Revista Catarinense da CIÊNCIA CONTÁBIL

ISSN 2237-7662, Florianópolis, SC, v. 18, 1-18, e2730, 2019

DOI: 10.16930/2237-766220192730
Available on http://revista.crcsc.org.br

CRCSC CONSELHO REGIONAL DE CONTABILIDADE DE SANTA CATARINA

# BEHAVIORAL FINANCE: HERD BEHAVIOR ANALYSIS ON [B]$^3$ LISTED COMPANIES

**VANESSA MENESES SILVA**
*Federal University of Paraíba.* ***Address:*** *Campus I - Lot. Cidade Universitaria |58051-900| João Pessoa/PB | Brazil.*
*http://orcid.org/0000-0002-6045-2143*
*vanessa_m.s@outlook.com*

**WENNER GLAUCIO LOPES LUCENA**
*Federal University of Paraíba.* ***Address:*** *Campus I - Lot. Cidade Universitaria | 58051-900| João Pessoa/PB | Brazil.*
*http://orcid.org/0000-0002-2476-7383*
*wdlucena@yahoo.com.br*

## ABSTRACT

We based our work on the Prospect Theory (Kahneman & Tversky, 1979), from the heuristic perspective of the herd effect, and our general objective was to investigate the relationship between the subprime crisis, the news publication and the size of the company with behavior herd in the 100 companies with the largest trading volumes listed on the [B]$^3$ - Brazilian Stock Exchange, from 2007 to 2016. In order to achieve this, we initially employed, as methodology, the *cross-sectional absolute deviation of returns* (CSAD) model, proposed by Chang, Cheng and Khorana (2004), to identify the presence of the herd effect. The relationships among the variables were analyzed through the regression of the panel data model with fixed effects and robust standard errors. In general, the results found indicated a positive relationship among the herd behavior, the subprime crisis and the publication of good news; however, revealed a negative relationship with the size of the company. For the Bad News variable, the results did not show statistical signifimayce (p-value > 0.26), so the hypothesis of a negative relationship between the herd effect and the bad news was rejected. Concluding, investors are influenced by the positive news about companies, and this tends to generate in them an investment behavior similar to that presented by the larger groups of investors, i.e., the herd effect.

**Keywords:** Herd Effect. Crisis. News.

## 1 INTRODUCTION

Finance is considered one of the pillars of organizations because prior to the main business decisions, managers seek to make an accurate analysis of their financial situation. Within finance, there are some aspects of thinking, such as Traditional Finance, which was based on a microeconomic approach, having as a central paradigm the total use of rationality in financial decisions by economic agents. In addition to this, there is the Modern Finance, based on the financial model of the Efficient-market Hypothesis (EMH), based on the maximum return expected and rational expectations, considering that investors order their preferences in a logical and rational way, seeking to maximize the returns from their investments (Lucena, Santos & Assis; Santos, 2014).

**Submitted on** 08/05/2018. **Reviewed on** 02/20/2019. **Accepted on** 03/07/2019. **Published on** 01/04/04.

The contributions brought by these currents of thought are evident; However, following some financial imbalances, such as the subprime[1]financial crisis, highlighted in 2008, some of its aspects were rethought, such as the Efficient-market Hypothesis (EMH), which states that decisions made by investors are always rational and based on maximizing the expected return.

Market Efficiency considers the existence of homogeneity in expectation, rationality, and information, i.e., it is structured on the absence of irrationality, informational asymmetry among agents (Barberis&Thaler, 2003). However, upon observing the market returns and the behavior of the investors, it is perceived that the occurrence of an environment with total efficiency in the financial market is unlikely.

In view of this, the currents of thought in Behavioral Finance have emerged and gained notoriety, with several research works and theories that consider cognitive factors to explain some decisions taken by the stakeholders. Among them is Prospect Theory, proposed by Kahneman and Tversky (1979), which caused the psychologist Daniel Kahneman to win the Nobel Prize in Economics in 2002, along with the neuroeconomist Vonon L. Smith of George Mason University, who was recognized for being able to connect the laboratory experiments to the empirical analysis of the economy, and especially to the study of the alternative mechanisms of the financial market.

In the same line of thinking as the Prospect Theory, there is the herd behaviour[2] heuristic, which in turn describes how investors tend to make decisions without a rationally planned orientation, only influenced by the decisions of other investors. That is, it occurs when the behavior of one group of investors imitates the behavior of another in an irrational way, ignoring their own analyzes and perceptions of the market (Sanches, 2013).

Still, on this theme, Silva, Barbedo and Araújo (2015) affirm that the herd effect occurs when a certain group of investors negotiates the same asset in the same direction of the market, in a certain period of time, disregarding their own experiences, information beliefs about asset values. Therefore, this effect might be considered as harmful, since it tends to cause information losses and distortions in aggregate market information (Bikhchandani, Hirshleifer & Welch, 1992; Bannerjee, 1992).

Through the observation of the literature related to the subject, it is noticed that several authors sought to analyze the factors that may be related to the occurrence of the herd effect. A number of studies, both national and international, have been conducted, dealing with the influence of variables such as analysts' opinions, financial returns and stock liquidity (Christie & Huang, 1999, Chang, Cheng & Khorana, 2004, Kutcukian, Dana & Eid Jr, 2010; Araujo Neto, Serrano, Oliveira Neto & Freitas, 2016).

Keynes (1936) noticed that the herd effect may also be perceived in some events present in the daily life of several people, such as in the choice of restaurants, shops, and brands, which is generally influenced by the popularity level, in which we may identify each option of choice, and at the end, the most popular is considered. In the same way, this effect may be observed when analyzing the way in which the agents of the stock market behave before the decisions of the other agents.

From this perspective, the work developed by Fu and Lin (2010) verified the occurrence of asymmetric reactions to the good and bad news regarding the monthly returns of the Chinese stock market. Through their research, it was possible to confirm the presence of the herd effect in extreme market conditions. Concomitantly, Yao, Ma and He (2014) analyzed the difference in the incidence of the herd effect on Chinese investors and investors of other nationalities on the

[1] The inancial crisis triggered in the middle of 2007, with the Dow Jones index fall, which was due to the deliberate granting of high-risk mortgage loans and to the default of the borrowers of these loans. This practice significantly damaged several banks, leaving them in a insolvency situation, which caused a downturn in the economy and had repercussions on the stock exchanges around the world.

[2] In the present work, the words "effect" and "behavior" should be understood as having the same meaning, since the herd effect heuristics deals with an expression of behavior.

Shanghai and Shenzhen stock exchanges. In their research, Tariki (2014) verified the existence of a relationship between the intensity of the herd effect and the size of the investment funds.

A financial crisis is one further aspect related to herd behavior. Within this perspective, Dzielinski (2011) examined that during times of economic uncertainty, such as those caused by financial crises, investors are exposed to a greater volume of unfavorable and unexpected news about companies, and this tends to promote greater insecurity, leading them to disregard their analysis and personal information and seek behavior similar to that of other investors.

