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# Article

Do socio-political factors affect investment performance?

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# FINANCIAL ECONOMICS | RESEARCH ARTICLE Do socio-political factors affect investment performance?

Sarwar Uddin Ahmed<sup>1</sup>, Samiul Parvez Ahmed<sup>2</sup>\*, Mohammad Abdullah<sup>3</sup> and Uttam Karmaker<sup>4</sup>

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Abstract: Despite increasing research on the relationship between behavioral factors and investment performance, little is known about the perspective of emerging markets like Bangladesh. This paper investigates the mediating role of socio-political factors in explaining the relationship between behavioral factors and investment performance in the Dhaka Stock Exchange (DSE). Using structural equation modeling (SEM) on 1,123 completed responses, we find that social and political environment mediates investors' behavior in translating into investment performance. The finding suggests behavioral factors and the socio-cultural context of Bangladesh can explain market anomalies seen for decades in the largest stock exchange in the country and demands further research in this direction. Additionally, results show herding effect has the strongest effect on investment performance through combined mediation effect of social and political factors. The study results have significant implications for both theoretical and practical analysts by contributing to the evolution of post-neoclassical finance theories from an emerging market viewpoint and suggesting the probable causes behind historical market instability in DSE, respectively.

Subjects: Multidisciplinary Psychology; Economic Psychology; Investment & Securities

Keywords: Social factors; political factors; behavioral factors; investment performance; emerging market; Dhaka Stock Exchange (DSE)

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#### 1. Introduction

It is widely documented that, since inception in 1950s, finance as an independent academic field has gone through several transformations which, often termed as paradiam shifts, can be marked by inherent epistemological characteristics of the field (Gippel, 2012). Notably, during 1960s and 1970s, finance, in search for deterministic approaches to generating knowledge, established several models and theories, popularly known as modern finance theories (e.g., Capital Asset Pricing Model in 1960; Efficient Market Hypothesis in 1970; Black-Scholes-Merton Option Pricing Model in 1973), that helped it being recognized as a science discipline. This neoclassical finance was particularly dominated by a single logical basis of the institutionalized form of rational expectations approach of economics and that single-handedly defined the boundary of the research agenda in finance at that time (Gippel, 2012; Watson, 2007). However, later, in the verge of several catastrophic market anomalies during past few decades, the neoclassical finance was challenged and, unfortunately, it failed to provide satisfactory explanations to the market failures or anomalies often created by the noise traders (Ramiah et al., 2015). The naïve efforts of neo-classical finance to justify anomalies as "market inefficiencies" and transitory and subject to correction through arbitrage could not get proper ground as empirical evidence showed persistent anomalies in the financial market during 1980s till last decade (Keim, 2008). In late 1970s and early 1980s, Michael Jenson, founder and editor of Journal of Financial Economics, referring to recurring anomalies, expressed his concerns for the validity of the Efficient Market Hypothesis as he argued that the market data persistently inconsistent to the theory (Jensen, 1978). Also the deterministic mathematical models (e.g., Capital Asset Pricing Model, Arbitrage Pricing Theory) were challenged on the ground that they take " ... unrealistic assumptions in order to provide boundary conditions for a mathematical solution" (Nawrocki & Viole, 2014:11). In similar vein, by harshly criticizing the neo-classical paradigm as dead, Colander et al. (2010) argued that, in a typical economic (or financial) model, assumptions and/or limitations are not explicitly depicted as such and, hence, at times of "exceptional" economic and financial crises, the deterministic models cease to give proper explanations (moreover, "exceptional" can be a contested concept as crisis recurs/sustain often in the financial market). Moreover, substantial empirical evidence shows that individuals with irrational behavior (often termed as noise traders) actively take part in the liquidity trading, speculation and hedging and that also challenges the EMH (Foster & Viswanathan, 1990, 1993; De Long et al., 1990).

Thus, the researchers urge for new theory and model that may address the causes of alleged "exceptionalities" by the deterministic mathematical models (Nawrocki & Viole, 2014) and this new shift in paradigm is termed as post-neoclassical approach (Davis, 2006, 2008). In the postneoclassical approach, finance academics, researchers, practitioners, and intellectuals put forth rigorous efforts to explore alternative ways to solve issues (e.g., persistent anomalies) of the neoclassical finance. In doing so, finance now embracing new philosophical stance, the behavioral finance school of thoughts (Zahera & Bansal, 2018), where the idea of treating investors as "economic rational being" is challenged on the ground that investors are not "natural" rational decision maker (Rahman & Gan, 2020; Sachdeva et al., 2022). In addition, it is argued that the investors are subject to bounded rationality where less optimal/efficient decision is being made with incomplete information which are processed through cognitive bias associated with various behavioral factors (Jain, Walia, Gupta et al., 2020). Hence, all deterministic models are deemphasized with novel ways, which explores on how such (ir)rationality or erratic behavior of individuals is being considered within a theory or model (Gippel, Colander et al., 2010). In similar vein, evidence from neuroscience, cognitive psychology, sociology, and evolutionary biology also rejects the notion that human is (instrumentally) rational and wealth-maximizing being (Gippel, 2012). Thus, objective of the post-neoclassical finance is not to falsify the traditional claim that humans are inherently rational, rather it highlights the fact that investment decision is subject to human characteristics and psychological process (Sachdeva et al., 2022) that complicates the reason of human mind and, hence evolving the field more so into behavioral finance that intends to make sense of the market "anomalies" through a more dynamic and fluid conception of rationality or behavior of economic agents.

