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Insider Trading B-side: relevance, timeliness and position influence

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ABSTRACT

Objective – Our main objective is to analyze the impacto f insider trading on stock investments' decision.

Design/methodology/approach – We used an online survey, obtaining 271 valid answers. To analyze our data, we used some parametric (t and F Anova), and non-parametric techniques (Mann-Whitney and Kruskal-Wallis).

Findings – We find that insider tradings are relevant to investment decisions, and the timeliness also exert an influence to this kind of decision, especially abnormal trades.

Practical implications – In practical terms, our results suggests that the Brazilian Securities and Exchange Commission (CVM) must update the Brazilian insider trading regulation to achieve the objective to protect investors. In the investors point of view, this possible update could improve investors' ability to control insiders and follow his activities as well as to mimic his trades.

Originality/value – The originality of our paper is an analysis of relevance, timeliness and influence of position in a firm as "determinants" of investment decisions. We use these three specific characteristics to criticize the Brazilian insider trading regulation.

Keywords – Capital Markets; Efficient Market Hyphotesis; Information asymmetry.

1 INTRODUCTION

In capital markets, for there to be efficient allocation of resources between surplus and deficit traders, "signals" have to be made to investors, signaling that this investment could earn them cash flows to offset investment risk. Considering the Efficient Market Hypothesis (Fama, 1970), asset prices should reflect at any time all available information, so that investors can assess whether or not to buy certain assets.

One of the sufficient conditions for the price system to be effective is all available information being free to all participants in the market (Fama, 1970). Thus, a trader in that market would not be able to have an advantage in a transaction due to holding undisclosed information, since all information would already be reflected in the very price of the asset. However, Fama (1970) loosens this assumption, stating that a sufficient number of investors with access to information would be able to make the price system efficient.

The fact that only a sufficient number of investors with access to information is necessary is theoretically corroborated by Grossman e Stiglitz (1980), when they created their model called "balance of imbalance". This model presumes that, in a market where there are investors with access to inside information, the more they trade based on that information, the more efficient the price system is, because they transmit "signals" to the market. However, some elements can become barriers to this model, such as the low liquidity of certain assets – like what occurs in the Brazilian capital market –, which would prevent investors from having access, through the price system (indirectly), to the information that has not yet been disclosed to the public.

In Brazil, *a priori*, this barrier could be settled with a document sent monthly by companies to the Comissão de Valores Mobiliários (the Brazilian Securities and Exchange Commission/CVM), reporting negotiations with a firm's own shares by insiders, who are traders that are inside the company and may have access to private information, before it is divulged – reducing information asymmetry and consequently increasing liquidity. However, CVM Instruction No. 358, which deals with the obligation to inform this kind of transaction, does not enable the public to effectively use this information, because this document is only released once a month, up to the tenth day of the month after the operation was carried out. Thus, efficient maintenance of the pricing system is undermined. Moreover, this information is disclosed in blocks, which implies that the investor does not know exactly which specific insider had negotiated the assets.

For comparative purposes, there is the United States of America, which has one of the strictest insider trading regulations and strongly combats the misuse of insider information, or private information, through "Form 4" of the Securities and Exchange Commission (SEC). It requires the person's name, as well as disclosure within 2 days after the fact occurred, allowing the market to monitor insider trading almost daily, in order to control their actions, also enabling the use of such information as an investment strategy called "follow the master," as quoted by Jaffe (1974). In this study, it is referred to as the "B-side" of insider trading, expression first used by Gregório (2007), where the author evidenced the signaling characteristic of operations conducted by insiders, which may be useful to other investors because they emit "signals".

Based on this, we present the following research problem: what is the impact of insider trading on decisions concerning investment in shares? Thus, we aim to analyze the impact of insider trading on the investment decisions of a fictitious company. In this sense, three research hypotheses were tested as to relevance, timeliness and the influence of the position of insiders on decisions concerning investment in shares. In results presented here, we found that insider trading had a significant effect on investors' decisions to raise or lower stock prices; the timeliness of information also influenced investment decisions. However, "insider" information referring to job positions did not reveal significant differences.

This study is carried out in five sections, besides this introduction, including: (2) theoretical foundations about information asymmetry and information contents of insider trading; (3) the methodological procedures that explain how the survey was conducted; (4) the analysis of the main results; and finally, (5) the conclusion and limitations of the study.

2 THEORETICAL FOUNDATIONS AND RESEARCH HYPOTHESES

2.1 Information asymmetry and information content of insider trading

At least from the 1960s on, there has been evidence that capital market traders use accounting information for their investment decisions, seeking to reduce existing information asymmetry in this trading environment (Ball & Brown, 1968 Beaver, 1968). More recent studies have also shown that financial information is relevant to value assets in this market (for example, Dechow, Hutton & Sloan, 1999, Holthausen & Watts, 2001). In addition to financial information disclosed by accounting numbers, there are reports of other types of information, not necessarily financial, that has proven relevant for determining the value of assets in capital markets (Fama, 1970, Fama, 1991, Azim & Habib, 2008,Wu and Wang, 2008, Schadewitz & Niskala, 2010).

