

Behavioral Finance: A Different View in the State of Rio de Janeiro

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Abstract — *The objective of this work is to present the consolidation of foreign reflections of a new branch in the financial theory, behavioral finance, that it aims at to adhere to the psychological aspects and the sociological ones of the individuals in the process of taking of decision at the moment to carry through an investment, as well as its applications through the incorporation of evidences on the irrationality of the investor. This new segment has as objective the revision and the improvement of the economic-financial model used currently. Through this study it was verified presence of the effect of super valuation of the assets and the effect disposal, as well as of aversion to the risk, since in the occurred economic crisis in 2008 middle a bigger index in the closing of companies was evidenced, and a minor in the opening of companies in the state of Rio De Janeiro. The association to the behavioral finance in such a way provides the agreement of the psychological process that motivates the investments, assisting in the construction of a model of more adequate taking of decision, how much in the act of contract of its administrators who will have to possess abilities adequate psychological techniques and in intention to prevent cognitive bias as reliable excess. The regression for being static got errors in its forecast high thus was not an incisive method, being able to be applied the forecast of demand of products, not obtaining success thus in this model.*

Keywords — *Behavioral Finance, Forecast of demand, Model.*

I. INTRODUCTION

Most of the traditional finance theories were built on pillars of neoclassical micro economy whose main paradigm is the rationality of economic agents. In them, through the Expected Utility Theory (EUT), it is argued that individuals make totally rational decisions, are risk averse and aim to maximize utility. However, several empirical evidence produced in recent decades reveals that these theories alone are not able to explain the various phenomena observed in the financial markets [1]. According to Barbedo & Silva [2], intelligent people make decisions seeking the maximization of utility that is the usefulness that something can produce of benefit. Even so, at all times, people lose money, whether in the stock market, in games, in sloppy purchases, in personal endeavors, and in activities involving decisions.

Behavioral finances are based on the combination of concepts from economics, finance, and psychology, with the aim of generating a specific and judicious model of human behavior in the financial markets, assuming that the Human agents are subject to behavioral determinants that, in many cases, push them away from a decision centered on rationality [3].

It is also worth mentioning the importance of authors Daniel Kahneman and Amos Tversky [4][5], Israeli psychologists and founders of this new study on finance, which in 1979 developed the theory of the prospectus in counterpoint to EUT. In their theory, risk aversion occurs only in the field of gains, because in the losses the

individual tends to be prone to risk, unlike what happens in the EUT. From this, these authors identified three distinct effects: the certainty, in which the individuals in the comparison between a certain event and a probable prefer the right, even if the probable is better; the reflection, which will demonstrate the search for people for safer gains and riskier losses; and isolation, which is linked to the ability to evaluate, presenting the difficulty of individuals to assume mistakes made.

Thus the study of behavioral finances arises as a way of predicting and modeling the said "irrational", but also systematic, of men and women in decision making, through their understanding, inducing them to a better decision, which will lead to the Reduction of money loss in simple everyday situations, consequently in a greater gain [6].

The objective of this article is to analyze the behavior of investors when trying to start a business in the state of Rio de Janeiro, on the optics of behavioral finance, glimpsing the motivations focused on entrepreneurship, using comparative analysis Static of a prediction through a linear regression and compared with the facts happened with the opening and closing of companies in the State. It is expected, through this presentation, to outline the process of analysis and to incite the study of financial behavior through theories from this alternative approach, emphasizing its usefulness for the understanding of important phenomena observed to this practice in the Rio de Janeiro market.

II. THEORETICAL REFERENCE

2.1 MODERN FINANCE

For a long period, finance studies were basically related to financial instruments and their respective uses by economic agents, which aimed to control and minimize financial risks. However, as nothing in the financial market is static, financial theories have been influenced by political, economic and social facts, adapting to the conditions of the time [7] [8].

The traditional finance theory was pioneering, considered the market irrational and judged that it was not always correct. In it, investors were based on past information to design the future [7]. This assumption, however, contradicts the principle of temporal discontinuity which states that companies-corporations and markets-do not behave in the future in the same way they have behaved in the past. [7]. From this, the theory of modern finances has as the main characteristic the Efficient Market Hypothesis (EMH) founded on the EUT and rational expectations [8].

