Turkish Research Journal of Academic Social Science, 8(1): 7-20, 2025
DOI: 10.59372/turajas.1456601

Turkish Research Journal of Academic Social Science

Available online, ISSN: 2667-4491 | www.turkishsocialscience.com | Turkish Science and Technology Publishing (TURSTEP)

Investigating the Effect of Behavioural Finance on Retail Investors' Stock Performance in Borsa Istanbul and Moderator Role of Psychological Capital in This Effect

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ARTICLE INFO

Research Article

Received : 21.03.2024
Accepted : 28.04.2025

Keywords:
Behavioural Finance
Psychological Capital
Stock Performance
Retail Investor
Borsa Istanbul

ABSTRACT

This study aims to investigate the effect of behavioural finance on the stock performance of retail investors in Borsa Istanbul and the role of psychological capital in this effect. In this regard, a survey was conducted on 223 retail investors who made transactions in Borsa Istanbul between 31st December 2022 and 16th January 2023. In the survey form, there are eleven questions to identify the demographic profile of the participants and three scales which are Behavioural Finance Scale with 26 statements, Psychological Capital Scale with 24 statements and Stock Performance Scale with 9 statements. SPSS-22 software was used for data analysis. As a result of the study, it is found that behavioural finance factors have a partial effect on stock performance of retail investors and psychological capital has a partial role in this effect.

Türk Akademik Sosyal Bilimler Araştırma Dergisi, 8(1): 7-20, 2025

Borsa İstanbul'da Bireysel Yatırımcıların Hisse Performansı Üzerinde Davranışsal Finansın Etkisi ve Psikolojik Sermayenin Moderatör Rolünün İncelenmesi

MAKALE BİLGİSİ

Araştırma Makalesi

Geliş : 21.03.2024
Kabul : 28.04.2025

Anahtar Kelimeler:
Hisse Senedi Performansı
Psikolojik Sermaye
Davranışsal Finans
Bireysel Yatırımcı
Borsa İstanbul

ÖZ

Bu çalışmada davranışsal finansın Borsa İstanbul'da bireysel yatırımcıların hisse senedi performansı üzerindeki etkisinin ve bu etkide psikolojik sermayenin rolünün araştırılması amaçlanmaktadır. Bu kapsamda 31 Aralık 2022-16 Ocak 2023 tarihleri arasında Borsa İstanbul'da işlem yapan 223 bireysel yatırımcıya anket uygulanmıştır. Anket formunda katılımcıların demografik profilini belirlemeye yönelik on bir soru ve Davranışsal Finans Ölçeği olan üç ölçek yer almaktadır. 26 ifadeli Psikolojik Sermaye Ölçeği, 24 ifadeli Psikolojik Sermaye Ölçeği ve 9 ifadeli Hisse Senedi Performans Ölçeği. Veri analizi için SPSS-22 programı kullanıldı. Çalışma sonucunda bireysel yatırımcıların hisse senedi performansı üzerinde davranışsal finans faktörlerinin, bu etkide psikolojik sermayenin ise kısmi bir etkisinin olduğu tespit edilmiştir.

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Introduction

The term "Behavioral Finance" was developed to help individuals facing financial decisions understand how they make decisions and behave when investing. Recent studies published in the financial literature have confirmed that the old and classical theories once utilized to measure and explain investor behavior are no longer adequate (Çam and Hırka, 2021). The focus of behavioral finance is on how investors assess information to make judgments about various investments and how this information influences them as they make these decisions (Kumar and Gupta, 2020: 8). The disciplines of psychology and finance have converged in the topic of behavioral finance. Investors' failure to act rationally and the manifestation of actions that are incomprehensible in light of conventional financial theories are the causes of behavioral finance (Turazada and Şimşek, 2022: 115). In this context, deviations from market efficiency and irrational actions of market participants are explained by behavioral finance. (Ülkü, 2001: 99).

Psychological capital refers to a favorable psychological state in which a person believes they can handle challenging situations and cope with issues about the durability of their success, as well as having optimistic expectations about achieving success now or in the future (Avey et al., 2008: 54). Similar to the classic economic capital idea, psychological capital may be assessed as an investment made on the basis of performance and competitive supremacy (Luthans et al., 2006: 26). Entrepreneurs, managers, and investors have become more aware of the value of psychological capital as a result of dealing with issues including financial incompetence, regulatory limits, growing competition, and a bad economy (Envick, 2005: 41).

In this study, the function of psychological capital in this effect is being investigated, along with the impact of behavioral finance on retail investors' stock performance in the Borsa Istanbul market. Numerous studies on behavioral finance and the variables influencing the choices and stock performance of retail investors have been published in the literature. There is, however, no research on the moderating effect of psychological capital in the relationship between behavioral finance characteristics and stock performance. The literatures on behavioral finance, psychological capital, and stock market research will all benefit greatly from this work.

Literature Review

Behavioural Finance

Behavioral finance is an interdisciplinary field which is based on theories, prejudices and research techniques from psychology, economy, neuroscience, decision-making fields and etc. (Ricciardi, 2006). Behavioral finance focuses on the role of cognitive factors and emotional effects on individuals, groups, organizations and markets. These prejudices are not only accidental behavioral types; on the contrary, such results are systematic missteps that individuals have the tendency to repeat over and over (Baker and Ricciardi, 2014). The field of behavioral finance attempts to shed light on how psychological factors affect investment decisions (Fuller, 1998: 10). Over time, with the developments in the discipline of psychology, some studies have begun to be conducted to explain why individuals do not carry out decision-making processes with the principle of maximum benefit. At this point, behavioral finance has made financial models much more explanatory by taking the discipline of psychology as a reference. Behavioral finance aims to reveal the irrationality in financial markets by expanding the concept of rationality that traditional financial models accept as data. (Barberis and Thaler, 2002: 2).