However, not all information is perfectly distributed among the participants of a capital market, as there may be, even after disclosure, information asymmetry between those who produce the information and those who use it. According to Akerlof (1970), in any market, traders tend to trade based on information they have about the asset. In his opinion, the seller of an asset has greater insight into its qualities and potential and, therefore, tends to sell it above the price it is really worth if the buyer possessed all the information about it. Knowing this, the buyer, since he does not have all the information to attest its quality, tends to buy the asset at a price lower than he would if all the information was available to the market. In this scenario, information asymmetry emerges, ultimately leading the market to its extinction. However, according to Akerlof (1970), government interference (in Brazil, CVM) plays a key role in maintaining the market and well-being of all parties.

According to Leland and Pyle (1977), many markets are characterized by the informational gap between buyers and sellers. In financial markets, this difference is more noticeable, because borrowers usually know their guarantees, skills and the moral integrity of their creditors. Thus, borrowers have "inside information" about their own projects, for which seek financing. On the other hand, lenders, who should deeply know the funded projects, are prevented by the existing moral hazard, which hinders the direct transference of information between the participants in this market. Therefore, we cannot expect borrowers to be entirely clear about their projects, because they can be rewarded if they exaggerate in their positive qualities.

As to the possibility of this moral hazard, Akerlof (1970) highlights the so-called "cost of dishonesty", which results from the problem of participation of rogue traders in the market – who, as well as taking the wealth of traders who trade without the use of private information, trading only with public information and their personal convictions, bring about the "expulsion" of the latter, the honest ones, making the proportion of dishonest ones increase, jeopardizing the existence of that market. This is one of the information asymmetry costs pointed out by Akerlof (1970). Also according to this author, in developing countries such as Brazil, this is a serious problem, because variations in quality are larger than in developed countries.

Facing existence of negotiations with inside information, or insider trading, Akerlof (1970) calls the likelihood of the asset being good as "q", where an estimated q can be obtained through direct observation of the interested market. However, this estimate is the same as the seller (or borrower) would make, as it has more (or

better) information on the quality of their assets. Based on this, it is expected that the behavior of the "owner" of this asset has significant influence on the behavior of other investors. In the stock market, we can understand "owner" as the insider, the investor who is usually also the controller, administrator, manager or other high position in a company, and who usually has private information that can give him an advantage when negotiating company shares.

As to this negotiation and its influence on stock prices, Grossman and Stiglitz (1980) proposed a theoretical model in which stock prices reflect information from traders that use resources to obtain this (inside) information in order to obtain abnormal returns. Based on this model, the negotiations of these traders indicate good or bad news to the market. Thus, the informative power of stock prices is directly proportional to the amount of informed investors (amount of informed trades), that is, those who consumed resources to get inside information.

The research of Grossman and Stiglitz (1980) has the same foundations as that of Akerlof (1970), where those with better information can expropriate those who have less or worse information. That is, if the individual who has access to inside information (insider) realizes that there is a potential for stock appreciation, he will initiate a buying movement that will send the price of that asset up. If the insider realizes that there is a downside potential, he will initiate a sell-off, taking the price of the asset down. Thus, based on Grossman and Stiglitz (1980), insiders send signals to the market, in the form of indirect information about the future performance of the company and other information that can impact stock prices. Thus, the higher the volume of informed trading, the stronger this effect will be and the more informative the prices will be.

Since, originally, all individuals have the same expectations as to a particular asset (Grossman & Stiglitz, 1980), we expect investors to assess it in a similar way. As an individual consumes resources for private information, he will change his expectations as to the others, and to the extent that he is negotiating, the information, hitherto private, will be disclosed to the market indirectly. Ultimately, if there is a very high volume of informed trading, all stakeholders will be informed and there will be no information asymmetry nor motivation to consume resources to obtain private information, since prices will be fully informative.

Thus, we developed the main hypotheses of this research:

> **Hypothesis 1:** the movement of insiders has a significant impact on stock prices.
>
> **Hypothesis 1A:** the buying movement of insiders makes stock prices go up.
>
> **Hypothesis 1B:** the selling movement of insiders makes stock prices go down.
>
> **Hypothesis 1C:** an abnormal trading volume by insiders has a stronger effect on stock prices than a normal trading volume.

