

Influence of Basic Human Behaviors (Influenced by Brain Architecture and Function), and Past Traumatic Events on Investor Behavior and Financial Bias

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Human behaviors are influenced by past experiences. Stress and trauma are potent determinants of thought processes and decision-making. They also influence perceptions towards risks. Past studies have linked these behaviors to various financial biases. This article explores human behavior and impacts on investment decisions. Behavioral finance shows that investment decisions are affected by cognitive factors such as biases, mood, and emotions. They also influence the rationality and nonrationality of investment decisions. The paper demonstrates that human brain architecture is an element in decision-making due to its involvement in information processing and memorization. However, cognitive psychology does not fully address the underlying nervous system response to stress and perceived threats. Based on the findings, exposures to stress and trauma can increase the sensitivity to financial uncertainty. Individuals who experienced the devastating effects of trauma may be risk averse or excessive risk takers. This element of underlying Sympathetic Nervous System response explained by Polyvagal Theory as applied to behavioral finance and financial bias specifically, are not addressed in past or current literature.

Keywords: behavioral finance, cognitive biases, rationality, financial biases, traumatic exposures, volatility, Polyvagal Theory

INTRODUCTION

For most people, investment is one of the significant approaches to wealth creation and maximization. Ideal investment decisions require investors or portfolio managers to analyze an asset's financial and non-financial elements under the fundamental and technical analysis processes. One of the most important considerations from the analyses is the risk-return trade-offs. Investors or their portfolio managers will focus on the expected returns from a portfolio. The level of investment will also depend on the risk appetite of an investor. A risk-aggressive investor will buy highly risky assets compared to a risk-averse investor. Traditionally, investment decision-making processes should focus on the expected returns and risks. Both the fundamental and technical analyses are important in evaluating the appropriate investment choices from a pool of assets. Ideally, successful investment outcomes require that investors remain rational in their decision-making processes. Rational investors focus on facts rather than emotions or perceptions. When investors are overly emotional, they may make investment mistakes that may yield long-term losses or

excess volatility. The investment decisions may also be influenced by past experiences. Exposure to trauma and other adverse events could make investors or their advisors' risk averse, or take excessive risks.

Rationale for the Study

Successful investment outcomes require that investors or portfolio managers execute proper fundamental and technical analysis of specific assets of interest. Rational investors require intelligence, emotional control, and common sense alongside fundamental and technical analysis when making investment decisions. These competencies can offset the myriad of biases that can adversely affect portfolio outcomes (Bakar & Yi, 2016). However, these are often overruled, specifically when an investor has undergone traumatic life events. The process often influences investor behavior and may trigger different types of biases that negatively affect investment performance (VanderPal, 2021). The traditional focus on the technical and fundamental analysis has led to a little emphasis on the effects of past trauma and emotions on investor decisions and behavior. The purpose of the article is to assess how basic human behaviors (influenced by brain architecture and function), and traumatic events influence investor behavior and financial bias. In so doing, it reviews SE as a process that influences brain architecture and function after exposure to traumatic events.

Purpose of the Study

This exploratory investigation seeks to analyze the root causes of behavioral finance decisions in the modern economy. On one hand, most scholars argue that financial decisions are primarily based on rational choices (De Bondt et al., 2013). This argument contends that rational decisions support optimal investment decisions and allow individuals to utilize data to make informed decisions. On the other hand, some scholars advocate using nonrational decision-making mechanisms such as intuition (De Bondt et al., 2013). Although nonrational actions may have adverse effects if implemented improperly, studies show that intuition plays a key role in financial decisions. Moreover, in most cases, investors are forced to make decisions without sufficient information, so practices such as intuition can offer significant rewards in the financial sector. Therefore, this study elucidates the rationality and nonrationality of investment decisions by describing the influence of trauma, stress, emotional quotient, and intelligence quotient.

Stress, Trauma and Investor Behavior

Assumed rationality in the investment market is where investors rely on all available information when making decisions. The assumption of investors' rationality negatively impacts most of the financial and economic models and their applicability in investment decisions. These theories have ignored the critical role of emotions and stress or trauma in the investment decision-making processes. Some of the financial models include the efficient market hypothesis that argues that stock prices should reflect all the available information in the stock market. The financial biases arising from cognitive and emotional brain processes make the investment decision-making processes a challenge for most investors and their advisors. Moreover, increased focus on technologies for financial and economic modeling to calculate risks and returns has led to reduced focus on behavioral finance as an important element in the investment decision-making processes. Specifically, there is increased attention on fundamental and technical analysis instead of the emotional and behavioral components as an important source of financial biases in investment decision-making.

Behavioral biases and psychological effects such as Cognitive Dissonance, the Dunning-Krueger effect, various cognitive biases, and newly introduced concepts from somatic psychology and neuroscience can dramatically affect investor decision making and response. Cognitive dissonance is the mental discomfort that develops when one holds two conflicting attitudes or beliefs (Setiawan, Atahau & Robiyanto, 2018). It results in inconsistencies between an individual's beliefs and their motivation to pursue various activities (Setiawan, Atahau & Robiyanto, 2018). Dunning-Krueger effect, on the other hand, is a psychological bias that arises when people overestimate their capability in a specific area despite limited knowledge (Mazor & Fleming, 2021). These psychological effects can stem from the past traumatic exposures of an investor. For example, exposure to traumatic events from the past may trigger behavioral biases and psychological

effects upon investors, with adverse implications for investment decision-making processes and overall portfolio performance.

Traditionally, finance was considered a straightforward discipline because it simply required individuals to analyze organizational, financial, and market factors. However, the rapid advancement of economic systems has increased the amount of stress faced by financiers and business investors. In order to understand the effect of stress on a person's financial wellbeing, it is essential to recognize how one's surrounding environment affects his or her daily decisions. Although most people seek to gain satisfaction by improving their financial status, living standards, and financial outcomes, the reality is that stress can pose profound implications on investment choices. Still, it is essential to recognize that stress levels vary based on different situations. For example, studies show that individuals with high incomes and better financial wellbeing are less susceptible to stress, whereas those with low incomes and poor financial wellbeing are highly vulnerable to stress (Taft et al., 2013). Thus, it is essential to understand the impact of stress on behavioral finance and financial bias.

Similarly, exposure to traumatic events can negatively influence the probability of investment in risky assets. Investors who have undergone past traumatic events will be afraid to assume specific levels of risks in the market, influencing their investment choices. Past studies have demonstrated that exposure to trauma from natural disasters or violent civil wars will change individual behaviors over time (Frydman & Camerer, 2016). The effects of these behavioral changes tend to spill over to the capital or financial markets where investors make decisions based on their responses to stress and/or traumatic events. Kim and Lee (2012) in a survey of the Korean War survivors established that the individuals who were children of 4 to 8 years at the time of the war were more averse to financial risks five decades later. They found that the war exposed the children to trauma that negatively influenced their perceptions of the risks. A basic grasp of the human nervous system and concepts from treatments such as SE can help overcome fear, leading investors to make more rational decisions.

Research Questions and Objectives

This exploratory investigation aims to analyze the main features of behavioral finance decisions by focusing on cognitive and behavioral considerations. The cognitive aspects highlight the correlation between polyvagal theory and the sympathetic nervous system in financial decisions. Cognitive psychology evaluates how people think and perceive financial decisions (Kumar & Goyal, 2016). As mentioned earlier, rationality is usually underscored as a major component of behavioral finance. However, it is common for certain psychological factors to push investors to favor nonrational financial decisions. Accordingly, this study aims to analyze how mediating factors such as stress, trauma, emotional quotient, and intelligence quotient affect investor behavior and financial bias. This study is aligned with the following research questions:

1. What is the relationship between the polyvagal theory and sympathetic nervous system in behavioral finance?
2. What is the impact of stress and trauma on financial behaviors?
3. How do rationality and nonrationality contribute to financial bias?
4. What are the main financial biases that emerge from variations in EQ and IQ?