Based on empirical evidence, while explaining persistent human errors or irrational behavior of traders in making economic decision (e.g., investment decision), a range of psycho-behavioral areas has been researched within the behavioral finance school of thoughts. Research areas covered within this new behavioral finance area are representative bias (Shah et al., 2018), availability bias (Meng, 2017; Shah et al., 2018), overconfidence (Ahmed & Duellman, 2013; Jain, Walia, Gupta et al., 2020; Trejos et al., 2018), anchoring (Furnham & Boo, 2011; Meub & Proeger, 2016), gamblers fallacy (Henderson, 2012; Hens & Vlcek, 2011), loss aversion bias (Aggarwal & Damodaran, 2019; Barberis et al., 2001; Best & Grauer, 2016; Jain, Walia, Gupta et al., 2020), mental accounting (Barberis et al., 2016; Richards, 2014; Rockenbach, 2004), market information (Hong et al., 2000), interpersonal influence (Hoffmann & Broekhuizen, 2009), moral hazard (could not find any paper), risk tolerance (Pak & Mahmood, 2015; Son & Nguyen, 2018), knowledge (Hoffmann & Broekhuizen, 2009; Nuzula et al., 2019), etc. These areas can further be grouped under broad theories in behavioral finance such as heuristics theory (Shah et al., 2018; Trejos et al., 2018), prospect theory (Kahneman & Tversky, 1979; Son & Nguyen, 2018), herding effect (Jain, Walia, Gupta et al., 2020; Kabir & Shakur, 2018; Metawa et al., 2018; Silva et al., 2019), market factors (Nuzula et al., 2019), and subjective expected utility theory (Nawrocki & Viole, 2014).

Although the above-mentioned factors are widely researched, there is dearth of such studies conducted in the context of an emerging economy like Bangladesh. The arguments of alleged, "market-anomalies" and investors' rationality is also questionable in the context of empirical evidence of the Bangladeshi stock markets. Bangladeshi stock market experienced its first major crash in 1996 when within a short period of time in Dhaka Stock Exchange (DSE), "(all share price) index rose from about 800 points in June, 1996 to around 3,600 in November, 1996" (S. U. Ahmed et al., 2012) and, then it started to fall and came down to 488 in 1999. This market crash or alleged "anomaly" repeated in 2011. The bubble started to form in late 1999 since when within just over a year's period the DSE (SPI) index more than doubled and reached to 6800 points at the end of 2010; and then, as usual, the index started to fall and came down to 4200 in September 2011 (S. U. Ahmed et al., 2012). Recently, the DSE has started to face high volatility again. The repeated bubble-crash and high volatility can no more be considered as mere market inefficiencies and subject to natural market correction, rather behavioral aspects needed to be explored to have better understanding about the Bangladeshi stock markets (M. T. Rahman et al., 2017).

Hence, this study intends to explore the comprehensive factors of behavioral finance that influence investors' decision-making process in the context of Bangladesh and, subsequently, supplement the literature from an emerging economy's perspective. In addition, it is worth mentioning that the paper has taken the initiative of focusing on two new aspects other than the widely accepted factors of behavioral finance (as discussed above). The newly researched two other unique factors, socio-culture and political environment, are considered in this study which is a unique contribution of this study as well. As Bangladesh is a high context culture, it's unique social and political environment is deemed to influence investment decisions through factors. The paper proceeds in the following order. Section 2 discusses the key characteristics/arguments of the relevant theories of behavioral finance and, subsequently, in Section 3, hypothesis and the Model are deduced and methodological aspects are discussed. Section 4 reports the findings of the data. Section 5 discusses the empirical implications. Section 6 illustrates the conclusion.

# 2. Theoretical framework

The focus of this study is to assess the influence of various psycho-behavioral factors on investment decisions. Initially a little insight into behavioral factors is discussed that includes evidence of behavioral finance in investment decisions. The independent variables for the study are built based on the behavioral finance theories and evidence such as heuristic, prospect, market, and herding. Subsequently, apart from the traditional behavioral factors, socio-cultural, and political factors are discussed as they may be considered as unique factors for the Bangladeshi context.

# 2.1. Heuristics

Systematic researches on cognitive Heuristics, linking to the concept of rationality, started in 20th century (Gigerenzer, 2008). The main arguments relate to how probability or material information (broadly rationality) is compromised when decision making focuses more on "self-defined satisfaction" over mathematical optimization. One of the elements of Heuristic is the Anchoring where investors come to a final decision by adjusting (may not be sufficient) some preliminary information (Matsumoto et al., 2013). Individual investor's processual evaluation of initial information and adjustments to that can be referred to as "cognitive shortcut" (Kahneman & Tversky, 1974). Evidence also shows that overconfidence is another aspect of Heuristics that influences individual decision making (Pauschunder, 2017). It is to be noted that the overconfident investors are not considered to be incompetent investors rather it is their judgment or evaluation of information deviates than that of the actual situation (Trejos et al., 2018); and, surprisingly, such investors are confident about their ability regarding understanding financial market (Subash, 2012). Representativeness is another dimension of Heuristics where investors make investment decision in an uncertain situation based on "similar" cases where similarity concept is contestable as investors often ignore critical comparability factors (e.g., base rate, sample size) in the decisionmaking process (Meng, 2017). Availability bias is another element of Heuristics that illustrates how investors often make decision based on information/cases that they can easily recall and relate (Meng, 2017). Thus, decisions taken with such a manner are subject to estimation bias. Finally, investors sometimes ignore the law of statistical independence and form decision based on association of future outcome with past results (Barron & Leider, 2010). Such decision-making approach that are not based on statistical rigor is referred to as gambler's fallacy, which often influence investment decisions. With this background, it is clear that, due to the presence of the elements (representativeness, availability bias, overconfidence, anchoring, and gamblers fallacy) of the Heuristics, investors end up in making irrational investment decisions, which subsequently has an impact on investment performance.

# 2.2. Prospect theory

Prospect theory was established on the evidence based on experimental studies that unfolded human irrational behavior to traditional utility theory when faced with expected gains and losses (Benartzi & Thaler, 1995; Best & Grauer, 2016; Kahneman & Tversky, 1979). In relation to the prospect theory, evidence shows that investors are loss averse in nature when followed by a prior loss and, in contrast, more susceptible to take risk followed by a prior gain (Barberis et al., 2001; Thaler & Johnson, 1990). From another angle, it is often argued that the investors seek for less risky investment choices when faced with a fear of realizing loss, and subsequently emotional pain, out of a decision. This behavior is termed as regret aversion bias which is supported by evidence (Zeelenberg et al., 1996). Experimental study conducted by Zeelenberg et al. (1996) shows that people faced with decision dilemma in uncertainty prefer to take loss-minimizing decision. Mental Accounting, another element of prospect theory, states that investors often segment a whole investment decision into several small parts and treat each part discretely. However, this evaluation technique or mental accounting process is inherently flawed (from the perspective of rational portfolio theory) as the portfolio to be assessed as a whole not in such a decomposed manner (Rockenbach, 2004). Assessment of small units of investment separately cannot balance the performance of whole portfolio in an integrated manner. With reference to this discussion, it is clear that, due to the presence of the elements (loss aversion, regret aversion and mental accounting) of the Prospect Theory, investors end up in making irrational investment decisions, which subsequently has an impact on investment performance.

