
BEHAVIOURAL STUDIES ON THE BULGARIAN STOCK EXCHANGE

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Abstract: Efficient Market Hypothesis by Eugene Fama is one of the most sufficient achievements in the field of normative economic (and thus financial) theory. Basically, it assumes, that market prices of financial instruments are a good approximation to fundamental or intrinsic value of a security and that investors are rational and do not exhibit any cognitive or emotional biases in decision making process. At the same time, behavioural finance proponents and researchers claim, that even rational investors may show behavioural biases in trading, and point at various documented market anomalies, that up to date may not be explained through the traditional economic framework.

This paper aims at summarizing and discussing the presence of behavioural biases in investors` decision-making process on one of the most avoided securities` markets for empirical examinations such as frontier financial markets like the Bulgarian Stock Exchange (BSE). Possible explanations for this evidence may be the lower liquidity at these markets, the lack of an official record of historical securities` prices and the absolutely local significance of such exchanges. On the other hand, frontier markets may offer valuable opportunity for portfolio diversification in addition to emerging and developed markets. Taking into consideration behavioural and cultural specifics at local financial markets may be beneficial for investment strategy construction.

Summary of research results shows that investors trading on the BSE exhibit specific behavioural biases. However, scientific interest on such non-conventional issues of practical importance on the BSE is limited to a few papers. It could be stated that investors on the BSE may have exhibited irrational behavioural in “hot markets”. Thus, they have overvalued the stocks at their initial public offering to a greater extent as it could be viewed on developed markets. Possible explanation may be the fact that investors on the BSE are less experienced. Second, it may be argued, that investors at the BSE show over-optimism. Another research observation is, that investors on the BSE are also myopic. This behavioural bias is very similar to recency bias, which means, that economic agents tend make investment decisions based on too recent historical performance of companies and their stocks. Further research conclusion shows that male investors on the BSE may have exhibited higher overconfidence bias than female ones.

In addition, short-term return predictability has been presented on the BSE. This evidence (also called momentum effect) is one of the most challenging market anomalies to be reconciled with the Efficient market hypothesis. It turns out to be persistent over time and vanishes within financial crisis periods only to reappear later. Based on research results it could be argued, that underreaction may be the underlying behavioural explanation for momentum effect to appear on the BSE within the period prior to the Global Recession of 2008 – 2009. Based on the empirical results and the 6-D Model of Culture by Hofstede for Bulgaria it may be indicated, that investors on the BSE may have exhibited loss-aversion bias.

The present study contributes to existing research literature by summarizing various empirical examinations that are related to the less analysed frontier financial markets like the BSE and by providing an up to date picture of different behavioural biases which may have influenced investment decisions, leading to the appearance of market anomalies like momentum effect.

Keywords: behavioural finance, biases, Bulgarian Stock exchange, momentum effect

1. INTRODUCTION

The present study provides a different perspective on one of the barely studied frontier markets, such as the Bulgarian Stock Exchange. A more complete picture of the cognitive and emotional biases that influence investors in the decision-making process is achieved. It is important to note the fact that behavioral research on the BSE is very limited. Thus, presenting a summary of what has been documented up to now would contribute to a more comprehensive understanding of the specific cultural features intrinsic for Bulgaria and of the investors trading on its capital market.

Possible explanations for the low Bulgarian academic interest on the BSE from a behavioural point of view may include: the lack of interest in behavioural theories, the short history of the Bulgarian capital market, the traditional low liquidity, which imposes certain challenges on the analysis, the transition to market economy accompanied by economics and political turmoil, and the unrepresentativeness of the BSE in regard to the Bulgarian economy and its branches (Angelov, 2009, p. 3; Yovogan, 2013). However, the Bulgarian capital market provides an opportunity of portfolio diversification within the European Union due to the free movement of capital and the liberalization,

facilitating the inflow of foreign investment in the country. According to Bogdanova (2014a, p. 9) it could be claimed that due to the low degree of integration of the Eastern European stock markets, including Bulgaria, with the developed stock exchanges, there is an opportunity for diversification. According to Bogdanova (2014b) American, German and British investors benefit from the inclusion of Bulgarian equity securities in their portfolios only in the short term, while for Japanese investors BSE generally provides an appropriate opportunity for diversification. On the other hand, Bogdanova (2014b) argues that the BSE is vulnerable to the emergence of global financial crises, which significantly reduces the benefits of diversification.

