Investor Loss Aversion and Stock Market Performance : An Empirical Study on the Egyptian Stock Market

نفور المستثمر من الخسارة وأداء سوق الأسهم

(دراسة تطبيقية على سوق الأوراق المالية المصري)

Dr. Ahmed Elgayar

Lecturer, Business Administration Department,
Faculty of Commerce, Tanta University, Tanta, Egypt
Ahmed_Elgayar@commerce.tanta.edu.eg

مجلة الدراسات التجارية المعاصرة

كلية التجارة – جامعة كفر الشيخ
المجلد 10 - العدد 18- الجزء الأول
يوليو 2024م

رابط المجلة: **https://csj.journals.ekb.eg**

Abstract:

Purpose – This study explores how Egyptian investor loss aversion affects the Egyptian stock market performance.

Design/methodology/approach – The research employed an empirical approach by collecting secondary data from the Egyptian Stock Market between January 2004 and December 2021. To achieve this, the study formulated one hypothesis and utilized the empirical multiple regression model. Additionally, the researcher employed the Granger Causality (GC) technique to identify the bidirectional relationships between the two time-series of the research.

Findings/originality/value – The investigative results affirm the validity of the main hypothesis. Additionally, they demonstrate that there is only a one-way effect from investor loss aversion to performance.

Future suggestions/recommendations – The research recommends future investigations to explore diverse behavioral factors and their influence on Egypt's stock market performance, directly or indirectly through mediators. Suggestions include using alternative metrics, narrowing research focus, and evaluating performance using profitability ratios like ROA and ROE via panel data analysis. Enhancements could involve integrating additional control variables. The study proposes incorporating major political, economic events, and ongoing geopolitical conflicts into empirical research. Researchers are encouraged to use an event study approach to illustrate how behavioral factors, particularly loss aversion, deviate from theoretical expectations in response to specific events.

Keywords – Investor Loss Aversion, Stock Market Performance, Multiple Regression Model, Granger Causality Test, Egypt.

Paper Type – Research paper

المستخلص:

الهدف – تستكشف هذه الدراسة كيف يؤثر نفور المستثمر المصري من الخسارة على أداء سوق الأسهم المصري.

التصميم / المنهجية / الاتجاه – استخدم البحث منهجاً تطبيقياً من خلال جمع بيانات ثانوية من سوق الأوراق المالية المصري بين يناير 2004 وديسمبر2021. ولتحقيق ذلك، صاغت الدراسة فرضية واحدة واستخدمت نموذج الانحدار المتعدد .بالإضافة إلى ذلك، استخدم الباحث تقنية سببية غرانجر(GC) لتحديد العلاقات ثنائية الاتجاه بين السلسلتين الزمنيتين للبحث.

النتائج / الأصالة / القيمة - تؤكد النتائج التحقيق من صحة الفرضية الرئيسية. بالإضافة إلى ذلك، فإنها تثبت أن هناك تأثير أحادي الاتجاه فقط من نفور المستثمر من الخسارة إلى الأداء.

مقترحات/توصيات مستقبلية – يوصي البحث بإجراء تحقيقات مستقبلية لاستكشاف العوامل السلوكية المتنوعة وتأثيرها على أداء سوق الأوراق المالية في مصر، سواء بشكل مباشر أو غير مباشر من خلال المتغيرات الوسيطة. تتضمن الاقتراحات استخدام مقاييس بديلة، وتضييق نطاق التركيز الخاص بالبحث، وتقييم الأداء باستخدام نسب الربحية مثل معدل العائد على الأصول ومعدل العائد على حقوق الملكية عبر تحليل البيانات المقطعية. يمكن أن تتضمن التحسينات إضافة متغيرات حاكمة أخري. تقترح الدراسة دمج الأحداث السياسية والاقتصادية الكبرى والصراعات الجيوسياسية المستمرة في الدراسة التطبيقية. كما يحفز الباحث الباحثين الأخرين على استخدام منهج دراسة الحدث لتوضيح كيف تنحرف العوامل السلوكية، وبالتحديد النفور من الخسارة، عن التوقعات النظرية استجابة لأحداث محددة.

الكلمات المفتاحية: نفور المستثمر من الخسارة، أداء سوق الأسهم، نموذج الانحدار المتعدد، اختبار غرانجر للسببية، مصر.

نوع المقالة: مقالة بحثية

1. Introduction:

The Efficient Market Hypothesis (EMH) posits that efficient markets are those where securities prices, at any given time, completely and immediately incorporate all available information regarding the issuers of these securities (Fama, 1970). This suggests that successive changes in prices are independent, making it impossible for anyone to predict these changes. In essence, securities prices adhere to a random walk, rendering them unpredictable.

According to conventional finance theory, asset prices are determined by rational investors, leading to a market equilibrium based on rationality. In this equilibrium, securities are priced according to the Efficient Market Hypothesis (EMH), a fundamental concept in traditional finance theory. The hypothesis relies on the assumption that individuals consistently act rationally, maximizing expected utility, and accurately processing all accessible information. Essentially, financial assets are always presumed to be rationally priced based on publicly known information. Although stock prices exhibit characteristics of random walks over time, the changes in prices are unpredictable since they occur solely in response to genuinely new information. As previously mentioned, achieving above-average profits and outperforming the market return over time without assuming excessive risk is deemed impossible (Johnsson et al., 2002).

In contrast, behavioral finance theory contends that various behavioral biases can lead investors to act irrationally, influencing their decision-making process. Some of these biases reflect investors' optimism, while others express investor pessimism. An example of a bias representing investor pessimism is the loss aversion bias, defined by Kahneman and Tversky (1979) as ***"the aggravation that one experiences in losing a sum of money appears to be greater than the pleasure associated with gaining the same amount."***

Numerous studies have explored the impact of loss aversion on stock market performance, with most focusing on developed countries. One such study conducted by Bouteska and Regaieg (2018) aimed to assess the effect of loss aversion on the performance of companies in the US stock market. Their findings indicated that loss aversion has a detrimental impact on the economic performance of companies in both the industrial and services sectors.

2. Research Problem Statement:

In contemporary financial theory, the efficient markets hypothesis defines the convergence of asset prices and available information, asserting that market efficiency relies on investors' perfect rationality. However, scholars have observed significant deviations from traditional market efficiency theory, attributed to market anomalies, leading to the emergence of the field of behavioral finance (Yiwen, 2021). Behavioral finance theory challenges the assumption of perfect rationality, emphasizing the ineffectiveness of arbitrage executed by perfectly rational investors (De Bondt & Thaler, 1985).

One prominent bias identified in behavioral finance is loss aversion, which can lead to the "disposition effect," where investors tend to hold depreciated investments longer than appreciating ones (Shefrin and Statman 1985). Loss aversion, first identified by Kahneman and Tversky, describes the tendency of individuals to prefer avoiding losses over acquiring equivalent gains, as the pain from losing money is perceived as more significant than the happiness derived from gaining the same amount (Kahneman and Tversky, 1979).

Research indicates that various behavioral biases, including loss aversion, significantly influence investors' decision-making processes, impacting investment choices and ultimately affecting company performance (Yiwen, 2021; De Bondt & Thaler, 1985). While numerous studies have explored the impact of loss aversion on the performance of companies in developed markets like the USA, there is a scarcity of studies focusing on emerging markets such as Egypt. Despite several studies in behavioral finance conducted in Egypt, the examination of loss aversion in this emerging market remains limited (e.g., Abdel Hameed, 2012; Allam, 2014; El-Shiaty and Badawi, 2014; Metawa et al., 2018; and El-Gayar, 2021).

Therefore, the research problem can be framed as follows:

“To what extent does the investor loss aversion behavioral bias affect the performance of the Egyptian stock market?"

3. Research Objective:

The primary aim of this study is to explore the potential reciprocal influences between the loss aversion behavioral bias and performance in the Egyptian Stock Exchange.