LITERATURE REVIEW

Employee Experiences and Financial Behavior

Frydman and Camerer (2016) assert that personal experiences will influence CEO behavior in the same manner as they do investors and households. In a study of the psychology of financial decision-making, the authors argued that the individuals who grew up during the Great Depression period are less likely to invest in corporate debt. The experiences from the Great Depression instilled some fears in these individuals, diminishing their risk tolerance levels. Frydman and Camerer (2016) further took a gender perspective in assessing the psychology of financial decision-making. According to the authors, the female top managers, particularly with the responsibility of financial managers will be less aggressive in exploring tax-saving

policies. Unlike their male counterparts, females tend to exhibit high levels of fear of legal actions, limiting their investment decisions. Investors who have had traumatic experiences will have similar shifts in psychological biases that influence their investment portfolio choices. Rational managers will make investment decisions to exploit investors with psychological biases (Frydman & Camerer, 2016). For example, when portfolio managers realize that investors are risk-averse and prefer low-priced stocks, they will issue more stocks when the prices are at the lowest, exploiting the psychological biases exhibited by the investors.

One of the important theories in behavioral finance is the normative theory, which is based on the risk-reward tradeoffs. The theory is important in predicting the investment decisions and behaviors of individual investors. Portfolio diversification helps the investors achieve the risk-reward tradeoff. It maximizes the expected returns and lowers the levels of exposure to risks in the stock market. Although the theory has been significant in explaining investor decisions, it is flawed by the behavioral or psychological biases developing from exposure to stress and traumatic events. For example, an investor who has undergone a major traumatic experience is unlikely to consider the risk-return tradeoff. Instead, they will make decisions that reflect their level of risk tolerance. These investors are more likely to select the less risky stocks for portfolio diversification to reflect their psychological conditions.

Brain Architecture, Function, and Influence on Human Behaviors

Brain architecture and functions also influence human behaviors and including investment decisions. In an attempt to understand how architecture influences human behavior, Chernavskaya, Chernavskii, and Rozhylo (2017) modeled an artificial cognitive system from human-brain architecture. Using the Natural-Constructive Approach (NCA), the authors argued that the artificial cognitive complex is a complicated multi-level combination of various types of neural processors that influence information processing through learning. According to Chernavskaya, Chernavskii, and Rozhylo (2017), one of the artificial cognitive systems contains a random element for the generation of information and is responsible for learning. It is critical towards the collection of information from the environment and influences the learning activities in an individual. For example, exposure to trauma often leads to information build-up in the brain, taking the form of memories. Through these memories, people learn and develop some fears that further influence their behaviors in different realms, including investment choices and levels of risk tolerance. For an individual who has undergone major traumatic experiences in the past, the brain architecture accumulates the information that influences subsequent learning and decision processes.

Chernavskaya, Chernavskii, and Rozhylo (2017) further recognized the other subsystem of brain architecture as free from noise. According to the authors, the subsystem is responsible for the memorization and processing of well-known information. It integrates emotions into information processing. The subsystem is more relevant in explaining how humans react to past traumatic exposures and how such experiences inform their decisions or behaviors (Chernavskaya, Chernavskii, and Rozhylo, 2017). Under the NCA approach, the cognitive architecture of the human brain explains the irregularities of human cognitive processes and behaviors. The noise-free subsystem of the brain links to logical thinking, which is critical in influencing human behaviors and actions, including in investment decision-making processes.

Arguably, the environment in which a brain develops can influence individual's financial risk tolerance levels. Chernavskaya, Chernavskii, and Rozhylo (2017) argued that human emotions are the product of neural transmitters and entail subjective appraisal of the present or future state. In their reviews, the authors asserted that emotions will be interpreted as dynamic variations of noise, controlling the activities of both the noise-reach and noise-free subsystems of the brain. The emotions are likely to manifest in the investment decision-making processes, triggering major biases in investors. Past traumatic exposures trigger these emotions, limiting rational thinking or behaviors among investors. Interestingly, emotions can override logical informational processes, impairing rational decision-making.

The NCA approach to understanding human-brain architecture and influence on human behaviors also classified emotions as either fixing or impellent. According to Chernavskaya, Chernavskii, and Rozhylo (2017), fixing emotions stimulate the memorization processes. The process further influences human behaviors as reflected in the decisions they make. In the investment realm, one could argue that human

brains memorize past losses that further build up into emotional reactions in the decision-making processes. Whether positive or negative, these emotions will significantly influence investment behaviors and can also lead to financial biases. The impellent emotions, on the other hand, stimulate the generation of information upon which individuals make decisions or take specific actions. The generation of information requires a high level of noise from the brain architecture. It may involve a recap of the past exposures to both traumatic and non-traumatic events. Therefore, based on the model, Chernavskaya, Chernavskii, and Rozhylo (2017) demonstrated that the NCA connects physiological and psychological approaches to cognitive processes like critical thinking, which is significant in the decision-making processes. The study also demonstrates that the human brain architecture, particularly from the noise-reach and noise-free systems is critical in explaining specific human behaviors and how the accumulation of past information affects such behaviors.

Problem-solving has been identified as one of the fundamental human cognitive processes (Wang & Chiew, 2010). However, such activities or processes are often negatively influenced by past traumatic exposures. Undoubtedly, problem-solving requires logical thinking, which according to Chernavskaya, Chernavskii, and Rozhylo (2017) should be a function of the brain architecture. The development of the noise-free subsystem of the brain will provide the basis for logical thinking and decision-making. Investments are one of the areas where logical thinking occurs. The past traumatic exposures may result in biases, leaning more towards the noise-reach subsystem. According to Wang and Chiew (2010), problem-solving is a higher-layer cognitive process that interacts with several other cognitive processes such as learning, searching, inference, analysis, and decision-making. As a cognitive process, the human-brain architecture plays a critical role in influencing how an individual will engage in any of these processes. The exposures to past traumatic events also influence how the brain will process current information and make decisions or synthesize data for specific actions. Wang and Chiew (2010) described problem-solving as a cognitive process of the brain that seeks to establish a solution for a specific issue. Therefore, it can involve a search process in the memory space (Wang & Chiew, 2010). However, the search process can be significantly influenced by past experiences, leading to irrationality among individuals and financial biases. The cognitive structure of the brain and internal knowledge presentation mechanisms makes it vulnerable to external influence. Past traumatic experiences can be one of these influences. The cognitive model of the brain identified the thinking component as a real-time natural intelligence system that can be influenced by both internal and external factors in one's environment.