# 2.3. Market factors

Various market factors such as price fluctuations, price/return trends, fundamentals underlying stocks are considered to be vital elements that influence investment decisions but these factors

are not free from behavioral biases. In other words, investors' characteristics, emotions and psychology are also subject to behavioral factors which eventually influence their investment decisions (Jain, Walia & Gupta, 2020). In a rational paradigm, any material information should be discounted properly in determining fair value of financial assets but investors often construct valuation which are subject to their internal customs, level of knowledge, values, beliefs, perceptions, self-defined reasoning, memory, emotion, and environmental factors which make the decision-making process complicated (Nuzula et al., 2019). Decisions influenced by such factors are referred to as irrational and often results in under-reaction or over-reaction to any new information, reliance on momentum or trends and valuing more on short-term opportunistic outcomes (Barberis & Thaler, 2003; De Bondt & Thaler, 1985; Lai et al., 2001; Nuzula et al., 2019; Waweru et al., 2008). With such arguments this study uses market factors and uses them to construct behavioral factors which affect the decision-making process of investors in the capital market.

# 2.4. Herding effect

Research suggests that herding is relatively a common behavioral-phenomenon that can be traced in various academic disciplines such as psychology, investment, and auction (Satish & Padmasree, 2018). In case of financial market, investors subject to herding ignore material information and are influenced by peers in making investment decisions (Barber & Odean, 2000). Particularly, herding behavior of the investors is accused for creating noise or volatility (Silva et al., 2019) and, often lead to speculative bubble (Sachdeva et al., 2021) in the financial market. A study conducted by Hoffmann and Broekhuizen (2009) found that incompetent investors and those who perceive investment decision is too risky to handle are more prone to follow others. Moreover, the study also found that, in many instances, investors are influenced by peers such intensely that they change their own preferences even with lower performing stocks (Hoffmann & Broekhuizen, 2009). The study infers that it may happen as investors are more inclined to social environment to collect information and, hence, often fall under peer pressure to comply. In similar vein, it is argued that, "... investors' self-image based on in-group preferences and the perception of group belongingness confirms the role of social identification in an investment decision" (Nuzula et al., 2019:52). A recent study conducted by Espinosa-Méndez and Arias (2020) found that, in the Australian Stock Market, herding behavior is evident during COVID-19 pandemic period where investors abstained from investing when faced with crisis situation. This phenomenon is explained as "panic behavior" in crisis situation when investors, due to lack of time and information to analyze uncertain situation, compromise rationality and follow crowd decision (Abd-Alla, 2020; Sachdeva et al., 2021). However, contrasting result is also reported about herding behavior. A recent study shows that the herding behavior does not significantly influence investment decision (Rahman & Gan, 2020). In any case, it is worth noticing that the herding behavior is much researched in recent times (Chauhan et al., 2020) as its influence is widely accepted for forming speculative bubble and stock market volatility and, hence, the purpose of this study is to find out how individual decision-making at the DSE is also influenced by interpersonal influences and, subsequently, overall effect on the market.

# 2.5. Socio-culture and political factors within behavioral paradigm

Investor behavior studies have been conducted in various different countries and it is found that the country of origin affects investor behavior in varying ways. Apart from the commonly researched behavioral finance factors, it is to be noted that socio-culture is another unique dimension, which can alter the expected results of a behavioral study, particularly between developed and developing and/or emerging economies. A study conducted by Son and Nguyen (2018) showed how culture could alter the relationship between prospect theory value and future return between Korean and US stock market. Another study conducted by Chua et al. (2010) revealed that interpretation of information by investors could vary with their socio-cultural orientation, individualism or collectivism. Likewise, a recent study on individual decision making in India shed light on the fact that individuals in India react differently in ambiguous situation due to unique cultural values and are influenced more so by its collectivism which can differ from the developed world and, hence, the researchers urged that further studies are needed in this area (Aggarwal & Damodaran, 2019). Having this background, as Bangladesh belongs to a high context culture, its influence on investment decisions of individuals has been explored in this study. From a different angle, political factors and their impact on the capital market is also quite prominent in the context of Bangladesh. Existing research shows that investment decisions of a specific group of investors are responsive to the local political environment (Hood et al., 2014). Overall, socio-culture and political factors influences the behavioral factors (i.e., Heuristics, Prospect Theory, Herding Effect, Market Factors), which in eventually effects the investment performance. Therefore, socio-culture and political factors serves as mediator in the relationship between behavioral factors and investment performance. This is a novel area to be researched for the investors of Bangladesh and therefore the political environment is examined in this study as well.

# 3. Research model

With reference to above discussion, Heuristics, Prospect Theory, Herding Effect, Market Factors, Socio-cultural and Political factors are considered in formulating the conceptual framework (Figure 1). Various behavioral biases, along with socio-cultural and political factors, used as independent variables to explore how they affect investment decision which in turn affect investment performance.

# 3.1. Hypothesis

To sum up the ongoing theoretical discussion and research model, the following hypotheses (H) are derived for testing:

H<sub>1</sub>: Behavioral factors have an impact on investment performance.

H<sub>2</sub>: There is a mediation effect of political factors between the relationship of behavioral factors and investment performance.

 $H_3$ : There is a mediation effect of social (socio-cultural) factors between the relationship of behavioral factors and investment performance.

H<sub>4</sub>: There is a combined mediation effect of social and political factors among the relationship of behavioral factors and investment performance.