4. Research Importance:

4.1 The Scientific Importance:

The study focuses on a contemporary and relevant finance topic that remains pertinent and not outdated, especially in recent times. It delves into how the loss aversion behavior of Egyptian investors affects performance in the Egyptian Stock Market. Consequently, this research contributes to the existing body of knowledge by exploring this impact within the context of an emerging market - the Egyptian market.

4.2 The Practical Importance:

The outcomes of this investigation are anticipated to be advantageous for five distinct categories of participants in the Egyptian Stock Market, specifically individual and institutional investors, brokerage firms, portfolio managers, and policymakers. Individual and institutional investors, along with brokerage firms, will gain the ability to anticipate periods of heightened or subdued trading and the flow of order volumes. Additionally, this study will assist portfolio managers in making more informed decisions during the portfolio selection process. Lastly, policymakers stand to benefit by gaining enhanced insights into the formulation of market surveillance policies. These advantages stem from the demonstrated value of analyzing the loss aversion bias among Egyptian investors, offering valuable information for assessing the current and future performance of the Egyptian Stock Exchange.

5. Literature Review:

In this section, the researcher underscores relevant prior studies that have explored behavioral finance in a broader context, with a focus on the independent variable (loss aversion), as well as studies examining both the independent variable (loss aversion) and the dependent variable (market performance) simultaneously.

1. Behavioral Finance Theory:

In the realm of finance, Ricciardi and Simon (2000) delved into the fascinating interplay between behavioral finance and its traditional counterpart. While traditional finance centers on theories such as modern portfolio theory and efficient market hypotheses, behavioral finance shifts its focus to the intricate factors, both psychological and sociological, that can sway the decision-making process of individual or institutional investors. Their study, encapsulating four key areas of behavioral finance—overconfidence, financial cognitive dissonance, the theory of regret, and prospect theory—served as an introductory exploration into this evolving field. The results of their research promised strategic insights, offering potential solutions to address "mental mistakes and errors" by proposing tailored investment strategies for both mutual fund and stock investors.

Ritter (2003) undertook a comprehensive study on behavioral finance, offering a succinct introduction to this burgeoning field that challenges conventional assumptions. He dissected the two fundamental pillars of behavioral finance: cognitive psychology, unraveling the intricacies of people's thinking attitudes, and the limits to arbitrage, pinpointing scenarios where arbitrage becomes ineffective. Incorporating data from stock markets in Japan, Taiwan, and the U.S., Ritter's findings suggested a tendency towards low-frequency underestimation in these exchanges. He emphasized that behavioral finance, in its introductory stage, isn't a standalone discipline but an integral part of traditional finance.

Chira, Adams, and Thornton (2008) conducted a study in the USA, aiming to unravel the impact of behavioral biases on the decision-making processes of individual equity investors. Through primary data collected from over 150 business students using a questionnaire, they uncovered a myriad of cognitive and emotional biases influencing investors in their decision-making journey. The study underscored the pivotal role of education in shaping investors' decision-making processes.

In a more recent exploration, Isidore & Christie (2018) delved into the emotional dimensions of investor behavior, uncovering gender disparities. The study focused on measuring various behavioral biases among investors in Chennai, including mental accounting, availability, loss aversion, anchoring, gambler’s fallacy, regret aversion, representativeness, and overconfidence. Utilizing independent sample t-tests, the results unveiled significant differences between male and female investors in six biases: mental accounting, anchoring, loss aversion, regret aversion, availability, and representativeness. Notably, female investors exhibited a higher susceptibility to these biases compared to their male counterparts.

2. The Concept of Loss Aversion:

In their 2018 study, Alizada and Clarin sought to uncover the potential causal impact of the loss aversion bias on the development of herding behavior among young Swedish retail investors. Their sample consisted of 77 retail investors in Sweden, all under the age of 35. Employing multiple regression analysis for their examination, the results led to the conclusion that there is no significant correlation between the degree of loss aversion and the manifestation of herding behavior among Swedish retail investors. Consequently, the loss aversion bias cannot be identified as a major driver of herding tendencies within this specific demographic.

Gächter, Johnson, and Herrmann (2007) focused their investigation on loss aversion in individual-level decision-making, specifically in both risky and riskless choices. Drawing from a sample of 660 randomly selected customers of a large car manufacturer in Germany, the data collection involved personal interviews across thirty cities in Germany, Austria, and Switzerland. The findings revealed a significant and positive connection between loss aversion in the riskless option job and loss aversion in the risky option job. Moreover, the study indicated that loss aversion tends to increase with income, age, and wealth, but decreases as education level rises.

Thaler and Johnson (1990) emphasized the influence of past outcomes on the degree of loss aversion, illustrating that an investor's aversion to loss is weakened when past results include gains and strengthened when the past results involve losses. For instance, investors who have experienced gains become weakly averse to losses, whereas losses in the past lead to a stronger aversion to further losses.

Fortin and Hlouskova (2011) delved into the asset allocation strategies of linear loss-averse investors, comparing them with more traditional mean-variance and conditional value-at-risk investors. Their findings, based on 13 EU and US assets, demonstrated that under asymmetric dependence, loss-averse portfolios outperformed mean-variance portfolios, particularly when investors exhibited sufficient loss aversion and dependence was significant. Additionally, incorporating a dynamic update of the loss-averse parameters significantly enhanced the performance of loss-averse portfolios.

3. Loss Aversion and Performance:

Bouteska and Regaieg (2018) embarked on an exploration into the influence of two behavioral biases, specifically loss aversion and overconfidence, on the performance of companies in the United States. Employing the percentage change of trading volume as a proxy variable for measuring loss aversion, the study meticulously examined approximately 6,777 quarterly observations across the population of US-insured industrial and services companies spanning the period from 2006 to 2016. To test their hypotheses, the researchers utilized Ordinary Least Squares (OLS) regression in two-panel data models. The outcomes of their investigation led to the conclusion that the loss-aversion bias has a detrimental impact on the economic performance of companies, evident in both the industrial and services sectors. Conversely, their findings indicated that overconfidence exerts a positive influence on the market performance of industrial firms but negatively affects market performance in the service sector.

Highlighting a noticeable gap in existing research, the researcher noted a scarcity of Arab studies analyzing the relationship between loss aversion and market performance in the Egyptian stock exchange. Consequently, his study was undertaken to address and fill this research void, contributing valuable insights to the understanding of the dynamics between loss aversion and market performance specific to the Egyptian context.

6. Theoretical Framework:

In this section, the researcher provides a precise and concise summary of different theoretical aspects closely related to the underlying research.

1. Rational or Irrational Investor?

In this subsection, the researcher discusses the Efficient Market Hypothesis (EMH) theory and the reasons behind the transition from traditional finance theory to behavioral finance theory.

1.1 The Theory of Efficient Market Hypothesis (EMH):

The Efficient Market Hypothesis (EMH) asserts that markets achieve efficiency when securities prices, at any given time, completely and instantly incorporate all available information about the issuers of these securities (Fama, 1970). EMH is closely linked with the Random Walk Hypothesis (RWH), suggesting that securities prices follow an unpredictable pattern (Tuyon & Ahmad, 2016). Moreover, according to EMH, securities prices are not mispriced; they are neither overpriced nor underpriced. Consequently, EMH implies that investors cannot consistently achieve abnormal returns, or in simpler terms, returns above the average, unless by sheer chance (Bottazzi, Dindo & Giachini, 2019).

While traditional finance models held sway until the 1980s, the legitimacy of EMH faced intense criticism from scholars. This skepticism arose because empirical studies consistently revealed various phenomena termed as market anomalies, which proved challenging to reconcile with traditional finance theory. Notably, these anomalies include the small-firm-effect, momentum effect, P/E effect, small-firm-in-January effect, and neglected firm effect. Such studies indicated that future stock returns could be predicted, providing investors with the opportunity to capitalize on this predictability and attain abnormal returns (Woo, Mai & McAleer, 2020).