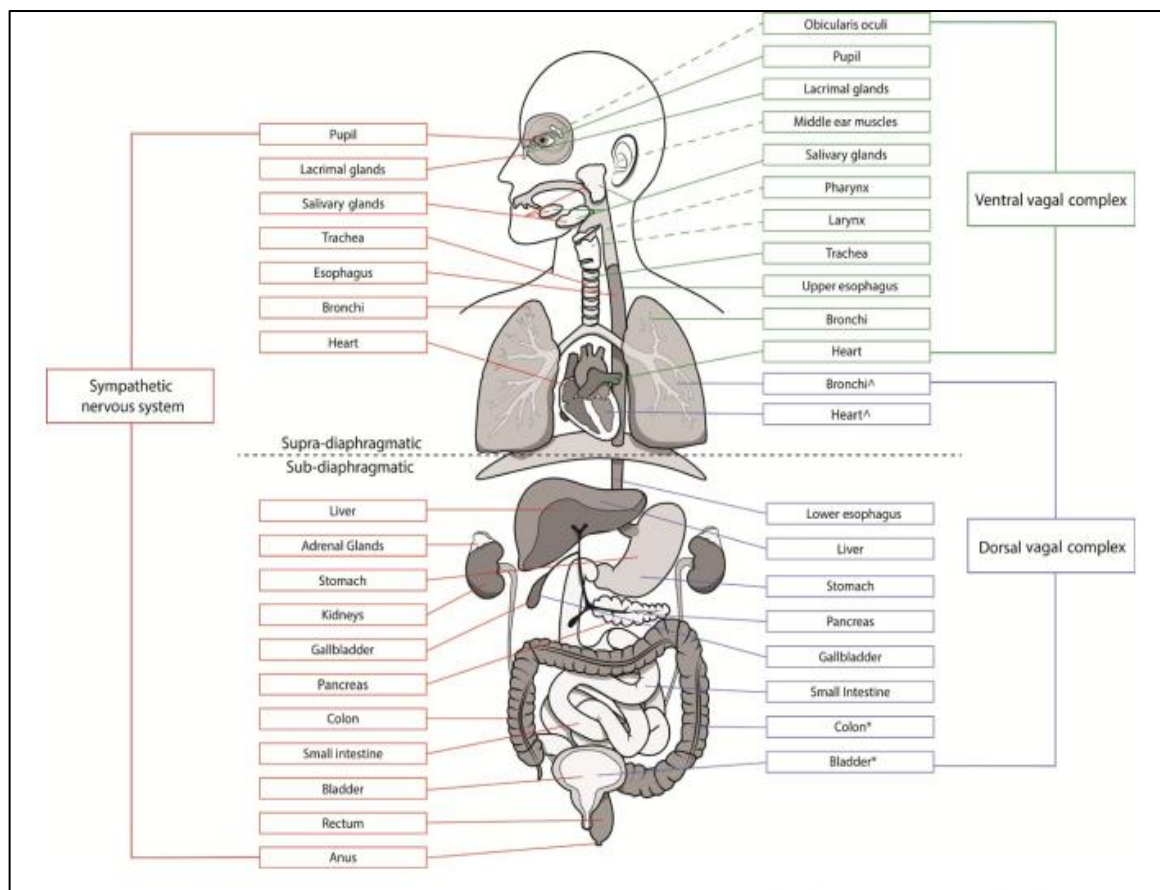
In a synthesis of cognitive biases, Hilbert (2012) took more interest in exploring how noisy information processing can result in biased decision-making in humans. Arguably, making decisions is often premised on several alternatives, yielding irrational choices. All the biases discussed in the previous sections are a function of cognitive processes in the human brain. According to Hilbert (2012), irrational irregularities may develop from past experiences, significantly influencing the critical thinking and decision-making processes among investors. For example, past losses may make an investor develop biases against specific assets in the investment markets. It reflects irrationality in the decision-making that may yield unfavorable outcomes. Moreover, Hilbert (2012) asserts that these cognitive processes are a function of the brain. Yet, traumatic experiences tend to destabilize the rationality in human-brain processes. In *Chernavskaya, Chernavskii, and Rozhylo's (2017)* research on human brain architecture, the identification of the noise-free and noise-reach subsystems of the brain relates to the cognitive processes and further influences the investment outcomes. The studies have demonstrated that the human brain architecture is a critical element in decision-making due to the information processing and memorization capabilities.

Polyvagal Theory and Effect on Thinking Brain

The polyvagal theory explains how neuroscientific and psychological constructs regulate emotions and influence human thinking. Introduced by Stephen Porges in 1994, the theory describes the autonomic nervous system as having three subsystems that define connection and social behaviors (Porges, 2018). Porges argued that the human autonomic nervous system is also about safety and it manifests in the decisions and actions people take in different situations (Porges, 2018). Moreover, Porges (2021) described Polyvagal Theory as a framework that emphasizes sociality as an important process in the mitigation of threats while supporting physical and mental health. The fear of losses or need for safety will trigger the

autonomic nervous system to take actions that premise safety. The main components of the autonomic system are shown in Figure 1 below: the ventral vagal complex, sympathetic nervous system, and dorsal vagal complex. The theory also explains how the vagus nerve (a part of the nervous system that connects the brain to the heart and viscera) links to the ability of humans to connect and interact with each other. It is important to understand the coherent nervous system and its influence on various decisions. Traumatic exposures threaten the safety of individuals and stimulate perceptions of danger, making individuals experience constant fear and loss-aversion behaviors.

FIGURE 1
THE POLYVAGAL THEORY AND THE CORRELATION OF THE VVC, SNS, AND DVC



Kolaz et al., 2019

The theory also explains social engagement systems. According to Porges (2018), complex neural circuits of the brain regulate the social engagement system. They involve sensory pathways from the higher brain structures and visceral organs that influence brain activities in controlling various activities. Using the polyvagal theory, Porges (2018) proposes that cues of safety are the profound remedy to trauma. The theory defined safety from the feeling of safety and does not necessarily imply the elimination of threats (Puder, 2018). However, the feeling of safety will depend on three different conditions including the autonomic nervous system not being in a state that supports defense (Porges, 2018). The author also identified the need for activation of the social engagement system in regulating sympathetic systems within the optimal ranges that positively influence growth, health, and restoration. Finally, there are the cues for safety (Porges, 2018). According to the theory, the cues for safety may initiate the processes through a trigger of the social engagement systems. It creates a window of tolerance in the human brain's thinking

system. The process explains why some individuals will be tolerant of risks as others prefer safety. Therefore, the polyvagal theory has explained the specific neural exercises that offer opportunities for the optimization of physiological state regulation. The theory further states that greater resilience can be achieved when neural exercises comprise of cues of safety and social connection.

Porges (2018) in a review of the theory argues that therapy is an ideal approach to exercise the capacity to shift through the recruitment of social engagement system features. Arguably, therapy is critical in keeping the autonomic nervous system from an extensive defense state. Somatic Experiencing is one of the therapies that can be used to help individuals get out of the defense space and become more resilient (Porges, 2018). Exposure to traumatic events often triggers the autonomic nervous system to find safety in the state of defense. It will be reflected in the behaviors and choices individuals make. For example, after a traumatic exposure, people will likely fear taking high risks due to the possible losses they may accrue from such decisions. However, with therapies such as Somatic Experiencing, it is possible to influence the autonomic nervous system to become more resilient through social engagements and get out of a prolonged state of defense (Porges, 2018). Based on the polyvagal theory, the human the need for safety will arise from the physiological state changes under the social engagement systems.

Kolacz, Kovacic, and Porges (2019) employed the polyvagal theory as an integrative framework for explaining traumatic stress. The authors also linked it to the autonomic brain-gut connection. According to Kolacz, Kovacic, and Porges (2019), pathological risks such as anxiety, post-traumatic stress disorders (PTSD), and depression develop from exposure to traumatic events. A history of trauma, chronic stress, and abuse increases the risk of exposure to these problems (Kolacz, Kovacic & Porges, 2019). In explaining the link between thinking brain and human behavior, the theory has been extensively explored in the research to provide a formwork of adaptive diversity. The studies demonstrate that polyvagal theory is critical in understanding the functionality of human brains, particularly in times of stress exposures. In the investment decision-making framework, pathological risks such as anxiety, post-traumatic stress disorders (PTSD), and depression yields biases in the decision-making process (Kolacz, Kovacic & Porges, 2019). It implies that investors are unlikely to make rational decisions under the circumstances. The influence on the thinking brain may result in individuals taking or not taking more risks after exposure to traumatic events.