## 3.2. Data and methods

## 3.2.1. Survey instrument

To evaluate the developed hypotheses and to measure constructs of the framework, multi-item scales were used. All items were assessed by using a six-point Likert scale ranging from 1 (Extremely disagree) to 6 (Extremely agree). Summary of the questionnaire is presented in Table 1. Moreover, this study evaluated control variables for testing the relationship between the latent variables. Age, trading experience, income and invested amount in DSE have been tested against the investment performance to check the controlling effects. The questionnaire was developed with a total of 45 questions, out of them 34 questions were used for evaluating seven constructs, three questions were used as the screening questions and the rest of the questions were used for assessing the demographic profile of the respondents (see Table A1).

#### 3.2.2. Sampling and data collection

The target was to collect a relatively large sample for this study as observing behavioral relationship calls for a bigger sample, though it was suggested that for quantitative research at least 100 respondents should be studied to have a statistically conclusive result (Hair et al., 1999; Saunders et al., 2009). Luong and Thu Ha (2011) and Sochi (2018) collected 172 and 203 samples, respectively, in somewhat similar studies examining the relationship between behavioral factors and investment performance.

In this study, from the whole population of stockbroker-house-customers listed in DSE, 30 stockbroker-house-customers were selected by considering their size and duration of operation. According to Sudman and Blair (1999), to reduce the error of data collection, a judgmental sampling method should be applied, as this allows to select the participants according to their expertise and knowledge relevant to the study (Littig, 2009; Plake & Impara, 2001). Accordingly, a judgmental sampling method was applied on the 30 stockbroker-house-customers and respondents were picked based on their active association, invested amount and experience of stock trading.

A pilot test was conducted with 10% of the total sample to check the data quality and normality. The result of the pilot test was acceptable to continue further analysis. In the second stage, 2000 questionnaires were circulated and received 1157 responses (58% response rate). Finally, after removing the incomplete responses the total sample size of 1,123 is used to conduct structural equation modeling (SEM). According to Jak et al. (2020), from power analysis sample size of 1,123 is sufficient for SEM analysis. The demographic profile of the respondent is presented in Table 2.

#### 3.3. Methodology

The methodology applied for data analysis can be divided into two segments. At the first stage, descriptive statistics and other statistical tests such as, mean, median, standard deviation, skewness, kurtosis, and correlation of coefficients were analyzed and results are presented in Table 3. Statistical programming Language R is used for the data analysis and specifically, the lavaan package is used for conducting SEM analysis. A two-step modeling approach is applied for this study to perform SEM (Anderson & Gerbing, 1988). At first, the measurement model is investigated such as reliability, factor loading, and goodness-of-fit for every scale linked to this study. In the second step structural model is examined to see the comprehensive connection between the different variables and checked how each variable reacts in the model. Nevertheless, this step also examined all paths of proposed models and estimated the fit indices of the structural model such as chi-square p-value, CFI, TLI, GFI, AGFI, RMSEA, and SRMR.

| Table 1. Summary of the questionnaire |   |                                  |   |  |  |  |  |
|---------------------------------------|---|----------------------------------|---|--|--|--|--|
| Factors                               | Dimensions  | Questions                        | Source  |  |  |  |  |
| Behavioral<br>Factors (BF)            | Heuristic:<br>• Representativeness<br>• Overconfidence<br>• Anchoring<br>• Gambler's fallacy<br>• Ability bias  | 12-13<br>14<br>15-16<br>17<br>18 | Pauschunder, 2017;<br>Subash, 2012; Metawa<br>et al., 2018              |  |  |  |  |
|                                       | Prospect:<br>• Loss Aversion<br>• Regret aversion<br>• Mental accounting  | 19-20<br>21-22<br>23-24          | Rockenbach, 2004  |  |  |  |  |
|                                       | Market<br>• Price changes<br>• Market information<br>• Past trends of stocks<br>• Fundamentals of<br>• underlying stocks<br>• Customer preference<br>• Over-reaction to<br>price<br>• Changes   | 25-30                            | Nuzula et al., 2019;<br>Barberis & Thaler, 2003;<br>Waweru et al., 2008 |  |  |  |  |
|                                       | <ul> <li>Herding</li> <li>Buying and Selling decisions of other investors</li> <li>Choice of stock to trade of other investors</li> <li>Volume of stock to trade of other investors</li> <li>Volume of stock to trade of other investors</li> <li>Speed of herding</li> </ul> | 31-34                            | Hoffmann & Broekhuizen,<br>2009; Espinosa-Méndez &<br>Arias, 2020       |  |  |  |  |
| Political Factors (PF)                |   | 35-39                            | Hood et al., 2014   |  |  |  |  |
| Social Factors (SF)                   |   | 40-42                            | Son & Nguyen, 2018;<br>Chua et al., 2010                                |  |  |  |  |
| Investment Performance<br>(IP)        | <ul> <li>Investment<br/>performance</li> <li>Return rate and<br/>satisfaction of<br/>investment decisions</li> </ul>  | 43-45                            | Abdin et al., 2017;<br>Metawa et al., 2018                              |  |  |  |  |

# 4. Analysis and results

# 4.1. Measurement of validity and reliability

Table 4 presents the results of confirmatory factor analysis evaluating the validity and reliability of the constructs. Values of comparative fit index (CFI) = 0.97, Tucker-Lewis index (TLI) = 0.96,