As these anomalies gained prominence, a paradigm shift unfolded, giving rise to a new perspective – behavioral finance.

1.2 Moving from Traditional Theory to Behavioral Finance Theory:

Traditional finance, also known as neoclassical finance, has been the dominant paradigm shaping academic thinking in finance since the late 1950s. Rooted in the philosophical tradition of the 18th-century Enlightenment, it seeks to reconstruct society with individual rational action as its central tenet (Johnsson et al., 2002). Standard finance, an integral part of this paradigm, is built on key principles, including the arbitrage principles of Miller and Modigliani, the portfolio principles of Markowitz, the capital asset pricing theory of Sharpe, Lintner, and Black, the option-pricing theory of Black, Scholes, and Merton, and the Efficient Market Hypothesis (EMH) formulated by Fama. This standard finance framework is compelling as it utilizes minimal tools to construct a unified theory intended to address all aspects of finance (Statman, 1999).

The emergence of behavioral finance theory can be attributed to two primary reasons. First, scholars critiqued EMH intensely, questioning its validity. Second, the rise of market anomalies as observable phenomena contributed to the development of behavioral finance (Prosad, Kapoor & Sengupta 2015).

Behavioral finance, defined as the study of how psychology influences financial decisions in households, markets, and organizations (De Bondt et al., 2008), relies on two foundational blocks. The first assumes that investors are not always rational and are susceptible to sentiment. The second block involves the concept of limits to arbitrage, signifying that arbitrage may become ineffective in certain situations, leading securities prices to systematically deviate from their fundamental value (Barberis & Thaler, 2003).

Despite the fundamental tenet in modern finance suggesting that arbitrageurs drive prices toward their true fundamental values, research has uncovered financial market phenomena that defy the notion of constant full arbitrage. Behavioral asset pricing models focus on the constraints faced by arbitrageurs when attempting to exploit mispricing, acknowledging that markets are not frictionless due to factors like transaction costs, taxes, and margin payments. Consequently, the actions of noise traders—traders with biased beliefs not grounded in fundamental information—may introduce inefficiencies into the market. As a result, arbitrage can be a risky endeavor (Shleifer, 2000).

2. Prospect Theory:

De Bondt et al. (2008) highlighted that prospect theory, developed by Kahneman and Tversky (1979), serves as a framework to systematically illustrate how individuals deviate from the axioms of expected utility theory.

Initially introduced by Kahneman and Tversky (1979), prospect theory emerged as an alternative explanation for individual decision-making in conditions involving risk. It was conceived as a replacement for expected utility theory, recognizing the limitations of the latter in fully capturing how individuals make decisions in risky situations. Kahneman and Tversky observed that expected utility theory failed to comprehensively describe decision-makers' choices, leading to instances where predictions were challenging. For instance, they noted that expected utility theory couldn't account for the impact of framing on individual decisions, nor could it explain why individuals exhibit risk-seeking behavior in certain scenarios and risk-averse behavior in others (Edwards, 1996).

In alignment with prospect theory, decision-making under risk hinges on values assigned to gains and losses concerning a reference point, and decision weights take precedence over final wealth and probabilities, as dictated by utility theory (Edwards, 1996).

2.1 Loss aversion:

Prospect theory posits that people's utility is influenced more by losses and gains than by the final wealth itself. Individuals operate from a psychological reference point and exhibit a strong inclination to avoid losses below that point. The value function, a key component of prospect theory, reveals a pronounced asymmetry in the values assigned to gains and losses, a phenomenon referred to as "loss aversion." Empirical tests indicate that losses are given roughly twice the weight of gains, meaning that the pain of losing 1€ is approximately twice as impactful as the pleasure derived from gaining 1€. This asymmetry contributes to the observed tendency of people to gamble in losses, as investors often cling to losing positions in the hope that prices will eventually recover. This behavior stems from the upward-sloping utility function under prospect theory for wealth levels below an individual's reference point (McDermott, 2009).

Loss aversion becomes particularly relevant in explaining investors' inclination to hold onto losing stocks while prematurely selling winning stocks, a phenomenon coined by Shefrin and Statman (2000) as the "disposition effect." This hypothesis finds empirical support in field data (Heisler, 1994; Odean, 1998) and experimental asset markets (Heilmann et al., 2000; Weber & Camerer, 1998). Odean (1998) analyzed trading records for 10,000 accounts at a large discount brokerage house, revealing that investors held losing stocks for a median of 124 days, while winners were held for only 104 days. Experimental findings by Heilmann et al. (2000) using a call market showed that the number of assets offered and sold was higher during periods of rising trading prices compared to falling prices.

When investors assess stocks individually, risk aversion in gains prompts them to sell too quickly during rising prices, leading to a depression in prices relative to fundamental values. Conversely, risk-seeking behavior in losses causes investors to hold onto declining prices for too long, resulting in the prices of stocks with negative momentum overstating fundamental values. Loss aversion also implies that decision-making is sensitive to the framing of action choices, emphasizing the significant role of frames in shaping investor choices (Jain & Kesari, 2021).

2.2 Framing and Mental Accounting:

Framing and mental accounting, integral components of prospect theory, significantly influence decision-making processes. A decision frame represents how a decision-maker perceives a problem and its potential outcomes, shaped by presentation, individual perception, and personal traits. If a person's decision changes merely due to a shift in frame, it violates expected utility theory, which assumes consistent choices irrespective of presentation. Mental accounting involves individuals categorizing events into distinct mental accounts based on superficial attributes. Decision-makers tend to separate various gambles into isolated accounts, applying prospect theoretic decision rules to each account while neglecting potential interactions between them. These mental accounts can be isolated not only by content but also in terms of time (Mbaluka, Muthama & Kalunda, 2012).

The mental accounting bias extends to investing practices, as some investors segregate their portfolios into safe and speculative investments to shield the entire portfolio from negative returns associated with speculative ventures. Despite efforts to separate portfolios, the net wealth of the investor remains unaffected. Mental accounting also explains why investors may resist adjusting their reference point for a stock. When a stock is purchased, a new mental account is opened with the purchase price as the natural reference point. Gains or losses relative to the purchase price are then tracked in this account. When another stock is purchased, a new separate account is created. Closing a mental account at a loss, especially when selling a depreciated stock to buy another, poses challenges for decision-makers (Rashwan, 2021).

Frames play a crucial role in the dividend puzzle, where private investors often treat dividends separately from capital gains. In a tax-free and transaction cost-free world, investors should be indifferent between a dividend Euro and a capital Euro. However, due to prospect theory, investors frame these Euros into distinct mental accounts, leading to a reluctance to sell a stock paying dividends, fearing the closure of an account containing dividend income. Mental accounting also contributes to the notion of having a "safe" part of the portfolio protected from downside risk and a risky part designed for potential gains (Broihanne, Merli & Roger, 2008).

Mental accounting can result in the continuation of non-profitable ventures, hoping for eventual recovery—a scenario where "good money is thrown after bad money." It may also explain beneficial framing for investors with imperfect self-control, such as the reluctance to realize losses, a self-control challenge observed in professional traders. This concept is evident in the dividends puzzle, where older investors, particularly retirees, fear overspending and loss of self-control, impacting their living expenditures financed from portfolios (Rashwan, 2021).

2.3 Integration versus Segregation:

In decision-making, the choice of a reference point plays a crucial role, as whether an outcome is perceived as positive or negative depends on the selected reference point. Consider the example adapted from Tversky and Kahneman (1981), where a bettor has lost 150€ at the horse track and is contemplating a 10€ bet on a horse with 15:1 odds in the final race. If the bettor considers the prior losses, the outcome could result in either breaking even (if the horse wins) or an overall loss of 150€ (if the horse loses, plus the 10€ bet). However, if the bettor disregards prior losses and views the current situation with a fresh slate, the final bet's outcome is either a gain of 150€ or a loss of 10€.

