THE INFLUENCE OF BEHAVIORAL ANOMALIES OVER RISK MANAGEMENT ON THE CAPITAL MARKET. THE COGNITIVE MODEL OF INVESTOR

Corina Maria ENE*

Abstract. *Behavioral finance is an area to which is attached an increasingly higher importance due to the increased complexity of current context. It has been demonstrated that when analysts build or revise their estimates, there is a tendency to anchor expectations in past events, displaying a conservative attitude, when it is necessary to adapt to new circumstances. The same thing also happens, when it comes to investors, who fail to incorporate wholly new information about various situations, remaining anchored in the past and having a tendency to underrate the new information.*

From a behavioral perspective, failure to purchase could be caused by the status quo error, by aversion to regret, paralysis of choice, the existence of too much information, the hope that the price will return to a lower previous value or by the regret not to have bought sooner. Similarly, the failure to sell may be due to error of status quo, aversion to regret, too high information volume, the endowment effect, recent memories persistence or desire not to sell at a loss. So, we notice that a proper identification of behavioral abnormalities shown by an investor may be relevant in explaining his behavior, which viewed globally, at the level of all investors, determine the capital market anomalies.

Keywords: *Behavioral finance, cognitive anomalies, herd effect, investment behavior, mood effect, risk, portfolio, theory of prospectus.*
JEL classification: *G40, G41.*

Introduction

Studies have shown that people exhibit a tendency to over-appreciate themselves when they evaluate the degree of fairness of their own judgments or skills, as well as when they evaluate a range in which certain values are positioned. Investors also attach great importance to information less relevant, but widely circulated and neglect the truly important information [9]. It was demonstrated the tendency of overestimation of the

* Hyperion University of Bucharest, corina.maria.ene@gmail.com

accuracy of knowledge that people possess as well as their ability to act in a positive sense, and the excessive confidence they have that in the future will happen more positive than negative things. In addition, people have a tendency to exaggerate the positive results of the past and remember more quickly the successes than failures. Excessive confidence in their abilities and unrealistic optimism can lead to a very strong motivation, a more active performance and ultimately to greater success [13], but at the same time can lead to erroneous judgments.

Self-attribution, as a behavioral abnormality in the investment process, was observed by analyzing how individuals assume their successes, while the failures are attributed to external factors. The origin of the self-attribution is the natural tendency of self-protection, as well as that of maintaining a positive image in front of other people. Thus, in a situation where an individual considers that a task is very important, it's very likely to use self-attribution in explaining the results, and the abnormality will manifest even more poignantly, as self pride is stronger. The existence of positive performance or previous experience is also important in the manifestation of self-award, just as the existence in the external environment of competitive participants, along with self pride lead to a strong manifestation of abnormality. Male persons tend to manifest the self award abnormality more poignant than female persons, just as persons belonging to Western cultures manifest the abnormality stronger than those belonging to Eastern cultures [6]. This is explained by the weak connection between self pride and the results of an action, present in people belonging to Eastern cultures, where the focus is more on the success of the group than the individual, by contrast with the philosophy of most investors in the West.

Two other major categories of cognitive abnormalities refer to availability and anchoring or similarity.

Availability defines the way in which a person is based on the knowledge that already possesses, at the expense of studying other alternatives that are not familiar, and similarity is the way to evaluate situations by comparison with similar situations. We can consider that the similarity is the generalization of the thinking process.

In terms of similarity or anchoring and adjustment, people who have to issue judgments under uncertain conditions start from a point of reference (anchor) following that through successive adjustments to formulate a final conclusion. There is a direct link between anchorage and over appreciating their own foresight capabilities for investors, which, in most cases, make decisions on the basis of the reduced information

available at a specific time, and when new information is available, there is a review of previous forecasts, although a new analysis would be more relevant. So, it's natural as a result of the review of an earlier analysis, to produce information that does not fully reflect the existing new elements.

Also in the category of major cognitive abnormalities enter the heuristics, defined as using experience and pro-active efforts to answer some questions or for improving performance [12]. Use of heuristics is usually for reducing the complexity of the problems to simple operations, requiring fewer judgments, their role being to ease the decision-making process. However, the reality pointed out that there are situations in which they can generate errors, leading to erroneous investment decisions, especially when changes occur. The most studied heuristics in relation to the area of behavioral finance are affects, representativeness, availability, anchoring and adjustment, familiarity, over-confidence, status-quo, aversion to regret, loss and ambiguity, conservatism and mental accounting.

Investment behavior from the perspective of behavioral finance

The behavior is dependent upon the method of framing mental events or information, how a problem is described and understood being essential in making a choice in the decision process. The manner in which framing is done depends both on mental and cognitive-emotional factors.

From the cognitive perspective, framing is affected by the way in which individuals organize information mentally and how they define their goals in terms of profit and loss. The emotional area is responsible for how people react emotionally to receiving various types of information.