| Table 2. Demographic     | profile                           |           |            |
|--------------------------|-----------------------------------|-----------|------------|
| Item                     | Category                          | Frequency | Percentage |
| Gender                   | Male                              | 945       | 84.06      |
|                          | Female                            | 178       | 15.85      |
| Age                      | 36-45                             | 481       | 42.83      |
|                          | 46-55                             | 320       | 28.50      |
|                          | 26-35                             | 224       | 19.95      |
|                          | Over 55                           | 57        | 5.08       |
|                          | 18-25                             | 41        | 3.65       |
| Marital status           | Married                           | 972       | 86.55      |
|                          | Single                            | 116       | 10.33      |
|                          | Divorced                          | 18        | 1.60       |
| Educational level        | Bachelor                          | 489       | 43.54      |
|                          | Master                            | 417       | 37.13      |
|                          | HSC/ A Level                      | 99        | 8.82       |
|                          | Others                            | 76        | 6.77       |
|                          | SSC/O Level                       | 36        | 3.21       |
|                          | Primary and lower                 | 6         | 0.53       |
| Working Experience       | Over 10 years                     | 622       | 55.39      |
|                          | 5–10 years                        | 406       | 36.15      |
|                          | Under 5 years                     | 95        | 8.46       |
| Average Income (BDT)     | More than 100,000                 | 538       | 47.91      |
|                          | 50,000- under 70,000              | 451       | 40.16      |
|                          | 20,000- under 40,000              | 123       | 10.95      |
|                          | Under 20,000                      | 11        | 0.98       |
| Stock Trading Experience | Over 10 years                     | 426       | 37.93      |
|                          | 5- under 10 years                 | 283       | 25.20      |
|                          | 3- under 5 years                  | 234       | 20.84      |
|                          | 1- under 3 years                  | 136       | 12.11      |
|                          | Under 1 year                      | 35        | 3.12       |
| Attended Trading         | Yes                               | 634       | 56.46      |
| Training                 | No                                | 484       | 43.10      |
| Total amount of          | Over 20,00,000                    | 268       | 23.86      |
| investment in DSE        | From 10,00,000 to under 20,00,000 | 229       | 20.39      |
|                          | From 200,000 to under 500,000     | 222       | 19.77      |
|                          | From 500,000 to under 10,00,000   | 180       | 16.03      |
|                          | From 100,000 to under 200,000     | 143       | 12.73      |
|                          | Under 100,000                     | 75        | 6.68       |
|                          | ·                                 |           |            |

| Table 2. (Continued)           |                                    |           |            |  |  |  |  |
|--------------------------------|------------------------------------|-----------|------------|--|--|--|--|
| Item                           | Category                           | Frequency | Percentage |  |  |  |  |
| Last year investment in<br>DSE | From 100,000 to under 200,000      | 251       | 22.35      |  |  |  |  |
|                                | Under 100,000                      | 246       | 21.91      |  |  |  |  |
|                                | From 200,000 to under<br>500,000   | 225       | 20.04      |  |  |  |  |
|                                | From 500,000 to under<br>10,00,000 | 165       | 14.69      |  |  |  |  |
|                                | Over 20,00,000                     | 142       | 12.64      |  |  |  |  |
|                                | From 10,00,000 to under 20,00,000  | 83        | 7.39       |  |  |  |  |

| Table 3. Descriptive statistics and correlation analysis |           |          |         |         |        |       |       |  |
|--|-----------|----------|---------|---------|--------|-------|-------|--|
|  | Heuristic | Prospect | Market  | Herding | PF     | SF    | IP    |  |
| Ν  | 1123      | 1123     | 1123    | 1123    | 1123   | 1123  | 1123  |  |
| Mean   | 4.59      | 4.38     | 4.76    | 3.97    | 3.92   | 4.56  | 2.79  |  |
| Median   | 4.86      | 4.33     | 4.83    | 3.75    | 3.60   | 4.67  | 2.67  |  |
| Std. Dev.  | 0.94      | 0.98     | 0.84    | 1.05    | 1.10   | 0.96  | 1.19  |  |
| Skewness   | -1.03     | -0.71    | -0.46   | 0.24    | 0.32   | -0.68 | 0.38  |  |
| Kurtosis   | 1.30      | 0.63     | -0.22   | -0.31   | -0.63  | 0.98  | -0.50 |  |
| Heuristic  | 1         |          |         |         |        |       |       |  |
| Prospect   | 0.50**    | 1        |         |         |        |       |       |  |
| Market   | 0.36**    | 0.49**   | 1       |         |        |       |       |  |
| Herding  | 0.10**    | 0.42**   | 0.53**  | 1       |        |       |       |  |
| PF   | 0.21**    | 0.45**   | 0.34**  | 0.42**  | 1      |       |       |  |
| SF   | 0.28**    | 0.34**   | 0.50**  | 0.33**  | 0.41** | 1     |       |  |
| IP   | -0.10**   | -0.20**  | -0.09** | -0.05   | -0.06* | 0.01  | 1     |  |

Note: \*\* Correlations are significant at the 1% level and \* Correlations are significant at the 5% level.

goodness-of-fit index (GFI) = 0.97, adjusted goodness-of-fit index (AGFI) = 0.96, Chi-square p-value (p) = 0.00, root mean square error of approximation (RMSEA) = 0.05, and Standardized Root Mean Square Residual (SRMR) = 0.06 indicate that measurement model fits satisfactorily, as the values of CFI, TLI, GFI exceeding 0.90 and AGFI exceeding 0.8 indicates the goodness-of-fit (Bentler, 2007; Fan & Wang, 1998). Additionally, the acceptable value of  $\chi^2$  p-value is less than 5%, RMSEA and SRMR is less than 0.08 (Anderson & Gerbing, 1988; Browne & Cudeck, 1993).

Details are presented in Table 4 which shows that each item factor loading (FL) is above 0.50. Moreover, the Cronbach's alpha ( $\alpha$ ) and composite reliability (CR) values are more than the cutoff value of 0.70 (Cronbach & Warrington, 1951; Nunnally, 1978). Additionally, the average variance extracted (AVE) demonstrates the convergent validity of the items and all of them were above the threshold value of 0.5 (Fornell & Larcker, 1981).

#### 4.2. Structural model

Following the confirmatory factor analysis results, this study moved forward to the second stage of the two-step modeling. Figure 2 represents the SEM, which shows the evidence of fitting the hypothesized model significantly (p = 0.00, CFI = 0.96, TLI = 0.96, RMSEA = 0.5, SRMR = 0.07, GFI = 0.97, AGFI = 0.96) within the indices of the threshold value (Anderson & Gerbing, 1988; Bentler, 2007; Browne & Cudeck, 1993; Fan & Wang, 1998).