In view of the above, we may notice that studies related to behavioral finances have gained space in the scientific environment, as it has become increasingly important to analyze the various aspects that influence the decision making of the agents that make up the financial market. Therefore, it was considered relevant in the development of this work to analyze the reasons that may explain the behavior of agents that are part of the Brazilian financial market, since their decisions are decisive for the market's own functioning.

Several authors have indicated that cognitive factors tend to influence this decision-making process. Since the studies evidenced a trend in behavior of investors that resembles patterns adopted by a certain group, thus explaining the existence of the herd effect. Therefore we considered investigating the explanatory factors of this behavior, as well as analyzing how the relationship between them and this behavior occurs. Thus, we suggested the following research problem: **What is the relationship among the subprime crisis, the publication of news and the size of the company, with the occurrence of the herd effect in the companies with the highest trading volumes as listed on [B]³ - Brazilian Stock Exchange?**

The importance of this research is due to its probable contribution to the construction of Behavioral Finance understanding, the factors that interfere in the decisions of the financial market, as well as the identification of possible relations between variables that may explain the behavior of the agents that compose this market. One further contribution observed concerns the information collected in this study, which may encourage the development of new research related to the topic.

Furthermore, several studies within this theme were conducted, most of them seeking to identify the herd effect focused on the institutional behavior (Almeida, 2011; Araujo Neto; Freire, 2013; Araujo Neto et al., 2016). Unlike previous studies, we sought, in this work, not only to verify the occurrence of the herd effect, but also to analyze some factors that possibly relate to the presence of this behavior, such as the period of the subprime financial crisis and the publication of news related to the companies. The originality of the research is underscored since these factors have not yet been jointly studied by the other authors who dealt with this theme.

The next sections of this work were structured as follows: in section 2 we present the theoretical reference referring to the Prospect Theory and aspects of the Heuristics of the herd effect; in section 3, we deal with the methodology used in the development of the work; in section 4, we present the results and their respective analysis, finally, in section 5, we report the final considerations of the research.

## 2 THEORETICAL LANDMARK

### 2.1 Behavioral Finance and the Prospect Theory

The study considered as the most relevant in the area of Behavioral Finance was published in the year 1979 by the researchers Daniel Kahneman and Amos Tversky, titles "Prospect Theory: analysis of decision under risk". On this study, the authors investigated the behavior, actions, and decision-making process of investors in situations involving the risks present on a daily basis in the financial market (Passos, Pereira & Martins, 2012). From the results obtained, the authors developed the Prospect Theory, in which the authors incorporated the heuristic judgment to the decision process of the investors. The development of this theory allowed Kahneman to win the

Nobel Prize in Economic Sciences in the year of 2002. Thus, Behavioral Finances began to gain space and notoriety.

The Prospect Theory considers that the probabilities adopted in finance must be replaced by decision weights and that these values must be attributed to the gains and losses rather than to the final results. From that, the value function is considered as concave in the domain of gains and convex in the domain of losses. Commonly, the function is seen as more inclined towards the negative results than for the positive ones. The weights attributed to decisions are lower than their probabilities, except in situations where the probability of occurrence is very low (Kahneman & Tversky, 1979).

Considering this theme, Ricciardi and Simon (2000) reported in their study that Behavioral Finance seeks to explain investors' thinking patterns, encompassing the emotional processes involved and their level of interference in the decision-making process. They also affirmed Behavioral Finance as seeking to analyze the psychological and sociological factors that influence the financial decision-making of individuals, groups and entities.

The evolution of studies in this area of knowledge made it possible to improve the Modern Model of Finance, since it added the results of research on the behavior and irrationality of the agents that make up the market, who may now be recognized as individuals whose actions and decisions receive the influence of emotions and cognitive errors, causing them to perceive situations in different ways, depending on the way they analyze the issues (Halfed & Torres, 2001).

We may notice that the Prospect Theory provides the identification of the behavioral differences in the investors in the face of losses and gains, i.e. their willingness to expose themselves more to risks in order to recover past losses, and the tendency to seek to revert previous positions to achieve high profits (Kimura, 2003).

According to Arruma (2006), Behavioral Finance refers to a particular approach to the study of the financial market and, particularly, to the analysis of investor behavior, reacting to the possible flaws observed in the model considered by Modern Finance Theory. Moreover, Sewell (2007) states that Behavioral Finance is a field of study that analyzes the influence of psychological aspects on the behavior of agents and their implications in the financial market.

Corroborating the theme, Rogers et al. (2007) suggested in their work that behavioral aspects are preponderant in decision making. Ariely (2008) emphasizes that the analysis of previous behavioral parameters is used as a reference base in the decision process and that the understanding of the information presented about the reality is always based on what is really true, but on the conception and representation or it. Therefore, decisions are influenced by cognitive factors.

According to Leone and Guimarães (2012), the main objective of studies in the field of Behavioral Finance is to identify and understand the cognitive illusions responsible for the systematic errors of evaluation of investors, in order to adapt economic-financial models, seeking to train economic agents to that their decision-making takes place more adequately.

For Lucena, Costa and Aragão (2013), the influence of psychological aspects on human behavior has become an important bias to be explored, from the consideration of a comprehensive view regarding the understanding of the decision process and the relationship between the rationality and irrationality in this process.

Given the fact that Behavioral Finance models consider the influence of the psychological aspects of human beings and recognize the possibility of irrationality in the decisions taken by the agents, these models may act in filling the theoretical gaps observed in the Modern Theory of Finance. That occurs because, according to Silva, Barbedo and Araujo (2015), Behavioral Finance uses concepts from various fields of knowledge, such as Psychology, Economics, and Finance, with the purpose of developing more complex market models and incorporating cognitive biases which may influence decision making. In this context, we may note that several studies have been performed in this sense and have shown that, in several situations, the behavior of economic agents differs significantly from the rationality addressed by Modern Finance Theory. Almeida (2011)

places as indeniable that human beings use their reasoning capacity in a limited way, mainly when it comes to decisions referring to complex questions involving other people.

Although some authors in the area of Finance consider Behavioral Finance as a current of thought that goes against the Modern Finances (Kutchukian, 2010; Barros, 2005; Borsato, Costa, Pimenta & Ribeiro, 2009), we sought in this work to show positionings related to the possibility of this line of thought to be able to contribute to investors being more rational through studying and understanding of the cognitive illusions that may influence them.

## 2.2 Heuristics of Herd Behavior

Several heuristics are studied within Behavioral Finances. Among them is the herd bevavior that, according to Almeida (2011), refers to behavior that leads some investors to ignore their personal information to follow the conduct of other investors. This effect considers that the individual seeks to follow the behavior and decisions of a group driven by the feeling that it is better to do mistakes in a group than sole (Passos, Pereira & Martins, 2012). Bikhchandani and Sharma (2001) also recognize it as the correlated movement of investors, who make investment decisions similar to a certain group.

The herd effect in the financial market is also characterized by homogenization of the actions of its participants, who behave at a certain moment in the same way. That is, it is when a market agent seeks to follow a group ("flock") in spite of having divergent opinions. (Tosmayi, 2006; Delitala & Lorenzi, 2014). For During, Juengel and Trussardi (2017) this behavior is driven by emotions and usually occurs because of the social pressure related to conformity. Another cause is the call to the belief that it is unlikely that a large number of people may be wrong.

