Behavioral Finance: The missing piece in modern finance

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Abstract

The aim of this article is to review the impact of heuristics bias on stock buying decisions, portfolio performance, stock prices, and the market. In addition, it attempts to identify gaps in the methodologies in behavioral finance. The paper reviews a number of researches that discuss the influence of heuristics on individuals’ stock decisions with reference to the Saudi Stock Exchange (SSE), Tadawul. We find that heuristics and framing will not only affect the individual investors on a personal level, but can be aggregated and extended to stock prices and market level. In terms of research methodologies, the majority of behavioral finance studies conducted on the stock market focus on institutional investors rather than individuals, and the methods used are based mainly on experiments and observing trading data, with a few based on the Likert scale. There is a lack of quantitative studies that use the multi-method approach. This article tries to fill those gaps by shedding light on the need for behavioral finance studies, especially on active traders’ buying decisions in Saudi Stock Exchange (Tadawul), as these traders represent 99% of market participants.

Keywords: Individual investors, Behavioral finance, Heuristics, Stock buying decision, Saudi Stock Exchange.
1. Introduction

In the past five years, the Kingdom of Saudi Arabia (K.S.A.) economy achieved incredibly high annual percentage growth rate of GDP, averaging 4.7% in 2014. The high economic growth of K.S.A. reflected positively on the increase in the wealth and prosperity of Saudi citizens. K.S.A. GDP per capita at purchasing power parity (PPP) was USD 23,217 in 2014 (Statista 2014). The high income encourages Saudi individuals to save but without receiving interest from the savings account. They avoid interest because it is prohibited by Islamic principles. Therefore, individuals in K.S.A. resolve to invest. There are two main investment channels that are popular in K.S.A.: real estate and stock market. However, the overvalued real estate prices drove many individuals to invest in the Saudi Stock Exchange (SSE), which is also known as Tadawul. The ease of accessibility to the stock market make it attractive to individual investors, as it provides liquidity and good return in the long run (Kelly 2013).

There are two main options for individuals to invest in the stock market: investing indirectly or directly. The first option is to invest indirectly through mutual funds in which the financial intermediaries pool money from investors to invest in different types of assets that usually focus mainly on stocks. Generally, mutual funds are managed by professional teams that create a diversified portfolio to reduce risk and maximize return. It is the best option for busy and amateur investors. Mutual funds are popular in developed and developing markets, but not in the K.S.A. The poor performance of mutual funds in the SSE and high management costs are fundamental reasons for individuals to choose the second option, which is investing directly in the SSE.

Individuals invest directly in the stock market through brokers who usually provide online platforms. Globally, it is found that individuals who invest directly in the stock market are the fewest participants in number. For example, the values of stock traded in 2014 by local individual investors in Bursa Malaysia represent 16.6% of RM 42.6 billion. However, individuals are the dominant category in the SSE. Like no other market in the world, the values of stock traded by individuals in the SSE represent 92% of the total market value, while the number of individuals represent 99% of total market participants. Yet, little is known about individuals’ buying decision behavior and how it influences stock prices and the market.

Many market anomalies are documented in the SSE, such as the day-of-the-week effect (Ulussever, Yumusak, & Kar 2011), while others anomalies are observe that individual investors prefer to invest in stock of companies that are near bankruptcy for a high price. The unjustified buying of struggling companies is also documented in other markets (Malkiel. 2003).
The irrational increase (decrease) in price for poor-performing companies (successful companies) is just a symptom. What is overlooked by researchers and Capital Market Authorities (CMAs) in the SSE is investigating the roots of the problem that lead Saudi investors to make such irrational buying decisions from a behavioral finance approach. Cognitive limitation in processing tremendous amounts of financial information could be one of the main reasons behind the irrational behavior of individuals and the stock market.

When faced with a complex situation while trading stocks, individuals rely on a simple mental shortcut called heuristics to simplify the decision-making. As a result, irrational decisions arise, creating a circle of negative consequences that starts from the individual level and extends to the market level.

Behavioral finance research is established mainly on experiment studies, some based on observing trading activity and a few based on questionnaire, but there is a lack of studies that use the multi-method approach, which is a combination of two different quantitative techniques to measure the influence of psychological factors on stock buying decisions.