Although theoretically negotiations do impact stock prices, Brazilian regulation (CVM Instruction No. 358) on the subject is still mild, since it only requires information to be disclosed to markets in blocks of negotiations (that is, investors can know that the Board or Councils traded stocks, but not individually, losing some of the effect of an insider's "volume" of trade), and, moreover, up to 40 days later, from the trade date and the release date (the requirement is that it be divulged within 10 days after the end of the month in which trading took place).

Thus, we developed two additional hypotheses for this research:

> **Hypothesis 2:** the disclosure of insider trading in a timely way has greater impact on stock prices than in an untimely way.
>
> **Hypothesis 3:** the disclosure of insider trading individually has a stronger impact on stock prices than that of trading disclosed in blocks.

The request for more effective disclosure of insider trading does not imply that the CVM would be working in order to grant free advice to investors, but that trading with inside information: (a) could be inhibited, because investors would be watching any abnormal movement by insiders and (b) could – considering that even with greater transparency insiders would continue trading based on inside information – increase the efficiency of the price system, as a consequence of item (a). The strategy of "following the master", in turn, would be a consequence of item (b), generating the "B-side" of insider trading, which, in turn, would be healthy for the proper functioning of capital markets.

2.2 Evidence of insider trading evidences in capital markets

It is not rare to find studies that address the use of inside information in stock trading in national or international literature. Among the main examples of these studies, some deserve special mention, such as the research of Marsden and Tung (1999), who simulated negotiations in a market to test whether individuals with inside information could get abnormal returns under various forms of monitoring and penalties. The subjects were told what was the likelihood of their being caught, and what penalty they would suffer. Thus, they observed that the individuals were able to obtain private information to achieve abnormal returns if there was no penalty. The aforementioned authors also analyzed the effect of increasing penalties or the probability of being caught using inside information.

In this same sense, Abdolmohammadi and Sultan (2002) carried out an experiment with students to determine if those who have low ethical standards are more likely to use insider trading. The authors divided the students into an experimental group and a control group. All participants in the survey said that insider trading is illegal and is generally viewed as unethical. However, in the experimental group (which had access to inside information), 15 of 24 subjects admitted to having used insider information. Still, Abdolmohammadi and Sultan (2002) found that individuals who had access to private information tended to have a low level of ethical reasoning.

Beams, Brown and Killough (2003), on the other hand, conducted a study with students to test the relationship between informed negotiations and the impediments and motivations for insider trading. In their findings, the authors observed that expected returns, guilt, cynicism and the equity (fairness) of laws were the determinants that had more meaningful relationships with the intention of making a deal with insider information. Moreover, they found support for the Prospect Theory with respect to insider trading. Based on this theory, individuals are averse to loss, and not to risks. Thus, they seek to deal with inside information in order to avoid losses, and not so much to obtain abnormal returns.

Despite the progress of legislation in different capital markets, such as the advent of the Sarbanes Oxley Law (SOX) in the US market, studies that are more recent continue to identify trading odds with the use of insider information in these markets.

Aslan, Easley, Hvidkjaer and O'Hara (2011) conducted a study in the United States using a probability of insider trading (PPIN) as a proxy for insider trading, in order to identify these negotiations from the variation in the volume of stock purchases and sales. According to these authors, the PPIN was statistically and economically significant in determining stock returns during the period. They found, also, that the PPIN dominates the illiquidity, that is: information is more important than illiquidity in determining stock returns.

Lei and Qin (2012), on the other hand, analyzed the use of inside information in the disclosure of the results of mergers and acquisitions of firms between 1986 and 2009, with an insider trading database. In their results, they found that insider trading increases ahead of the release of these events, however, this relationship is stronger in unscheduled announcements: mergers and acquisitions.

As to the types of jobs and their possible impact on investors' decisions, Tavakoli, McMillan and McKnight (2012) found that only negotiations by senior managements contained "predictive" contents about the future returns of the shares of the company which they are insiders, and the signal emitted by purchases was also stronger than the signal emitted by sales. This type of methodological approach cannot be applied in the Brazilian capital market, due to limitation of CVM Instruction No. 358, that doesn't demand information about which internal traders conducted transactions with the firm's shares.

About the result which indicates that the buying signal is stronger than that of sales, this is reasonable, because insiders may sell for various reasons. In addition, among them may be the fact that they have certain inside information that the shares will decrease in value, but there also may be the fact that they want to make a profit and go on holiday, buy a new house, fund their child's college, and diversify their investments, among others. Moreover, in the purchase, the range of motives is smaller. A rational investor would only buy a stock if he perceived in that action an opportunity to get feedback, that is, when he believes in the performance of that company.