2.2 OPPORTUNITY FOR EFFICIENT MARKETS

An opportunity for efficient markets, according to Milanez [9], it is characterized by neoclassical economic tradition, and admits that human behavior is rational,

capable of maximizing the expected utility and optimally analyzing all the information that is Available. In this way, it is stated that the markets are driven by economic agents that act under an unlimited rationality, making decisions in the perspective of the expected utility theory, formulating expectations often precipitated.

However, with the advent of rational expectations theory, developed in the work of Milanez [9], individuals began to use all available information to improve their predictions, and to make more reasonable decisions. From this, it was found that these conditions imply the same result of the perfect market models, in which the price history of an asset does not influence its future price, because what has occurred in the past is not correlated with the future changes.

In this way, according to EMH, whenever the economic agents check some new information about a particular asset, they immediately adjust the asset prices given the new information available. In addition, a possible irrational behavior of a given agent, characterized as random, would be compensated by another individual, not impacting on the prices [10] [11].

Modern finance theory has its emphasis in the 80 with globalization, but in the 90 the expected utility theory had its rise with the analysis of emerging countries.

2.3 BEHAVIORAL FINANCE

In this new area of study concerning finance, the themes of psychology and economics were incorporated in order to clarify the decision-making process in this new scenario. Following this line of thought, the behavioral finances are based on the study of human action and their weaknesses and failures. These, in turn, are linked to the decision-making process, in which most of the decisions are influenced by the behaviors described by Barbedo & Silva [2] where there are effects on the certainty and uncertainty of investments tied to behavioral finance, analyzed and stated to follow.

This effect is characterized by the tendency of individuals to value more possibilities with greater likelihood of occurring. That is, people prefer events that give them absolute certainty of gain by the simple fact that they do not understand the meaning of the probable results and the notion of expected value [7] [12].

According to Ferreira et al. [7], this effect deals with the fact that individuals remember, most of the time, of events that occur more often, or those that have a greater likelihood of occurring. In this way, their respective behaviors would be influenced by the availability of events, as well as by the association of these to visibility, exposure and overhang.

In addition, Barbedo & Silva [2] it states that people are more dissatisfied with losses than they are satisfied with earnings. In this way, the investor tends to risk more in a loss situation in an attempt to minimize it, or even

eliminate it, recovering at least his initial investment initial. This attitude can lead to more drastic losses, to the point of not being able to bear it anymore and being forced to abandon the investment.

According to Bazerman [13] the rational decision-making model is based on elements that define the way in which the decision must be made, not as it really is. In this line of thinking, considering that managers process many decisions, many of them routine - requiring little mental effort - and other, however, strategic - require a special sensitivity, dealing with several aspects such as new directions, setting, winning the competition, and above of everything, to obtain profit - it is essential for the projection of the company that the latter are well defined. [14]. For this, we study some biases that are intrinsic to the individuals, so that the decision making is not biased. Some of these behaviors will be analyzed for a better understanding.

This status expression is defined by Samuelson and Zeckhauser [15] to demonstrate the tendency of people to cling to old rules or conditions. That is, when new relationships are presented to individuals, they tended to prefer pre-defined options. This phenomenon is tied to the idea of loss aversion relative to the reference point, that is, most people define and set a benchmark to follow, even if they offer better opportunities. One way of breaking this paradigm and following more patterns that are rational is the very knowledge of this bias.

According to Yoshinaga [1], people tend to make judgments from previously formed models. From this, individuals estimating a probability disregard sample size, taking into account only one representation for the entire population, selecting information that is more convenient to them than the relevant ones.

This behavior is known in the literature as the belief that there is a tendency to regress to the mean of the results. It occurs because of the inability of people to statistically analyze independent events - the occurrence of one does not statistically influence the occurrence of the other. One of the cases that can be cited is the multiple-choice test with 5 alternatives for each question, when you have a sequence of questions with the same alternative, consequently, individuals begin to doubt if that is really the correct template. This behavior is biased, because each question is an event independent of each other, that is, for each of them you would have a 20% chance of success [16].

The great challenge in the field of finance is in proving the predictability of behavioral anomalies, and whether these can actually determine changes in the market. The theory of perspectives based on the grounds of loss aversion and excessive self-confidence was one of the ways in which some of the types of behaviors were identified by the researchers Tversky and Kahneman [4].