Behavioral Finance and the Rationality and Irrationality of Investor Decisions

According to the conventional finance theories, investors will act rationally and consider all available information when making investment decisions. The rational economic factor in investments often relies on the principles of consistent choice, return maximization, and self-interests (Bergset, 2015). Neoclassical economic theories oppose the rational investor theories. According to the neoclassical economic theories, investors will have limited access to information at any given time. They suggest that external market and economic constraints will exist to influence investors' decisions.

Stressful experiences and trauma often compel most investors to embrace the disposition effect in their investment decisions (Frydman & Camerer, 2016). The disposition effect reflects the tendency of investors to sell stocks or investment assets that have accumulated significant growth in price after purchases compared to the assets that have recorded falling prices. The fears developing from the traumatic experiences make most investors avoid risks. As such, they will dispose of the stocks that have accumulated high profits for gains (Zhuo, Li & Yu, 2021). For the stocks that have maintained a declining trend (losers), these categories of investors will continue holding them for the fear of making losses from the portfolio.

The other important theory in behavioral finance is the repurchase effect. According to Frydman and Camerer (2016), the repurchase effect is the tendency of investors to repurchase the stocks that have been previously sold and recorded a decline in the prices. However, the decision to repurchase these stocks may be influenced by exposure to trauma or stress in the past. For example, when an investor has undergone traumatic experiences, they may become extremely risk averse or risk tolerant. They develop specific perceptions about risky or high volatile investment. For risk averse investors, they will hesitate in purchasing the stocks that have recorded falling prices in the past due to possible losses. Investors exhibiting the behaviors may avoid the assets whose prices have increased since the last sale. Moreover, the theory suggests that the stocks will undergo devaluation particularly after experiencing regret over "missing out"

on a purchase. The devaluation makes the stocks less attractive, particularly for the investors who have undergone traumatic experiences in the past. It is a behavioral characteristic developing from the past traumatic experiences.

Both the disposition and repurchase effects reflect the rationality of investors. Rational investors will adopt either the repurchase or disposition effect as they depend on the available information for the assets. The historical prices will inform whether an investor disposes or repurchase a stock (Zhuo, Li & Yu, 2021). However, the decision is subject to traumatic experiences for investors. An investor who has undergone traumatic experiences is more likely to depict the disposition effect due to the risk aversion behavior in the stock or capital markets.

Normative models in behavioral finance predict that investors will trade infrequently as a strategy for rebalancing risks in a portfolio. The infrequent trading may also be motivated by the need to liquidate investment assets for long-term gains (Frydman & Camerer, 2016). Some investors will also prefer frequent trading due to fear of risks. Investors with overtrading behaviors are more likely to make losses than investors engaging in infrequent trading. According to Frydman and Camerer (2016), overtrading is often motivated by the overconfidence of investors. Irrational investors will believe that they have better information when in the actual sense, they do not. As a behavioral concept, overconfidence leads to biases in investment decisions. The biases manifest when investors trade frequently, leading to major portfolio losses.

Outcomes from Bayesian learning also result in trading biases in the stock market. Most investors will use reinforcement learning whether they learn asymmetrically from both the bad and good news. These investors will be overconfident when interpreting the information. Past studies have demonstrated that investors are heterogenous in their trading behaviors due to genetic or psychological factors. Strong genetic effects will exist on financial and investment behaviors as reflected in the overtrading, under-diversification, and risk-taking strategies.

Rational investors tend to benefit from the efficient market hypothesis compared to irrational investors. This is because rational investors will consider all the available information in the stock market when making investment decisions. The consideration of the available information results in decisions that optimize expected returns. According to the hypothesis, all prices should reflect all the available information in the market (Naseer & Bin Tariq, 2015). It implies that irrational investors will not benefit from any positive news in the stocks. In an efficient market, the stock prices will accurately and immediately reflect the announcement of earnings in a company, whether positive or negative. The reflection of the information on the asset pricing implies that investors will not benefit from high returns due to possible good news since the information is already reflected on the stock prices (Naseer & Bin Tariq, 2015). Critics of the efficient market hypothesis, however, argued that investors are likely to depict various behaviors from company announcements. The behaviors indicate the significance of the information in influencing investor decisions. Investors will overreact to bad news and develop pessimism in their investment decisions. For the investor who experiences severe stress or trauma, the overreaction tends to be high due to the risk aversion characteristics of the investors (Cohn, Engelmann, Fehr & Maréchal, 2015). After a series of poor earnings recorded by a company, these investors will sell their stake or avoid the shares for fear of accumulating more losses in a portfolio. The investor behaviors contradict the efficient market hypothesis, which suggests the share prices reflect all available information such that investors or traders cannot take advantage of the changes for investment gains (Bakar & Yi, 2016). The assertion that prices should not respond to information with no effect on the firm value.

According to VanderPal (2021), the levels of asset price volatility or measures and expected returns are the major factors that inform portfolio investment decisions for most investors. In some instances, emotions and intelligence levels may overrule the focus on facts. Irrational investors will focus on intelligence levels, emotions, and past psychological experiences such as trauma. An individual's traits may also influence their investment decisions and behaviors. Personality traits are psychological factors that will influence human behaviors. VanderPal (2021) highlighted neuroticism, conscientiousness, extroversion, agreeableness, and openness as some of the psychological factors influencing human behaviors and investment decisions. These traits also stem from past stressful or traumatic experiences. For example, an investor who has

undergone major stress and trauma will consider past experiences over logic in making decisions (VanderPal, 2021).

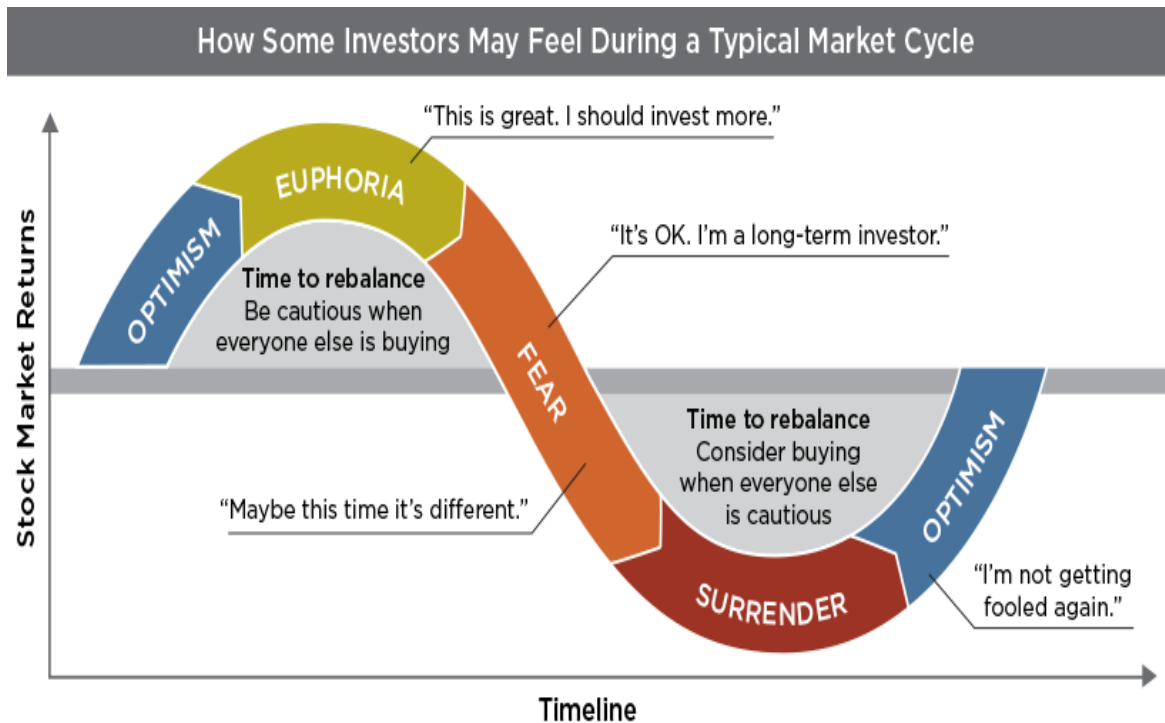
Traumatic Exposures and Impact on Investment Decisions