In Brazil, we can cite recent studies that also found evidence of the use of private information in the determination of stock prices, such as that of Martins and Paulo (2014) and Girão, Martins and Paulo (2014) who observed a relationship between the probability of informed trading (PIN) and stock returns in the Brazilian capital market. This research, in addition to those carried out by Barbedo, Silva and Leal (2009) and Martins, Paulo and Albuquerque (2013), found odds of trading with worrying insider information at around 20%.

With regard to negotiations with the company's own shares, Tonindael and Decourt (2012) observed that, in Brazil, insiders can obtain abnormal returns. These evidences are divided into: (a) sales, where they found that, one month after sales by insiders, there is a negative return of -3.73%, on average, even reaching the amount of -10.66% in 6 months after the sale; and (b) purchases, where it was found a positive return of 5.72%, on average, one month after insiders' purchases, reaching 9.87% 6 months after the purchase. That is, based on current regulations, when the market becomes aware of transactions, the effect has already been reflected in stock prices for weeks, not leaving outsider investors many options.

Based on the above, it appears that there is a likelihood of insider trading in the Brazilian market and that there is evidence that this type of operation can send a signal to the market, as summarized in the preceding paragraphs. Thus, considering the relevance and timeliness of this issue, we justify this research, which differs from the aforementioned research in that it ascertains whether there is a "positive side" in this type of operation to the market, since disclosure of insider trading information emits signals to the market that, with reduced time of disclosure and greater transparency, can lead the insiders' very practice to the antidote to their abnormal gains, by expropriation of outsiders. Moreover, this research points out a few fragile aspects of current Brazilian laws in regard to insider trading, and highlights some possible solutions to them.

3 METHODOLOGY

3.1 Sample

This research was conducted with a sample of 271 respondents, of which 146 were students, 81 teachers and 44 professionals from the field of Business. As to students, the ones who participated belonged to Accounting (98), Business Administration (30), Actuarial Sciences (7), Economics (4) undergraduate courses and to other courses (7). As for teachers, 59 belonged to Accounting, 11 to Business Administration, 6 to Economics, 1 to Actuarial Sciences and 4 to other courses. The professionals who responded to the survey were from the Accounting (33), Business

Administration (3), and Actuarial Sciences (3) courses, and to other courses (5).

Among the participants characterized as students, 69.86% had already studied subjects referring to investment analysis, business evaluation, finance or equivalent disciplines. Moreover, from the total respondents, 71.92% had no experience with investments in shares, 10.96% had this experience only through a simulator, while 17.12% had actual experience with other types of investment. It should be noted also that this study was not to assess the effect of investors' experience, but rather the behavior of individuals when faced with insider trading.

We stress that 71.22% of respondents believed that insider trading has the power to influence the market value of the shares (this question was made at the end of the survey instrument, which may influence the answers of the participants). Thus, *a priori*, it is expected that insider trading in the situations presented in this research has a significant influence on the decisions of respondents.

Furthermore, we emphasize that Akerlof (1970) states that individuals tend to give a mean value to similar assets, because of informational asymmetry. So, we adopted as intrinsic value per share the average value of the stocks of the sector where the company was located. Moreover, to try to encourage respondents to participate in the search and strive to find the "true" value of the shares, was offered a prize at the symbolic value of R$ 300.00, which would be donated in the form of food to a charity, chosen by the respondent, and most closely approached the intrinsic value of the share.

3.2 Research instrument

The data collection instrument used was a questionnaire with questions made according to the purpose of the study. Its choices occurred in view of the need to reach respondents in different parts of the country. Therefore, it was prepared and made available electronically on the Survey Monkey platform for 19 days, between May 30 and June 17, 2013.

We created two types of questionnaire, one with normal negotiations and other with abnormal negotiations, which were sent to the electronic addresses of students, teachers and coordinators of undergraduate and graduate courses, as well as to professionals of Accounting, Business Administration, and Economics from all Brazilian states. This transmission occurred randomly, so that half of the respondents could access the questionnaire Type I and Type II the other half. In this email, we asked recipients to forward the questionnaire to others.

The general idea of these questionnaires were based on Lima (2012), containing, in Part I, questions about the profile of the respondents to characterize the sample were possible and the comparison between groups. In Part II, we presented the information referring to two companies, "Gross" and "Lemon", as well as its financial statements: the Income Statement, Balance Sheet and Cash Flow Statement. We did not include information on the payment of dividends so as not to "induce" respondents to use a dividend discount model.

After the initial information has been presented seven (7) questions where the respondent would have to measure the value of two stocks and agree or disagree with some events. On the measurement of the share value, were presented three (3) situations in which the respondent was asked to rate how much each stock.