However, there is not yet a single model that explains all the anomalies generated by human behavior, but for each one in particular. The following will describe some theories.

Tversky and Kahneman [4] conducted research at Stanford University and Columbia. In it they have found evidence that changing from a perspective to a specific situation can influence and bias the choice of alternatives. From this, it has been found that people, within certain gain events, are risk averse, while in choices involving losses, they are risk prone. Through the theory in question two basic concepts are analyzed: loss aversion, and excessive self-confidence.

2.3.1 LOSS AVERSION

This is a concept considered one of the pillars of Behavioral Finance, and states that the investor ponders both gains and losses, but from different perspectives. According to Tversky and Kahneman [4] investors feel much more the pain of loss than the satisfaction gained by an equivalent gain. According to Rogers et. al [8], it is observed that the fear of loss leads people to make irrational decisions, creating cognitive frames that make it difficult to analyze historical data and mainly statistical probabilities.

This theory contradicts the Theory of Utility, a precept integral to the Modern Model of Finance. Figure 1 assumes that the investor assesses the risk of an investment according to the change it provides to its level of wealth, the other in Figure 2 states that the investor assesses the risk from a will measure gains and losses.

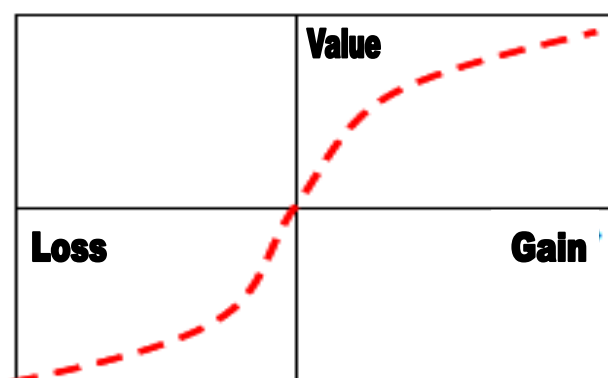


Fig. 1: Theory of Utility

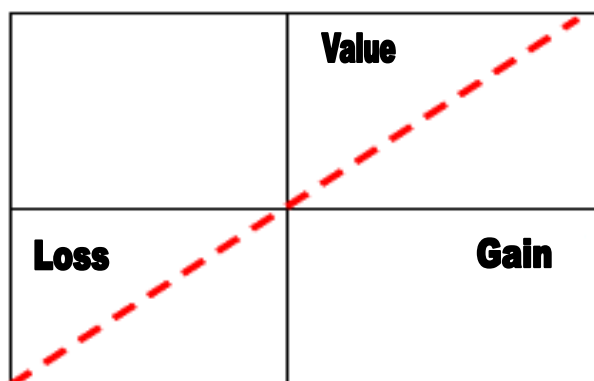


Fig. 2: The Prospectus Theory

Another characteristic of this behavior is the fear of repentance. It is worth remembering that it is quite painful for an investor to make mistakes, and with this attitude, his profit is not maximized, contradicting once again the Theory of Utility.

2.3.2 EXCESSIVE SELF-CONFIDENCE

According to Milanez [9] overconfidence is a hallmark of most of the world's population. With investors, it is no different, since most consider themselves to be above average. This behavior makes sure that your information is better and more reliable than that of others who operate in the same market. Consequently, due to the incorrect understanding of reality, there is a tendency to achieve an excessive turnover, with a marked risk.

III. COMPARATIVE ANALYSIS BETWEEN THE FINANCIAL MARKET AND A STATISTICAL FORECASTING METHOD

We then return to the discussion about the opening of companies in the state of Rio de Janeiro in 2007, being of great relevance in the study of behavioral finances in the line of temporal analysis, as shown in Figure 3 (relation from 2007 to 2008). According to Barbedo & Silva [2], there was emphatic entrepreneurial motivation in microsystems in the state of Rio de Janeiro in investments in entrepreneurial ventures.