Prospect theory predicts that a decision-maker adopting the approach of segregating outcomes (the latter reference point) will be less inclined to accept risk, as the gamble transitions between loss and gain, invoking loss aversion. Additionally, being in the domain of gains with a concave value function reduces risk-taking. On the contrary, a decision-maker integrating outcomes (the first reference point) and considering the cumulative impact of bets on the day will be more risk-seeking, particularly when in the domain of losses (McDermott, 2009).

Integration occurs when positions are grouped together, while segregation involves viewing situations one at a time. Standard prospect theory assumes that people generally segregate, although Kahneman and Tversky (1981) acknowledged instances where integration frames are adopted. For example, more bets are placed on long shots at the end of the racing day, indicating that some bettors integrate outcomes and take risks to break even.

In the context of financial decision-making, the break-even effect is evident when individuals are willing to increase risk to break even after losses. Interestingly, after gains, the house money effect comes into play, where individuals, having moved up the value function and distanced from the loss boundary, are more willing to assume greater risk. This behavior is akin to betting with the "house money." Both the break-even effect and the house money effect play significant roles in financial decision-making after portfolio growth or shrinkage (Gärling et al., 2009).

3. Loss Aversion and Performance:

In recent years, the Internet has revolutionized how individual investors manage their investments. The availability of real-time stock quotes and market information, coupled with low transaction costs from online brokerage firms, has empowered more investors to engage in self-directed trading at minimal expense. The surge in online stock trading underscores the increasing significance of retail investors in the market, particularly in the trading of stocks with small floating shares, where professional traders may be more cautious (Barber & Odean, 2001).

While microstructure literature often characterizes retail investors as noise traders, submitting orders of random sizes to provide market liquidity, evidence suggests that their trading activities exhibit certain regularities. One notable regularity is the reluctance to sell assets below their purchase price, a phenomenon known as loss aversion. This reluctance is rooted more in psychology than economics, as selling at a loss is perceived as admitting a prior mistake, prompting individuals to naturally avoid such actions (Ouzan, 2020).

Odean (1998) provides empirical evidence that individual investors tend to sell winners too soon and hold losers too long. Laboratory studies further demonstrate that people become more risk-averse after prior losses and less risk-averse after prior gains.

Odean (1998) introduces a model to examine how retail investors' aversion to selling at a loss influences the trading strategies of informed traders. The findings suggest that in a market dominated by retail investors unwilling to realize losses, informed traders may not trade as aggressively on bad signals compared to a market with regular noise traders. Informed traders act promptly on good signals, leading to price increases, but this rise does not significantly impact the behavior of retail investors. Conversely, when informed traders receive bad signals, they must weigh the price decrease resulting from selling against the potential benefits. Early selling captures immediate profits, but the subsequent reluctance of retail traders to sell reduces liquidity, impacting the trading profit of informed traders in the future. In situations where the initial signal is moderately bad, the loss in trading profit from reduced liquidity outweighs the early gain, resulting in less aggressive trading on bad news.

The model suggests that due to informed traders refraining from selling after bad news, such information will travel slowly in these markets. Conversely, good news is not hindered by informed traders, leading to faster dissemination. The paper also proposes an explanation for the assumptions made by Hong, Lim, and Stein (2000). Regarding price patterns, these markets are likely to exhibit prolonged steady climbs with abrupt drops because informed traders opt to delay selling until the last possible moment. Since the volume during the increase comprises trades by both informed traders and retail investors (who are hesitant to sell during price drops), the volume during the ascent is expected to be higher than during the descent. Consequently, the theory posits a positive impact of investor loss aversion on stock market performance variables (Bouteska & Regaieg, 2018), such as that of investor loss aversion upon market performance variable as the EGX30 return measure employed in this study.

7. Sample:

This research utilizes monthly data from the EGX30 index spanning from January 2004 to December 2021 to construct measures of loss aversion and stock market performance. The choice of 2004 as the starting point is associated with the establishment of the EGX index committee in April 2004. The study concludes in December 2021, a significant year marked by internal tensions in the Egyptian capital market. The market capitalization for the entire market experienced an 18% rise, marking a transitional phase for the Egyptian stock market amidst health concerns and economic challenges (EGX Annual Report, 2021).

The data covers an 18-year period, allowing for the creation of a comprehensive monthly time series, essential for robust statistical analysis and considering the availability of relevant data. The EGX30 index, denominated in US dollars since 1998, comprises the top 30 companies based on liquidity and activity, measured by market capitalization and adjusted for free float. The EGX 70 and EGX 100 indices track the performance of 70 and 100 active companies, respectively, with adjustments made semi-annually in June and December (www.egx.com.eg).

The study incorporates two variables: loss aversion as an independent variable and stock market performance as a dependent variable. Loss aversion is measured by the percentage change in transaction volume within a specified period, supported by previous literature (Bouteska & Regaieg, 2018). Stock market performance is gauged by calculating the return of the EGX30 index, as an overall alternative to individual companies' performance, computed using natural logarithms of the ratio of current and previous close prices (Karaca and Ekşi, 2012; Chari et al., 2012; Miranty and Sisnuhadi, 2011; Valenti et al., 2011; Geletkanycz and Boyd, 2011; and Prabowo and Simpson, 2011).

Control variables include GDP growth rate, money supply M2, exchange rate, and lag of the dependent variable. Previous research suggests expectations that an increase in GDP growth rate may negatively impact stock returns in emerging markets, while an increase in money supply could lead to a similar effect due to rising inflation (Fama, 1981). Additionally, the study anticipates a decline in Egyptian stock market returns with a depreciating exchange rate, considering the import-oriented nature of listed companies (Bahmani and Saha, 2015).

To address autocorrelation issues, a lag of the dependent variable is introduced, treating the original dependent variable and its future lag as separate variables to isolate autocorrelation effects. This occurrence is widely recognized, particularly concerning variables influenced by political circumstances, such as those examined in this research (Achen, 2000). Monthly exchange rates are sourced from the Central Bank of Egypt, money supply M2 from tradingeconomics.com, and GDP growth data is obtained from data.worldbank.org, converted to a monthly format using EViews 13.

This comprehensive data framework aims to facilitate a rigorous examination of the relationships between loss aversion, stock market performance, and associated control variables in the Egyptian context.

8. Methodology:

The empirical investigation in this study spans the years 2004 to 2021, employing four distinct statistical techniques to analyze secondary data. This study adopts a deductive approach, starting with general principles acknowledged for their validity and progressing to specific conclusions through logical analysis. The methodology involves applying specific theories to interpret and predict findings related to the hypotheses under investigation. This process includes a thorough review of existing studies, formulation of testable hypotheses, and subsequent collection of data for hypothesis testing using statistical methods. The chosen methodologies encompass the KPSS unit root test for time-series adjustments, statistical description, and correlation matrix for a comprehensive overview of research variables, multiple linear regression for in-depth analysis, and the Granger causality test to assess causative relationships.

8.1 KPSS Unit Root Test for Time-Series Adjustments:

In the context of time-series analysis, the presence of trends or non-stationary behavior is a common characteristic, particularly in financial series such as stock price indices. Non-stationary series, unless co-integrated with other non-stationary series, can lead to spurious regressions, especially when examining relationships over an extended sample period. Given the 18-year duration covered by the researcher in this study, changes in market structure, competition, technology, and financial market activities may contribute to non-stationarities in the data series.

To address the stationarity of time series data, several unit root tests can be performed. The researcher opts for the Augmented Dickey-Fuller (ADF) test and the Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) test, omitting the Phillips-Perron (PP) test as it tends to yield similar conclusions to the ADF test. The ADF test is criticized for low power when the process is nearly non-stationary, implying that it might fail to detect stationarity in such cases. Consequently, the researcher relies primarily on the KPSS test, proposed by Kwiatkowski et al. (1992), where the null hypothesis posits that the series is stationary.