This paper discusses the following: (1) modern finance and Efficient Market Theory, (2) behavioral finance, the missing piece in modern finance, (3) influence of irrational stock buying decisions on the portfolio, stock prices, and the market, (4) issues related to measuring irrational buying decisions with reference to Saudi Stock Exchange, and (5) Suggest future study.

2. Modern finance and the efficient market theory

Consumers, investors, business, and government are assumed to be rational in decision making. The concept of the rational man has dominated economic and finance theories for more than 50 years. The rational man is assumed to be economical, rational, knowledgeable, and skillful in calculating the probabilities of each alternative, and then to choose the best alternative that maximizes his utility for the lowest cost (Simon 1955). However, tremendous empirical evidence raises the question of the rationality of investors (Kahneman 2013).

Modern finance taught in finance courses built its foundation on the notion of rationality. It assumes that investors are rational and thus should make decisions that maximize their return for the lowest level of risk. Efficient market theory (EMT) is one of the most fundamental theories of modern finance that assumes rationality of investors.

Efficient market theory, introduced by Fama (1969), states that stock prices reflect all relevant information. Thus, if stock markets are said to be efficient, then active investors cannot beat the market return on a continuous basis. On the other hand, passive investors can profit on average as active investors do. Rational investors (e.g. buying undervalued stock) should correct any deviation in prices. As a result, stock prices always reflect their true value.
According to EMT, market efficiency is divided into three hypotheses, which differ based on the type of information involved. The hypotheses are:

1. The Weak-Form Efficient Market Hypothesis, where stock prices reflect all historical information (e.g., rate of return, trading volume, and prices), implies that investors who use historical data (e.g., technical analysis) cannot simply beat or predict the market.

2. The Semi Strong Efficient Market Hypothesis assumes that stock prices reflect historical and public information. This implies that an investor who makes the decision to invest based on historical (technical analysis) and publicly released information (e.g., annual report) cannot achieve superior return.

3. The Strong Form Efficient Market Hypothesis assumes that stock prices reflect past public and private information. This implies that investors who trade based on past, public, and insider information will not be able to achieve above-average risk-adjusted return (Reilly & Brown 2011).

However, empirical evidence has been accumulating since 1970 that tends to contradict EMT. There are a number of observed deviations in stock prices that appear not to be related to any information (Ang, Goetzmann, & Schaefer 2011). The unjustified deviations in stock prices are known as stock price anomalies.

2.1 Stock prices anomalies

Stock price anomalies are unjustified deviations in the stock price that are not directly linked to any type of market information (Cleary, Atkinson, & Drake 2013). These anomalies imply that investors can beat the market by trading based on the anomalies (Statman 2014). These anomalies are said to contradict EMT.

For the past 40 years, many studies have discovered anomalies that could be used to beat the market. Some anomalies appear once and disappear, while others persist or diminish (Schwert 2003); momentum is an example of such an anomaly. Momentum is a short-term increase (decrease) in price pattern or volume. Investors who trade based on momentum can earn abnormal return. The momentum anomaly contradicts weak-form market efficiency. It represents a pattern in prices that can be exploited by using historical price information.

Despite the empirical evidence supporting modern finance theories such as Efficient Market Theory (EMT) and Capital Assets Pricing Model (CAPM), many stock price anomalies contradict modern finance theories. There is obviously a missing piece in modern finance theories.

3. Behavioral finance: the missing piece in modern finance

Behavioral finance is a relatively new and growing area in the economic and finance field. The revolution of behavioral finance started with Daniel Kahneman and Amos Tversky at the beginning of the 1970s. Behavioral finance can be defined as “a subject that attempts to
explain the behavior of investors through psychology” (Baddeley 2012). The large field can be subdivided into Micro Behavioral Finance (MIBF) and Macro Behavioral Finance (MABF).

MIBF examines the biases (irrationality) of individual investors’ behavior and decision-making. On the other hand, MABF attempts to explain anomalies in the stock market that contradict the EMT (Pompian 2012). Behavioral finance assumes that not all investors are rational. Investors are human. Thus, the decision made can be influenced by cognitive psychology and emotion. This type of investor represents most of us, the “normal” investors (Statman 2014).

Normal investors do not make decisions as a computer program does; they are subject to cognitive psychology. Normal investors have limitations in processing a tremendous amount of financial information, thus they rely on heuristics. This could lead to bias or less-than-optimal decisions. The bias decisions made by individuals influence their portfolio performance at the personal level and at the market level, as well as influence stock prices and the market. To comprehend how an individual’s decision can influence stock prices and the market, we should first discuss the building blocks of behavioral finance: limits to arbitrage and cognitive psychology.