Some studies on the herd effect have been developed. At the international level, Shih et al (2012) analyzed emerging markets and identified this behavior on the Pacific stock exchanges in relation to operations on the American stock markets. Similarly, Chiang and Dazhi (2010) also found evidence of the occurrence of this effect on the Chinese stock markets in Shenzhen and Shanghai. Moreover, Chiao, Hung and Lee (2011), in their study employing the companies' intraday data, have identified the effect of stock trading on institutions operating on the Taiwan stock exchange.

Taking Brazil into consideration, the results found in the study by Lobão and Serra (2002) suggest that a higher level of herd effect occurs in emerging markets than in developed markets. Kutchukianet al. (2010) observed evidence of a herd effect in investor groups with different sizes of equity investments and fixed income investments. Almeida (2011), by employing the methodology suggested by Christie and Huang (1999), investigated the possible occurrence of the herd effect in Latin Amerimay financial markets; however, this study did not present consistent results that suggested the acceptance of the hypothesis of occurrence of the herd effect. Similarly, the presence of the herd effect was not found in the study by Sanches (2013), in which the group employed the model proposed by Hwang and Salmon (2001 and 2004).

Following the same line of thinking, Schlender and Ceretta (2014) identified the presence of herd behavior by analyzing the daily shares returns of companies related to five USA *commodities*[3]. As in the research by Zhou and Anderson (2013), the behavior was also detected by observing different periods of returns (daily, weekly, and monthly) in Real Estate Investment Funds from 1980 to 2010. Likewise, in the study developed by Cont and Bouchaud (2000), the group verified the presence of the herd effect from the return on assets.

One of the explanations for this behavior is the fact that the agents often have their performances evaluated through the comparison with the performance of the market. Therefore, managers do not aim to maximize results by minimizing risk, but seek similar results to market

[3] Term employed for products or goods that function as raw material. In the study of Schlender and Ceretta (2014), cotton, coffee, wheat, soy, and sugar were considered.

returns in order to present a satisfactory assessment for their own performance (Araujo Neto et al., 2016). According to Puckett and Yan (2008), another justification for the occurrence of the herd effect may also be attributed to the informational asymmetry present in the financial market since it is speculated that investors imitate others by observing their attitudes, believing that they are under some implicit informational content.

Several motives may theoretically justify the fact that an individual changes an investment decisions by becoming aware of the behavior of others (Lakonishok, Shleife & Vishny, 1992; Christie & Huang, 1999; Sias, 2004). One of them that the herd indicates that there is additional information about the market and therefore such behavior would occur through a presumption of market-related additional information. Therefore, we might understand that the disclosure of information about companies tends to be related to the occurrence of the herd effect.

There are also studies that have verified the existence of the relationship between the herd effect and stock returns, such as that by Cont and Bouchaud (2000), which concluded that amateur investors exhibit herd behavior. This effect may also be explained by similar reactions from investors to shocks and new information. Furthermore, Teh and DeBondt (1997) identified a relationship between the herd effect and the returns and realized that this behavior presents additional power to explain the variance of stock returns. Additionally, other factors related to herd behavior may be listed: imperfections in market information, such as asset size; trading volume; feedback from past-return investors; and risk management (Kremer & Nautz, 2013).

In order to identify the explanatory factors of the herd behavior in the agents participating in the national financial market, four research hypotheses were formulated based on studies related to the proposed theme, such as Araujo Neto et al. (2016) - which indicated that the decision process does not strictly employ rationality, since it also considers the influence of judgment heuristics on the alteration of the rational choice of each individual - and the work developed by Silva, Barbedo and Araújo (2015), which detected the existence of the herd effect in two companies listed on [B]$^3$ - Brazilian Stock Exchange with high trading volumes.

In this context, we should also emphasize that during periods of economic uncertainties, such as those caused by financial crises, investors are exposed to a greater volume of unexpected negative news about companies (Dzielinski, 2011). In their study, Badhuri and Mahapatra (2013) applied alternative tests to obtain symmetry in the returns distributions in the Indian stock market and confirmed a greater presence of herd behavior in the period of financial crisis. Therefore, we considered necessary to analyze the following hypothesis**: H1: There is a positive relationship between the occurrence of the herd effect and the subprime crisis period in the companies with the highest trading volumes listed on [B]$^3$ - Brazilian Stock Exchange.**

In the search for reasons that clarify the financial market movements, we also observed that there is a confidence on the part of the investors in the use of the news, because according to Tibúrcio, Carvalho and Nunes (2012), investors tend to believe that, when their investment decisions are based on news reports about companies, there may be an increase in the probability of obtaining returns on their applications, i.e., they believe that through the news it is possible to predict, reliably, the future results. Therefore, the published information about the companies tends to affect the judgment of the agents, being able to cause excessive optimism or pessimism.

Cutler, Porteba, and Summers (1989) showed in their research that the observed variations in the negotiations and, consequently, the stock prices in the stock market reflected the news about the financial and economic world. In this perspective, the research by Marsden, Veeraraghavan and Ye (2008) concluded that the disclosure of positive news regarding publicly traded companies enhances analysts' optimism, causing them to make predictions by considering exaggerated increases in their profits. In a similar manner, the study by Amir and Ganzach (1998) also gave evidence that the exposure of economic agents to good news tends to foment excessive optimism, which may lead to an increase in the prediction errors of the expected returns on their investments. Thus, we hypothesized that: **H2: There is a positive relationship between the presence of the herd effect and the publication of good news regarding the analyzed companies.**

For Tibúrcio et al (2012), news on political and economic events also directly affects the movement of stock markets around the world. Lam, DeRue, Karam and Hollenbeck (2011) state that receiving too much news might result in an overload of information, which tends to stimulate the loss aversion bias, potentially reducing investor trading activities during instability.

The study by Damodaran (2010) concluded that the presence of negative news tends to cause a behavioral bias in investors aversion to loss. Thus, in order to analyze the possible influence of the publication of negative news with the occurrence of the herd effect in the companies that have the highest trading volumes listed on [B]$^3$ - Brazilian Stock Exchange, we have as hypothesis of research: **H3 : There is a negative relationship between the presence of the herd effect and the publication of bad news regarding the analyzed companies.**

Regarding the "asset size" factor, Lakonishok, Shleifer, and Vishny (1992) investigated the stock-market effect of assets held in USA funds and found weak evidence of a herd effect on low-capitalization securities; they have also identified little evidence of the relationship between stock size and herd behavior in the sample analyzed. In their studies, however, Kremer and Nautz (2013) also considered elements such as asset size, trading volume, investor feedback from past returns, and risk and volatility management. They found that amateur investors exhibited herd behavior and that this was related to the factor "asset size"; moreover, they concluded that the herd effect is more likely to occur in stocks with higher trading volumes in the market because institutions tend to exhibit greater uniformity in information. As well as Tariki (2014), who, through his analysis, found evidence that the intensity of the herd effect varies according to the investment fund size. Also, studies by Choi and Sias (2009), and by Venezia, Nashikkar and Shapira (2011) have confirmed a higher incidence of herd behavior in small entities. Therefore, this variable was considered as a control variable in the model used.