Investment is about taking risks to make significant gains. However, the ability to tolerate risks vary across individuals and may be influenced by other cognitive or psychological factors. Exposure to traumatic events in the past is one of the fundamental factors that influence investment decision-making processes. The primary purpose of the study was to explore how stress and trauma influence human behavior to determine their investment behaviors and rationality. In developing the argument that the exposures negatively affect investment behavior, the study has linked the decisions to biases that reflect the irrationality of investors, especially after an exposure to traumatic events.

One of the traumatic experiences can be exposure to wars, both at the family or societal levels. Bellucci, Fuochi, and Conzo (2020) sought to explain how the exposure of children to the Second World War shaped their perceptions towards financial risk tolerance in their adult life. According to the authors, adverse childhood experiences will present life-long effects on the decisions individuals make, especially under uncertainty during their adult life. Stock investments are one of the decisions people make with high levels of uncertainty. The study demonstrated that exposure to warfare during childhood results in low financial risk tolerance in adult life. Individuals who experienced the devastating effects of the wars underwent major losses including loss of lives. These individuals are unlikely to invest in stocks due to their high volatility. It is a reflection of the brain architecture where people will tend to associate the losses with all major events in their lives.

Bellucci, Fuochi, and Conzo (2020) further argued that exposure to war in childhood will increase the sensitivity to financial uncertainty. These individuals are less tolerant and unlikely to hold stocks following seasons of high volatility in the investment market. The findings from the study have reflected the adverse effects traumatic events can have on the investment decisions of clients. The exposures will result in limited risk tolerance due to the fears of financial losses. Moreover, investors holding risky assets are likely to dispose of them after experiencing a small trigger in the market performance. It implies that traumatic experiences are critical to the investment decision-making processes. However, Somatic Experiencing as a therapeutic approach has attempted to help individuals with such experiences recover and remain rational in their investment decision-making. The rationality of the investors is compromised with the exposure to traumatic events. It informs the development of specific biases that will make most people ignore the facts from fundamental and technical analysis and refocus on their past experiences as the basis of decision-making.

FIGURE 2
INVESTORS' BEHAVIORS IN MARKET CYCLES BASED ON EMOTIONAL INFLUENCES ON BEHAVIORS



Somatic experiencing (SE) is a therapy mechanism aimed at helping individuals recover from past traumatic experiences. The process can influence the emotions and perceptions of investors, affecting their investment decisions and behaviors. The Somatic Experiencing International (SEI) defines it as:

“a body-oriented therapeutic model applied in multiple professions and professional settings—psychotherapy, medicine, coaching, teaching, and physical therapy—for healing trauma and other stress disorders. It is based on a multidisciplinary intersection of physiology, psychology, ethology, biology, neuroscience, indigenous healing practices, and medical biophysics and has been clinically applied for more than four decades. It is the life’s work of Dr. Peter A. Levine.” (SEI, n.d).

SE may positively influence financial biases and investor behaviors that negatively affect investment performance. When an investor has a history of trauma, they may overlook facts and logic and focus on emotions and perceptions. The behaviors negatively influence investment performance. VanderPal (2021) identified emotional quotient as an important factor influencing investment decisions. According to the authors, irrational investors will rely on their emotions and perceptions rather than facts and logic when making investment decisions. The ability to identify, interpret, and effectively use emotions in addressing problems and making decisions will often be undermined by past traumatic experiences. Although SE tries to help individuals recover from the experiences, it potentially has a major effect on investors' behavior and financial biases.

Stress and Impact on Investment Decisions

In the current society, stress is often associated with poor employee performance and organizational productivity. As a result, stress often poses adverse effects on employee satisfaction in the financial sector.

Heryanda (2019) conducted a study to determine the impact of stress on financial workers, particularly collectors. In the study, the researcher demonstrated that debt collectors often face significant challenges on a daily basis, thereby increasing their stress levels. In this case, stress negatively affects the employees' mindset and professional decisions, so organizations must mitigate it as soon as it is discovered. This strategy can play a critical role in improving employee satisfaction and overall productivity. Furthermore, the study highlights that stress and employee satisfaction are opposing dimensions that counteract each other (Heryanda, 2019). In other words, high stress tends to worsen employee satisfaction, and low stress enhances the workers' satisfaction. Overall, it is essential to create workplace environments that reduce stress and encourage workers to deliver optimal performance in their respective organizations.

In essence, various financial behaviors are strongly related to stress. For instance, Parcia and Estimo (2017) mention the following practices: inability to manage debt, lack of emergency funds, overspending, low income, and inadequate knowledge about proper spending habits. These issues can induce financial stress in different people, especially when financial resources are limited. In the workplace, the principal causes of financial stress are life-cycle events, job-related challenges, and unfavorable work situations (Estimo, 2017). Furthermore, most people have few alternatives to improve their economic conditions, which worsens their stress levels at home and work. The main signs of financial stress are high rates of absenteeism, frequent requests for pay-day advances, and wage garnishments. Due to these consequences, Estimo (2017) emphasizes the importance of financial literacy in alleviating stress. In summary, appropriate countermeasures should be adopted to mitigate the detrimental effect of financial stress among workers.

Several studies reveal that financial stress often emerges from a person's inability to resolve immediate money-related needs. Netemeyer et al. (2018) conducted an investigation to ascertain the impact of financial stress on consumers. The authors discovered that financial stress is a significant barrier to financial wellbeing and future security. In addition, the article demonstrates that stress originating from money management stems from the inability to meet immediate financial obligations (late payments, minimum bills/ credit cards, materialism, and lack of self-control) rather than future-oriented goals (retirement plan and long-term investment risks) (Netemeyer et al., 2018). In this context, it can be perceived that having adequate funds on hand (or bank account) positively correlates with life satisfaction, whereas debt status is typically associated with stress and low life satisfaction. This rationale explains why most individuals make decisions that prioritize their financial wellbeing. In brief, financial security is essential for reducing financial stress and poor financial decisions.

EQ and Financial Behaviors

In recent years, many investors have developed the assumption that emotions are a pitfall to optimal financial decision-making. This rationale encourages financiers and investors to believe that sound thinking requires one to eradicate emotions and their related influences (Sullivan, 2011). As a result, emotions can increase the complexity of financial decisions in unpredictable ways. Although most people are confident about their investment decisions, the reality is that these decisions are constructs of emotional and intellectual considerations. Even experienced financial investors experience are not immune to the influence of emotions on monetary decisions (Sullivan, 2011). For that reason, some investors pride themselves on the ability to separate emotions from financial decision-making. Contrary to this perspective, psychology research demonstrates that emotions offer significant benefits to professionals.