3.1 Limit to Arbitrage

The limit to arbitrage theory explains why the deviations in stock prices (mispricing) cannot simply be corrected by rational investors, at least not quickly (Shleifer & Vishny 1997). Gromb and Vayanos (2010) explain that the mispricing in stock is driven by demand shock created by irrational buying decisions of individual investors. In other words, irrationality and demand shock are driven by psychological factors that generate overpriced stock and anomalies.

Efficient market theory suggests that when stock prices deviate from the stock’s fundamental value, arbitrageurs buy the undervalued stock and sell the overvalued stock. The high demand for undervalued stock and high supply (selling) of overvalued stock will push the prices back to their fair value, thus arbitrageurs are supposed to make profits. However, in practice, arbitrageurs face a number of constraints, making it difficult to profit and correct the mispricing; Brealey, Myer, and Allen (2010) classify this as the limit to arbitrage. The three main constraints are fundamental risk of the company; transaction costs; and noise trader risk, which is a source of risk beyond systematic and unsystematic risk. Noise traders do not usually trade based on analyzing information. When the majority of market participants are noise traders and act together (herding behavior), they make the same systematic error at or around the same time. This increases mispricing and hence produces more risks to all the market participants as well as some risky opportunities (Shfrin, 2007; Jordan, Miller, &
Dolvin 2011). However, the risk factors and costs involved create a limit to arbitrage. Consequently, stock prices will not be corrected, at least not quickly. A number of studies relate the price anomalies to cognitive psychology, which is the second building block in behavioral finance.

3.2 Cognitive Psychology

Cognitive psychology is “the study of how people perceive, learn, remember, and think about information” (Sternberg 2011). Cognitive psychology plays a greater role in explaining how individuals make decisions under the conditions of risk and uncertainty. It explains why individuals make irrational buying decisions. Behavioral finance is based on knowledge from the area of cognitive psychology. There are two main theories to describe and explain what drives individuals to make irrational bias decisions; these are heuristics theory and prospect theory.

3.2.1 Heuristics Theory

This theory explains how individuals make decisions under the condition of uncertainty (Tversky & Kahneman 1974). The heuristics theory takes into consideration those individuals that are subject to psychological influences and thus are not completely rational when making decisions (Johnson & Busemeyer 2010).

In psychology, heuristics can be defined as “a mental shortcut that allows people to solve problems and make quick judgments.” When decision makers face a complex problem, overwhelmed with information, or have to make a decision in a short time, they rely on heuristics, which are quite useful when making a fast, acceptable decision. But sometimes, this may lead to cognitive biases (error) in the decision making (Tversky & Kahneman 1974). The bias in decision making is due to the cognitive limitation of individuals to process complex information. Therefore, the decision is usually made based on the person’s belief and preference instead of facts. Kahneman and Tversky (1979) state that “cognitive bias is a common tendency to acquire and process information by filtering it through one’s own likes, dislikes, and experiences regarding the reality.” Such bias can lead to a perceptual distortion, inaccurate judgment, or illogical interpretation of financial information.

Heuristics, however, can be good in some situations where simple and fast decisions are needed immediately (e.g. avoiding a car accident). Nonetheless, heuristics will probably not apply when attempting to make decisions in an active, dynamic, and complex environment like the stock market. Therefore, decisions based on heuristics could lead to a less-than-optimal and costly decision.

There are more than 20 types of heuristics biases, which have been documented in behavioral finance literature. In Table 1, we show three examples of heuristics and their implications at the personal level, stock prices, and market level.