## 3 METHODOLOGY

The sample analyzed was composed of the 100 companies with the highest trading volumes listed on [B]$^3$ - Brazilian Stock Exchange. The choice of these companies may be justified by their representativeness in the stock market. Roth, Albuquerque and Silva (2012) showed that those companies are highly representative and are part of the structure of the Bovespa Index (Ibovespa) and IBrX100[4], two important indexes that demonstrate the mean performance of the market. The period analyzed covered the years from 2007 to 2016, i.e., ten years. The 100 [B]$^3$ companies list with the largest trading volumes was taken from the website of the stock exchange analyzed, and the financial information was collected through the Thomson Reuters Eikon database.

We performed the collection of the variables on the news publication using the content analysis technique since we observed the publications of reports about the companies, referring to the years studied, on the websites of the communication vehicles *Capital, Mercado & Negócios*, *Valor Econômico* e *Folha de S.Paulo*.

For this end, we considered that information on the valuation of the company's shares; improvement of results; new investments; project development; mergers; acquisitions; the opening of new units; and receiving foreign investments would be positive news. On the other hand, factors such as decreased profit; worse results (increased losses); problems with justice (fines, irregularities, penalties, etc.); customer complaints, and the devaluation of the company's shares were recognized as negative news. Generally, we identified news that could influence positively and negatively the company's image in relation to the investor.

In order to collect the information about the companies, in each newspaper, individually, a dummy variable was used, adopting 0 for the absence of news and 1 for the existence. Thereafter, they were added together, and the value 3 was assigned to companies reporting in the three newspapers, 2 to companies whose news was found in two newspapers, 1 to companies reporting

[4] Refers to the Brazil Index, one of the indexes presented by [B]$^3$ – Brazilian Stock Exchange, which shows the result of a theoretical portfolio composed of the shares of the 100 most traded companies on this stock exchange.

only in one newspaper, and 0 in case there is no news about them in the three newspapers. This treatment was performed for both the "Good News" and "Bad News" variables. This method was used to avoid that the dummy variable remained constant throughout the period and to inhibit the presence of multicollinearity.

For the identification of the occurrence of the herd effect, we employed the model developed by Chang et al. (2004), the cross-sectional absolute deviation of returns (CSAD), i.e., the verification through the use of the mean of the absolute standard deviations of returns, since this is considered the best measure of dispersion. This model considers the hypothesis that during some periods, investor tends to suppress their own beliefs and base their decisions on collective actions, and therefore returns tend to approximate the overall market return. Therefore, for this work, we performed all tests considering absolute standard deviations of returns, calculated using the CSAD formula:

$$CSAD_t = \frac{\sum |R_{i,t} - R_{m,t}|}{N-1} \qquad (1)$$

in which:
$CSAD_t$ = Means of the absolute standard deviations of returns;
$R_{i,t}$ = Return on asset i in period t (stock return);
$R_{m,t}$= Mean market return in period t;
$N$ = Number of assets analyzed.

Although there exists the option of verifying the herd behavior through the cross-section standard deviation of returns (CSSD), due to the fact that it is an intuitive measure, it tends to be more sensitive and influenced by the presence of outliers. The regression model considers a quadratic specification for the relationship between CSAD and market return according to equation (2):

$$CSAD_t = \propto + \gamma_1 \left|R_{m,t}\right| + \gamma_2 R_{m,t}^2 + \varepsilon_t \qquad (2)$$

in which:
$\varepsilon_t$= Errors in the model.

The rationale present in rational asset pricing models is conditioned by linear relationships between the dispersion of the return and the market return. When linear relationships do not hold, there is the presence of the herd effect. That is, if the coefficient of the non-linear item is significantly negative, then the herd behavior is identified.

The CSAD model seeks to capture the herd effect from the understanding that in a fully efficient market the relationship between CSAD variables and market returns should be linear, i.e. when market dispersion increases, it is expected that the same thing will happen with its returns. When investors tend to act in a more homogeneous manner as a result from irrational behavior, this linear relationship does not happen. Therefore, what explains the return absolute standard deviation is the non-linear term, indicating the occurrence of herd behavior in the stock market.

In our work, we employed the logarithmic form to determine the return, as presented in equation (3). The choice of using this formula was due to the fact that it makes the data representation curve less dispersed, increasing the chances that the normality requirements of the validation tests of the results will be achieved (Macedo, Almeida & Dornelles, 2016; Soares, Rostagno & Soares, 2002).

$$R_{i,t} = ln\left(\frac{P_{i,t}}{P_{i,t-1}}\right) \qquad (3)$$

in which:
$R_{i,t}$ = Return on asset i in period t;
$P_{i,t}$ = Share price of company i in period t;
$P_{i,t-1}$ = Share price of company i in period t-1;

Considering that the companies analyzed in this study were the ones that presented the highest trading volumes in [B]3 – Brazilian Stock Exchange, because those make up the IBrX100 index, this index was employed as the reference of the mean market return. In order to identify the mean index of each year analyzed, the annual mean was calculated by means of the monthly IBrX100 indexes.

Regarding the analysis of the factors related to the herd effect, we applied a multiple regression, with the HE (herd effect) as the dependent variable, the other variables - the size of the company, the crisis period, and the publication of good and bad news about the companies - as explanatory variables, and the stock trading time and the Ibovespa as control variables. The model used, in order to illustrate the relations we sought to analyze, was an adaptation of the one proposed by Flores, Vieira and Colonel (2013).

$$EM_{i,t} = \beta_{0\,i,t} + \beta_1 CRISIS_{i,t} + \beta_2 NOTB_{i,t} + \beta_3 NOTR_{i,t} + \beta_4 TAM_{i,t} + \beta_5 IBovespa_{i,t} + \beta_6 TEM_{i,t} + \varepsilon_{i,t} \quad (4)$$

in which:
$EM_{i,t}$= Variable that represents the presence of the herd effect on the returns of the stock of firm i in period t, measured by the coefficient of the nonlinear term (variable$R^2_{m,t}$ from equation (2)).When performing an OLS regression with the variables structured according to equation (2), a coefficient is obtained for each variable of the model. For the herd effect, the coefficients obtained by means of the regression for the non-linear term (represented by the $R^2_{m,t}$) of each of the companies analyzed in each year.
$CRISIS_{i,t}$= Periods of financial crisis (considered as a dummy variable to represent periods of crisis/financial constraints, assuming value 1 for the period of 2008 and 2009, and value 0 for the other periods), assigned for each company i in period t.
$NOTB_{i,t}$= Publication of good news about company i on the websites of the three newspapers during the period t.
$NOTR_{i,t}$= Publication of bad news about the company i analyzed in the sites of the three newspapers during the period t.
$TAM_{i,t}$ = Size of company i (calculated by means of the logarithm of the net equity of the companies), during the period t.
$IBovespa_{i,t}$= Index of [B]$^3$returns – Represents the behavior of the stock market for each company i in the period t; it was included for demonstrating the effects of the effects of periods of financial crisis on market income (Santana &Trovati, 2014).
$TEM_{i,t}$ = Trading period of the shares of company i (calculated by means of the neperian logarithm of the total days from the beginning of stock trading until the last day of analysis, i.e., from the IPS date until the end of each analyzed year), in period t.
$\varepsilon_{i,t}$ = Errors in the model.