When it comes to deciding how and where to invest their money, individuals are subject to the influence of a great number of different circumstances. In addition to this, it is quite tough to arrive at decisions by accessing data that is available on the market and accurately evaluating this data in accordance with these aspects (Goldenberg, 2004: 131). According to behavioural finance theory, investors are categorized in two groups as rational arbitrage traders investing within knowledge, and noise traders who make investment decisions irrationally via their emotions and rumours. These two groups to meet within capital markets creates competition. However, costless and riskless arbitrage is a limited situation. Irrational investors make transactions according to the changes in their emotions and sensibilities. Such a situation leads to mistakes via preventing healthy price formations (Baker and Wurgler, 2007: 1-31). These mistakes generate the effect of errors, emotions, prejudices and beliefs on financial markets, and prove the authenticity of behavioral finance (Barberis and Thaler, 2002: 5).

In the behavioral finance approach, it is argued that individuals cannot always act rationally and logically, and that individuals have some cognitive biases, and that their emotions and moods have an effect on their behavior; therefore, individuals cannot always make optimum choices and make their choices not to maximize their overall benefits, but to satisfy themselves. (Bostancı, 2003: 13). In other words, individuals make choices not for maximizing their utility overall, but for satisfying themselves. "Herd Behaviour", "Over Confidence", "Loss Aversion", and "Uncertainty Avoidance" are the four key elements that are employed in this study. These are the factors that have an effect on the investing decisions made by retail investors. Because many people place a high level of importance on a society's cultural values and beliefs, the culture in which an individual lives can have a significant impact on that individual's worldview. Herd behaviour becomes apparent when viewed in this light. Investors who engage in a manner that is referred to as "herd behaviour" are those who execute transactions for the same stocks or in the same market at the same time and move in the same direction. As a result, investors base their choices on the choices made by other investors (Günak, 2007: 46). An individual is said to have overconfidence in themselves when they think their own information and talents to be of a greater degree than they actually are in relation to the circumstances they are in. This circumstance constitutes one of the most significant errors committed in terms of financial activity (Bernstein, 2005: 236). The propensity to base current decisions on one's past successes and losses is known as loss aversion. The emergence of a loss following the realization of a profit presents less difficulties than the

emergence of a loss following the realization of an additional loss, according to Dom (2003) and Thaler et al. (1997: 648). Eliot Ellsberg was the first to suggest avoiding uncertainty (1961). According to Ellsberg's (1961) research on how people behave in uncertain situations; people do not like to be in uncertain situations and do not prefer to participate in uncertain situations that already exist. (Ertan, 2007: 44).

Psychological Capital

As a result of advancements in positive organizational behaviour, which occurred as a result of the impact of positive psychology, the notion of psychological capital emerged and was introduced to literature (Luthans and Avolio, 2009: 300). As a result of the focus on improving life quality, positive psychology arose as a science of positive subjective experience and positive individual qualities promising to prevent negativities (Seligman and Csikszentmihalyi, 2000: 5). In this regard, psychological capital states a psychological situation in which positivity stands in the centre, differently from intellectual capital focusing on gaining competitive advantage (Çetin and Basım, 2012: 161). Psychological capital means the tendency to keep the evaluations and cognitions about coping skills with various situations. These situations can be undertaking difficult tasks, producing alternative solutions for the problems, endurance under difficult conditions, and trusting into the capability to get rid of failures rapidly. Studies made on psychological capital have showed that psychological capital is related to some significant outcomes withing work environment and also out of the office such as job performance, citizenship behaviours, turnover intention, life satisfaction, job satisfaction, relation quality, physical health, substance addiction and etc. (Harms, Krasikova and Luthans, 2018: 551) The primary focus of psychological capital is on the identity of the consumers and what will occur in the future as a result of positive development (Erkuş and Fındıklı, 2013: 304). There are distinguishing characteristics of psychological capital, including that it is more valuable than human capital and social capital, that it is distinctive in a positive way, that it is based on theory and research, that it can be measured, that it is situation-specific and developable, and that it has an impact on people's productivity and performance (Nelson and Cooper, 2007: 11-13). A higher order positive construct known as psychological capital is made up of the four constructs hope, resilience, optimism, and confidence (Luthans and Youssef, 2004). A person's confidence is his or her belief that they can complete a task. In this regard, a person's belief in his ability to complete the work increases as his level of confidence does. Therefore, those who lack confidence are more likely to give up when faced with challenges. However, those with greater confidence make more of an attempt to complete the work (Robbins, 2001: 167). Such people are eager to take on challenging jobs and never back down, and they do not hesitate to use all of their strength to achieve achievement (Larson and Luthans, 2006: 50). Additionally, because of its connections to variables like happiness, health, and success, optimism can be seen as a powerful structure (Peterson, 2006: 119). Those who are optimistic can succeed in many different areas and improve their health (Scheier and Carver, 1987). Additionally, hope is about a person's ability to recognize instances of positive motivation that lead to a sense of achievement, the effort and tenacity put out in pursuit of intended goals, and potential alternatives (Jensen and Luthans, 2006: 261). Hope is a cognitive activity that involves using willpower to make concrete goals, coming up with creative solutions to achieve these goals, and achieving those goals (Snyder, 2002: 249-252). It might be argued that people with high hope levels like challenging goals and put forth more effort to achieve them by setting smaller, more manageable goals (Hefferon and Boniwell, 2014: 108). Last but not least, resilience can be defined as overcoming challenges or recovering well despite serious hazards (Wilkes, 1979; Benard, 1993). The ability to exert effort for tasks that are undertaken and deal with challenging circumstances, such as traumatic changes, uncertainties, conflicts, issues, dangers, failure, and others, is referred to as psychological resilience in terms of psychological capital (Luthans and Jensen 2002: 702). A top-level core structure called psychological capital collects and combines many laudable organizational behaviour standards. Therefore, it can be said that all aspects of psychological capital are interconnected. An individual with a great degree of hope, for instance, has the conviction to overcome challenges and a high degree of resilience and endurance. Additionally, people with strong levels of confidence may manifest their optimism, hope, and toughness in their daily actions (Luthans, Youssef and Avolio, 2006).

Numerous studies on behavioral finance and the variables influencing the choices and stock performance of retail investors have been published in the literature. There is, however, no research on the moderating effect of psychological capital in the relationship between behavioral finance characteristics and stock performance. The literatures on behavioral finance, psychological capital, and stock market research will all benefit greatly from this work.