When conducting the KPSS test, the researcher calculates the T-statistic and compares it to critical values at different significance levels. If the test statistic is less than the critical values, the null hypothesis of stationarity is not rejected. If rejected, it implies that the series contains a unit root. The researcher must specify whether to include a constant, a constant and a linear trend, or neither in the test regression (Verbeek, 2004). In this study, both a constant and a linear trend are included, as this represents a general specification applicable to growing macro-economic time series (Xu and Sun, 2010).

The standard KPSS test may be oversized for highly autoregressive processes due to a semiparametric heteroskedasticity and autocorrelation consistent covariance estimator (HAC) with a positive finite sample bias. The choice of bandwidth for the HAC estimator involves a trade-off between overestimating or underestimating the long-run variance. To mitigate this, the researcher suggests an automatic form of the KPSS test that reduces size distortion without suffering from inconsistency, addressing concerns related to both overestimation and underestimation (Hobijn, Franses & Ooms, 2004).

8.2 Multiple Linear Regression:

The researcher examines predictive regressions in the form:

$$\boldsymbol{Stock\ Market\ Performane_{t+1} = \alpha + \beta Investor\ Loss\ Aversion_t + \gamma` X_t + u_{t+1}}, \quad (1)$$

where:

- $\boldsymbol{Stock\ Market\ Performane_{t+1}}$ is the return of the EGX30 index over month t+1,
- $\boldsymbol{Investor\ Loss\ Aversion_t}$ is % change in transaction volume measured for month t,

- $\boldsymbol{X_t}$ is a vector of control variables (exchange rate, GDP growth rate, money supply M2, and lag of dependent variable) observed at t,
- $\boldsymbol{\gamma'}$ is the vector of coefficient estimates on the control variables, and
- $\boldsymbol{u_{t+1}}$ represents the error term in the regression.

This model is used to assess the predictive relationship between investor loss aversion, control variables, and the subsequent returns of the EGX30 index. The coefficients $\boldsymbol{\alpha}$, $\boldsymbol{\beta}$, and $\boldsymbol{\gamma}$`are estimated to comprehend the impact and significance of investor loss aversion and control variables on stock market performance.

8.3 Granger Causality Test:

Granger Causality (GC) is a technique initially developed for econometrics, aiming to identify causal relationships between two or more time series (Granger, 1969). In this work, the researcher applies GC to two variables. Stating that variable X Granger causes another variable Y implies that, by utilizing past values of both X and Y, we can enhance the prediction of future values of Y compared to using only the past values of Y. In essence, past observations of X provide information that is beneficial for predicting Y, going beyond what is available from Y's own past observations. Consider a bivariate time series represented by the dynamic relationship:

$$\mathbf{Y_t} = \varphi_0 + \sum_{j=1}^{n} \boldsymbol{\alpha_j}\, \boldsymbol{Y_{t-j}} + \sum_{j=1}^{n} \boldsymbol{\beta_j}\, \boldsymbol{X_{t-j}} + \boldsymbol{\varepsilon_{1t}} \tag{2}$$

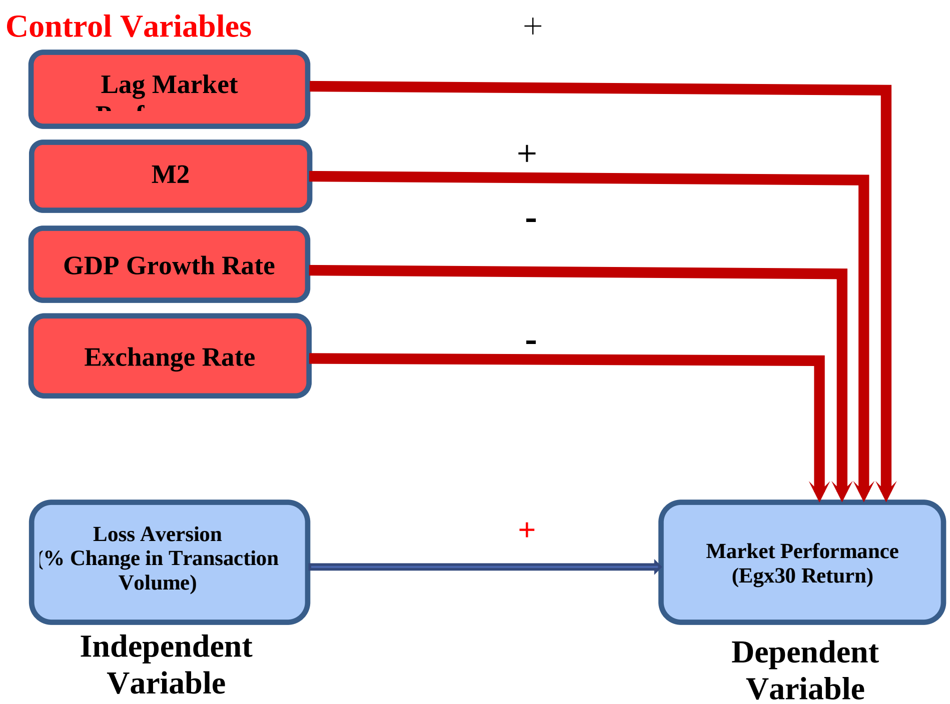
$$\mathbf{X_t} = \lambda_0 + \sum_{j=1}^{n} \boldsymbol{\delta_j}\, \boldsymbol{X_{t-j}} + \sum_{j=1}^{n} \boldsymbol{\omega_j}\, \boldsymbol{Y_{t-j}} + \boldsymbol{\varepsilon_{2t}} \tag{3}$$

If $\boldsymbol{\beta = (\beta_1, \ldots \beta_n)^T}$ is not the zero vector $(0, .. 0)^T$ and $\boldsymbol{\omega = (\omega_1, \ldots \omega_n)^t}$ is the zero vector $(0,..0)^T$, then X is considered to Granger cause Y. On the other hand, if ω is not the zero vector and β is the zero vector, then Y Granger causes X. In case neither β nor ω is the zero vector, there is a mutual dependence, indicating feedback between X and Y. If both β and ω are the zero vectors, there is no Granger causality. The terms represent the white noise innovation at each instance of time t and are assumed to be independently and identically distributed with a bivariate normal distribution. The terms φ_0 and λ_0 represent intercepts for each equation.

Following hypothesis was developed for testing by application of above-mentioned methods:

- **H1:** There is a statistically significant positive impact of investor loss aversion on stock market performance.

Figure 1 depicts the main empirical model used to test the hypothesis of this research, as shown below:



(**Figure 1**: The General Empirical Model)

9. Results and Discussion:

9.1 KPSS Unit Root Test for Time-Series Adjustments:

The outcomes presented in Panel 1 of Table 1 indicate that the null hypothesis of stationarity is upheld for several series. However, it is rejected for the exchange rate and M2 variables. Specifically, in Panel 1, the test statistic for Loss Aversion (% Change in Transaction Volume) is 0.130170, below the critical value at the 1% significance level (0.739000). This pattern is consistent across the other stationary variables.

Moreover, Panel 1 displays test statistics for non-stationary variables, such as the exchange rate and M2, which are 1.448616 and 1.663502, respectively. These values exceed the critical value at the 1% significance level (0.739000).

Consequently, the two non-stationary variables undergo first-difference transformation. Panel 2 results reveal that the null hypothesis of non-stationarity is rejected for only one series, namely the exchange rate, after employing the first difference. However, the variable M2 requires a second-difference transformation to achieve stationarity (Batchelor, 2000). Ultimately, the final test statistics for the exchange rate and M2, using the first and second differences, are 0.127416 and 0.225528, respectively. Both values are below the critical value at the 1% significance level (0.739000), indicating the successful transformation of these variables into stationary ones.