Neuroeconomic research proves that emotions play an influential role in financial decision-making. The sections of the brain responsible for emotional deliberation is strongly linked to the cognitive mechanisms that decide risks and rewards (Sullivan, 2011). Human beings frequently make decisions that manifest as the most logical choices, but these choices are primarily based on emotional processes rather than ideas, data, or analytical considerations. Accordingly, simple actions and emotions can cause severe deviations in investment choices. For instance, a recent study reveals that participants touched lightly by a woman on the shoulder are more willing to embrace greater financial risks than those not touched on the shoulder (Sullivan, 2011). Similarly, another study illustrated that subjects who viewed a picture depicting adverse financial outcomes had a higher likelihood of making safe investment decisions than those who

viewed neutral photos (Sullivan, 2011). These studies illustrate that emotions can cause unpredictable deviations in rational decision-making mechanisms about finance.

Despite the importance of emotions in decision-making, studies show that it can worsen or mitigate financial bias. For instance, emotional bias affects investment preferences and beliefs through risk aversion, overconfidence, and optimism (Ali & Jarboui, 2014). Correspondingly, emotional intelligence is highlighted as a novel approach for eliminating prejudice and complementing decisions based on IQ. Furthermore, emotional intelligence is vital for minimizing behavioral biases originating from optimism and loss aversion and improving financial policies (Ali & Jarboui, 2014). Overall, many leaders have acknowledged the necessity of using emotional intelligence to optimize the outcomes of financial decisions.

An emotional quotient becomes important in making better investment decisions that yield positive outcomes such as high returns and low-risk levels. Investors who have undergone SE or similar therapies may show improved attitudes and decision-making around specific stocks. The past performance through technical and fundamental assessment of the stocks may not be significant, particularly when an investor is overshadowed by past traumatic experiences. According to VanderPal (2021), investors with high EQ are more risk-tolerant due to their ability to consider facts over emotions. Therefore, the ability to take risks will presumably rely on the outcomes of SE following trauma.

IQ and Financial Behaviors

Intelligence quotient is a construct that primarily supports rational and logical thinking. Hafer (2016) reveals that higher IQ people are often more patient and more likely to save finances than others. In addition, research findings illustrate that these economic decisions are similar at the individual and national levels. In other words, countries with higher national IQ within the population have higher saving rates and tend to possess more financial assets. If IQ positively correlates with savings, it can be argued that a higher IQ can improve financial development and economic growth (Hafer, 2016). The study highlights that human intelligence plays an integral role in justifying various socio-economic outcomes in modern society. Therefore, countries that aim to optimize economic growth should invest in policies that improve IQ, such as comprehensive education and improved healthcare (Hafer, 2016). Such approaches can improve the financial behaviors of the citizens, thereby enhancing the economic wellbeing of the overall society.

Furthermore, IQ can be used to analyze rational risk-taking behaviors in a population. VanderPal (2021) reveals that individuals with high IQ often demonstrate elevated risk-taking behavior in comparison to those with low IQ. Fundamentally, risk preference and risk-taking behaviors are strongly aligned with a person's cognitive and analytical capabilities (VanderPal, 2021). This argument can also be perceived by evaluating behavioral bias. Studies show that investors with IQ are more likely to report behavioral biases affecting investment outcomes than those with low IQ. However, the author complains that most studies conducted on the influence of IQ on decision-making primarily focus on leadership and human resources instead of behavioral finance (VanderPal, 2021). This research gap highlights the need for investigating the rational and nonrational mechanisms behind financial behavior. In conclusion, IQ reflects a person's cognitive ability to anticipate losses and make choices that mitigate the impacts of bad financial decisions.

RESEARCH METHODOLOGY

The study utilizes the exploratory research design. In this approach, the principal goal is to explore a research issue that has not been clearly defined or whose scope of research is unclear (Singh, 2007). Thus, exploratory research allows researchers to familiarize themselves with unique concepts and ideas by breaking down several research themes. An important defining characteristic of exploratory research is the strong dependence on secondary research materials. This reliance explains the need to review existing literature and qualitative findings (Singh, 2007). Although the exploratory research design can fail to deliver conclusive answers to existing research problems, it is essential for acquiring accurate and reliable insights. Another weakness of exploratory research is its findings cannot be generalized or should be interpreted with caution because they may not represent the target population (Singh, 2007). Despite these weaknesses,

the exploratory research method can achieve significant results when used to analyze rational and nonrational financial behaviors.

DISCUSSION

Correlation Between Polyvagal Theory, Sympathetic Nervous System and Financial Behaviors

According to the study's findings, few studies have been conducted investigating the correlation between the polyvagal theory and financial behaviors. However, Sullivan et al. (2018) outline that the theory is essential for elucidating the connections between the body, brain, and complex cognitive processes. The researchers highlight that PVT focuses on delineating neural platforms towards three situations: safety, danger, or life-threatening situations. In this case, the polyvagal theory demonstrates that human beings rely on neuroception to perform subconscious detection of safe and threat environments. With that said, the polyvagal theory and sympathetic nervous system are strongly tied professional decisions through three neural platforms that determine social communication and personal defense.

The Ventral Vagal Complex (VVC) and Social Engagement

This component determines the mechanisms of social engagement. When a person detects safety within the internal and external environment, the VVC supports neural processes that promote prosocial behaviors and social connection. The process relies on the motor component, which regulates and coordinates facial, head, bronchi, and heart muscles (Sullivan et al., 2018). Accordingly, the VVC supports communication, vocalization, and listening ability, thereby providing more versatile opportunities for resolving social challenges and optimizing social interactions.

The Sympathetic Nervous System (SNS) and Environmental Analysis

This component is usually associated with flight/fight behaviors. In essence, flight/fight behaviors are dependent on the activation of the SNS and the interactions of primary defense mechanisms of the physical body. For that reason, defense requires one to increase metabolic functions and support mobilization or evasive responses (Sullivan et al., 2018). When the SNS system is affected, significant physiological changes occur, which include inhibition of gastrointestinal functions, increase in heart rate and respiration rate, increase in muscle tone, and release of catecholamines. In other words, the body supports physiological functions that mobile the body towards safety or survival as the primary end goals (Sullivan et al., 2018). Therefore, while social engagement and connection are linked to the VVC, the SNS is tied to behaviors and emotions such as anger, fear, and anxiety that allow one to orient cognitive behaviors for safety or protection.

The Dorsal Vagal Complex (DVC) and Response to Extreme Situations

This component controls the neural functions linking the motor fibers to different organs below the diaphragm. Correspondingly, Sullivan et al. (2018) state that the DVC is designed to allow a person to adaptably react to situations of immense danger, terror, or extreme stress. In this context, the activation of the DVC results in a passive response based on reduction of cardiac output to reserve metabolic systems, shifts in bowel and bladder function, reflexive urination and defecation, and other bodily processes. These operations allow a person to reduce the capacity of metabolic resources and oxygen needed to achieve safety. In some cases, these behaviors can be associated with behavioral shutdown, 'freeze' responses, collapse, feigning death, or loss of consciousness (Sullivan et al., 2018). Therefore, the VVC and SNS deal with social engagement and evaluation of the surrounding environment during threats, whereas the DVC usually functions during moments of extreme danger or extreme psychological issues such as stress or trauma.

With regards to cognitive decisions, trauma survivors often have difficulty controlling their autonomic and behavioral responses. In some cases, these individuals face psychological difficulties responding to threat-level situations and demonstrating hypervigilance for overwhelming stress, anxiety, or anger (Kolacz et al., 2019). Research shows that some threat events are dependent on one's heightened sensitivity to

sensory threat cues, which may increase one's perceptions and resilience towards danger triggers. This phenomenon can also be elucidated by explaining how threat-state maintenance behaviors can improve cognitive outcomes. For example, resting and therapy can improve one's perceptivity and salience towards social regulation and safety processes, hence, reducing the negative impact of psychological issues aligned with trauma and stress (Kolacz et al., 2019). In summary, although recent studies did not reveal strong links between the polyvagal theory and behavioral finance, the findings reveal that the polyvagal theory plays a vital role in mediating social, emotional, and cognitive responses.