Generally, what we proposed in equation 2 was identifying the presence of the herd effect in the Brazilian financial market. After this effect was identified, equation (4) proposed the analysis of possible factors (variables) that may explain and relate to the occurrence of such behavior.

In order to test the hypothesis of the research, searching to verify the relationship of the factors proposed in the model with the herd behavior, we employed the regression analysis using the panel data model with robust standard errors, which was identified as the more suitable by

means of the Chow tests, HausmaneBreusch-Pagan. SarloNeto, Lopes and Dalmácio (2010) report that these tests are used to identify the selection of the approach that offers the best specification. Each of them has different purposes and are employed in different pairs of specifications. Initially, the Breusch-Pagan test is applied between pooled models and random effects. If the null hypothesis is rejected by the Breusch-Pagan test, it is necessary to apply the Hausman test to choose between fixed effects (FE) and random effects (RE).

According to Marques (2000), the panel data model presents as an advantage the fact of suggesting the existence of characteristics that differentiate the individuals, being able to be constant or not over time, and this contributes to avoiding biased results.

## 4 PRESENTATION AND ANALYSIS OF RESULTS

From the observation of the descriptive statistics, as demonstrated in Table 1, we notice that the data with the largest dispersions around their means were the ones of stock trading time and size variables; its values are 2.305 and 1.753, respectively. This reveals that the companies sample studied displays a high dispersion, both in the size data of the companies and in the trading time of their shares.

The distancing from the mean may also be confirmed by comparing the maximum and minimum values of such variables. Similarly, it is worth mentioning that the variable HE, which represents the presence of the herd effect, evidenced, through its standard deviation (0.008), that the herd behavior values in the companies tended to approach the mean, presented low dispersion.

Table 1
**Descriptive statistics of model variables**

| Variable | Mean | Mode | Median | Standard Deviation | Maximum | Minimum |
|---|---|---|---|---|---|---|
| Herd Effect (HE) | 0,102 | 0,104 | 0,101 | 0,008 | 0,182 | 0,051 |
| Crisis | 0,196 | 0 | 0 | 0,397 | 1 | 0 |
| Good News | 1,083 | 1 | 1 | 0,794 | 3 | 0 |
| Bad News | 0,945 | 1 | 1 | 0,799 | 3 | 0 |
| Size | 22,160 | 24,136 | 22,072 | 1,753 | 26,575 | 4,605 |
| Ibovespa | 10,929 | 10,991 | 10,896 | 0,086 | 11,112 | 10,801 |
| Trading Time | 7,518 | 0 | 7,937 | 2,305 | 10,244 | 0 |

Source: Research Data (2017).

The maximum and minimum values in Table 1, both from the size variable and the trading time variable, presented a large range. This shows that their mean does not carry very representative information about the sample. In relation to the Ibovespa mean, since this variable had a low standard deviation and a small interval between the minimum and maximum values, this indicates that the mean represented the information found for this index. The low mean value for the HE may be justified by the fact that it is the quotient of the division, in which the divisor considered was the total of the 100 companies analyzed, subtracted from 1.

Similarly, the mean of the good news (1,083) surpassed that of the bad news (0.945), evidencing the existence of more positive reports than negative ones about the analyzed companies. We may also observe that there is a significant difference between the mean and the median of the variables HE, size, Ibovespa, and trading time, indicating that the distribution of the data is asymmetric.

In order to verify if the ordinary least squares (OLS) regression presented multicollinearity, the test was performed using the Variance Inflation Factor (VIF). According to Field (2009), a model does not reveal multicollinearity between the variables when the FV values are all below 10. Table 2 presents the VIF result for the variables. Considering that the values were not greater than or equal to 10, we may infer the absence of multicollinearity between the variables of the model.

Table 2
**Multicolinearity tests**

| Test | Variables | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Good News** | **Bad News** | **Trading Time** | **Size** | **Crisis** | **Ibovespa** | **Mean VIF** |
| **VIF** | 2,49 | 2,49 | 1,26 | 1,22 | 1,07 | 1,05 | **1,60** |

Source: Research data (2017).

In order to test for the existence of heteroscedasticity in the model used, we performed the Breusch-Pagan-Godfrey test, which provided a result based on chi-square statistics. The test detects any linear form of heteroscedasticity and considers that the residues are non-normal (Gujarati & Porter, 2011). We verified that the model is heteroscedastic, considering that the null hypothesis of homoscedasticity (Prob > Chi2 = 0.00) was rejected at 1% of significance.

The result was also evidenced by the White test since the p-value obtained was close to zero; therefore, the hypothesis of a test in which the occurrence of homoscedasticity was affirmed was rejected. This test is taken as a more general test and presents no problem if heteroskedasticity is non-linear, since it detects both linear and non-linear heteroskedasticity. It considers that the residues are not normally distributed (Gujarati & Porter, 2011). In light of this evidence, we used White's robust correction, in which the standard errors were adjusted from the heteroscedasticity identified in the model.

The values expressed in Table 3 reveal the result of the regression of the panel data model with robust estimation. From the observation of both the positive signal found for the coefficient of the crisis variable and the value obtained in its p-value, which was found to be statistically significant at 1%, we may infer the non-rejection of hypothesis 1, in which the existence of a positive relation between the occurrence of the herd effect and the crisis period in the companies with the highest trading volumes listed in $[B]^3$ - Brazilian Stock Exchange.

The findings for the variable crisis describe that, in periods of economic uncertainty, investors tend to follow the decisions and behavior of larger groups. This result corroborates that found in the study by Badhuri and Mahapatra (2013), in which a positive relationship between the crisis period and the occurrence of herd behavior was also identified. Dzielinski (2011) also reports in his research that at such times investors are more exposed to negative and unexpected information about companies, which may justify their tendency to behave similarly to large groups.

Table 3
**Result of panel data model regression with fixed effects and robust standard error**

| **Variable** | **Coeficient** | **Standard Error** | **T-ratio** | **P-value** | |
|---|---|---|---|---|---|
| Crisis | 0,00480095 | 0,000766056 | 6,2671 | 0,0000 | *** |
| Good news | 0,000795001 | 0,000339673 | 2,3405 | 0,0195 | ** |
| Bad news | -0,000523282 | 0,00046789 | -1,1184 | 0,2637 | |
| Size | -0,000151803 | $7{,}00196e^{-05}$ | -2,1680 | 0,0304 | ** |
| Ibovespa | -0,0116387 | 0,00114066 | -10,2035 | 0,0000 | *** |
| Trading Time | 0,000266282 | 0,00010074 | 2,6433 | 0,0083 | *** |
| Constant | 0,228853 | 0,0115979 | 19,7322 | <0,0001 | *** |

| | | | |
|---|---|---|---|
| Sum of squared residuals | 0,063088 | D.P. dependent var. | 0,008501 |
| $R^2$ | 7,72% | Regression E.P. | 0,008197 |
| Wooldridge | Prob> chi2 = 2,5% | Adjusted $R^2$ | 0,0754 |
| Breusch-Pagan-Godfrey | Prob> chi2 = 0,0 | White | 0,0 |

**Note.** *** = statistically significant at 1% and ** = statistically significant at 5%.
Source: Research data (2017).

The result obtained in the significance test for the variable good news revealed, by means of p-value (0.0195), statistically significant at 5%. Considering that a positive sign was also found for the coefficient of this variable, we suggested not to reject hypothesis 2, since it was evidenced the occurrence of a positive relationship between the presence of the herd effect and the publication of good news about the companies analyzed. This indicates that the disclosure of positive reports in the newspapers with the largest circulation in Brazil regarding the companies analyzed positively influences the behavior of financial market investors.