| Table 4. Rel        | Table 4. Reliability and discriminant validity |       |       |       |       |  |  |  |
|---------------------|--|-------|-------|-------|-------|--|--|--|
| Latent<br>variables | Items  | FL    | α     | AVE   | CR    |  |  |  |
| Heuristic           | Hrs1   | 0.610 | 0.903 | 0.586 | 0.905 |  |  |  |
|                     | Hrs2   | 0.948 |       |       |       |  |  |  |
| -                   | Hrs3   | 0.799 |       |       |       |  |  |  |
| -                   | Hrs4   | 0.635 |       |       |       |  |  |  |
|                     | Hrs5   | 0.813 |       |       |       |  |  |  |
|                     | Hrs6   | 0.684 |       |       |       |  |  |  |
|                     | Hrs7   | 0.792 |       |       |       |  |  |  |
| Prospect            | Prs1   | 0.883 | 0.916 | 0.652 | 0.916 |  |  |  |
|                     | Prs2   | 0.687 |       |       |       |  |  |  |
|                     | Prs3   | 0.933 |       |       |       |  |  |  |
|                     | Prs4   | 0.713 |       |       |       |  |  |  |
|                     | Prs5   | 0.839 |       |       |       |  |  |  |
|                     | Prs6   | 0.741 |       |       |       |  |  |  |
| Market              | Mrk1   | 0.617 | 0.846 | 0.495 | 0.856 |  |  |  |
|                     | Mrk2   | 0.760 |       |       |       |  |  |  |
|                     | Mrk3   | 0.754 |       |       |       |  |  |  |
|                     | Mrk4   | 0.901 |       |       |       |  |  |  |
|                     | Mrk5   | 0.548 |       |       |       |  |  |  |
|                     | Mrk6   | 0.620 |       |       |       |  |  |  |
| Herding             | Hrd1   | 0.809 | 0.894 | 0.683 | 0.896 |  |  |  |
|                     | Hrd2   | 0.774 |       |       |       |  |  |  |
|                     | Hrd3   | 0.924 |       |       |       |  |  |  |
|                     | Hrd4   | 0.794 |       |       |       |  |  |  |
| PF                  | PF1  | 0.841 | 0.886 | 0.617 | 0.888 |  |  |  |
|                     | PF2  | 0.827 |       |       |       |  |  |  |
|                     | PF3  | 0.732 |       |       |       |  |  |  |
|                     | PF4  | 0.784 |       |       |       |  |  |  |
|                     | PF5  | 0.730 |       |       |       |  |  |  |
| SF                  | SF1  | 0.921 | 0.860 | 0.690 | 0.868 |  |  |  |
|                     | SF2  | 0.831 |       |       |       |  |  |  |
|                     | SF3  | 0.726 |       |       |       |  |  |  |
| IP                  | IP1  | 0.743 | 0.864 | 0.690 | 0.870 |  |  |  |
|                     | IP2  | 0.919 |       |       |       |  |  |  |
|                     | IP3  | 0.825 |       |       |       |  |  |  |

# 4.3. Hypothesis testing

For hypothesis testing four models are developed according to the research model presented earlier. Table 5 and Table 6 present the model fitness and hypothesis testing results, respectively.

Model 1 presents the interaction between behavioral factors and investment performance. All fitness measures confirm the model fitness (Anderson & Gerbing, 1988; Bentler, 2007; Browne, 1993; Fan & Wang, 1998) and hypothesis 1 testing results accept the hypothesis significantly (Coefficients = -0.21 to 0.14). However, the results of hypothesis testing for hypothesis 1 indicate

Figure 2. Structural model.



| Table 5. Model fitness indices |        |        |        |        |        |        |        |  |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--|
| Models                         | р      | CFI    | TLI    | GFI    | AGFI   | RMSEA  | SRMR   |  |
| Model 1                        | 0.00   | 0.96   | 0.95   | 0.97   | 0.96   | 0.05   | 0.07   |  |
| Model 2                        | 0.00   | 0.95   | 0.95   | 0.96   | 0.96   | 0.06   | 0.07   |  |
| Model 3                        | 0.00   | 0.96   | 0.95   | 0.97   | 0.96   | 0.05   | 0.06   |  |
| Model 4                        | 0.00   | 0.95   | 0.95   | 0.96   | 0.95   | 0.06   | 0.07   |  |
| Acceptable<br>Range            | < 0.05 | ≥ 0.90 | ≥ 0.90 | ≥ 0.90 | ≥ 0.80 | ≤ 0.08 | < 0.08 |  |

that each variable of behavioral factor has a significant impact (p-value <0.2) and lend support to  $H_1$  that behavioral factors have impact on investment performance.

In model 2, political factor was included as a mediator between behavioral factors and investment performance. Threshold values of all fitness indicators demonstrate the fitness of model 2 (Anderson & Gerbing, 1988; Bentler, 2007; Browne, 1993; Fan & Wang, 1998). Results of hypothesis testing indicate that there is a significant direct and total mediator effect of political factors between behavioral factors and investment performance (Coefficients = 0.01 and -0.06). Moreover, after the inclusion of mediator, all variables of behavioral factors have a significant coefficient value (p-value <0.2). Thus, results accept the hypothesis that there is a mediation effect of political factors between the relationship of behavioral factors and investment performance.

Next model 3 included social (culture) factor as the mediator among behavioral factors and investment performance. The fitness indices here support the goodness of fit of the model (Anderson & Gerbing, 1988; Bentler, 2007; Browne, 1993; Fan & Wang, 1998). The results of hypothesis testing demonstrate the significant direct and complete mediating effect of social factor in between behavioral factors and investment performance (Coefficients = 0.02 and -0.06). The results of the hypothesis testing reveals that there is a mediation effect of social factor in determining the relationship between behavioral factors and investment performance.

Finally, model 4 included both political and social factor as mediating factors in determining the relationship between behavioral factors and investment performance. Revealed results were found