Mileva (2014) analyzes the BSE before and during the Global Recession. Thus, between 2003 and 2006 there is a market boom and constantly rising prices of traded Bulgarian equity securities. This evidence stems from the inflow of new capital to the stock exchange, as well as the highly positive expectations of investors. In 2007 the BSE performed best so far. The registered turnover for 2007 amounting to BGN 9.946 billion is three times higher than that for the previous year. In addition, there is an increase in transactions by 200%. According to Mileva (2014), the Great Recession also affects regional markets such as BSE AD. Bulgarian stock exchange indices such as SOFIX and BG-40 lost 300 to 350% of their value between 2008 and 2010. Their further decline in 2011 was about 10%. The first signs of market recovery appeared in 2012, when the annual increase in turnover on the regulated market was 9.36%. The following 2013 marked an increase in all stock exchange indices of BSE (SOFIX by over 43%, BG-40 by 27% and BGTR30 by almost 12%). The burst of the Great Recession from 2008-2009 slowed economic growth in Bulgaria, and on average for the period 2008-2017 it dropped to 1.9% on an annual basis (Zlatinov, 2018). According to the work of Petranov (2017), the recession in Bulgaria was overcome in 2015, given the changes in the values of the main macroeconomic indicators.

What is more, Kenourgios & Samitas (2009) state that momentum effect trading strategy is the most suitable for the realization of abnormal profits on the emerging Balkan stock exchanges (Bulgaria, Romania, Croatia and Turkey). Next, we will summarize the findings of the 6-Dimensions Model of Culture by Geert Hofstede for Bulgaria. According to the freely available data provided by Hofstede Insights (2018) it could be concluded that Bulgarian society features centralization and a strictly defined hierarchy, collectivism, understanding, equality, mutual assistance, esteeming of quality of life, emotionality, strong need for regulations regardless of their effectiveness and pragmatism.

Although legally allowed short sales are still practically absent on the BSE. Thus, according to Minchev (2018), there are still a number of factors on the Bulgarian stock market that deter speculators from entering, such as scarce information, limited borrowing, and a lack of market makers.

The rest of the paper is structured as follows. Section 2 provides the analytical framework in the context of literature review of basic characteristics and findings for the BSE. The paper methodology is presented in Section 3. Next, section 4 discusses the major research results concerning previous behavioural studies on the BSE and Section 5 concludes the paper.

2. MATERIALS AND METHODS

The main purpose of the current paper is to provide a structured overview on the BSE focusing on behavioural evidence. Thus, the research focuses on a descriptive analysis of the main documentations for behavioural aspects on the BSE and its investors. Comparative analysis is also performed aiming at formulating conclusions for the investors on the Bulgarian equity market, their decision-making biases, and the implicit causality. This approach would contribute to the better understanding of a regional frontier financial market such as the BSE. Within the discussion in the next section research methodology of each paper is shortly presented.

3. RESULTS AND DISCUSSION

Ivanchev (2017) examines the issue of the initial public offering (IPO) of shares during the so-called “hot markets”, when there is widespread evidence of irrational behavior by investors and markets. According to the argumentation of Ivanchev (2017, p. 83) increased demand on equity securities and the resulting optimism of investors leads to increasing prices of traded financial assets increase due to, which leads to overestimation of public companies.

As an example of “hot market” implications we can take the late 90s of the 20th century with numerous initial public offerings in the United States conducted by technology companies, and not only, which became extremely popular among investors, who manifested high degree of irrational behavior. Economic agents perceive economic upswing as a chance to make good profits. So many companies go public. For example, the company Value Software Corp. initially issued shares on an organized stock exchange in 1999, with an issue price of \$30 per share. On the first day of trading, the company registered a closing market price, that was by 697.5% higher than the issue price. Thus, the market price reached \$239.25 per share for one day only. Thus, Value Software Corp. tops the list of the 25 companies listed on a stock exchange in 1999, that have realized the highest increase in the closing price compared

to the issue price. Despite this phenomenal increase of over 200% on the first day of stock trading, most of these 25 companies reported poor results over the period 2001-2002 (Ghosh, 2006).