In Situation 1, the respondent had access only to the financial statements of both companies, in addition to the sector and continent of operation, to companies stock price range of this sector, the stock price of "Gross" and "Lemon" risk and growth prospects, as well as the free float of the two companies. In Situation 2, it was considered that any other information remain true, however, was added to information that some insiders bought stocks of "Gross" and no further information was given about "Lemon" (the questionnaire Type I reported that the quantity purchased was abnormal, above the

average monthly purchases from insiders, whereas Type II reported that these purchases were normal, the average monthly purchases of insiders). In Situation 3, the opposite of the Situation 2 was informed: the insiders sold stocks of the company "Gross", and the "Lemon" there was no new information (in the questionnaire Type I sales were abnormal and Type II were normal).

The aim was to assess whether the knowledge of insider trading would have any effect on the decision to price every stock by the respondent (relevant information). For that, we addressed four (4) several questions on this subject, referring to the main assumptions of the research. Following the evaluation of the stocks, were addressed three (3) questions about the level of agreement with some related phrases insider trading to assess directly whether those talks were or no difference in the respondent's behavior as two additional research hypotheses raised: timeliness and position influence.

On issues that serve to analyze the hypothesis of the timeliness (Hypothesis 2) and the influence of the position (Hypothesis 3), 7-points scales were used (0-6), it allows a greater discrimination among respondents, with internal consistency gain and reliability with respect to smaller scales (Dalmoro & Vieira, 2013). The problem of 7-points scale, compared to the 5-points, which is most common, is that it requires a large sample; however, this is not a problem for this research, as the responses of the 271 individuals were analyzed.

Finally, a situation where the respondent is asked whether he believes that trading in stocks by insiders can indirectly disseminate information on stock prices was presented. Based on this response, we could assess the decisions of the groups which believed or not in the power of insider trading.

3.3 Data analysis tools

To analyze the collected data and test whether there were differences in prices attributed to the shares were used some statistical tests, including the normal Kolmogorov-Smirnov and Levene's for homoscedasticity. If both assumptions were met, we used parametric tests: (a) F ANOVA and *post hocs* tests to more than two groups; or (b) the *t*-test for two samples. If the assumptions were not met, we used nonparametric tests to test the hypotheses of the study: (a) the Kruskal-Wallis and Mann-Whitney tests as *post hoc* him to analyze more than two groups; or (b) the Mann-Whitney test was used to analyze two groups.

We did not use any pre-stablished level of significance because the goal is to compare the significance of the insider trading information. Thus, we accepted as significant *p*-values from 0.000 to 0.150.

4 RESULTS ANALYSIS

4.1 Information about insider trading and stock prices

Before beginning analysis of the hypotheses previously established for this research, it is interesting to observe the price behavior of the two stocks presented. In the three different situations, we ascertained whether the behavior of the respondents was not caused only by the change in situation, because, theoretically, the two companies have the same possibilities of future earnings as well as the same risk, debt etc., which should lead to similar prices. The distinction between them is due to the fact that a company consists of real numbers and the other by numbers that were obtained from the addition of 3% to the value of the first, beyond the situations experienced in this article, with respect to transactions of insiders.

Thus, the research participants, in general, did not attribute values, on average, different for the two companies in the first two situations, where in Situation 1 only had disclosure of accounting figures and in Situation 2 had disclosure insider purchases of the company Gross. However, when we consider the situation where there is information on the sale of stocks by the insiders in company Gross, we noticed a

detachment of prices between Gross and Lemon companies, which was significant at the 0.01 level, as shown in Table 1. This confirms the observation of Grossman and Stiglitz (1980) that insiders send signals to the market, at least in sales by these traders. Moreover, this result strengthens the evidence Tonindael and Decourt (2012), which identified obtaining abnormal returns Insider in Brazil.

Furthermore, it is important to note that, especially in the third case, we used the Mann-Whitney test, in place of the *t*-test, since the assumption of homogeneous variance (Levene) was discarded. Additionally, it was noted that even with the t Test, the averages would be different and significant at 0.100.

TABLE 1 – Comparison between the prices of shares in the two companies in the three situations presented

Pooled **Analysis** N = 542	**Mean**	**Standard Deviation**	**Kolmogorov-Smirnov**	**Levene**	***t*-test**
Situation 1					
Gross	88.56	11.99	0.187 (0.000)	0.047 (0.829)	-1.305 (0.192)
Lemon	89.89	11.75			
Situation 2					
Gross	90.66	12.04	0.198 (0.000)	0.323 (0.570)	1.263 (0.207)
Lemon	89.39	11.43			
Situation 3					
Gross	87.11	14.10	0.176 (0.000)	4.643 (0.032)	29,440.500 (0.000) [1]
Lemon	88,93	10,75			

Note: [1] Since the homoscedasticity hypothesis was rejected by Levene's test, we used the nonparametric Mann-Whitney test, in the place of the *t*-test. By comparison, the *t*-test statistic has -1.687 (*p*-value = 0.092).