| Table 6. Hypothesis testing                            |                  |              |                    |                  |                 |                   |  |
|--|------------------|--------------|--------------------|------------------|-----------------|-------------------|--|
|  |                  |              |                    | Estimate<br>(SE) | Results         | Analysis          |  |
| Before the incl  | usion of the me  | diator       |                    |                  |                 |                   |  |
| Hypothesis-1   | IP               | 4            | Heuristic          | 0.04*<br>(0.02)  | Significant     | Accepted          |  |
|  | IP               | 4            | Prospect           | -0.23*<br>(0.02) |                 |                   |  |
|  | IP               | 4            | Market             | -0.07*<br>(0.03) |                 |                   |  |
|  | IP               | 4            | Herding            | 0.08*<br>(0.02)  |                 |                   |  |
| After the inclu  | sion of the medi | ator (PF)    |                    |                  |                 |                   |  |
| Hypothesis-2   | IP               | 4            | Indirect<br>Effect | 0.01*<br>(0.00)  | Significant Acc | Accepted          |  |
|  | IP               | 4            | Total Effect       | -0.06*<br>(0.00) |                 |                   |  |
| After the inclu  | sion of the medi | ator (SF)    |                    |                  |                 |                   |  |
| Hypothesis-3   | IP               | 4            | Indirect<br>Effect | 0.02*<br>(0.01)  | Significant     | Accepted          |  |
|  | IP               | 4            | Total Effect       | -0.05*<br>(0.00) |                 |                   |  |
| After the combined inclusion of the mediator (PF & SF) |                  |              |                    |                  |                 |                   |  |
| Hypothesis-4   | IP               | <del>~</del> | Indirect<br>Effect | 0.02*<br>(0.00)  | Significant     | Full<br>Mediation |  |
|  | IP               | ÷            | Total Effect       | -0.07*<br>(0.01) |                 |                   |  |

\*Significant Coefficients (p-value <0.2), SE = Standard Error in brackets

| Table 7. Control variables estimation |              |                                 |                 |               |                      |  |
|---------------------------------------|--------------|---------------------------------|-----------------|---------------|----------------------|--|
|                                       |              |                                 | Estimate (SE)   | Results       | Analysis             |  |
| IP                                    | 4            | Gender                          | -0.05<br>(0.08) | Insignificant | No Control<br>Effect |  |
| IP                                    | 4            | Age                             | 0.00<br>(0.04)  | Insignificant | No Control<br>Effect |  |
| IP                                    | <del>~</del> | Trading<br>Experience           | 0.03<br>(0.03)  | Insignificant | No Control<br>Effect |  |
| IP                                    | 4            | Monthly Income                  | 0.00<br>(0.06)  | Insignificant | No Control<br>Effect |  |
| IP                                    | ÷            | Investment at<br>Stock Exchange | 0.00<br>(0.02)  | Insignificant | No Control<br>Effect |  |

Note(s): \*Significant Coefficients (p-value <0.2), SE = Standard Error in brackets

to be positive. All fitness indices were within the tolerable threshold value (Anderson & Gerbing, 1988; Bentler, 2007; Browne, 1993; Fan & Wang, 1998). After the combined inclusion, all variables of behavioral factors register a positive impact on investment performance. These results lend support to the hypothesis that there is a full mediating effect of political and social factor among behavioral factors and investment performance.

Table 7 presents the result of applying control variables which indicates that there is no controlling impact of Age, Gender, Trading Experience, Monthly Income, Investment at the Stock Exchange on dependent variable, investment performance.

#### 5. Discussion

Overall, findings of the study indicate that behavioral factors: heuristic, prospect, market, and herding, do have impact in determining investment performance of the investors. This is consistent with findings by several studies (Waweru et al., 2008; Lehenkari & Perttunen, 2004; Barberis et al., 2001; Barberis & Thaler, 2003; Tan et al., 2008; & Durand et al., 2008). Sochi (2018) also found the presence of heuristic, prospect theory and market biases in DSE. Historically, the principal stock exchange of the country, (DSE), has been quite volatile. It has experienced several crashes in 1996, 2011 and 2019. Key reasons identified behind these crashes are short-term profit motive and lack of knowledge base of investors to make rational choices (S.U. Ahmed et al., 2014). They are susceptible to errors and irrational behaviors that substantiates arguments in favor of post-neoclassical behavioral finance theories (Colander et al., 2010; Gippel, 2012). As a result, the results of this study showing evidence of behavioral biases among DSE investors are justifiable.

The presence of mediating impact of political factors in defining the relationship between behavioral factors and investment performance is an insightful findings form this study. DSE experienced a huge rise in share price index after the general elections in 1996 and 2008 (M.A. Rahman et al., 2013). This may be due to the positive expectations of the investors from the newly formed government and can be termed as post-election effect. However, this jubilation did not continue due to subsequent abrupt fall in stock prices (S. U. Ahmed et al., 2012). Political consideration does have an impact in the investment decision-making process and investors do know about this and are responsive to the domestic political environment (Hood et al., 2014). Again, statistical significance of the mediating role of social factor found in the study is consistent with existing literature where it was found that cultural orientation of the investors may lead towards varying interpretations of information by the investors (Chua et al., 2010; Son & Nguyen, 2018). Typical cultural factors of Bangladeshi investors featured by reciprocity, social consciousness, and myopic investment behavior proved to be statistically significant. Accordingly, contrary to the previous studies dismissing investors to be ignorant (Securities and Exchange Commission (SEC), 2006), the findings of the study suggest that investors do consider the socio-political environment of the country while making their investment decisions.

Finally, the full mediating effect of political and social factors in determining the relationship between behavioral factors and investment performance provides ground to the post-neoclassical finance theories and confirms that anomalies exist in investors behavior in DSE (Sochi, 2018). However, these behavioral biases can be better explained by investors' consciousness about the sociopolitical environment and their investment decisions and outcome are not solely based on rationality.

#### 6. Conclusion

In this paper, an important but understudied aspect, namely, socio-political factors have been examined in explaining the behavior of investors linking with investment performance. The findings of the study reveal an explanation to the complex balancing act of DSE investors in managing risk and return. Cultural mindset, political developments in the country, particularly general election dates, influence investment decision-making process.

Given these findings, this research has a series of theoretical and practical implications for practitioners, scholars and policy makers. It relates to the concerns of policy makers and regulators, who are trying to bring stability in the capital market of Bangladesh and prevent frequent crashes. Also, the practitioners such as stock brokers, bankers, investment managers will be benefited by knowing that, contrary to the conventional belief, investors consider information before investing which are indeed reflected in their investment performance. Theoretical analysts may take the discussion further in evolving the post-neoclassical finance theories to accommodate the fluid conception of rationality in shaping the behavior of investors. However, like most of the studies this research is not also free from shortcomings. Inclusion of respondents only from DSE limits the generalization ability of the paper to entire investment climate of Bangladesh. A more comprehensive study by extending the theoretical outreach, including respondents from Chittagong Stock Exchange and broadening the sample size might be conducted in the future to have a better understanding.