In the Prospectus Theory, is described how investors frame and evaluate decisions involving uncertain area. Thus, investors examine their options in terms of potential losses or earnings by comparison with a reference price, which usually is the purchase price.

Another behavior feature is the narrow framing that individuals do, focusing on changes in income defined in the narrow sense, both portfolio and time horizon. An ideal behavior, without anomalies, should involve the evaluation of changes in income of the entire owned portfolio, on a more distant time horizon. But the inability to process a large volume of information in a very short time, leads to another anomaly, cognitive over-load. Thus, individuals tend to give great importance to the information appearing in multiple sources and not to consider the so-called weak signals.

Habits are also a source of excessive simplification of information, and in situations where reference points are missing, people tend to think that the present condition will continue indefinitely into the future and the fact that the assessments they make are correct.

Cognitive anomalies of the investor

The most important cognitive abnormalities refer to the herd behavior, the simplified common denominator, the dominant investors and manipulation.

The herd behavior was defined as trading of a group of investors in the same direction in a given period of time [8] or like an action which misrepresents previous beliefs of some investors to bring them closer to those of the investors who express their convictions very clearly [3].

Thus, the conduct of the herd or imitative behavior refers to the consideration by the investor of decisions taken by other participants before making their own decisions. Thus, an investor can choose the same portfolio with that of another investor only to avoid losing his reputation or may choose portfolios whose value is very close to that of benchmark portfolios to reduce the risk of underachieving.

The study of the herd behavior has important implications for the financial market, investors ignoring the information they have, which leads to a deviation of the shares price from their fundamental value. Also, the herd effect appears to be the most plausible explanation for the formation of speculative bubbles.

It was observed that the herd effect tends to manifest itself more powerful in the periods in which information flows are abnormal, or in situations where there is no economic crisis and when investors are looking for a support in others' opinion in terms of the subsequent evolution of the share price. It has thus been revealed that, if the herd effect was present for the vast majority of investors before the beginning of the economic crisis, their dealing has decreased significantly during the crisis [2].

Another factor that determines the manifestation of this effect has been demonstrated to be the nationality of investors. So, American investors and those from Hong Kong do not display a herd effect as strong as that of the investors from South Korea, Taiwan or Japan [1]. It was also pointed out that a country's residents exhibit such behavior much stronger than non-residents trading on local markets [7].

Other determinants of herd behavior are limited available sources of information, as well as the size of the companies – there is a greater

tendency for the manifestation of the effect when it comes to the small companies' shares compared to those of large companies.

The simplified common denominator represents, in most cases, the conventions and rules that generate social behavior and to which the investors tend to report, ignoring signals or information that have a lower resonance or are weaker.

The dominant investors, such as the holders of very high value portfolios, or known analysts, are considered very often as some benchmarks in terms of investment behavior, their advice and information being considered as safe and interpreted in exaggerated manner.

Manipulation is another form of cognitive anomaly. There are various forms of market manipulation, which essentially is due to investor manipulation, being demonstrated that groups are more easily to influence. In the presence of strong personalities, people easily accept to undergo certain opinions or apparent authority.

Another type of behavioral phenomenon is defined by the individual emotions, composed by affects, aversion to risk and loss, aversion to regret, the excessive optimism, pride of involvement, status-quo anomaly and excessive patriotism.

Affects relate to the manner the subjective opinions about how "good" and "evil", or favorable and unfavorable situations may influence the development of quick judgments and the production of systemic abnormalities. They refer to the results of interpretation of positive and negative things, and are effective responses that are occurring rapidly and automatically to various stimuli [11].

For example, investors assess as good the actions that have a low risk and high gain and by the opposition as evil, those involving a high risk and a small gain [4]. So, for actions that are not familiar to them, the perceived risk and gain are negatively correlated, while for known actions, the two notions have a positive correlation.

The decisions of individuals depend on the emotions they manifest, correlated with their needs, fears and fantasies which they manifest in different contexts. Subtle and complex, the way in which emotions influence the drafting of judgments, relating to investment offers, is an explanation of anomalies in the market.

The desire to avoid regret generates cognitive dissonance that is defined as a mental distress for those who figure out directly or indirectly that their assessments or actions were wrong [10].

Due to the anticipation of a potential future regret, investors are willing to take a lower risk because in this way they think they can avoid a

loss. The natural tendency for protection against the emergence of regret leads to the sale of assets that register growth and keeping in the portfolio of those that register decrease. On the other hand, we can also identify a positive influence of this emotional anomaly, which may also cause investors to take risks, according to the feedback they're going to receive after making a decision.

Another behavior treated as an individual abnormality is excessive optimism. The existence of this abnormal excessive optimism can be attributed to over-confidence, but should not be confused with this. If over-confidence is about excessive confidence in their own abilities, excessive optimism is derived from previous anomaly and involves the belief that the events to occur are more likely to be favorable than unfavorable.