Relation between Variables

Today, as in other branches of science, human characteristics have become more evident in the field of finance. It is observed that investors' behaviours displayed while making financial decisions are influenced by psychological and sociological factors. In this regard, behavioural finance as a sub-field of finance discipline investigates financial behaviours via

transferring these factors into finance discipline (Göçer and Karaca, 2019). Behavioral finance is a field of psychology and economy examining how cash management and decision-making in investment can be affected by cognitive tendencies. Thus, it is possible to state that the roots of behavioral finance studies are based on cognitive psychology which is a field of psychology investigating the internal cognitive processes such as visual processing, memory, thinking, learning, feeling, problem solving and decision-making, judgment etc. (Kasemsap, 2015: 95). There are some previous studies in the literature about behavioural finance, investor decisions and psychological factors. Aydın and Ağan (2016) investigated psychological factors affecting investors to make financial decisions and made a survey with 600 individuals. As the result, it was found that psychological prejudices have

effective role in individuals' investment decisions and behaviours, individuals are interested in investors' social structures, and they make mistakes in their decisions via exhibiting irrational behaviours with the impact of this situation. Öncü and Özevin (2017) examined the effect of psychological factors on woman investors' investment decisions and made a survey on woman investors. As a result of the study, it was revealed that women investors turn to investment instruments they trust and prefer short-term investments rather than long-term investments. Moreover, woman investors attach much importance to knowledge acquisition, they are affected psychologically and exhibit behavioural tendencies in this way. Öztopçu and Aytekin (2017) investigated irrational behaviours of individuals and examined how behavioural finance emerged and behavioural tendencies of individuals about investment decision. In this regard, researchers made a survey with 326 participants. As the result, it was found that individuals attach importance to social and emotional tendencies in their investment decisions. Ormancı et al. (2022) investigated whether behavioural finance tendencies differ according to the demographic characteristics of individual investor and found significant differences in the tendency to self-deception from behavioural finance tendencies of investors and in education, marital status and income variables from socio-demographic characteristics in social tendencies; no significant relationships were found between demographic characteristics and cognitive and emotional tendencies. Arslan and Boztosun (2022) conducted a survey on 420 individual investors residing in Kayseri and investigated the effect of demographic characteristics of individual investors on behavioral tendencies and biases. They found that demographic characteristics of investors had an effect on behavioral finance tendencies and biases, which are herding tendency, anchoring tendency, overconfidence tendency, hindsight bias tendency, confirmation tendency and regret tendency. However, the effect of demographic characteristics on loss aversion tendency and representativeness tendency could not be determined.

Rasiah et al. (2022), Among 500 adult employees in Malaysia They investigated the effect of psychological beliefs on financial well-being and the mediating role of financial behavior in the relationship between psychological beliefs and financial well-being. As a result of the study, psychological beliefs including subjective financial attitude, financial knowledge and locus of control were positively associated with financial well-being, financial behavior, financial attitude and locus of control were positively associated with financial well-being. Chavalı et al. (2021) investigated the extent to which financial behaviour affects financial well-being in India and conducted a study with 150 participants. The findings of the study showed that except loan commitment, all other behavioural factors such as future security, savings and investments, credit indiscipline and financial awareness have a significant impact on the financial well-being of an individual. Atmaningrum et al. (2021), Financial Knowledge, Income and Self-Control variables through Financial Behaviour and Financial Attitudes on Investment Decisions As a result of the study, it was seen that financial knowledge has an effect on financial behaviour, financial knowledge affects financial attitudes and financial knowledge affects investment decisions.

When the literature is examined, it is seen that the studies mostly examine the effects of individual investors' financial behavior tendencies on demographic characteristics, financial well-being, financial awareness It has been seen. In this sense, it has been seen that there is no study examining the effect of behavioral finance and the role of psychological capital on the stock performance of individual investors. In this context, it is thought that the study will contribute to the literature.

Method

In this study, the effect of behavioural finance on retail investors' stock performance in Borsa Istanbul and moderator role of psychological capital in this effect was investigated. Within this scope, research was done on retail investors who make transactions in Borsa Istanbul. Survey technique was used as data collection method in the study. Validity and reliability analyses were conducted on the data. To identify significant relations among research variables, correlation analysis was made. Moreover, in order to test research hypotheses, regression analyses were made.

There are three types of variables in this study as independent variable (behavioural finance), dependent variable (retail investors' stock performance) and moderator variable (psychological capital). In this regard, the research model was constituted in Figure 1.

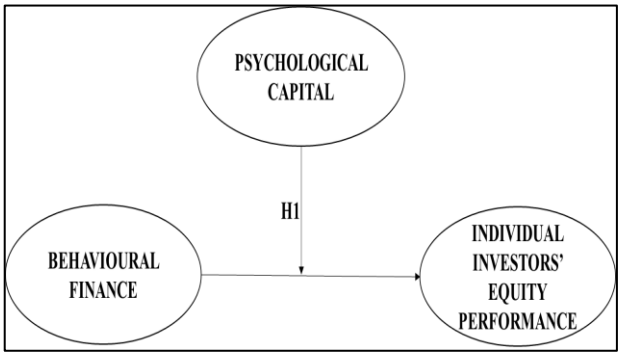

Figure 1. Research model

According to research model shown in Figure 1, these main and sub hypotheses were formed:

H1: Psychological capital has moderator role in the effect of behavioural finance on stock performance.

$H1_a$: Psychological capital has moderator role in the effect of herd behaviour on stock performance.

$H1_{a1}$: Hope has moderator role in the effect of herd behaviour on stock performance.

$H1_{a2}$: Confidence has moderator role in the effect of herd behaviour on stock performance.

$H1_{a3}$: Resilience has moderator role in the effect of herd behaviour on stock performance.

$H1_{a4}$: Optimism has moderator role in the effect of herd behaviour on stock performance.

$H1_b$: Psychological capital has moderator role in the effect of over confidence on stock performance.

$H1_{b1}$: Hope has moderator role in the effect of over confidence on stock performance.

$H1_{b2}$: Confidence has moderator role in the effect of over confidence on stock performance.

$H1_{b3}$: Resilience has moderator role in the effect of over confidence on stock performance.

$H1_{b4}$: Optimism has moderator role in the effect of over confidence on stock performance.

$H1_{c}$: Psychological capital has moderator role in the effect of loss aversion on stock performance.

$H1_{c1}$: Hope has moderator role in the effect of loss aversion on stock performance.