The behavior of respondents with respect to the information given on the negotiations of insiders in the prices of Gross, testing the hypotheses 1A, 1B and 1C, the entire sample was analyzed (pooled) without distinguishing between normal and abnormal negotiations. The average of observed prices, from the largest to the smallest, occur in the following order: Situation 2 (R$ 90.66), Situation 1 (R$ 88.56) and Situation 3 (R$ 87.11), as we expected, since, according to the investigated literature, purchases of insiders may have the power to raise stock prices, as well as sales may have the power to reduce (Grossman & Stiglitz, 1980).

However, the F ANOVA rejects the hypothesis if at least one of the cases presents itself differently from the others. Therefore, it is necessary to conduct a post hoc test. In the case of this research, since the sample size is similar, we chose the Gabriel test. By this test it can be inferred that the difference between groups was made between Situations 2 and 3, the level of 0.010 (Panel A of Table 2). With a less conservative analysis, we can also consider the different Situations 1 and 2, the level of 0.158. Thus, we can assess the information that insiders were buying stocks may raise the stock price and they were selling, can reduce the stock price. However, in this case, it was not considered the issue of normality or abnormality of the facts.

When the separation between the two groups was carried out: (i) those who received the information that trading was abnormal (Panel B of Table 2) and (ii) those who received the information that trading was normal (Panel C of Table 2), we realized that the effect of insider trading is more evident in the first case, of abnormal trading, since the *p*-value of F ANOVA in abnormal trading volume was 0.011 (*p*-value or the Kruskal-Wallis 0.000), compared with a

p-value of 0.233 in normal trading. This implies that, when the respondent was informed that trading was normal, he did not interpret this signal as being as strong as the one who received the information that trading was abnormal, so that the Gross company's prices for normal negotiations were not statistically different.

Given only the abnormal trading, as the situations were different in this case, it was observed that in all cases the prices are different at a significance level of 0.010. The price difference between Situation 1 and 2 is R$ 3.38 (increase), while between Situation 1 and 3 is R$ 1.14 (decrease). These results allow us to infer that the investor is important to know how the insiders are trading, since signals can be output indirectly by stock prices, as set down Grossman and Stiglitz (1980) and as evidenced by Jaffe (1974) and Tonindael and Decourt (2012), for example.

TABLE 2 – Comparison between the prices of the Gross company in the three situations presented

Statistics	**Mean**	**Standard Deviation**	**Kolmogorov-Smirnov**	**Levene**	***F* ANOVA**
Panel A - Analysis (*pooled*, N= 813)					
Gross Prices					
Situation 1	88.56	11.99	0.181 (0.000)	1.664 (0.190)	5.303 (0.005)
Situation 2	90.66	12.04			
Situation 3	87.11	14.10			
Post-hocs	**Standard Error**	**Gabriel**			
Sit. 1 x Sit. 2	1.0953	0.158			
Sit. 1 x Sit. 3	1.0953	0.462			
Sit. 2 x Sit. 3	1.0953	0.004			
Statistics	**Mean**	**Standard Deviation**	**Kolmogorov-Smirnov**	**Levene**	**Kruskal-Wallis [1]**
Panel B - Analysis of abnormal trading (N = 405)					
Gross Prices					
Situation 1	87.28	10.74	0.180 (0.000)	3.179 (0.043)	32.142 (0.000)
Situation 2	90.66	11.88			
Situation 3	86.14	15.27			
Post-hocs	Mann-Whitney [2]				
Sit. 1 x Sit. 2	6,618.000 (0.000)				
Sit. 1 x Sit. 3	7,425.500 (0.008)				
Sit. 2 x Sit. 3	5,816.500 (0.000)				
Statistics	**Mean**	**Standard Deviation**	**Kolmogorov-Smirnov**	**Levene**	***F* ANOVA**
Panel C - Analysis of normal trading (d.f. = 408)					
Gross Prices					
Situation 1	89.84	13.03	0.199 (0.000)	0.016 (0.985)	1.461 (0.233)
Situation 2	90.66	12.25			
Situation 3	88.08	12.82			
Post-hocs	Standard Error	Gabriel			
Sit. 1 x Sit. 2	1.5406	0.932			
Sit. 1 x Sit. 3	1.5406	0.588			
Sit. 2 x Sit. 3	1.5406	0.258			

Note: [1] The F ANOVA test was carried out for comparison, yielding a similar result with a *p*-value of 0.011. [2] The *post-hoc* test with Gabriel was carried out for comparison, obtaining the following results: Sit 1 x Sit. 2 (*p*-value = 0.088), Sit.1 x Sit. 3 (*p* = 0.845), and Sit.2 x Sit. 3 (*p*-value = 0.011).