Table 1: Unit Root (KPSS) Test

Series to be Tested	1% Critical Value	KPSS Statistic
Panel 1: Before Differencing		
Loss Aversion (% Change in Transaction Volume)	0.739000	0.130170
Market Performance (Egx30 Return)	0.739000	0.436443
Market Performance Control Variables Measures:		
1. Exchange Rate	0.739000	1.448616
2. GDP Growth Rate	0.739000	0.382588
3. M2	0.739000	1.663502
4. Lag Market Performance	0.739000	0.436443
Panel 2: After Differencing		
(First Difference)		
Market Performance Control Variables Measures:		
1. Exchange Rate	0.739000	0.127416
2. M2	0.739000	1.596481
(Second Difference)		
Market Performance Control Variables Measures:		
1. M2	0.739000	0.225528

Source: EViews 13 Outputs

9.2 Statistical Description of Research Variables and Correlation Matrix:

Examining the descriptive statistics in Panel A of Table 2, the independent variable representing loss aversion exhibits a maximum of 9.2%, a minimum of

-0.97%, a mean of 0.14%, a median of 0%, and a standard deviation of 0.79%. As for the measure of stock market performance variables, it ranges between 0% and 0.37%, with a mean of 0.01%, a median of 0.013%, and a standard deviation of 0.12%.

Moving on to the control variables, the first difference of the exchange rate displays a maximum of 8.99%, a minimum of -2.91%, a mean of 0.04%, a median of 0%, and a standard deviation of 0.67%. The GDP growth rate has a maximum of 7.16%, a minimum of 1.76%, a mean of 4.47%, a median of 4.36%, and a standard deviation of 1.48%.

Regarding the second difference of M2, its maximum is 387.93, the minimum is -377.09, the mean is 0.37, the median is 0.21, and the standard deviation is 40.7843.

Table 2: Describing Research Variables

Panel A: Descriptive Statistics

	Fast Variation Trading Volume	*Return*	*1st. Diff. Exchange Rate*	*GDP Growth Rate*	*2nd. Diff. M2*	*Lag Return*
Mean	0.138162	0.010005	0.044163	4.465939	0.373234	0.014703
Median	0	0.012541	0	4.364618	0.21	0.012714
Standard Deviation	0.786446	0.115498	0.673235	1.483369	40.7843	0.092807
Minimum	-0.97443	-1	-2.91	1.764572	-377.09	-0.3319
Maximum	9.196571	0.366045	8.9851	7.156284	387.93	0.366045

Source: Excel 2019 Outputs

Panel A shows descriptive statistics of research variables. The independent variable examined is fast variation trading volume. The dependent variable examined is return. The control variables examined are 1st. diff. exchange rate, GDP growth rate, 2nd. diff. M2, and the lag of dependent variable.

Panel B: Correlations Matrix

	Fast Variation Trading Volume	*Return*	*1st. Diff. Exchange Rate*	*GDP Growth Rate*	*2nd. Diff. M2*	*Lag Return*
Fast Variation Trading Volume	1					
Return	0.213441	1				
1st. Diff. Exchange Rate	-0.05121	0.002958	1			
GDP Growth Rate	0.036177	-0.01221	-0.03193	1		
2nd. Diff. M2	-0.00803	0.026284	0.575845	-0.00321	1	
Lag Return	-0.01821	0.093564	0.28376	0.061689	0.11896	1

Source: Excel 2019 Outputs

Panel B shows correlation between research variables. The independent variable examined is fast variation trading volume. The dependent variable examined is return. The control variables examined are 1st. diff. exchange rate, GDP growth rate, 2nd. diff. M2, and the lag of dependent variable.

In Panel B of Table 2, the contemporaneous bivariate correlations between each pair of variables used in the analysis are presented. Notably, the correlations between the variables are all below 0.80, indicating the absence of multicollinearity between them (Gujarat, 2003). There exists a positive relationship between the dependent and independent variables, specifically between return and loss aversion (Bouteska and Regaieg, 2018). Additionally, there is a negative relationship between GDP growth rate and return, as suggested by Dimson et al. (2002) and Ritter (2005). Moreover, a positive relationship is observed between return and M2, aligning with Fama's findings (1981). Finally, there is a positive correlation between return and the exchange rate in the market, as indicated by Saha (2015).

9.3 Multiple Linear Regression:

Initially, it's important to note that the Durbin-Watson test is not suitable when incorporating a lagged dependent variable (Godfrey, 1978). Consequently, the researchers opt for an alternative assessment to address the autocorrelation issue in their regression models, namely the Breusch-Godfrey LM test. The outcomes of the Breusch-Godfrey LM test, depicted in Table 3, support the null hypothesis of no autocorrelation, indicating its acceptance in this research study.

The probability value of the Chi-Square test for the impact of investor loss aversion on returns is 0.1837, exceeding the 5% significance level. This implies that the null hypothesis of no autocorrelation is accepted. Consequently, we proceed with the standard multiple regression model. It's worth noting that if the null hypothesis were rejected, alternative methods such as the Cochrane-Orcutt iterative procedure (Cochrane & Orcutt, 1949) and the Prais-Winsten test (Prais & Winsten, 1954) could be considered. However, these alternatives are not deemed necessary for the present analysis.

Table 3: Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.69	**Prob. F (2,211)**	0.1871
Obs.*R-squared	3.39	**Prob. Chi-Square (2)**	0.1837

Null hypothesis: No serial correlation at up to 2 lags

Source: EViews 13 Outputs

Table 4: Multiple Linear Regression Model Results

EGX30 Return as a Dependent Variable							
a	**Investor Loss Aversion (Fast Variation Trading Volume)**	**Control Variables**				**R^2**	**Adjusted R^2**
		1st. Diff. Exchange Rate	**GDP Growth Rate**	**2nd. Diff. M2**	**Lag EGX30 Return**		
.013	.032**	-.007	-.002	.000	.133	.057**	.034**
VIF	1.005	1.619	1.008	1.503	1.098		

Source: EViews 13 Outputs

Table 4 presents the outcomes of the multiple regression models, wherein the researcher regresses next month's investor loss aversion (fast variation in trading volume) on EGX30 return for the period 2004 to 2021, considering four control variables as previously outlined. The Variance Inflation Factor (VIF) values for independent and control variables are all below 10, indicating the absence of multicollinearity issues in the model. Furthermore, the table provides support for the study's hypothesis. Specifically: The multiple regression model, examining the impact of investor loss aversion (fast variation in trading volume) as an independent variable on EGX30 return as a dependent variable, along with the inclusion of four control variables, is statistically significant overall at the 5% significance level (**). The individual significance of the β coefficient (0.032) for investor loss aversion (fast variation in trading volume) as an independent variable on EGX30 return is observed at the 5% significance level (**), with a positive sign. This aligns with the theoretical expectation (Bouteska and Regaieg, 2018). Additionally, the R2 and Adjusted R2 values are 0.057 and 0.034, respectively. This indicates that the investor loss aversion variable explains only 5.7% and 3.4% of the variation in EGX30 return, while the remaining variance is attributed to other factors not considered in our study model.

9.4 Granger Causality Test:

Based on the findings in Table 5, it is concluded that there is a unidirectional impact from investor loss aversion (fast variation in trading volume) to stock market performance (EGX30 return) (Bouteska and Regaieg, 2018). Specifically, the null hypotheses of no impact, both for the influence of stock market performance on investor loss aversion and the influence of investor loss aversion on stock market performance, are rejected at the 5% significance level. The p-value of 0.0004 is less than 5%, providing evidence of a significant impact. This finding reinforces the results obtained from the multiple regression analysis.