The conclusion obtained for the variable Good News evidenced the conformity with the study of Marsden, Veeraraghavan and Ye (2008), in which it was also identified that the disclosure of positive news about public companies tends to raise the optimism of the analysts, causing them to make their predictions considering exaggerated increases in their profits and therefore are motivated to apply their resources in companies that reveal greater amounts of positive reports. The conclusion also resembled the findings of the Amir and Ganzach (1998) survey, in which the authors described that exposing the investor to good news tends to elicit excessive optimism.

The variable Bad News, even though it showed a coefficient with the expected negative sign, did not present statistically significant (p-value > 0.26); Therefore, the hypothesis of the existence of a negative relationship between the presence of the herd effect and the publication of Bad News was rejected. This result was shown to be different from that found in the study by Damodaran's (2010), where the authors indicated that the presence of bad news tends to cause a behavioral bias in investors' aversion to loss - this divergence may be justified by the fact that this work has analyzed another market, investigated the behavior of investors and managers and considered another time frame.

In a study by the authors Kremer and Nautz (2013), it was noticed that the amateur investors exhibited the herd behavior, and that this had a relation with the factor "asset size". Furthermore, Tariki (2014), in his analysis, has identified evidence that the intensity of the herd effect varies with the size of the investment fund.

In accordance with the results aforementioned, the values expressed in Table 3 describe that the size variable was statistically significant at 5% (p-value = 0.03), indicating the existence of a relationship between the herd behavior and the size of the companies with the largest trading volumes listed in [B][3] - Brazilian Stock Exchange. We could also notice, by means of the coefficient signal, that this relation is negative. However, this finding differs from that found in the work by Lakonishok's, Shleifer and Vishny (1992), who found little evidence of the relationship between stock size (active) and herd behavior.

Considering that the variable good news presented a positive influence on the herd effect, while the variable bad news did not indicate significance - and therefore, no influence could be attributed to the herd behavior - this shows that market investors Brazilians tend to behave more optimistically, in which they take the good news more into consideration in their investment decisions than the bad news about companies.

Regarding the variables Ibovespa and negotiation time, both were statistically significant at 1%; however, the Ibovespa showed a negative relationship with the herd behavior, while the stock trading time presented a positive relation. Therefore, we may understand that the longer the trading time of shares of the companies in the stock market, the greater the occurrence of the herd effect; the opposite happens with the Ibovespa.

The values found for the regression coefficient $R^2$ describe that, according to the F-test, the model presented low explanatory power, since it indicated that the independent variables of the model may explain only 7.7% of the variations identified in the behavior herd

In order to verify the autocorrelation of the data variables in the panel data model with fixed effects and robust standard error, the Wooldridge test was also applied, its result showed that there was no autocorrelation between the variables (Prob > chi2 presented a value high and it was above 2%). Therefore, we did not reject the null hypothesis of non-autocorrelation at the expense of rejection of the autocorrelation hypothesis. This result evidences that the errors of the model did

not indicate the presence of a significant level of autocorrelation. Thus, the hypothesis of independence of the errors was satisfied since we did not find multicollinearity in the residues, and, therefore, the test hypothesis possesses a high satisfaction degree.

## 5 FINAL CONSIDERATIONS

The results obtained evidenced the existence of a positive relationship among the presence of the herd effect, the crisis period, and the good news. This means that in periods of economic uncertainty, investors tend to be more insecure and therefore seek to act in accordance with larger groups. Dzielinski (2011) also observed in his study that the period of crisis influences the behavior of investors. Similarly, Badhuri and Mahapatra (2013) have identified that in these periods the herd behavior is more evidenced.

It became evident that financial crises impact on investor behavior. The positive relationship of the crisis period with the herd behavior may be explained by the fact that, in these periods, investors find it more difficult to analyze the companies and identify the risks inherent to each investment option. Thus, they choose to comply with the market, suppress their analyzes and personal information and seek a performance that resembles that of other investors. This elicits the herd effect.

The positive relationship observed in the variable good news indicates that the disclosure of positive reports on the companies also influences the investment decisions of the agents that compose the stock market. This may be justified by the fact that these reports tend to generate excessive optimism on investors and thereby motivate them to invest their resources in companies with a more positive image. This result reveals compliance with the findings in the studies of Marsden, Veeraraghavan and Ye (2008), Amir and Ganzach (1998), and Cutler, Porteba and Summers (1989).

Positive news may cause a behavioral bias in investors, leading them to be more optimistic in their investment valuations, and believing that the company with the highest volume of favorable reports may be the best investment choice. However, the news is not considered to be the best information source for decision-making, as companies themselves may use it to influence market expectations in order to maximize their usefulness.

In this research, we have also noted the existence of a relationship among the herd effect, the size of the companies and the trading time of their shares, indicating that investors are also influenced, in their investment decisions, both by the company and by the period time it negotiates its shares in the stock market, in its investment decisions. As for the relationship between firm size and herd effect, that was also observed by Kremer and Nautz (2013) and Tariki (2014).

Regarding the size aspect, a possible justification for the relationship found may be the fact that smaller companies are considered to be of greater risk because of the incentives they have to manage their information, promoting greater information asymmetry and generating problems in evaluations. Speculative investors, in turn, are more risk-averse. As we produce an association, the herd effect was possibly more evident in smaller companies because their investors presented a more speculative profile.

Considering that the herd effect indicates that investment decisions are sometimes made without a rational explanation, it is understood that it is a harmful factor to the market, since one of the assumptions of the Efficient-market Hypothesis is the use of rationality in the choices investment.

In the development of the research, we observed the existence of limitations, such as subjectivity in the identification of good and bad news (since we employed content analysis, which may have contributed to the statistical significance presented in the Bad News variable); the model used; and the number of variables considered. Therefore, we suggest, for future research, the addition of other variables that may be related to the herd behavior, the application of other models, and the study of different company samples.

In view of the above, it is concluded that, despite the limitations identified in the study, the results obtained contribute to the achievement of the objective, since the presence of the herd effect was identified. There was a relationship between this behavior and the subprime crisis period, the publication of news about the size of the company, as well as the lack of relationship between the effect and the publication of bad news. Therefore, it is considered that the objective of the work was reached and we could answer the research questioning.