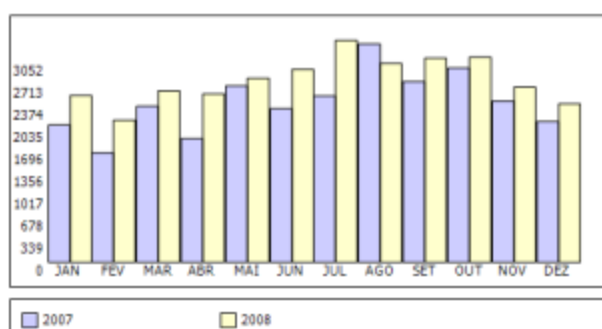


Fig. 3: Comparative Statistics of Companies Opening from 2007 to 2008. Source: Rio de Janeiro Trade Board, 2008.

In 2008 and 2009 there is another increase in the opening of companies in a few months, as shown in Figure 4, this can be noticed with greater emphasis as of May 2009, when the government initiated the reduction of IPI (Products Tax Industrialized).

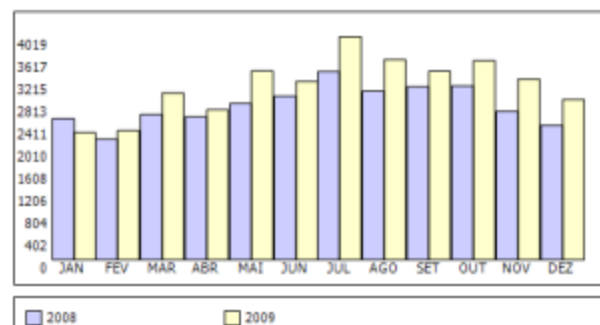


Fig. 4: Comparative Statistics of Companies Opening from 2008 to 2009. Source: Rio de Janeiro Trade Board, 2008.

Figure 5 shows the relation between the closures of companies from 2007 to 2008, as well as an increase in the second half.

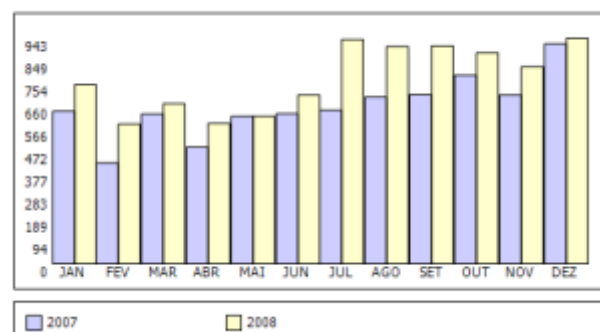


Fig. 5: Comparative Statistics of Closing Companies from 2007 to 2008. Source: Rio de Janeiro Trade Board, 2008.

Figure 6 shows the relation between the closures of companies from 2008 to 2009, as well as a comparative increase in all related months, due to the beginning of the world crisis.

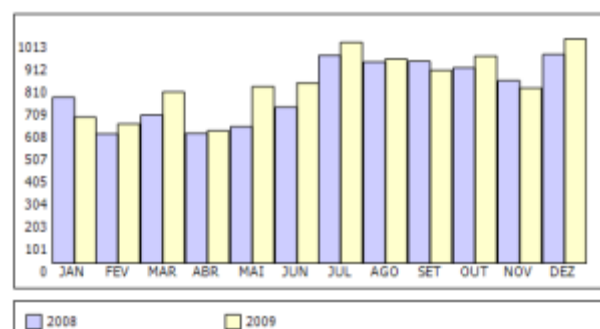


Fig. 6: Comparative Statistics of Companies Closing from 2008 to 2009. Source: Rio de Janeiro Commercial Board, 2009.

The analysis from the behavioral finance perspective of the relationship between opening and closing companies, according to Barbedo & Silva [2], is a consequence of the involvement of the emotions in the financial market as the tendency to exaggerate in front of new information. According to the Efficient Markets Hypothesis, new information should be reflected instantly in the asset price. Based on this, it can be correlated that during the crisis there was an increase in the closure of companies due to the fear it received in mid-2008.