Rational and Nonrational Decision-Making Considerations in Behavioral Finance

In the finance sector, professionals are usually compelled to make quick judgments with limited cognitive resources and information. As a result, most individuals rely on shortcuts to determine optimal decisions (Hirshleifer, 2015). These shortcuts are usually labeled heuristics because they describe the innate cognitive and automatic processes developed through learned or consciously selected principles. Research shows that the rational and nonrational mechanisms are based on dual processes. On one hand, the nondeliberative (or intuitive) system usually generates quick perceptions and judgments; on the other hand, the reasoning system monitors and revises these judgments based on permissible circumstances and environmental variables (Hirshleifer, 2015). The nonrational aspects of behavioral finance are typically aligned with intuitive decision-making systems where a person is overconfident about their gut instincts, whereas all information that does not conform to the intuitive viewpoints are neglected. Additionally, emotions and affective reactions can also affect financial choices such as entering or leaving a stock market due to panic buying or too much enthusiasm instead of critical evaluations (Hirshleifer, 2015). Therefore, research demonstrates the importance of both rational and nonrational decision-making considerations in behavioral finance.

In modern markets, financial investors and decision-makers are usually encouraged to make analytical decisions instead of depending on intuition and feelings. The intuition-generating systems provide poor guidance for evidence-based market decisions, especially in large economies. Although beliefs are usually considered a social phenomenon, it is common for people to overvalue their personal choices. Therefore, self-deception can occur subconsciously at the expense of excessive simplification, taking shortcuts, or affective short-circuiting. This behavior is described in a quote made by Hirshleifer (2015): "What you see is all there is." Therefore, the main root causes of financial bias are attributable to: investor overconfidence, limited attention and cognitive processes, feelings and affective reactions, and firm behavior (Hirshleifer, 2015). Overall, financial bias can emerge from various intrinsic or extrinsic factors.

Traditional economists modeled financial systems in accordance with rational decision-making processes. This method has demonstrated significant results in terms of optimizing the use of information and resources. However, De Bondt et al. (2008) outline that the rationality assumption is unrealistic in real-life markets. Therefore, behavioral finance has evolved from the evaluation of rational market choices towards emotional and non-rational dimensions. Human beings are logical and autonomous agents, so their financial decisions are constructs of their rational and rational expectations. Furthermore, most markets are relatively complex structures that fluctuate based on various financial and business decisions. Therefore, the best approach is to ignore the rationality of market choices because investment choices are based on the idea "price equals value" (De Bondt et al., 2008). Therefore, rational and nonrational decision-making mechanisms will be supported as long as they generate optimal financial outcomes.

Impact of Stress and Trauma on Financial Behaviors

Lim and Kim (2019) also examined the influence of the psychological traits of investors on their financial behaviors in the stock market. According to the study, anxious individuals are less likely to participate in the stock market due to the high volatility and risk exposures in the market. When the risk levels are high, there are high chances of accumulating losses. However, with high anxiety, one will less likely to hold onto the investments (Lim & Kim (2019). The anxieties may also develop from the past experiences from traumatic events such as family conflicts or wars. Other studies have also demonstrated that emotions or feelings arising when making investment decisions often yield behaviors that deviate from

rational economic or financial decisions. The emotions will develop from past traumatic experiences, making investors irrational in their investment actions. Psychological factors stemming from the traumatic experiences also yield decision biases (Lim & Kim, 2019). Therefore, more anxious investors are likely to invest in assets with low levels of risk. This is primarily due to the fear of incurring losses in a portfolio that could further affect their behaviors in the investment arena. Anxiety developing from traumatic experiences also makes individuals avoid uncertain environments, hence the choices for less risky investment choices. However, with the decision biases and risk-return trade-offs, these investors are unlikely to benefit from the high returns that develop from the high levels of risks in investments.

Financial Biases in Behavioral Finance

Financial bias often emerges due to a person's inability to mediate the conflict between rational and non-rational decision-making mechanisms. Although the finance discipline places a lot of emphasis on rational decisions, many situations exist where investors deviate from the rational mechanisms and embrace nonrational ones. In this context, it is essential to acknowledge that no investor has an awareness of all the market factors that can affect financial decisions. Therefore, instead of underscoring rationality, many researchers support limited rationality (Sadi et al., 2011). Limited rationality implies that a person's decisions are rational but are limited by his or her knowledge and perceptions. This perspective encompasses both the rational and non-rational aspects of financial bias. For that reason, scholars have identified a strong correlation between investors' personalities, perceptual errors, and financial bias. Accordingly, Sadi et al. (2011) attribute financial bias to perceptual errors, personal feelings, emotions, and the investor's personality. Therefore, organizations should utilize strategies that target the intrinsic and extrinsic drivers of financial bias.

In examining the irrationality of investors, the behavioral biases that emerge when making investment decisions are critical. These biases may develop from investors' exposure to past trauma. When investors are subjected to these biases, they undermine rationality and logic when making investment decisions. Some of the common biases in behavioral finance include overconfidence bias, self-serving bias, herd mentality, loss aversion, framing cognitive bias, narrative fallacy, anchoring bias, hindsight bias, confirmation bias, recency bias, and representativeness heuristic (Cohn et al., 2015). The following is a discussion of each of the financial biases and how they relate to trauma and their effects on the investment decisions for investors and their advisors.

Overconfidence Bias

Overconfidence results from someone's false sense of their skill, talent, or self-belief. It can be a dangerous bias and is very prolific in behavioral finance and capital markets (Daniel & Hirshleifer, 2015). The most common manifestations of overconfidence include the illusion of control, timing optimism, and the desirability effect (Daniel & Hirshleifer, 2015). Exposure to stress and/or traumatic events may stimulate investors to develop a false sense of skill and self-beliefs, negatively influencing their investment behaviors. When an investor develops a false sense of skills and self-belief, they tend to make irrational investment decisions that yield negative returns (Daniel & Hirshleifer, 2015). Investors with past traumatic experiences may have low overconfidence in their investment decisions. The past experiences trigger fears in investment processes, negatively affecting the cognitive ability to make the best decisions and investment choices. Moreover, from past stress or trauma, people tend to develop specific social behaviors. These behaviors are linked to specific neurobiological processes that influence decisions (Porges, 2021). They also influence the capability to support homeostatic functions leading to optimized growth, restoration, and health (Porges, 2021). The polyvagal theory explains how humans will respond to stress and resulting overconfidence bias. The support for physical and mental health after trauma or stress experiences may lead to quick recovery, encouraging rational investment decisions.

Self-Serving Bias

Self-serving cognitive bias is the propensity to attribute positive outcomes to skill and negative outcomes to luck. Self-serving biases stem from cognitive processes distorted by the need to enhance and

maintain high self-esteem. The bias also develops from the behavior of perceiving oneself in an overly favorable manner. The biases are critical in influencing investment behavior and decisions. For example, when a portfolio generates positive results, an investor is likely to attribute the performance to personal efforts. However, when a portfolio is recording negative performance, investors or their advisors will link the performance to external factors. The self-serving bias may also be affected by exposure to stress and/or traumatic events, with a tendency to overly personalize or view others as having malevolent intent. The polyvagal theory as it explains sociality in threat mitigation and support for physical and mental health may also explain the self-serving cognitive bias. As social beings, humans tend to take credit for positive outcomes and blame external factors to negative results. The automatic nervous system as defined under the polyvagal theory also explains the behavior. It may yield biases in the investment decision-making processes.

