0002	0,023	-0,0028	-0,228
0	0,0047	0,412	0,0008	0,160	0,0036	0,650	0,0000	0,004	0,0000	0,001	0,0051	0,744	-0,0387	-4,880	0,0003	0,028	-0,0046	-0,377
+1	0,0021	0,188	-0,0003	-0,054	0,0006	0,112	-0,0001	-0,013	-,0001	-0,016	-0,0106	-1,543	0,0016	0,206	0,0002	0,025	0,0044	0,365
+2	-0,0019	-0,172	0,0004	0,081	0,0010	0,187	0,0001	0,011	-,0001	-0,012	0,0019	0,274	0,0075	0,949	0,0002	0,024	0,0016	0,130
+3	0,0025	0,219	0,0012	0,237	-0,0013	-0,234	0,0004	0,056	-,0002	-0,026	-0,0018	-0,255	-0,0042	-0,533	0,0002	0,026	-0,0020	-0,163
+4	0,0045	0,398	0,0009	0,172	0,0011	0,202	0,0004	0,044	-,0002	-0,026	-0,0061	-0,890	-0,0049	-0,620	0,0003	0,028	-0,0003	-0,027
+5	0,0079	0,702	0,0012	0,227	0,0001	0,021	0,0007	0,087	0,0000	-0,003	0,0010	0,145	-0,0063	-0,794	0,0003	0,026	0,0008	0,068

Note. Legend: AR: average abnormal returns of stock i at time t. * R: consensual recommendations of analysts on the date of the event.   Source: Research (2017)

5. CONCLUSION

This article proposed a debate about the effects of the dissemination of consensual recommendations of financial analysts on the prices of stocks traded on the São Paulo Stock Exchange. In this regard, we have examined, from the technique called event study, the reactions resulting from the most recent changes of recommendations, based on a 12-month period. A set of eighteen stocks merged with the theoretical-empirical essay. The results showed that, after making the recommendation changes public, the average abnormal daily returns jumped from a predominance of positive gains to negative gains. This behavior is incompatible with the greater fraction of analysts' opinions: which led to the purchase. From the event, as the real gains observed in the market were lower than the projections of these returns, the directives were expected to gravitate toward the logic of asset sales. Focusing on the janela of 3, 7 and 11 days, the supremacy of negative returns was also evidenced.

However, it was found that, in general, the abnormal returns were not significant at the 5% level. This highlights the postulates of Fama (1970). In fact, this evidence was maintained when an even more particular prism was applied: valuation of average daily returns per stock. Few evidence of surplus returns (with statistical significance) were noted and limited to the date of the event. This approximates the evidence of Murg et al. (2014).

Limitations surround the present work, such as the reduced number of events and stocks that compose it. Therefore, generalizations are not advisable because the findings are limited to the built-in constraints, including the time cut. Nevertheless, it provides insights for theorists in the financial area as well as for investors. However, expanding the number of investigations in this area will allow a deeper understanding of the phenomenon.

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