Ivanchev (2017) cites a study on the US capital market, which shows that in the long run, companies conducting an IPO in a “hot market” realize for the next 5 years an annual return, that is lower by 2.2% to 3.8% compared to companies in the same industry (Ritter, 2003, p. 295). So, Ivanchev (2017) aims to examine a “hot market” state on the BSE through comparing the performance of Bulgarian companies, that resorted to an IPO in the years between mid-2006 and the end of 2007, with that of the index BG40. Employing empirical historical data for 5 companies listed on the BSE, Ivanchev (2017) compares the closing market price as of the first day of trading to the corresponding values in each of the following five years. Thus, annual growth rate of closing prices for each company is calculated and compared to corresponding results for the market index BG40. Total realized stock return for the whole five-year period is also calculated and geometrically annualized. The results achieved by Ivanchev (2017, pp. 90-91) clearly show that the BG40 index achieves higher profitability than each of the five companies investigated according to the geometric mean. As regards the annual growth rate of closing prices, it can be summarized that in most cases the index used as a benchmark performs better. Possible explanation for this evidence may be the overestimation of the issues at the moment of the initial public offering. According to Ivanchev (2017, p. 99) this is due to the issue price set by the majority owner, who takes advantage of the irrational behaviour of investors on the Bulgarian stock market.

According to Ivanchev (2017), Bulgarian investors have shown a higher degree of irrationality than investors in the US stock markets as of the study of Ritter (2003), that covers the period from 1970 to 2000. This is due to significantly higher deviations of the profitability of the examined 5 Bulgarian companies (between 7% and 20%) compared to those for the USA (between 2.2% and 3.8%). The reason for this, according to Ivanchev (2017) lies in the lower experience of Bulgarian individual and institutional investors, as well as the conditions that are typical for BSE such as low liquidity, the presence of informal arrangements and the lack of new assets with sufficiently good quality. Thus, the researcher concludes, that investors on the Bulgarian stock market tend to show optimism when making investment decisions over the period of market growth (2004-2007).

A conclusion obtained by second research paper by Ivanchev (2015) shows that the investors` behaviour on the BSE shows myopia bias. According to the author, economic agents neglect the importance of tracking the results achieved by different types of securities over a sufficiently long period of time. Thus, investment decisions are based on the analysis of historical data from the most recent past and from small databases. The tendency to myopia coincides in meaning with recency bias. Influenced by it, investors ignore the occurrence of market bubbles and the concept of fundamental value, thus risking financial losses (Pompian, 2012a, p. 184).

The third behavioural study of the BSE by Ivanchev (2013, p. 157) examines the self-confidence bias inherent in the investors on the Bulgarian equity market depending on gender. The study period covers the period between mid-2006 and mid-2012. The author concludes that men who traded on the Bulgarian stock market show higher self-confidence than women. Men show increased prejudice in reaching the desired price level when ordering, which is not justified. Women performance is higher. Additional results include: number of male investors for the whole period is over 4 times higher than that of women (1,026 men against 249 women), men submitted about 2.5 times more orders than women, and matched orders of men exceeded those of women by more than 2 times for the period. It is important to emphasize that the data presented is calculated in regard to the number of placed orders and of actually executed transactions, per man and per woman.

Another behavioural research strand in regard to the BSE is provided by Nedev & Bogdanova (2017). The authors examine the presence of momentum effect on the Bulgarian equity market. Basically, momentum effect is documented for the first time by Jegadeesh & Titman (1993). The two scientists prove that the stocks achieving the highest actual return for the past three to twelve months tend to continue to perform this way in the consecutive period of similar length. Conversely, stocks performing the poorest in terms of return for a given period in the past will continue to do so in the short term. Thus, momentum effect investment strategy consists of holding a long position in winners` stocks and short selling losers` stocks.

Based on the empirical results of Nedev & Bogdanova (2017) it could be concluded, that momentum effect is not present on the Bulgarian capital market during the entire study period between January 2004 and July 2017, as most momentum investment strategies show negative gains. This is due to the strong negative impact of the Great Recession of 2008 on the performance of the BSE. When using sub-periods to account for different market states, it turns out that during the pre-crisis period (2004 - 2007) momentum effect has realized positive and statistically significant profits on the BSE. The most successful strategy realizes 1.46% (t-stat. = 2.6522) on a weekly basis. It is constructed by holding a long position for a week (also called holding period - J) in those 25% of the traded stocks on the BSE, that have performed best over the previous one week (also called formation period - K). At the same

time, due to the typically low liquidity on the Bulgarian capital market, the strategy of using a formation period of 26 weeks and holding period of 8 weeks provides an optimal profit of 1.34% per week (t-stat. = 4.2987).