Table 5: Granger Causality Test

There is no Impact	Significance Level
Investor Loss Aversion (Fast Variation Trading Volume)	
From it to Stock Market Performance (EGX30 Return)	0.3018
From Stock Market Performance (EGX30 Return) to it	0.0004

Source: EViews 13 Outputs

10. CONCLUSION

The primary objective of this study is to delve into the potential influence of investor loss aversion on stock market performance through an empirical analysis of the Egyptian stock market, while considering bidirectional effects. The key finding of this research underscores that Investor Loss Aversion, measured by fast variation in trading volume, exhibits a statistically significant positive impact on stock market performance, represented by EGX30 return.

In paving the way for future research endeavors, this study proposes a significant avenue for exploration, emphasizing the investigation of other behavioral factors, either directly or indirectly through mediators, and their impact on stock market performance within the Egyptian context. Furthermore, several suggestions for future research are delineated, spanning various dimensions:

1. **Measurement of stock market performance:** Future research could explore alternative metrics such as EGX30 close prices or a combination of return and close prices in multivariate models, offering a more nuanced understanding of stock market dynamics.
2. **Sector-specific analysis:** Researchers may opt for a more granular approach by focusing solely on a subset of listed companies, considering different sectors, and assessing stock market performance through profitability ratios like Return on Assets (ROA) and Return on Equity (ROE) via panel data analysis. This sector-specific analysis could shed light on sectoral nuances impacting stock market behavior.
3. **Inclusion of additional control variables:** Enhancing the model by incorporating other relevant control variables can enrich the analysis and provide a more comprehensive understanding of the factors influencing stock market performance in the Egyptian context.
4. **Consideration of significant events:** Extending the empirical study to account for major political and economic events in the Egyptian stock market, such as the 2011 and 2013 revolutions, the 2016 Egyptian Pound floatation, the COVID-19 pandemic crisis in 2020, and the ongoing Russian-Ukrainian and Israeli-Palestinian conflicts would offer valuable insights into how these events shape investor behavior and stock market dynamics.
5. **Event study approach:** Researchers might adopt an event study approach to further elucidate the deviation of behavioral factors, such as loss aversion, from theoretical expectations in response to specific events. This approach would enable a more focused analysis of the impact of significant events on investor behavior and stock market performance.

By embracing these avenues for future research, scholars can deepen their understanding of the intricate interplay between behavioral factors and stock market dynamics in the Egyptian context, paving the way for more nuanced insights and informed decision-making in financial markets.

References

Abdel Hameed, N. A. (2012). A study of the Impact of Investor Sentiment on Stock Market Return: The Case of Egypt, doctoral dissertation, Faculty of Commerce, Cairo University, Egypt.

Achen, Christopher H. (2000). ‘Why Lagged Dependent Variables Can Suppress the Explanatory Power of Other Independent Variables’. Presented at the Annual Meeting of the Political Methodology Section of the American Political Science Association, July 20–22, Los Angeles.

Alizada, Z., & Clarin, O. (2018). The Impact of Loss Aversion Bias on Herding Behavior of Young Swedish Retail Investors: A Behavioral Perspective on Young Swedish Retail Investors' Decision Making in the Stock Market.

Allam, N. (2014). Herding Behavior in the Egyptian Stock Market. Master Thesis. School of Business, The American University in Cairo, Egypt.

Bahmani-Oskooee M, Saha S (2015) On the relation between stock prices and exchange rates: a review article. J Eco Stud 42:707-732.

Barber, B., M., and T. Odean. (2001). The Internet and the Investor. Journal of Economic Perspectives, 15 (1): 41-54.

Barberis, N., Ming Huang, Tano Santos, (2001). Prospect Theory and Asset Prices, The Quarterly Journal of Economics, Volume 116, Issue 1, Pages 1–53.

Barberis, N., Thaler, R. (2003). A survey of behavioral finance. Handbook of the Economics of Finance, 1 (B), 1053-1128.

Bottazzi, G., Pietro Dindo & Daniele Giachini (2019). Momentum and reversal in financial markets with persistent heterogeneity, Annals of Finance, Springer, vol. 15(4), pages 455-487, December.

Bouteska, A. and B. Regaieg (2018). Loss aversion, overconfidence of investors and their impact on market performance evidence from the US stock markets. Journal of Economics, Finance and Administrative Science, 25(50), 451-478.

Broihanne, M., M. Merli & P. Roger, (2008). Solving some financial puzzles with prospect theory and mental accounting: a survey, Revue d'économie politique, Dalloz, vol. 118(4), pages 475-512.

Brooks, C., (2002). Introductory econometrics for finance. United Kingdom, Cambridge University Press.

Campbell, John Y., Andrew W. Lo, and A. Craig MacKinlay (1997), The Econometrics of Financial Markets, Princeton, NJ: Princeton University Press.

Chari, A., Chen, W. and Dominguez, K.M.E. (2012), "Foreign ownership and firm performance: emerging market acquisitions in the United States", IMF Economic Review, Vol. 60 No. 1, pp. 1-42.

Chira, I., Adams, M., & Thornton, B. (2008). Behavioral Bias Within the Decision-Making Process. Journal of Business & Economics Research (JBER), 6(8).

Cochrane, D., & G., H., Orcutt, (1949). Application of least squares regression to relationships containing auto-correlated error terms. Journal of the American Statistical Association, 44 (245), 32–61.

De Bondt, W. F. M., & Thaler, R. H. (1985). Does the stock market overreact. Journal of finance, 40, 793-808.

De Bondt, W., Muradoglu, G., Shefrin, H., & Staikouras, S.K. (2008). Behavioural finance: quo Vadis? Journal of Applied Finance, 18(2): 7-21.

Dickey, D., & W., Fuller, (1979). Distribution of the estimators for autoregressive time series with a unit root, Journal of the American Statistical Association, 74, 427-431.

Dimson, E., Marsh, P., and Staunton, M. (2002). Long-run global capital market returns and risk premia.

Edwards, K.D. (1996). Prospect theory: A literature review. International Review of Financial Analysis, 5, 19-38.

Egyptian Stock Market (2021). Annual Report. Smart Village, Cairo, Egypt.

El-Gayar, A. H. (2021). The Impact of Investor Sentiment and Herding Behavior on Stock Market Liquidity (Doctoral dissertation, Tanta University).

El-Shiaty D. & Badawi A. A. (2014). Herding Behavior in the Stock Market: An Empirical Analysis of the Egyptian Exchange. Working Paper, Faculty of Management Technology, German University in Cairo, Egypt.

Fama, Eugene F, 1970. "Efficient Capital Markets: A Review of Theory and Empirical Work," Journal of Finance, American Finance Association, vol. 25(2), pages 383-417, May.

Fama, Eugene, (1981), Stock Returns, Real Activity, Inflation, and Money, American Economic Review, 71, issue 4, p. 545-65.

Fortin, I., & Hlouskova, J. (2011). Optimal asset allocation under linear loss aversion. Fuel and Energy Abstracts.

Francisco J. Gomes, (2005), Portfolio Choice and Trading Volume with Loss-Averse Investors, The Journal of Business, 78, (2), 675-706.

Gärling, T., Kirchler, E., Lewis, A., & van Raaij, F. (2009). Psychology, financial decision making, and financial crises. Psychological Science in the Public Interest, 10(1), 1–47.

Gachter, Simon, Eric J. Johnson, and Andreas Herrmann. (2007). Individual-level loss aversion in riskless and risky choices. CeDEx Working Paper 2007-02, University of Nottingham.

Geletkanycz, M.A. and Boyd, B.K. (2011), “CEO outside directorships and firm performance: a reconciliation of agency and embeddedness views”, Academy of Management Journal, Vol. 54 No. 2, pp. 335-352.