Herd Mentality

It is a type of bias that explains the influence of peers on others to embrace specific behaviors that are irrational and emotional. Sociality of individuals is influenced by their environment as explained from the polyvagal theory. It informs the investment decisions one may make. The peer influences may also support proper response to threats and fears emanating from past stress and traumatic experiences. The dependence on the peers' behaviors in making decisions may negatively affect the investment outcomes. Exposure to past traumatic events such as child abuse may trigger emotional influence from peers. The influence of peer or mob mentality yields decisions that are irrational. Investors are also likely to practice the herd mentality by copying the actions of other successful investors in the market. The practice implies that the investors will be influenced by emotions rather than facts from technical or fundamental analysis of the market. The herd mentality may take different forms including self-deception, heuristic simplification, emotion, and social bias.

Loss Aversion

Any rational investor will fear losses and strive to build portfolios that minimize the risk exposures. Loss aversion has been described as the tendency for investors to fear losses and avoid them more than they focus on trying to make profits. Polyvagal theory relates to the loss aversion bias as it emphasizes threat mitigation and physical and mental health. The fear of losses may also develop from trauma and stress. The loss aversion bias often develops from exposure to past traumatic events. When an investor has a history of trauma, they will always fear losses. The investment decisions they make will reflect their loss aversion. For example, they will select investment assets with low exposure to risks. The psychological bias may negatively affect the investment performance and outcomes based on the risk-return in the stock market. Loss aversion is a behavioral element in investment decisions that will reflect the investment outcomes and decisions.

Framing Cognitive Bias

Framing cognitive bias develops from making decisions presented to an individual rather than their independent analysis of information and facts. The presentation of the same information in different ways will yield different conclusions for investors exhibiting the framing cognitive bias. Investors may pick investments differently, depending on how the opportunity is presented to them. Framing cognitive bias may also develop from social influences. The actions of other people within a social setting such as family and friends may make an individual to undermine independent analysis. Stress and trauma may also make victims to trust other people over their independent analysis. The emphasis of polyvagal theory on sociality explains why one would be comfortable with other people's recommendations over their personal views or perceptions. The bias compromises the rationality of investors as most individuals may emphasize their emotions rather than facts when making various investment decisions for portfolio investment. Risk-averse investors are more likely to view information based on their past experiences. These past experiences may include exposure to traumatic events that negatively influence the rationality of an investor.

Anchoring Bias

Anchoring is the idea that we use pre-existing data as a reference point for all subsequent data, which can skew our decision-making processes. The bias develops from the dependence on historical data on investment to make future decisions. The past data may be influenced by trauma and stress. The polyvagal theory also explains the bias from a sociality perspective. The social interactions may help in responding to threats or fears that develop from the traumatic exposures. It also develops from the efficient market hypothesis, which suggests that the current stock prices reflect all the available information about an investment in the market. Situations often change and so perform various investment assets. Over-relying on past information as a reference point without considering the current conditions and circumstances results in the anchoring bias, negatively influencing the investment decisions. The exposure to past traumatic events may make investors to disregard present realities and social capital that has emerged over the past. The experiences from the past events will inform an individual's current position without consideration of the changes in circumstances over time.

Confirmation Bias

Confirmation bias is the idea that people seek out information and data that confirms their pre-existing ideas. They tend to ignore contrary information. For example, social media users will attack anyone who raises a question or point that contradicts the held beliefs of the others as is common with crypto currencies and social media influenced equities. This can be a very dangerous cognitive bias in business and investing. The polyvagal theory introduces the concept of sociality as an important perspective in threat mitigation. The social support may be important in seeking information to confirm specific beliefs on the investment arena. Rational investors should rely on facts when making investment decisions. They should not allow emotions and perceptions to override their emphasis on facts. The traditional fundamental and technical analysis helps investors in achieving the objectives.

Hindsight Bias

Hindsight bias is the theory that when people predict a correct outcome, they wrongly believe that they “knew it all along”. It is a social behavior that could also be explained by the polyvagal theory. The belief that one could have predicted an outcome in the past based on the current results often leads to poor investment decisions. The hindsight bias may also be influenced by exposure to past stress and/or traumatic events, negatively affecting the investment decisions.

Representativeness Heuristic

Representativeness heuristic is a cognitive bias that happens when people falsely believe that if two objects are similar then they are also correlated with each other. An investor may assume that a strategy or situation that resulted in a specific outcome in the past may be the same as the current one, compromising their rationality in the investment decision-making processes. Rational investors should independently view events and make decisions based on individual outcomes. The social influences as explained by the polyvagal theory and negative experiences from stress and trauma can also result in representativeness heuristic cognitive bias. The false belief and defensive strategies that individuals develop past experiences may help in mitigating fears.

Recency Bias

The recency, or availability, bias is a cognitive error identified in behavioral economics whereby people incorrectly believe that recent events will occur soon again. According to polyvagal theory, humans are social beings who use autonomic nervous systems to respond to emerging threats and fears. The false beliefs may also be influenced by the social environment. This tendency is irrational, as it obscures the true or objective probabilities of events occurring, leading people to make poor decisions. The bias is also influenced by the exposures to past traumatic events where individuals will think that the past events will occur again in the future. It negatively influences the investment decisions and behaviors of individuals.

Contemporary Applications of the Findings

Basic human behaviors tend to be influenced by their past experiences. Stress and trauma are important psychological constructs that are likely to shape how one thinks. It may also influence the perceptions towards risks and levels of risk tolerance. Past studies have linked these behaviors to various financial biases and theories. For example, the polyvagal theory explains the behavior from a sociality perspective. The article makes significant contribution to the understanding of human behaviors and their influence on financial bias and investment decisions. The review demonstrates that stress or trauma may result into financial biases, making investors make bad investment decisions. The study also shows that rationality of investors become compromised when they experience trauma. It creates fear of loss, making investors risk averse. Future studies should explore how recovery measures such as Somatic Experiencing can change an individual's perceptions towards risks in the investment market. The forms of therapy can also address financial biases that result in poor investment decisions. A study of the therapeutic approaches provides solutions to building of rational investors.

CONCLUSION

This exploratory research explains how basic human behaviors influenced by brain architecture and function affect investor behaviors and financial biases. The study also explores how past exposures to traumatic events influence investment choices. The findings appreciate Somatic Experiencing as a therapy process that can help individuals recover from the negative effects of past traumatic events and remain rational in their investment decision-making processes. The study also provides explanations on the human brain architecture from different perspectives and how it supports cognitive processes such as critical thinking, decision-making, searching, and appraisals among others. Undoubtedly, human brain architecture is critical to rational decision-making. It limits the possible biases one could make that undermine their objectivity. However, with the exposure to past traumatic events, there is a characteristic instability in the decision-making and critical thinking that negatively affects the investment choices. The studies have demonstrated that the human brain architecture is a critical element in decision-making due to the information processing and memorization capabilities.

The core of our study was to evaluate how past traumatic experiences will influence investment behaviors and financial biases. Based on the findings, exposures to war in childhood will increase the sensitivity to financial uncertainty. These individuals are less tolerant and unlikely to hold stocks following seasons of high volatility in the investment market. Individuals who experienced the devastating effects of the wars underwent major losses including loss of lives. These individuals are unlikely to invest in stocks due to their high volatility. It is a reflection of the brain architecture where people will tend to associate the losses with all major events in their lives. It reflects the critical influence of the events on the investment choices and behaviors of different individuals.

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