Regarding the simplified momentum trading strategy (holding only a long position in winners' stocks), in the pre-crisis period, it can be argued that it provided a higher average weekly profit for investors than in the hypothetical pursuit of the traditional momentum trading strategy (portfolios consisting of long position in winners' stocks and short position in losers' stocks based on their historical performance). The highest gain of 3.23% per week when avoiding short sales is evidenced in the portfolio of winners' stocks ($K = 1$; $J = 1$). In comparison, the simplified momentum trading strategy ($K = 13$; $J = 13$) with the weekly gain of 2.38% provided a more optimal profit due to the need for less frequent rebalancing of the portfolio.

Empirical data for the crisis period (2008 – 2012) provided by Nedev & Bogdanova (2017) show that momentum effect on the BSE ceases to exist, and profits are either highly negative or statistically indistinguishable from zero. Another interesting observation is that during the holding period, the portfolios of the best performing corporations register negative gains, while the portfolios of the losers' stocks provide positive returns.

At the same time, momentum effect does not reappear on the BSE during the post-crisis period (2013-2017). The gains from momentum effect are still either negative or statistically insignificant. Again, it is noteworthy that the portfolios of losing corporations perform better than those of winning ones.

Second research by Nedev & Bogdanova (2018) tries to find out the specific behavioural explanation for the rise of momentum effect on the BSE over the pre-crisis period (2004-2007). Thus, the authors may formulate specific behavioural biases, that could have influenced the process of decision making of the investors on the BSE. The statistical tests conducted by Nedev & Bogdanova (2018) clearly show that underreaction of investors on the BSE to the specific information about a public company is the basis of momentum effect rising in the period from January 2004 to December 2007. This conclusion is based on empirical results showing that in the long run the gains from the WML-portfolio ($K = 26$; $J = 8$) do not show reversibility (ie in the period following the holding they do not become negative).

Based on this conclusion of Nedev & Bogdanova (2018), two hypotheses may be considered regarding the possible behavioral biases that may have caused the underreaction of investors and the rise of momentum effect on the BSE. These are the disposition effect and the principle of loss aversion on the one hand and the anchoring and adjustment bias on the other.

Nedev (2021) argues, that the obtained results in regard to investors underreacting to firm-specific information and thus causing momentum effect on the BSE in the pre-crisis period may be complemented by the 6-Dimensions Model of Cultures by Geert Hofstede. According to Hofstede Insights (2018) the Bulgarian society is characterized by high level of pessimism. In this line of thought, plenty of scientific studies cited in the article by Ceschi, et al. (2014, p. 72) associate pessimism with the principle of loss aversion and the disposition effect, which in turn underlie the hypothesis of a underreaction according to the behavioural model of Grinblatt and Han (2004, p. 316). Thus, the conceptual model of Hofstede allows Nedev (2021) to assume that in the case of BSE pessimism and restraint have led Bulgarian investors to hold for too long equity securities with falling market prices at the expense of too hasty sale of profitable assets. The motive for such behaviour is the aversion to incur losses from investment activities due to the predisposition to attach more importance to failures than to successes.

At the same time, according to Nedev (2021) the conclusions from Hofstede Insights (2018) for Bulgaria reject the hypothesis that anchoring bias is the basis of underreaction, as Bulgarian society is characterized by a high index of long-term orientation - that is, Bulgarians manage to adapt quickly to changing conditions, environment and are pragmatic in decision-making, taking into account the current circumstances. At the same time, anchoring bias implies that the economic agents adhere to historical data, ignoring new information about the analyzed securities. However, according to Nedev (2021) it must be highlighted that Hofstede's six-dimensional cultural model considers purely national behavioral characteristics. Within the research framework of all previously mentioned studies on momentum effect in the pre-crisis period (2004 - 2007) on the BSE it should be explicitly stated, that quite a few foreign investors participate along with the Bulgarian ones and trade Bulgarian securities. In this line of thought, it should be emphasized that behavioral scientific literature in the field of momentum effect refers to the Hofstede model despite the openness of the capital markets in question. However, according to Nedev (2021) behavioural researchers acknowledge that the relationship between the six-dimensional model and momentum is not direct. An example of such work is the study of Chui, et al. (2010), in which the authors associate the lack of momentum effect on the Istanbul Stock Exchange and the tendency of the Turkish society to collectivism in its behavior.