Another interesting finding referred to the signal emitted by the purchase and sale negotiations. Corroborating Tavakoli, McMillan and McKnight (2012), the signal emitted by purchasing (*p*-value of 0.000) is stronger than the signal output from sales (*p*-value 0.008), as was expected, since a rational investor would only buy stocks if he really believed in the potential for generating future cash flows by the company he invested in. Sales, on the other hand, can occur for various reasons, many of them unrelated to the business. We could also observe this in the full sample, however, with less statistical power, with *p*-value of 0.158 in purchases against *p*-value of 0.462 for sales. Thus, one can see the importance of monitoring the activities of insiders by the other investors (outsiders).

4.2 Timeliness of insider trading

According to CVM Instruction No. 358, companies in Brazil are required to disclose any (legal) insider trading within 10 days after month end on which trading took place (CVM, 2002). Thus, if an insider traded on the 1st day of the month, this operation will be known only to the market within 40 days after it becomes effective, which makes the market self-regulation could be harmed, as well as the informative power of trading as an investment strategy.

For example, between May 24 and 29, 2013, the (well known) controlling shareholder of a (very well known) Brazilian company sold more than 70 million stocks of this company at an average price of R$ 1.73. The information was only disclosed to the market on June 10, 2013, as the statutory deadline of CVM Instruction No. 358, when the shares were trading at R$ 1.29. The next day after the release of the controller trading, the market discounted the market value of the company even more, causing its stocks were traded at R$ 1.17. That is, the information, when disclosed, may have had an effect on the devaluation of the stocks, so that a more timely disclosure could cause harm insider trading that fewer investors.

Based on this type of situation, we tested the timeliness of insider trading disclosure using the maximum time allowed by Brazilian regulations, 40 days, and the deadline set by US legislation, which is 2 days. The situation experienced alluded to the fact that analysts from the major brokerage firms were strongly recommending that their customers should not buy the stocks of a particular company. However, an information was disclosed that a group of insiders was buying the stocks of this company. Thus, we presented to respondents a situation where they did not give attention to the recommendations of analysts and bought the shares. Added to this, a scale agreement or disagreement ranging from 0 to 6, with 0 (zero) to "strongly disagree" and six (6) the "strongly agree".

Panel A of Table 3 shows that the level of compliance with the situation presented was greater when the information was available 2 days after the insider trading, with an average in the range of 3.15, against 2.92, when trading occurred 40 days. However, these means were not statistically different (*p*-value = 0.149).

TABLE 3 – Timeliness of insiders information (*pooled*)

Statistics	Mean	Standard Deviation	Kolmogorov-Smirnov	Levene	*t*-test
Panel A – Timeliness (*pooled*, N = 542)					
40 days	2.929	1.735	0.121 (0.000)	2.701 (0.101)	-1.444 (0.149)
2 dias	3.151	1.832			
Statistics	**Mean**	**Standard Deviation**	**Kolmogorov-Smirnov**	**Levene**	***F* ANOVA**
Painel B – Comparison of normal and abnormal trading (N = 542)					
40 days (normal) - A	2.674	1.601			
40 days (abnormal) - B	3.183	1.830	0.121 (0.000)	2.204 (0.087)	5.576 (0.001)
2 days (normal) - C	2.829	1.712			
2 days (abnormal) - D	3.470	1.897			
Post-hocs	**Standard Error**	**Gabriel**			
A x B	0.214	0.102			
A x C	0.214	0.977			
A x D	0.214	0.001			
B x C	0.214	0.464			
B x D	0.213	0.696			
C x D	0.214	0.017			

Separating the groups that had access to the information of normal or abnormal trading, it was observed that perceptions about the negotiations of the insiders were different (p-value of the ANOVA F = 0.001). These differences stem from stronger way among the groups receiving regular information with 40 days late, and those receiving the information 2 days late, but abnormally (p = 0.001), as well as between who received the information 2 days late, normal and abnormal (p = 0.017). We consider significant, but with lower statistical power than the two previous situations, situations with 40-day lag, normal and abnormal (p = 0.102).

These results are evidence that there is a difference in investors' perception level for the same case, with time lags, which implies that the effect of time makes a difference in the decision making process of investors. Since in Brazil the disclosure of insider trading happens unexpectedly, investors lose the power to control, monitor and trace investment strategies in Brazilian companies based on these information.

4.3 Relevance of position to decision making on investments

In Brazil, when a company discloses insiders' trading, it does so in blocks. This implies that the investor does not know exactly who negotiated a certain amount of stocks. We know that the controlling shareholders trade, that the Board traded, but this is not disclosed individually. One probable reason for non-disclosure of insiders' names is that their safety might be jeopardized. However, this is another point that needs to be analyzed, because it can make a difference in the decision to buy, sell, or keep a particular investment.