$H1_{c2}$: Confidence has moderator role in the effect of loss aversion on stock performance.

$H1_{c3}$: Resilience has moderator role in the effect of loss aversion on stock performance.

$H1_{c4}$: Optimism has moderator role in the effect of loss aversion on stock performance.

$H1_{d}$: Psychological capital has moderator role in the effect of uncertainty avoidance on stock performance.

H1d1: Hope has moderator role in the effect of uncertainty avoidance on stock performance.

H1d2: Confidence has moderator role in the effect of uncertainty avoidance on stock performance.

H1d3: Resilience has moderator role in the effect of uncertainty avoidance on stock performance.

H1d4: Optimism has moderator role in the effect of uncertainty avoidance on stock performance.

Sampling and Participants

This study covers Borsa Istanbul retail investors. Convenience and snowball sampling were used. Using Google Forms, 223 retail investors who traded in Borsa Istanbul between 31 December 2022 and 16 January 2023 were surveyed. Demographic characteristics of the participants are given in Table 1 below.

Table 1. Demographic characteristics of variables

Variables		**Number (n)**	**Percentage (%)**
Gender	Female	36	16.15
	Male	187	83.85
Educational Status	Primary/Secondary School	3	1.34
	High School/Vocational High School	38	17.05
	Üniversity	132	59.19
	Master's Degree/Doctorate	50	22.42
Occupation	Public Official	54	24.22
	Private Sector Employee	82	36.77
	Serbest Meslek Sahibi	43	19.28
	Student	13	5.83
	Retired	17	7.62
	Unemployed	7	3.14
	Other	7	3.14
Marital Status	Married	141	63.23
	Simple	82	36.77
Monthly Income	5.000-7.000 ₺	7	3.14
	7000-10.000	35	15.70
	10.000-15.000	71	31.84
	15.000-20.000	34	15.25
	20.000 +	76	34.08

According to the findings in Table 1, 36 of the participants are female and 187 are male. 54 participants are public officers, 82 private sector workers, 43 self-employed, 13 students, 17 retired, 7 unemployed, and 7 "other." 2 participants have primary school degrees, 1 has secondary, 26 have high school, 12 have vocational, 132 have undergraduate, and 50 have graduate degrees. Marital status: 82 single, 141 married. 10 participants earn minimum wage, 7 earn between 5.500 ₺ and 7.000 ₺, 35 earn between 7.000 ₺ and 10.000 ₺, 61 earn between 10.000 ₺ and 15.000 ₺, 34 earn between 15.000 ₺ and 20.000 ₺, and 76 earn more than 20.000 ₺.

Table 2. Participants' stock market performance information

Variables		**Number (n)**	**Percentage (%)**
Portfolio Size	1	21	9.42
	2-5	94	42.15
	6-10	57	25.56
	11-15	28	12.56
	16-20	9	4.04
	21-25	8	3.59
	25 +	6	2.69
Holding Period	Less than 1 Year	36	16.14
	1-5 Year	127	56.95

	6-10 Year	10	4.84
	10 + Year	50	22.42
Transaction Frequency	Daily	17	7.62
	Less than 1 Month	43	19.28
	1-6 Months	111	49.78
	6-12 Months	25	11.21
	12-18 Months	15	6.73
	18-24 Months	1	0.45
	24 +	11	4.93

According to table 2; 36 participants have invested in the stock exchange market for less than a year, 30 for 1-2 years, 72 for 3-4 years, 25 for 5-6 years, 10 for 6-10 years, and 50 for more than 10 years. In Borsa Istanbul, 51 participants make transactions between 1-5, 54 between 6-10, 31 between 11-15, 8 between 16-20, and 79 over 20. 21 participants have 1 portfolio, 10 have 2, 84 have 3-5, 57 have 6-10, 28 have 11-15, 9 have 16-20, 8 have 21-25, and 6 have over 25. 17 participants day trade, 43 participants hold stocks less than 1 month, 73 participants hold stocks between 1-3 months, 38 participants between 4-6 months, 9 participants between 7-9 months, 16 participants between 10-12 months, 15 participants between 12-18 months, 1 participant between 18-24 months, and 11 participants more than 24 months.

Measurement Instruments

Primary data was collected from a sample population via a survey in this investigation. This led to the development of a questionnaire for use with the retail investors who transact on the Borsa Istanbul Exchange. Eleven questions are designed to identify the participants' demographic profile, and the survey's three scales — the Behavioural Finance Scale, the Psychological Capital Scale, and the Stock Performance Scale — measure participants' attitudes and behaviours regarding money and investing.

Behavioural Finance Scale

Behavioural Finance Scale was developed by Turazada and Şimşek (2022) with 24 statements and 4 dimensions. These dimensions are Over Confidence (OC - 9 statements), Herd Behaviour (HB - 5 statements), Loss Aversion (LA - 5 statements) and Uncertainty Avoidance (UA - 5 statements). Moreover, 2 statements were added to HB by researcher. Behavioural Finance Scale is measured via 5-point Likert scale.

In Table 1, exploratory factor analysis and reliability analysis results of Behavioural Finance Scale were indicated. According to Kaiser Mayer Olkin (KMO) value which is 0.745 and higher than 0.500 in Table 1, the size of sample group of study is sufficient to make exploratory factor analysis on the scale. Also, in terms of Bartlett Sphericity Test result, the scale is suitable to make exploratory factor analysis on the scale (p=0.000). During exploratory factor analysis, the statements coded as LA3, UA5, LA4, OC9, OC4, UA3 and UA4 were discarded from scale structure since these have factor load under 0.50. After exploratory factor analysis made on Behavioural Finance Scale, it can be seen that there are four factors suitable with original structure as Herd Behaviour (HB), Over Confidence (OC), Loss Aversion (LA) and Uncertainty Avoidance (UA). HB explained 21.44 percent of the scale variance, OC explained 18.69 percent of the scale variance, LA explained 9.99 percent of the scale variance, and UA explained 9.08 percent of the scale variance. In this regard, total explained variance of Behavioural Finance Scale is 59.188 percent. Moreover, reliability analysis results for Behavioural Finance Scale and its factors were shown in Table 1. According to the reliability result, HB has the reliability of 0.867; OC has the reliability of 0.810; LA has the reliability of 0.657; and UA has the reliability of 0.770. Moreover, Behavioural Finance Scale has the reliability of 0.757.