Based on the discussion of the presented research results for documented behavioural aspects on the BSE we could highlight some other considerations that may have predetermined the rise of short-term return predictability on the Bulgarian equity market. Traditionally the low liquidity of BSE may also be considered as a factor predetermining

the occurrence of momentum effect. As it can be seen from the empirical results by Nedev & Bogdanova (2017), the strategy ($K = 1$; $J = 1$) achieved a positive profit both in each of the three subperiods (pre-crisis, crisis and post-crisis period) and for the whole sample period from 2004 to 2017. Only in the crisis period this specific momentum trading strategy is not statistically significant. This observation can be interpreted as evidence of a continuation of the trends on the Bulgarian capital market within two consecutive weeks.

In this line of thought, as another factor for the presence of momentum effect in the period 2004 - 2007 it can also be mentioned the specific market infrastructure and trading rules of BSE. A trading system built on the principle of a "market driven by orders" can also create momentum in the change of market prices of traded capital financial assets. Although such trading system provides higher transparency, it is characterized by lower liquidity, as there may be a lack of counter-orders and difficulties in matching purchase and sale orders. The BSE does not lack trading orders, but they are often not enough to have a sufficient number of counter orders to be matched and executed in practice.

Another feature specific to the BSE, which could also lead to short-term return predictability in the returns of traded financial assets, is the specific regulation concerning the activities of large institutional investors such as private pension companies, which are a major investor in the Bulgarian capital market, but are limited in terms of taking higher risks. Thus, although there may be attractive investment opportunities, these companies may not be entitled by law to take advantage of them, leading to predictability in the returns on traded public companies.

The scope of the current paper is not aimed at considering these additional circumstances, which may also underlie the presence of momentum effect on the BSE in the period 2004 - 2007. The focus is entirely on the behavioural causes of that market anomaly based on of the considered scientific literature in the field. In addition, the quantification of the potential effects of these micro-structural market factors could be extremely difficult to determine due to the lack of representative and comprehensive historical data on the trading activity on the BSE.

5. CONCLUSIONS

We can summarize that investors who traded on the Bulgarian stock market show three tendencies according to the research of Ivanchev. These are the optimism bias and wishful thinking bias, self-confidence bias, and recency bias. What is more, momentum effect (a short-term return predictability) has been documented to exist on the Bulgarian Stock Exchange in the pre-crisis period between 2004 and 2007. The underlying behavioural cause for momentum effect turns out to be the underreaction of investors to firm-specific information. Based on the 6-Dimensions Model of Cultures by Geert Hofstede it could be concluded, that disposition effect and loss aversion bias may have been the behavioural biases, that have influenced investors' decision making process on the BSE in the years before the burst of the Great Recession.

Conclusions in this paper show that the BSE as a frontier market has also been subject to irrational behavior in making investment decisions by economic agents along with developed and developing international capital markets. Regardless of whether to a greater or lesser extent, both individual investors and professional portfolio managers have been subject to cognitive and emotional biases in their behavior that influenced stock trading. Awareness of these often-subconscious circumstances in decision-making and the attempt to take them into account by economic agents would help to avoid at least some of the errors made. According to Pompian (2012b, p. 26), the elimination or at least partial reduction of the existence of behavioral biases is not achievable. Economics agents could only learn to recognize situations in which systemic behavioral errors are likely to occur and to take steps to limit their impact on the decision-making process¹⁴.

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¹⁴ Behavioural biases should be taken into consideration not only in the field of finance and investments, but in all various aspects in professional and even personal life. For instance, the interested reader may find interesting insights in conflict management of organisations in the papers of Mihaylova (2017) and Mihaylova (2020a). The author investigates and discusses the employed approaches and strategies by chief executive officers when managing conflicts between employees. Mihaylova (2020b) present an examination of self-perceived estimation of CEO-s in regard to their skills and capabilities for resolving confrontations in the corporation.

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