To analyze the effect of position on investment, two positions were chosen to test the relevance of their trading information. The first is the position of Director-President, or Chief Executive Officer (CEO), by the representative that the office has. The second position chosen to represent individual negotiations was a Director responsible for a given Project which is being

developed by the company, but that is not yet operating. In this case, the respondents could imagine, for example, which is responsible for a project that is still not working are buying the company's shares, it is because this project may have some prospect of creating value in the future. About the differences in their positions, we did find a different level of agreement between the two groups (Panel A of Table 4).

However, when negotiations are separated into normal and abnormal, we find some differences between the perception of participants, but the differences were less significant than those found based on the relationship between timing and normality versus abnormality of negotiations. We infer, from the data analyzed, that what makes a difference to investors' decisions is negotiations being normal or abnormal, and not the position itself, for this case specifically.

Thus, with regard to the research hypotheses, it can be seen that the hypotheses which assume that insider trading has a positive impact on stock prices (H1) and that disclosure of these negotiations in a more timely manner has an even stronger impact on stock prices (H2) cannot be rejected. On the other hand, the third hypothesis, which assumes that the disclosure of individual insiders has a stronger impact on stock prices (H3), can be rejected.

TABLE 4 – Position influence (individual disclosure)

Statistics	**Mean**	**Standard Deviation**	**Kolmogorov-Smirnov**	**Levene**	***t*-test**
Panel A – Timeliness (N = 542)					
President	3.103	1.876	0.117 (0.000)	0.221 (0.639)	-0.325 (0.745)
Project	3.155	1.823			
Statistics	**Mean**	**Standard Deviation**	**Kolmogorov-Smirnov**	**Levene**	**Kruskal-Wallis**
Panel B – Comparison between normal and abnormal negotiations (N = 542)					
President (normal) - E	2.822	1.740			
President (abnormal) - F	3.382	1.970	0.117 (0.000)	3.247 (0.022)	8.389 (0.039)
Project (normal) - G	3.000	1.692			
Project (abnormal) - H	3.308	1.937			
Post-hocs	**Mann-Whitney**				
E x F	7,591.500 (0.013)				
E x G	8,541.000 (0.366)				
E x H	7,828.500 (0.034)				
F x G	8,028.500 (0.071)				
F x H	9,035.000 (0.740)				
G x H	8,307.000 (0.171)				

Note: President = President Director or CEO and Project = Project Director.

5 FINAL CONSIDERATIONS

The debate on insider trading, although old, is still in evidence in the universe of business, since it may be harmful to investors. However, there is no way to control people's behavior and prevent them from negotiating with private information. For this reason, it is important that Brazilian regulation be updated as to how this information is disclosed to the market, enabling greater monitoring and even the use of this information as a basis to draw investment strategies (the B-side of insider trading). In this regard, this research showed that insider trading make a difference, being relevant to investors' decision-making because it affects stock prices in the capital market.

Another relevant result observed was the ratification of the assumptions of Grossman and Stiglitz (1980), which seem to make sense, at least in the analyzed sample, since the existence of insider trading suggested the informativeness to the stock prices system. This can be seen when comparing the prices of the fictitious company Gross, that had insider trading information, because when the information was about purchases, the stock prices went up, and when it was about sales, the stock prices went down. One cannot see the same movement in the company that has no such disclosed information (Lemon), whereas the average price cannot be considered statistically different (data not tabulated).

A priori, it was expected that the effect of position would have a significant impact on investors' decisions. When the individual responsible for a project that can bring good profits to the company bought the stocks, he should be signaling to the market that the new project would work. However, there was no statistical difference between the two positions, which may refer to the fact that one of the positions had great relevance (President Director) and the other was connected to a project that would generate cash flows in the future. Perhaps with the consideration of a position of counsel, the result could be different. However, as noted, in Brazil it is not possible to identify the individual negotiations of these insiders.

Two specific points must be highlighted. The first refers to CVM Instruction No. 358, which, according to the results, needs to be revised to better meet the demands of investors and the capital market as a whole, since transparency is something particularly important. The second is linked to the results, which reinforce the importance of transparency of insider trading, so that market participants are able to monitor and better control their operations and use some based investment strategy in the signs of insiders, highlighting that "B-side" of insider trading exists and cannot be ignored.

Finally, it is noteworthy that the authors of this study do not advocate illegal insider trading, but there is no denying that insiders trade the stocks of the companies in which they work and that these negotiations may contain important information about these companies' futures. Therefore, we emphasize that this is early and exploratory evidence on this issue, and that it still needs to be explored in greater depth in Brazil, and qualitatively in future research, in order to rethink the regulation of this phenomenon in the capital market. It is also important to note that the results presented here are limited to the sample.

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