Table 3. Factor analysis and reliability analysis results for behavioural finance scale

Statements	HB	OC	LA	UA	Reliability	Scale Reliability
HB3- The investment preferences of the people with whom I communicate closely while investing in stocks are effective in my decisions.	0.843					
HB4- When investing in stocks, I care about the investment preferences of the people I come in close contact with.	0.834					
HB6- I find the stocks that my close friends invest in safer.	0.822					0.757
HB7- It is important for me to have preferences similar to my own stock investment preferences in my environment.	0.780				0.867	
HB5- When investing in stocks, I follow the decisions of the majority.	0.754					
HB2- I take social media shares or comments into consideration when investing in stocks.	0.590					

HB1- I follow various focus groups when investing in stocks; eg: signal groups (Telegram, WhatsApp etc.)	0.508				
OC2- When investing in stocks, I think I have all the necessary skills to choose the right stock.		0.785			
OC1- When investing in stocks, I think I have all the necessary information to choose the right stock.		0.755			
OC5- I think I made the right decisions when investing in stocks.		0.752			
OC6- The return I get from my stock investments is always above average returns in the market.		0.673			
OC8- When I examine the end-of-period performance of a stock, I usually have a belief that I know what will happen in advance.		0.669			0.810
OC7- When investing in stocks, I think that the information available to very few investors in the market gives me an advantage.		0.636			
OC3- I don't need the knowledge of investment advisor when making a stock investment decision.		0.513			
LA2- I immediately dispose of losing shares in my stock investments.			0.781		
LA1- When investing in stocks, I prefer the most profitable stocks.			0.729		0.657
LA5- When the price of a stock that I wait at a loss in my stock investments comes to the cost of purchase, I do not hold and sell any more.			0.698		
UA1- When investing in stocks, I prefer the stocks of companies I know.				0.882	
UA2- When I have to decide between two stocks, I prefer to invest in the stock I have the most knowledge of.				0.806	0.770
Explained Variance	21.44%	18.69%	9.99%	9.08%	Total %59.188
KMO: 0.745; Chi-Square: 1825.584; df: 171; p: 0.000					

Psychological Capital Scale

Psychological Capital Scale was developed by Luthans et al. (2007) with 24 statements and 4 dimensions. These dimensions are Hope (HO), Confidence (CO), Resilience (RE) and Optimism (OP). Psychological Capital Scale is measured via 6-point Likert scale.

In Table 2, exploratory factor analysis and reliability analysis results of Psychological Capital Scale were indicated. According to KMO value which is 0.890 and higher than 0.500 in Table 2, the size of sample group of study is sufficient to make exploratory factor analysis on the scale. Also, in terms of Bartlett Sphericity Test result, the scale is suitable to make exploratory factor analysis on the scale (p=0.000). During exploratory factor analysis, the statement coded as PC20 was discarded from scale structure since this statement has factor load under 0.50. After exploratory factor analysis made on Psychological Capital Scale, it can be seen that there are four factors suitable with original structure as Hope (HO), Confidence (CO), Resilience (RE) and Optimism (OP). HO explained 19.98 percent of the scale variance, CO explained 18.77 percent of the scale variance, RE explained 18.11 percent of the scale variance, and OP explained 12.52 percent of the scale variance. In this regard, total explained variance of Psychological Capital Scale is 69.379 percent. Moreover, reliability analysis results for Psychological Capital Scale and its factors were shown in Table 2. According to the reliability result, HO has the reliability of 0.878; CO has the reliability of 0.923; RE has the reliability of 0.914; and OP has the reliability of 0.788. Moreover, Psychological Capital Scale has the reliability of 0.946.

Table 4. Factor analysis and reliability analysis results for psychological capital scale

Statements	Hope	Confidence	Resilience	Optimism	Reliability	Scale Reliability
PC9- There is more than one solution for every problem in stock investments.	0.814					
PC7- Even if I feel stuck with my stock investments, I can find many ways to get out of this situation.	0.721					
PC11- I can find many ways to achieve my portfolio goals in my stock investments.	0.707				0.878	
PC8- I am energetically trying to reach my goals regarding my stock investments.	0.622					
PC3- I feel confident to contribute to other people's decisions regarding stock investments.		0.842				
PC6- I feel confident in informing people around me about stock investments.		0.723				
PC1- I feel confident when making long-term analysis of stock investments.		0.642				
PC5- I feel confident when discussing with other people about stock investments.		0.631			0.923	
PC4- I feel confident in setting goals for my stock investments.		0.612				
PC2- I have full confidence in my decisions about my stock investments.		0.586				
PC12- I am currently realizing my portfolio goals that I have set for myself regarding my stock investments.		0.531				0.946
PC10- I believe that I am quite successful in my current stock investments.		0.504				
PC17- Thanks to my experience, I am able to overcome difficulties in the stock market.			0.812			
PC18- I can overcome multiple simultaneous challenges in my stock investments.			0.762			
PC15- I can manage my stock investments on my own if I have to.			0.711		0.914	
PC16- I can manage my stock investments without stress.			0.695			
PC14- I somehow overcome the difficulties I encounter in my stock investments.			0.619			
PC13- Even if I fail in my stock investments, I have no trouble getting out of it and moving on.			0.570			
PC21- I always look at the glass half full when it comes to stock investments.				0.827		
PC19- I always hope for the best when it comes to uncertainty in my stock investments.				0.791	0.788	
PC24- I approach my stock investments with the belief that there is good in the end.				0.715		

PC22- I am optimistic about the future of my stock investments.				0.549	
PC23- In stock investments, everything goes as I want.				0.548	
Explained Variance	19.98%	18.77%	18.11%	12.52%	Total %69.379
KMO: 0.890; Chi-Square: 4181.867; df: 253; p: 0.000					

Stock Performance Scale

Stock Performance Scale was developed by the research with 9 statements. Stock Performance Scale is measured via 5-point Likert scale.