## REFERENCES

Agnew, J. R., &Szykman, L. R. (2005). Asset allocation and information overload: the influence of information display, asset choice, and investor experience. *The JournalofBehavioralFinance, 6*(2), 57-70.

Almeida, R. P. (2011). *O comportamento manada em mercados acionários latino-amerimayos*. Dissertação de mestrado em Administração, Universidade Federal de Santa Catarina (UFSC), Florianópolis, Santa Catarina, Brasil.

Amir, E., &Ganzach Y. (1998). Overreaction and underreaction in analysts forecasts. *Journal of Economic Behavior and Organization, 37*, 333-347.

Araujo Neto, L. M. de, Serrano, A. L. M., Oliveira Neto, J. C. da C., Freitas,R. L. C. de & Abreu, E. S. de. (2016). Efeito manada no mercado de capitais: um estudo com gerentes de bancos públicos do Distrito Federal. *Revista de Administração, Contabilidade e Economia, 15*(2), 601-620.

Ariely, D. (2008). *Previsivelmente irracional: as forças ocultas que formam as nossas decisõ*es. Tradução de Jussara Simões. Rio de Janeiro: Elsevier.

Arruda, P. B. (2006). *Uma investigação sobre o efeito disposição*. Dissertação de Mestrado em Engenharia de Produção, Universidade Federal de Santa Catarina, Florianópolis, SC, Brasil.

Banerjee, A. V. (1992). A simple model of herd behavior. *Quarterly Journal of Economics, 107*(3), 797-817.

Barberis, N., & Thaler, R. (2003). A survey of Behavioural Finance. *Working Paper Series, 1*, 1053-1128.

Bastos, E. de S., Rosa, M. P., & Pimenta, M. M. (2016). Os impactos da Operação Lava Jato e da crise internacional do petróleo nos retornos anormais e indicadores contábeis da Petrobras 2012-2015.*Pensar Contábil, 18*(67), 49-56.

Bhaduri, S. N., & Mahapatra, S. D. (2013). Applying an alternative test of herding behavior: A case study of the Indian stock Market. *Journal of Asian Economics, 25*, 43–52.

Bikhchandani, S., Hirshleifer, D., & Welch I. (1992). A theory of fads, fashion, custom, and cultural change as informational cascades. *Journal of Political Economy, 100*(5), 992-1026.

Bikhchandani, S., & Sharma, S. (2001). Herd Behavior in Financial Markets. *IMF Staff Papers, 47*(3) 279-310.

Borsato, J. M. L. S., Costa, R. B. da, Pimenta, D. P., & Ribeiro, K. C. de S. (2009). Otimismo e excesso de confiança: Um estudo do perfil comportamental dos indivíduos, à luz das finanças comportamentais. *Anais doSemeAd, São Paulo*, SP, Brasil, 12.

Chang, E., Cheng, J., & Khorana, A. (2004).An examination of herd behavior in equity markets: an international perspective. *Journal of Banking & Finance, 24*, 1651-1679.

Chiang, T. C., &Dazhi, Z. (2010). An empirical analysis of herd behavior in global stock markets. *Journal of Banking & Finance, 34*, 1911-1921.

Chiao, C., Hung, W., & Lee, C. F. (2011). Institutional, trading and opening price behavior: evidence from a fast emerging market. *Journal of Financial Research, 34*(1), 131-154.

Choi, N., &Sias, R. W. (2009). Institutional industry herding. *Journal of Financial Economics, 94*(3), 469-491.

Christie, W. G., & Huang, R. D. (1999). Following the pied piper: do individual returns herd around the market? *Financial Analysts Journal, 51*(4), 31-37.

Cont, R., & Bouchaud, J-P. (2000). Herd behavior and aggregate fluctuations in financial markets. *Microeconomic Dynamics, 4*, 170-196.

Cutler, D. M., Porteba, J. M., & Summers, L. H. (1989). What moves stock prices? *Journal of Portifolio Management, 15(*3), 4-12.

Delitala, M., &Lorenzi, T. (2014) A mathematical model for value estimation with public information and herding. *Kinetic and Related Models, 7*(1), 29-44.

Damodaran, A. (2010). Equity Risk Premiums (ERP): Determinants, Estimation and Imprications.*Stern School of Business*, 1-89.

During, B. Juengel, A., & Trussardi, L. (2017). A kinetic equation for economic value estimation with irrationality dnd herding. *Kinetic and Related Models, 10*(1), 239-261.

Dzielinski, M. (2011). News sensitivity and the cross-section of stock returns. Social Science Research Network, Rochester, NY. Recuperado em 19 janeiro, 2017, de http://www.zora.uzh.ch/49785/4/Dzielinski_New_sensivity_and_the_cross-section_of_stock_returns-V.pdf

Field, A. (2009). *Descobrindo a estatística usando o SPSS* (2a ed.). Porto Alegre, RS, Brasil.

Flores, S. A. M., Vieira, K. M., & Coronel, D. A. (2013). Influência de fatores comportamentais na propensão ao endividamento. *R. Adm. FACES Journal Belo Horizonte. 12*(2),13-35.

Fu, T. & Lin, M. (2010). Herding in China equity market. International. *Journal of Economics and Finance, 2*(2), 148-156.

Gil, A. C. (2010). *Como Elaborar Projetos de Pesquisa* (5a ed.). São Paulo, SP, Brasil.

Halfeld, M., & Torres, F. de F. L. (2001) Finanças comportamentais: aplicações no contexto brasileiro. *Revista de Administração de Empresas, 41*(2), 64-71.

Gujarati, D. N., &Dawn C. P. (2011). Econometria Básica (5a ed.). Porto Alegre: AMGH.

Hwang, S., & Salmon, M. (2001). *A New Measure of Herding and Empirical Evidence*. Financial Econometrics research Centre – Working Papers Series. London, England.

Hwang, S., & Salmon, M. (2004). Market stress and herding. *Journal of Empirical Finance, 11*(4), 585-616.

Kahneman, D., & Tversky, A. (1979) Prospect Theory: an analysis of decision under risk. *Econometrica, 47*(2), 263 – 292.

Keynes, J. M. (1936). The general theory of employment, interest and money. London: Macmillan.

Kimura, H. (2003). Aspectos comportamentais associados às reações do mercado de capitais. *Revista de Administração de Empresas (RAE), 2*(1), 2-14.

Kremer, S., & Nautz, D. (2013). Causes and consequences of short-term institutional herding. *Journalof Banking andFinance, 37*(5) 1676-1686.

Kutchukian, E. (2010). *O efeito manada nos fundos de investimento no Brasil: um teste em finanças comportamentais*. Dissertação de mestrado em Administração, Fundação Getúlio Vargas (FGV), São Paulo, SP, Brasil.

Kutchukian, E., Dana, S., & Eid Jr., W. (2010). O Efeito Manada nas captações de fundos de investimento no Brasil entre 2005 e 2009. *Anais do Encontro Brasileiro de Finanças*, 10. Recuperado em 21 janeiro, 2017, de http://bibliotecadigital.fgv.br/ocs/index.php/ebf/10EBF/paper/view/1921/1010

Lakonishok, J., Shleifer, A., & Vishny, R. W. (1992). The impact of institutional trading on stock prices. *Journal of Financial Economics, 32*(1), 23-43.