Another individual anomaly is investment patriotism, that refers to keeping in the portfolio of the shares from the country where the investors are domiciled or whose citizenship they took: American investors will hold mostly American companies' shares, just as the Europeans will hold shares of European companies or the Japanese will hold shares of Japanese companies [12], due to the feeling of familiarity of national markets in comparison with foreign ones.

The Mood Effect as a behavioral template to avoid theoretical losses

The elements listed above as part of investor's psychology have a significant influence on the behavior of the market, the most important identified template being the mood effect. The mood effect [12] defines the behavioral template to avoid theoretical losses and attempt to obtain the theoretical gains. The consequences of this effect translate into a tendency for investors to sell shares that have experienced a positive return and to keep those that register loses or negative return.

The analysis of the mood effect starts with the definition of the share price as:

$$P_t = wF_t + (1-w)R_t \tag{1}$$

where: F_t – the fundamental value of the share, R_t – the reference share price for the investors manifesting the mood effect, w – percentage of investors manifesting the mood effect.

Since the reference price suffers successive alterations based on new information that appears in the market (v_t), the reference share price for the investors manifesting the mood effect is given by the equation:

$$R_t = v_{t-1}P_{t-1} + (1 - v_{t-1})R_{t-1}, \tag{2}$$

and as a consequence

$$P_t = wF_t + (1-w)[v_{t-1}P_{t-1} + (1 - v_{t-1})R_{t-1}]. \tag{3}$$

The previous equation (3) shows that the price of an action depends both on the fundamental value F_t and the impact of previous achievements R_t defining the gains or losses adjusted by a factor of investors' impact showing the effect of mood.

Return on assets can be thus defined as:

$$Ran_t = \frac{P_{t+1} - P_t}{P_t} = \frac{w}{wF_t + (1-w)R_t}\varepsilon_{t+1} + \eta_t, \tag{4}$$

and volatility:

$$\sigma_t = \frac{w}{wF_t + (1-w)R_t}\sigma_\varepsilon \tag{5}$$

where σ_ε is volatility in relation to the fundamental value of shares.

The return formula (4) clearly illustrates the role of the mood effect: the share price reacts to the information about fundamental value, maintaining a constant reference price [5]. The higher proportion of investors that manifest the effect of mood is the lower will be the price sensitivity towards its variations by the fundamental value. In other words, the presence of this type of investors leads to the emergence of price fluctuations, and the number of investors in this category, or their percentage, directly influences the type of change (amplification or reduction).

The relationship between the mood effect and the volume of transactions can be characterized by the equation:

$$E[V_{t+1}] = \mu(1-\mu)wE[|\varepsilon_{t+1} - v_t(P_t - R_t)|] = 2\mu\frac{1-\mu}{1+\mu}\sqrt{\frac{2}{\pi}}\sigma_\varepsilon^2. \tag{6}$$

Thus, the impact of the change in the proportion of investors showing the mood effect depends on the size of this type of investors, μ.

Studies have shown that for $\mu < 0,4$, an increase of μ will lead to an increase in traded volumes, while for $\mu > 0,4$ the increase the value of μ will involve reducing the traded volumes.

The effect of mood can be easily noticed in the traded volumes, which are very high when the market is rising and fall then when the market goes down.

Conclusions

According to traditional finance, financial decisions should be based on rational calculations. Experience shows, however, that people do not possess enough computing skills, and the assessment of investment-related decisions shall be made by analyzing their effects on total income. Because the way in which short-term decisions affect long-term revenue it is difficult to estimate, just as it is difficult to perceive at the emotional level, individuals are separating the investments in different mental accounts, each account having a different meaning. Also people tend to separate decisions which should be taken together.

Cognitive errors and anomalies of individuals or groups are influencing the market trend and evolution of share price. According to classical theories, the mistakes of investors does not affect share price since a deviation from the fundamental value will be exploited by investors for profit. Although institutional investors are those that maintain efficient markets because of their knowledge and the necessity to obtain profit, their behavior may cause abnormalities of the prices. Because investors are reviewing their expectations lately and incompletely, there may be a false surprise effect that can be both positive and negative.

Attitude towards risk is also influenced by previous choices results – previous earnings will result in a behavior characterized by an increasing risk tolerance, while earlier losses have an opposite effect. These behaviors can be explained by mental accounting, and it is important to determine if the attitude of investors towards risk in terms of gains and losses is based on individual assessment of assets, on a part of the portfolio or on the entire portfolio.

Interaction between cognitive and affective system can be regarded as the main cause of a certain attitude towards risk. Cognitive system is the one responsible for addressing risk probability, while the affective system can be assimilated to the approach consistent with the elements of the behavioral theories of the portfolio.

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