In Table 3, exploratory factor analysis and reliability analysis results of Stock Performance Scale were indicated. According to KMO value which is 0.856 and higher than 0.500 in Table 3, the size of sample group of study is sufficient to make exploratory factor analysis on the scale. Also, in terms of Bartlett Sphericity Test result, the scale is suitable to make exploratory factor analysis on the scale (p=0.000). After exploratory factor analysis made on Stock Performance Scale, it can be seen that there is only one factor suitable as Stock Performance (SP). SP explained 69.706 percent of the scale variance. Moreover, reliability analysis result for Stock Performance Scale was shown in Table 3. According to the reliability result, SP has the reliability of 0.944.

Table 5. Factor analysis and reliability analysis results for stock performance scale

Statements	SP	Reliability
P5- If you evaluate the medium-term (6-12 Months) performance of your stock investments, what level is your profitability according to the Gram Gold Yield?	0.888	0.944
P8- If you evaluate the medium-term (6-12 Months) performance of your stock investments, what level is your profitability according to the Foreign Exchange Yield (USD)?	0.876	
P7- If you evaluate the short-term (0-6 Months) performance of your stock investments, what level is your profitability according to the Foreign Exchange Yield (USD)?	0.874	
P6- If you evaluate the long-term (Above 12 Months) performance of your stock investments, what level is your profitability according to the Gram Gold Yield?	0.873	
P9- If you evaluate the long-term (Above 12 Months) performance of your stock investments, what level is your profitability according to the Foreign Exchange Yield (USD)?	0.849	
P4- If you evaluate the short-term (0-6 Months) performance of your stock investments, what level is your profitability according to the Gram Gold Yield?	0.839	
P2- If you evaluate the medium-term (6-12 Months) performance of your stock investments, what level is your profitability compared to the average of BIST100 Index?	0.802	
P1- If you evaluate the short-term (0-6 Months) performance of your stock investments, what level is your profitability compared to the average of BIST100 Index?	0.762	
P3- If you evaluate the long-term (Above 12 months) performance of your stock investments, what level is your profitability compared to the average of BIST100 Index?	0.736	
Explained Variance		Total %69.706
KMO: 0.856; Chi-Square: 2197.798; df: 36; p: 0.000		

In Table 4, descriptive values for research variables were indicated. According to the table, SP has high mean, HB has the mean under average, OC has high mean, LA has low mean, UA has high mean, HO has very high mean, CO has very high mean, RE has very high mean, and OP has high mean. Furthermore, according to the skewness and kurtosis values of research variables, the data is closer to normal distribution standards.

Table 6. Descriptive values for research variables

Variables	N	Min.	Max.	Mean	SD	Skewness	Kurtosis
Stock Performance	223	1.00	5.00	3.745	0.828	-1.004	1.059
Herd Behaviour	223	1.00	5.00	2.835	0.898	-0.198	-0.209
Over Confidence	223	1.00	5.00	3.552	0.708	-0.310	0.470
Loss Aversion	223	1.00	5.00	2.671	0.874	0.461	0.039
Uncertainty Avoidance	223	1.00	5.00	3.948	0.886	-1.290	2.358

Hope	223	1.00	6.00	4.600	0.871	-0.635	1.058
Confidence	223	1.00	6.00	4.406	0.937	-0.485	0.802
Resilience	223	1.00	6.00	4.633	0.930	-0.717	0.924
Optimism	223	1.00	6.00	3.978	0.921	-0.161	0.407

Results

To identify significant relations among research variables, correlation analysis was conducted. According to Table 5, there are generally positive or negative significant relations among research variables. However, LA does not have significant relations with UA, HO, CO, RE and OP, and OC does not have significant relation with LA, and OP does not have significant relation with HB.

Table 7. Correlation analysis results

	SP	HB	OC	LA	UA	HO	CO	RE	OP
SP	1								
HB	-.228**	1							
OC	.445**	-.164*	1						
LA	-.158*	.286**	.041	1					
UA	.194**	.164*	.253**	.052	1				
HO	.462**	-.218**	.698**	-.005	.249**	1			
CO	.390**	-.178**	.705**	-.014	.314**	.767**	1		
RE	.414**	-.337**	.628**	-.084	.219**	.756**	.719**	1	
OP	.179**	.013	.379**	.080	.176**	.376**	.496**	.414**	1

In order to test "H1: Psychological capital has moderator role in the effect of behavioural finance on stock performance."; "$H1_a$: Psychological capital has moderator role in the effect of herd behaviour on stock performance.", "$H1_b$: Psychological capital has moderator role in the effect of over confidence on stock performance.", "$H1_c$: Psychological capital has moderator role in the effect of loss aversion on stock performance." and "$H1_d$: Psychological capital has moderator role in the effect of uncertainty avoidance on stock performance." were tested separately. Hypothesis test results were reflected in Table 6. According to the results shown in Table 6, these findings were reached:

- For $H1_{a1}$, HB has no significant effect on SP (p=0.079), HO has significant, mid-level and positive effect on SP (ß=0.346; t=6.899; p=0.000), and moderator interaction variable has significant, low-level and negative effect on SP (ß=-0.102; t=-2.155; p=0.032). In this regard, HO does not have moderator role in the effect of HB on SP. Thus, $H1_{a1}$ is rejected.
- For $H1_{a2}$, HB has significant, low-level and negative effect on SP (ß=-0.124; t=-2.421; p=0.016), CO has significant, low-level and positive effect on SP (ß=0.288; t=5.640; p=0.000), and moderator interaction variable has significant, low-level and negative effect on SP (ß=-0.093; t=-2.316; p=0.022). In this regard, CO has moderator role in the effect of HB on SP. Thus, $H1_{a2}$ is accepted.
- For $H1_{a3}$, HB has no significant effect on SP (p=0.291), RE has significant, mid-level and positive effect on SP (ß=0.325; t=6.032; p=0.000), and moderator interaction variable has no significant effect on SP (p=0.123). In this regard, RE does not have moderator role in the effect of HB on SP. Thus, $H1_{a3}$ is rejected.
- For $H1_{a4}$, HB has significant, low-level and negative effect on SP (ß=-0.179; t=-3.197; p=0.002), OP has significant, low-level and positive effect on SP (ß=0.142; t=2.593; p=0.010), and moderator interaction variable has no significant effect on SP (p=0.444). In this regard, OP does not have moderator role in the effect of HB on SP. Thus, $H1_{a4}$ is rejected.
- For $H1_{b1}$, OC has significant, low-level and positive effect on SP (ß=0.208; t=3.087; p=0.002), HO has significant, low-level and positive effect on SP (ß=0.203; t=2.910; p=0.004), and moderator interaction variable has significant, low-level and negative effect on SP (ß=-0.073; t=-2.193; p=0.029). In this regard, HO has moderator role in the effect of OC on SP. Thus, $H1_{b1}$ is accepted.
- For $H1_{b2}$, OC has significant, low-level and positive effect on SP (ß=0.276; t=3.969; p=0.000), CO has no significant effect on SP (p=0.138), and moderator interaction variable has significant, low-level and negative effect on SP (ß=-0.068; t=-2.007; p=0.046). In this regard, CO does not have moderator role in the effect of OC on SP. Thus, $H1_{b2}$ is rejected.
- For $H1_{b3}$, OC has significant, low-level and positive effect on SP (ß=0.268; t=4.305; p=0.000), RE has significant, low-level and positive effect on SP (ß=0.141; t=2.220; p=0.028), and moderator interaction variable has significant, low-level and negative effect on SP (ß=-0.108; t=-2.923; p=0.004). In this regard, RE has moderator role in the effect of OC on SP. Thus, $H1_{b3}$ is accepted.
- For $H1_{b4}$, OC has significant, mid-level and positive effect on SP (ß=0.350; t=6.569; p=0.000), OP has no significant effect on SP (p=0.825), and moderator interaction variable has significant, low-level and negative

effect on SP (ß=-0.101; t=-2.923; p=0.004). In this regard, OP does not have moderator role in the effect of OC on SP. Thus, $H1_{b4}$ is rejected.

- For $H1_{c1}$, LA has significant, low-level and negative effect on SP (ß=-0.166; t=-3.061; p=0.003), HO has significant, mid-level and positive effect on SP (ß=0.386; t=7.935; p=0.000), and moderator interaction variable has no significant effect on SP (p=0.128). In this regard, HO does not have moderator role in the effect of LA on SP. Thus, $H1_{c1}$ is rejected.
- For $H1_{c2}$, LA has significant, low-level and negative effect on SP (ß=-0.130; t=-2.374; p=0.019), CO has significant, mid-level and positive effect on SP (ß=0.321; t=6.326; p=0.000), and moderator interaction variable has no significant effect on SP (p=0.861). In this regard, CO does not have moderator role in the effect of LA on SP. Thus, $H1_{c2}$ is rejected.
- For $H1_{c3}$, LA has significant, low-level and negative effect on SP (ß=-0.169; t=-3.155; p=0.002), RE has significant, mid-level and positive effect on SP (ß=0.330; t=6.672; p=0.000), and moderator interaction variable has significant, low-level and positive effect on SP (ß=0.178; t=3.245; p=0.001). In this regard, RE has moderator role in the effect of LA on SP. Thus, $H1_{c3}$ is accepted.
- For $H1_{c4}$, LA has significant, low-level and negative effect on SP (ß=-0.173; t=-3.012; p=0.003), OP has significant, low-level and positive effect on SP (ß=0.154; t=2.841; p=0.005), and moderator interaction variable does not have significant effect on SP (p=0.130). In this regard, OP does not have moderator role in the effect of LA on SP. Thus, $H1_{c4}$ is rejected.
- For $H1_{d1}$, UA has no significant effect on SP (p=0.060), HO has significant, mid-level and positive effect on SP (ß=0.329; t=6.485; p=0.000), and moderator interaction variable has significant, low-level and negative effect on SP (ß=-0.143; t=-3.440; p=0.001). In this regard, HO does not have moderator role in the effect of UA on SP. Thus, $H1_{d1}$ is rejected.
- For $H1_{d2}$, UA has no significant effect on SP (p=0.220), CO has significant, low-level and positive effect on SP (ß=0.297; t=5.407; p=0.000), and moderator interaction variable has no significant effect on SP (p=0.631). In this regard, CO does not have moderator role in the effect of UA on SP. Thus, $H1_{d2}$ is rejected.
- For $H1_{d3}$, UA has significant, low-level and positive effect on SP (ß=0.152; t=2.887; p=0.004), RE has significant, low-level and positive effect on SP (ß=0.282; t=5.516; p=0.000), and moderator interaction variable has significant, low-level and negative effect on SP (ß=-0.200; t=-3.891; p=0.000). In this regard, RE has moderator role in the effect of UA on SP. Thus, $H1_{d3}$ is accepted.
- For $H1_{d4}$, UA has significant, low-level and positive effect on SP (ß=0.127; t=2.325; p=0.021), OP has significant, low-level and positive effect on SP (ß=0.166; t=2.873; p=0.005), and moderator interaction variable has significant, low-level and negative effect on SP (ß=-0.128; t=-2.252; p=0.025). In this regard, OP has moderator role in the effect of UA on SP. Thus, $H1_{d4}$ is accepted.

Table 8. H1 test results

Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
HB	-0.090	-1.766	0.079	-0.190	0.010				
HO	0.346	6.899	0.000	0.247	0.444	24.66%	1.60%	23.889	0.000
HB X HO	-0.102	-2.155	0.032	-0.195	-0.009				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
HB	-0.124	-2.421	0,.016	-0.225	-0.023				
CO	0.288	5.640	0.000	0.188	0.389	19.80%	1.96%	18.022	0.000
HB X CO	-0.093	-2.316	0.022	-0.173	-0.014				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
HB	-0.059	-1.059	0.291	-0.169	0.051				
RE	0.325	6.032	0.000	0.219	0.431	18.92%	0.89%	17.036	0.000
HB X RE	-0.082	-1.549	0.123	-0.186	0.022				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
HB	-0.179	-3.197	0.002	-0.289	-0.068				
OP	0.142	2.593	0.010	0.034	0.249	8.76%	0.25%	7.005	0.000
HB X OP	-0.038	-0.767	0.444	-0.136	0.060				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
OC	0.208	3.087	0.002	0.075	0.341				
HO	0.203	2.910	0.004	0.066	0.341	25.92%	1.63%	25.541	0.000
OC X HO	-0.073	-2.193	0.029	-0.139	-0.007				

Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
OC	0.276	3.969	0.000	0.139	0.413				
CO	0.105	1.491	0.138	-0.034	0.243	22.41%	1.43%	21.086	0.000
OC X CO	-0.068	-2.007	0.046	-0.134	-0.001				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
OC	0.268	4.305	0.000	0.145	0.390				
RE	0.141	2.220	0.028	0.016	0.267	25.71%	2.90%	25.261	0.000
OC X RE	-0.108	-2.923	0.004	-0.180	-0.035				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
OC	0.350	6.569	0.000	0.245	0.456				
OP	0.012	0.222	0.825	-0.093	0.116	22.85%	3.01%	21.616	0.000
OC X OP	-0.101	-2.923	0.004	-0.168	-0.033				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
LA	-0.166	-3.061	0.003	-0.272	-0.059				
HO	0.386	7.935	0.000	0.290	0.482	24.59%	0.80%	23.808	0.000
LA X HO	0.081	1.527	0.128	-0.024	0.187				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
LA	-0.130	-2.374	0.019	-0.238	-0.022				
CO	0.321	6.326	0.000	0.221	0.422	17.57%	0.01%	15.556	0.000
LA X CO	0.009	0.176	0.861	-0.092	0.110				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
LA	-0.169	-3.155	0.002	-0.274	-0.063				
RE	0.330	6.672	0.000	0.233	0.428	22.41%	3.73%	21.080	0.000
LA X RE	0.178	3.245	0.001	0.070	0.285				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
LA	-0.173	-3.012	0.003	-0.286	-0.060				
OP	0.154	2.841	0.005	0.047	0.261	7.16%	0.98%	5.631	0.001
LA X OP	0.072	1.522	0.130	-0.021	0.165				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
UA	0.095	1.889	0.060	-0.004	0.194				
HO	0.329	6.485	0.000	0.229	0.429	26.01%	4.00%	25.668	0.000
UA X HO	-0.143	-3.440	0.001	-0.226	-0.061				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
UA	0.067	1.230	0.220	-0.040	0.173				
CO	0.297	5.407	0.000	0.189	0.406	15.88%	0.90%	13.780	0.000
UA X CO	-0.019	-0.481	0.631	-0.096	0.058				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**
UA	0.152	2.887	0.004	0.048	0.255				
RE	0.282	5.516	0.000	0.182	0.383	23.55%	5.29%	22.489	0.000
UA X RE	-0.200	-3.891	0.000	-0.302	-0.099				
Dependent Variable: SP	**ß**	**t**	**p**	**LLCI**	**ULCI**	**R^2**	**R^2 Change**	**Model F**	**Model p**

UA	0.127	2.325	0.021	0.019	0.235				
OP	0.166	2.873	0.005	0.052	0.279	8.04%	2.13%	6.386	0.000
UA X OP	-0.128	-2.252	0.025	-0.241	-0.016				

After hypothesis tests' results, these findings were reached as follows:

i. Since $H1_{a1}$, $H1_{a3}$ and $H1_{a4}$ are rejected, and $H1_{a2}$ is accepted, $H1_a$ is partially accepted.

ii. Since $H1_{b2}$ and $H1_{b4}$ are rejected, and $H1_{b1}$ and $H1_{b3}$ are accepted, $H1_b$ is partially accepted.

iii. Since $H1_{c1}$, $H1_{c2}$ and $H1_{c4}$ are rejected, and $H1_{c3}$ is accepted, $H1_c$ is partially accepted.

iv. Since $H1_{d1}$ and $H1_{d2}$ are rejected, and $H1_{d3}$ and $H1_{d4}$ are accepted, $H1_d$ is partially accepted.

v. Since $H1_a$, $H1_b$, $H1_c$ and $H1_d$ are partially accepted, H1 is also partially accepted.

Conclusion

The purpose of this study is to investigate the impact that behavioral finance has on the stock performance of retail investors in Borsa Istanbul, as well as the role that psychological capital plays in the formation of this impact. In order to accomplish the research objective, a survey was given to 223 different individual investors.

Following the completion of a factor analysis on the Behavioural Finance Scale, the following four factors manifested themselves: Over Confidence (OC), Herd Behavior (HB), Loss Aversion (LA), and Uncertainty Avoidance (UA) (UA). In addition, a factor analysis was performed on the Psychological Capital Scale, and the results showed that there are four factors: Optimism (OP), Hope (HO), Confidence (CO), and resilience (RE) (OP). In the end, after doing factor analysis on the Stock Performance Scale, there was only one factor that emerged as the Stock Performance (SP). In addition, the results of the reliability tests on all of the factors are determined to be sufficiently high. After that, the descriptive values of the factors were evaluated, and it was discovered that SP has a high mean, HB has a mean that is below average, OC has a high mean, LA has a low mean, UA has a high mean, HO has a very high mean, CO has a very high mean, RE has a very high mean, and OP has a high mean.

During the course of the hypothesis testing, it was discovered that all of the sub-hypotheses (H1a, H1b, H1c, and H1d) were partially accepted; thus, the H1 main hypothesis was also partially accepted. When seen from this angle, it is possible to say that psychological capital plays a partial moderator function in the effect that behavioral finance factors have on the stock performance of retail investors. It suggests that investors' overconfidence, herd behavior, loss aversion, and uncertainty avoidance views are partially significant in the financial decisions and performance of retail investors. Furthermore, as positive psychological capital components, hope, confidence, and resilience are effective on this influence. Optimism is also an important factor. Therefore, it is plausible to assert that the psychological make-up, circumstances, and level of wealth accumulation of retail investors all have a role in the kinds of financial choices they make while investing in the Borsa Istanbul. This conclusion lends credence to the findings obtained in earlier research (Aydın and Ağan, 2016; Öncü and Özevin, 2017; Öztopçu and Aytekin, 2017).

In conclusion, it is possible to conclude that behavioural finance factors have a significant and partial effect on the stock performance of retail investors, and that psychological capital has a significant role in this effect, along with a partial role and a moderating function. When considering investments in the stock market and conducting research on the relationship between finance and stock performance, both academics who study finance and retail investors should place a significant emphasis on topics related to positive psychology and psychological capital.

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