Genesove D, Mayer C (2001) Loss aversion and seller behaviour: evidence from the housing market. Q JEcon 116:1233–1260

Gertner., R. (1993). "Game shows and economic behavior: Risk-taking on Card Sharks", Quarterly Journal of Economics, Vol. 108, 507 – 521.

Glick, I.O. (1957) A Social Psychological Study of Futures Trading. Doctoral thesis (PhD), University of Chicago. USA.

Godfrey, L.G. (1978). Testing against general autoregressive and moving average error models when the regressors include lagged dependent variables", Econometrica, 46, 1293–1302.

Granger, C. W. J. (1969). "Investigating Causal Relations by Econometric Models and Cross-spectral Methods". Econometrica. 37 (3): 424–438.

Gujarati, D.N. (2003). Basic Econometrics. New York: McGraw Hill Book Co.

Heilmann, K., Läger, V. and Oehler, A.: 2000, The disposition effect: Evidence about theinvestors aversion to realize losses: A contribution to behavioral finance through the use of experimental call markets, Mimeo. University of Bamberg.

Heisler, J. “Loss Aversion in a Futures Market: An Empirical Test.” Review of Futures Markets, 13 (1994), 793–822.

Hobijn, B., Franses, P., & M., Ooms (2004). Generalizations of the KPSS-test for stationarity. Statistica Neerlandica, Netherlands Society for Statistics and Operations Research, 58(4), 483-502.

Hong, H., Lim, T. and Stein, J. (2000) Bad News Travels Slowly: Size, Analyst Coverage, and the Profitability of Momentum Strategies. Journal of Finance, 55, 265-295.

Isidore, R., & Christie, P. (2018). A behavioral finance perspective of the stock market anomalies. International Journal of Research in Management, Economics and Commerce, 8(4), 5-9.

Jain, N., & Kesari, B. (2021). Impact of behavioral biases in financial risk tolerance ability of mutual fund investors. Tobacco Regulatory Science, 7(5), 2748-2765.

Johnsson,M, Lindblom, H & Platan,P. (2002). Behavioral Finance and Change of Investor Behavior During and after The Speculative at the end of the 1990s, School of Economics and Management.

Kahneman Daniel & Tversky, A. (1979). Prospect Theory: An Analysis of Decision Under Risk, Econometrica: Journal of the Econometric Society, 47 (2), 263-291.

Kahneman, D. & Tversky, A. (1992), Advances in Prospect Theory: Cumulative Representation of Uncertainty, Journal of Risk and Uncertainty, 5, (4), 297-323.

Karaca, S.S. and Eksi, I.H. (2012), "The relationship between ownership structure and firm performance: an empirical analysis over _Istanbul stock exchange (ISE) listed companies", International Business Research, Vol. 5 No. 1, pp. 172-181.

Kwiatkowski, D., Phillips, p., C., B., Schmidt, p., & Y., Shin, (1992). Testing the null hypothesis of stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root? Journal of Econometrics, 54, 159–178.

Mbaluka, P., Muthama, C., & Kalunda, E.N. (2012). Prospect Theory: Test on Framing and Loss Aversion Effects on Investors Decision-Making Process at the Nairobi Securities Exchange, Kenya. Research Journal of Finance and Accounting, 3, 31-41.

McDermott, R. (2009). Prospect Theory and Negotiation. In: Sjöstedt, G., Avenhaus, R. (eds) Negotiated Risks. Springer, Berlin, Heidelberg.

Metawa, N., Hassan, M. K., Metawa, S., & Safa, M. F. (2018). Impact of behavioral factors on investors' financial decisions: case of the Egyptian stock market. International Journal of Islamic and Middle Eastern Finance and Management.

Miranty, H. and Sisnuhadi, (2011), "Corporate governance and firm performance in Indonesia", International Journal of Governance, Vol. 1 No. 1, pp. 1-20.

O'Connell, Paul G. J. and TEO, Melvyn. (2009), Institutional Investors, Past Performance, and Dynamic Loss Aversion. Journal of Financial and Quantitative Analysis. 44, (1), 155-188. Research Collection Lee Kong Chian School of Business.

Odean, T., (1998). Volume, volatility, price, and profit when all traders are above average, Journal of Finance, 53, 75-109.

Ouzan S. (2020). Loss aversion and market crashes. Economic modelling, 92, 70–86.

Prais, S., J., & C., B., Winsten, (1954). Trend estimators and serial correlation. Chicago: Cowles Commission.

Prabowo, M. and Simpson, J. (2011), "Independent directors and firm performance in family-controlled firms: evidence from Indonesia", Asian-Pacific Economic Literature, Vol. 25 No. 1, pp. 121-132.

Prosad, J.M., Kapoor, S., & Sengupta, J. (2015). Theory of Behavioral Finance.

Rashwan, A.R. (2021). Measuring the Impact of Mental Accounting on Financial and Investment Decisions among Investors.

Ricciardi, V. and Simon, H. (2000). The case for behavioral finance: A new frontier. The Northeast Business & Economics Association, 27th Annual Conference, Islandia, New York.

Ritter, J.R. (2003). Behavioral Finance, Pacific-Basin Finance Journal, 11 (4), 429-437.

Ritter, Jay, (2005), Economic growth and equity returns, Pacific-Basin Finance Journal, 13, issue 5, p. 489-503.

Sekaran, U. (2003) Research Methods for Business: A Skill-Building Approach. 4th Edition, John Wiley & Sons, New York.

Shefrin, H., & Statman, M. (1985). The Disposition to Sell Winners Too Early and Ride Losers Too Long: Theory and Evidence. The Journal of Finance, 40(3), 777–790.

Shefrin, H. and Statman, M. (2000) Behavioral Portfolio Theory. Journal of Financial and Quantitative Analysis, 127-151.

Shleifer, A. (2000). Inefficient markets: an introduction to behavioral finance, Oxford: Oxford University Press.

Startz, Richard. (2009). EViews illustrated for version 7. 2nd ed. Irvine, CA: Quantitative Micro Software.

Statman, M. (1999). Behavioral Finance: Past Battles and Future Engagements. Financial Analysts Journal, 55(6), 18–27.

Thaler, R.H. and Johnson, E.J. (1990) Gambling with the House Money and Trying to Break Even: The Effects of Prior Outcomes on Risky Choice. Management Science, 36, 643-660.

Tuyon, J., & Ahmad, Z. (2016). Behavioural finance perspectives on Malaysian stock market efficiency. Borsa Istanbul Review, 16(1), 43–61.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. Science, 211(4481), 453–458.

Valenti, M.A., Luce, R. and Mayfield, C. (2011), "The effects of firm performance on corporate governance", Management Research Review, Vol. 34 No. 3, pp. 266-283.

Verbeek, M., (2004). A guide to modern econometrics. Rotterdam, Johan Wiley& Sons.

Weber, Martin and Camerer, Colin F. (1998) The disposition effect in securities trading: an experimental analysis. Journal of Economic Behavior & Organization, 33 (2). pp. 167-184. ISSN 0167-2681.

Woo, Kai-Yin, Mai, Chulin, McAleer, Michael and Wong, Wing-Keung, (2020), Review on Efficiency and Anomalies in Stock Markets, Economies, 8, issue 1, p. 1-51.

Xu, Y., & Y., Sun, (2010). Dynamic linkages between China and US equity markets under two recent financial crises, A Thesis Presented in Fulfillment of the Requirements of Master Degree, LUND University, School of Economics and Management.

Yiwen H (2021) Impact of investors' loss aversion and overconfidence on market performance evidence from China Stock Markets. In: Thurasamy R, MajidIA, Rahman NABA, Zulkafli AH (Eds). 2021 3rd International Conference on Economic Management and Cultural Industry (ICEMCI 2021). Atlantis Press, pp. 2022–2025.

Electronic Sites:

www.sis.gov.eg

www.egx.com.eg

www.cbe.org.eg

www.tradingeconomics.com

www.data.worldbank.org

–