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#### correction

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# Appendix A

| Table A1. Survey  | Table A1. Survey instrument |       |      |      |  |  |  |
|---|-----------------------------|-------|------|------|--|--|--|
| Questions   | FC                          | Alpha | AVE  | CR   |  |  |  |
| Heuristic   |                             | 0.90  | 0.59 | 0.90 |  |  |  |
| 12. You try to avoid<br>buying stocks that<br>have<br>underperformed in<br>the recent past and<br>buy "hot" stocks.                           | 0.61                        |       |      |      |  |  |  |
| 13. For making<br>investment<br>decisions for all<br>stocks that you<br>invest; you use<br>trend analysis of<br>some similar stocks.          | 0.95                        |       |      |      |  |  |  |
| 14. You believe that<br>the skills and<br>knowledge you<br>possess about the<br>stock market can<br>help you<br>outperform the<br>market.     | 0.80                        |       |      |      |  |  |  |
| 15. You depend on<br>your previous<br>experiences while<br>making your next<br>investment.  | 0.64                        |       |      |      |  |  |  |
| 16. Your forecasting<br>of the changes in<br>stock prices in the<br>future is basically<br>based on the recent<br>stock prices.               | 0.81                        |       |      |      |  |  |  |
| 17. You are<br>generally able to<br>anticipate the end<br>of good or poor<br>market outcomes<br>at the Dhaka Stock<br>Exchange.               | 0.68                        |       |      |      |  |  |  |
| 18. While making<br>your investment<br>decisions you<br>consider the<br>information from<br>your kit and kin as<br>the reliable<br>reference. | 0.79                        |       |      |      |  |  |  |
| Prospect  |                             | 0.92  | 0.65 | 0.92 |  |  |  |
| 19. After a prior<br>gain, you become<br>more risk seeker<br>that usual.  | 0.88                        |       |      |      |  |  |  |

| Questions  | FC   | Alpha | AVE  | CR   |
|--|------|-------|------|------|
| 20. After having<br>a prior loss you<br>have a tendency to<br>become more risk<br>averse.  | 0.69 |       |      |      |
| 21. You abstain<br>from selling shares<br>that have<br>diminished in worth<br>and promptly sell<br>shares that have<br>increased in value. | 0.93 |       |      |      |
| 22. You feel more<br>distress about<br>holding losing<br>stocks excessively<br>long than about<br>selling winning<br>stocks too early.     | 0.71 |       |      |      |
| 23. You in general<br>treat every<br>component of your<br>investment<br>portfolio<br>independently.  | 0.84 |       |      |      |
| 24. You ignore the<br>relation between<br>various investment<br>possibilities.   | 0.74 |       |      |      |
| Market   |      | 0.85  | 0.50 | 0.86 |
| 25. You carefully<br>consider how the<br>price of stocks<br>changes.   | 0.62 |       |      |      |
| 26. You tend to<br>over-respond when<br>there are price<br>changes of stocks.  | 0.76 |       |      |      |
| 27. You consider<br>market information<br>to be important for<br>your stock<br>investment.   | 0.75 |       |      |      |
| 28. You put the past<br>trends of stocks<br>under your<br>consideration for<br>your investment.  | 0.90 |       |      |      |
| 29. You analyze the<br>companies'<br>customer<br>preferences before<br>you invest in their<br>stocks.                                      | 0.55 |       |      |      |

| Table A1. (Continued)  |      |       |      |      |  |  |  |
|--|------|-------|------|------|--|--|--|
| Questions  | FC   | Alpha | AVE  | CR   |  |  |  |
| 30. You study about<br>the market<br>fundamentals of<br>underlying stocks<br>before making<br>investment<br>decisions.                       | 0.62 |       |      |      |  |  |  |
| Herding  |      | 0.89  | 0.68 | 0.90 |  |  |  |
| 31. Other investors'<br>decisions of<br>choosing stock<br>types have impact<br>on your investment<br>decisions.                              | 0.81 |       |      |      |  |  |  |
| 32. Other investors<br>of the stock volume<br>have impact on<br>your investment<br>decisions.  | 0.77 |       |      |      |  |  |  |
| 33. Other investors'<br>decisions of buying<br>and selling stocks<br>have impact on<br>your investment<br>decisions.                         | 0.92 |       |      |      |  |  |  |
| 34. You usually<br>react quickly to the<br>changes of other<br>investors' decisions<br>and follow their<br>reactions to the<br>stock market. | 0.79 |       |      |      |  |  |  |
| Political Factors  |      | 0.89  | 0.62 | 0.89 |  |  |  |
| 35. You consider<br>political stability of<br>the country before<br>making investment<br>decisions.  | 0.84 |       |      |      |  |  |  |
| 36. You avoid<br>buying shares<br>during general<br>election.  | 0.83 |       |      |      |  |  |  |
| 37. You tend to<br>avoid trading during<br>strike/ hartals.  | 0.73 |       |      |      |  |  |  |
| 38. You try to avoid<br>buying stocks<br>during government<br>change.  | 0.78 |       |      |      |  |  |  |
| 39. You prefer<br>economic stability.  | 0.73 |       |      |      |  |  |  |
| Social Factors   |      | 0.86  | 0.69 | 0.87 |  |  |  |
| 40. You want to<br>reciprocate<br>greetings, favors<br>and gifts.  | 0.92 |       |      |      |  |  |  |

| Questions  | FC   | Alpha | AVE  | CR   |
|--|------|-------|------|------|
| 41. You want to<br>maintain your<br>family or social<br>status.  | 0.83 |       |      |      |
| 42. You focus on<br>quick return from<br>investment.   | 0.73 |       |      |      |
| Investment<br>Performance  |      | 0.86  | 0.69 | 0.87 |
| 43. The return rate<br>of your recent stock<br>investment meets<br>your expectation.   | 0.74 |       |      |      |
| 44. Your rate of<br>return is equal to or<br>higher than the<br>average return rate<br>of the market.  | 0.92 |       |      |      |
| 45. You feel<br>satisfied with your<br>investment<br>decisions in the<br>last year (including<br>selling, buying,<br>choosing stocks,<br>and deciding the<br>stock volumes). | 0.83 |       |      |      |



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