Good news should raise the price of the asset, and it should not fall if no new information is given. The reality, however, tends to contradict the theory, since based on the theory of challenge and risk of it can be incited that even at the beginning of the crisis in 2008 people invested in the opening of companies for their entrepreneurial spirit. Sometimes financial market participants act exaggeratedly on new information, creating an asset overvaluation effect. According to the availability theory, people tend to give more weight to the latest information for decision-making. This happens all the time in our daily lives. For an analysis relating the behavior in the opening of companies applying the linear regression analysis and verifying the prediction and the real behavior simulating the year of 2008 and forecast for 2009 (Table 1 and Table 2).

Table 1: Linear Regression

X	2008 – Y	2009 – X.Y	X ²
1	2548	2548	1
2	2173	4346	4
3	2621	7863	9
4	2576	10304	16
5	2816	14080	25
6	2949	17694	36
7	3391	23737	49
8	3039	24312	64
9	3119	28071	81
10	3135	31350	100
11	2678	29458	121
12	2424	29088	144
78	33469	222851	650

Table 2: Forecast and correlation of the deviation.

X	2008	Forecast	2009 Real	Deviation
1	2548	2816,83	2292	81,37
2	2173	2820,53	2328	82,54
3	2621	2824,23	3007	106,47
4	2576	2827,93	2705	95,65
5	2816	2831,63	3403	120,18
6	2949	2835,33	3215	113,39

7	3391	2839,03	4019	141,56
8	3039	2842,73	3606	126,85
9	3119	2846,43	3399	119,41
10	3135	2850,13	3588	125,89
11	2678	2853,83	3259	114,20
12	2424	2857,53	2888	101,07
78	33469	34046,16	37709	110,76

The correlation of the forecast and the opening of companies show that there is a margin of error above 10% that can be explained by the static forecast and by the variable behavior of the financial market. The forecast and behavior in Closing Companies.

Table 3: Linear Regression

X	2008 – Y	2009 – X.Y	X ²
1	750	750	1
2	585	1170	4
3	670	2010	9
4	588	2352	16
5	617	3085	25
6	706	4236	36
7	939	6573	49
8	909	7272	64
9	912	8208	81
10	883	8830	100
11	825	9075	121
12	943	11316	144
78	9327	64877	650

For an analysis relating the behavior in the closing of companies applying the linear regression analysis and verifying the prediction and the real behavior simulating the year of 2008 and forecast for 2009.

Table 4: Forecast and correlation of the deviation

X	2008	Forecast	2009 Real	Deviation
1	750	1000,23	660	65,99
2	585	1029,96	630	61,17
3	670	1059,69	774	73,04
4	588	1089,42	599	54,98
5	617	1119,15	799	71,39
6	706	1148,88	815	70,94
7	939	1178,61	998	84,68
8	909	1208,34	923	76,39
9	912	1238,07	872	70,43
10	883	1267,80	937	73,91
11	825	1297,53	792	61,04
12	943	1327,26	1013	76,32
78	33469	13964,88	9812	70,26

The correlation of the forecast and the closure of companies show that there is a margin of error above 30% that can be explained by the static forecast and by the variable behavior of the financial market.

The study of this new branch, behavioral finance, came to aggregate to the analysis of the decision making in the investments made by the individuals, once the theory of modern finances was not enough to explain the anomalies occurred in the financial market.

IV. CONCLUSION

In the present work, this theme was used in a new perspective, that is, the studies found on behavioral finances, mostly, are focused on the financial market, but through this work can be analyzed, from a motivational point of view, the factors that drive and influence individuals at the time of making any investment. In the case in question, which leads them to open as well as to close a deal.

Through this study, we verified the presence of the effects of asset overvaluation and the disposition effect, Barbedo & Silva [2], risk aversion, advocated by Tversky and Kahneman [5], since in the economic crisis occurred in the middle of 2008 was evidenced a higher index in the closing of companies, and a lower in the opening of companies in the State of Rio de Janeiro.

As previously discussed by, it is known that, despite the EMH defend the rationality of investors, human behavior is influenced by several psychological factors that, most of the time, distort the rational decision-making process. From this, the association with behavioral finances provides a better understanding of the psychological process that drives investments, favoring the construction of a more adequate decision-making model, as well as in the selection and hiring of its managers who should have appropriate psychological and technical skills in order to avoid cognitive biases such as overconfidence. Regression, because it is static, has raised errors in its prediction. In this way, this was not an incisive method, because it was not successful. However, it can be applied to the demand forecast of products.

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