Lam, C. F., Derue, D. S., Karam, E. P., & Hollenbeck, J. R. (2011). The impact of feedback frequency on learning and task performance: challenging the more is better assumption. *Organizational Behavior and Human Decision Processes, 116*(2), 217–228.

Leone, R. J. G., & Guimarães, T. C. (2012). O comportamento financeiro durante e após a crise financeira de 2008 sob a ótica da teoria dos prospectos. *Revista de Contabilidade do Mestrado em Ciências Contábeis da UERJ, 17*(3), 119-140.

Lobão, J., & Serra, A. P. (2002). *Herding behavior: evidence from Portuguese mutual funds. Workingpaper*. Recuperado em 23 janeiro, 2017, de http://www.fep.up.pt/investigacao/cempre/actividades/sem_fin/sem_fin_01/PAPERS_PDF/paper_sem_fin_20jun02.pdf

Lucena, W. G. L., Costa, A. M. M., & Aragão, F. B. (2013). Finanças Comportamentais: Evidências do benefício da aquisição de medicamentos genéricos na população de Caruaru/PE.*InterSciencePlace, 1*, 139-162.

Lucena, W. G. L., Santos, J. M. A., Assis, J. T., & Santos, M. C. (2014). Fatores que influenciam o endividamento e a inadimplência no Setor Imobiliário da cidade de Toritama-PE à luz das Finanças Comportamentais. *Holos, 6*, 90-113.

Macedo, M. A. da S., Almeida, J. E. F. de, & Dornelles, O. M. (2016). Os mercados acionários internacionais reagem mais às demonstrações contábeis ou às notícias? O caso do escândalo do Banco HSBC. *Pensar Contábil, 18*(67), 5-22.

Marques, L. D. (2000). *Modelos Dinâmicos com Dados em Painel: Revisão de Literatura*. WorkingPaper, Faculdade de Economia do Porto. Recuperado em 7 janeiro, 2017, de http://www.fep.up.pt/investigacao/workingpapers/wp100.pdf

Marsden, A., Veeraraghavan, M., & Ye, M. (2008). Heuristics of Representativeness, Anchoring and Adjustment, and Leniency: Impact on Earnings Forecasts by Australian Analysts. *Journal of Finance and Accounting, 47*(2), 83-102.

Menard, S. (2002). *Applied logistic regression analysis* (Vol. 106). Sage.

Passos, J. C., Pereira, V. S. & Martins, V. F. (2012). Contextualizando a pesquisa em Finanças Comportamentais: Uma análise das principais publicações nacionais e internacionais que abrange o período de 1997 a 2010.*Revista de Auditoria, Governança e Contabilidade (RAGC),1*(1), 38-60.

Puckett, A, & Yan, X. S. (2008).Short-Term Institutional Herding and its Impacto on Stock Prices, in SSRN Electronic Journal. Recuperado em 24 janeiro, 2017, de https://www.researchgate.net/publication/228267058_Short-Term_Institutional_Herding_and_its_Impact_on_Stock_Prices

Ricciardi, V., & Simon, H. K. (2000). What is behaioral finance? *The Business, Education and Technology Journal, 2*(2) 26-34.

Rogers, P., Securato, J. R., & de Sousa Ribeiro, K. C. (2007). Finanças comportamentais no Brasil: um estudo comparativo. *Revista de Economia e Administração, 6*(1).

Roth, G. C., Albuquerque, A. A. D., & Silva, D. M. D. (2012). Uma análise dos impactos causados pela alteração do rating soberano sobre o retorno das ações das dez empresas com maior volume de negociações na BM&FBOVESPA. In *Congresso USP de Controladoria e Contabilidade* (Vol. 12).

Sanches, M. V. (2013). Comportamento de manada em direção ao índice de mercado: evidências no mercado brasileiro de ações. Dissertação de mestrado em Administração de Empresas, Universidade de São Paulo, São Paulo, SP, Brasil.

Santana, V. de F.,&Trovati, L. M. (2014). Pessimismo nas segundas-feiras: uma análise do efeito dia da semana no mercado de capitais brasileiro em períodos de crise e de estabilidade. Revista de Gestão, Finanças e Contabilidade, 4 (2), 38-53.

Sarlo Neto, A., Lopes, A. B., & Dalmácio. F. Z. (2010). A influência da estrutura de propriedade sobre a informatividade dos lucros contábeis divulgados pelas empresas negociadas na Bovespa. *Base – Revista de Administração e Contabilidade da Unisinos, 7*(4), 301-314.

Sewell, M. (2007). *Behavioural Finance*. University College London.

Shih, T., Hsu, A., Yang, S., & Lee, Chien-Chiang. (2012). Empirical research of herding behavior in the Pacific Basin stock markets: Evidence from the U.S. stock market rise (drop) in succession. *Procedia – Social and Behavioral Sciences, 40*, 7-15.

Sias, R. (2004). Institutional Herding. *The Review of Financial Studies, 17*(1), 165-206.

Silva, J. X. S. da., Barbedo, C. H. da S., & Araújo, G. S. (2015). Há Efeito Manada em Ações com Alta Liquidez do Mercado Brasileiro? Trabalhos para Discussão, Banco Central do Brasil, 1-19. Recuperado em 20 janeiro, 2017, de https://www.bcb.gov.br/pec/wps/port/TD386.pdf

Soares, R. O., Rostagno, L. M., & Soares, K. T. C. (2002). Estudo de evento: o método e as formas de cálculo do retorno anormal. *Anais do Encontro Nacional dos Programas de Pós-Graduação em Administração*, 27, 30-33.

Tarik, F. R. (2014). *Evidência do efeito manada em fundos de renda variável na indústria de fundos brasileira*. Dissertação do mestrado em Macroeconomia, Fundação Getúlio Vargas (FGV/EESP), São Paulo, SP, Brasil.

Teh, L. & Debondt, W. F.M. (1997). Herding behavior and stock returns: an exploratory investigation. *Swiss Journal of Economics and Statistics, 133*, 293- 324.

Tibúrcio, C. A. S., Carvalho, C. C. de., & Nunes, D. M. S. (2012). O que move o preço da ação? Uma abordagem sobre a influência das notícias no mercado acionário. *REUNIR – Revista de Administração, Contabilidade e Sustentabilidade, 2*(3), 1-13

Tosmayi, G. (2006). Kinetic models of opinion formation. *Communications in Mathematical Sciences, 4*(3), 481-496

Venezia, I., Nashikkar, A., & Shapira, Z. (2011). Firm specific and macro herding by professional and amateur investors and their effects on market volatility. *Journal of Banking & Finance, 35*(7), 1599-1609.

Yao, J., MA, C. & HE, W. P. (2014). Investor herding behaviour of Chinese stock market. *International Review of Economics & Finance, 29*, 12-29.

Zhou, J., Anderson, R. (2013) I. An empirical investigation of herding behavior in the U.S. REIT Market. *Journal of Real Estate Finance and Economics, 47*(1), 83-108.