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Table 1: Heuristics Influence at Personal Level, Stock Prices, and Market Level

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<tr>
<th>Heuristics</th>
<th>Definition</th>
<th>Personal level</th>
<th>Stock price</th>
<th>Market level</th>
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<tbody>
<tr>
<td>Overconfidence</td>
<td>A bias where investors overestimate the knowledge they have while underestimating risk.</td>
<td>Under-diversified portfolio and excessive trading that reduce return.</td>
<td>Overpricing, mispricing, and price volatility.</td>
<td>Market bubbles, high trading volume in bull market, and reduces market efficiency.</td>
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<td>bias</td>
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<td>Loss aversion</td>
<td>The pain of loss is greater than the joy of gain of the same amount of money.</td>
<td>Holding losing stock too long; as a result, negatively affects the portfolio performance.</td>
<td>The price of losing company stock will not drop sufficiently to reflect its true value.</td>
<td>Reduces market efficiency.</td>
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3.2.2 Prospect theory

Prospect theory explains how individuals make decisions under the condition of risk (Kahneman & Tversky 1979). It explains how people choose between two risky options in a world of uncertainty (Altman 2012). It describes how people make decisions in reality. Prospect theory is the most fundamental theory in behavioral finance and decision making under risk. In comparison to expected utility theory, prospect theory is more realistic. The theory helps explain individuals’ irrational decisions.

The theory describes elements such as loss aversion and framing affect that influence individuals’ decisions under the condition of risk. Kahneman (2013) defined loss aversion in the following words: “The possible loss loom twice as large as possibe gain.” Loss aversion makes individuals avoid the pain of loss more than they seek gain. Investors may take more risk to avoid the pain of loss. Holding losing stock too long (dispostion effect) pulls the portfolio return down. On the personal level, it causes the overall portfolio return to be negative. On the other hand, on the stock price level, losing stocks held by many individuals will prevent the stock price from dropping enough to reflect the true value. Ultimately, at the market level, stock market efficiency will be reduced.
Framing effect is another important aspect of prospect theory. Framing effect means that individuals’ decisions usually rely on the way the problem is framed and proposed (Shfrin 2007). For example, proposing an investment with a 79% chance of success seems more attractive than proposing an investment with a 21% chance of failure even though both are the same investment. In behavioral finance, the way the investment is being proposed can influence the decision-making of an individual investor. At the personal level, an individual may make an irrational stock-buying decision due to positive framing of a company via the media while, at the price level, the strong buying of the stock by individuals who are affected by the positive framing will push the stock price away from its fair value. Eventually, stock market efficiency will be reduced at the market level. Heuristics and prospect theory describe how investors actually make decisions in real-life situations. However, decisions have different dimensions. It is important to know these dimensions and know which of these dimensions should be given more attention.

4. Heuristics and stock buying decisions

Individual investors can be defined as individuals who purchase stock directly for themselves to benefit from the growth of the stock market and increase their wealth. Individuals play an important role in providing liquidity in the stock market. Individuals decisions in stock trading consist of three dimensions: buy, sell, and hold. Of these three dimensions, the buying decision dimension should be given more attention. Buying decision is “the process of choosing particular alternative after evaluating a number of alternatives then making the buying decision” (Mathews 2005). Buying decision is important for two reasons. Firstly, investors are net buyers (Barber & Odean 2011), and secondly, measuring stock buying decisions can provide a more accurate response in a questionnaire compared to measuring a general decision-making dimension. For instance, Baker and Stein (2004) found that individual investors buy more when the market is in a bullish condition, which pushes prices to a higher level, and will buy less in a bearish market, which eventually brings down stock prices. Therefore, measuring the influence of heuristics and framing through buying decisions can provide a more accurate measure than measuring decision-making in general.

The importance of individual buying decisions cannot be undermined. Individual investors have the power to move stock prices away from their fundamental value. In the short horizon, like days or weeks, individuals can move stock prices in the direction of their trade. However, in the long horizon, like a year or more, individuals can move only small stock prices. In general, individual investors can be influential on small stocks and the market (Barber, Odean, & Zhu 2007). The authors further explained that individual trading is found to be coordinated and irrational. This raises a question of why individuals make coordinated irrational decisions.
5. The irrational stock buying decision and its consequences

The daily fluctuation in stock prices affects the individual investors’ rational buying decisions. Investors experience an emotional roller coaster of fear and greed while observing the market and the value of their portfolio fluctuate daily, which interrupts their rational decision process. During the decision-making process, investors face the pressure of time risk and uncertainty together with the complexity of the investment environment. Such situations lead the majority of individuals to rely on heuristics, which is a simple method for making fast economic decisions. However, heuristics could lead to bias or less-than-optimal decisions. Bias decision occurs due to cognitive biases, which influence even experienced individual investors (Tversky & Kahneman 1974).

The high level of cognitive biases exhibited leads to a less-than-optimal and costly buying decision that will negatively affect the individual portfolio return (Barber & Odean 2013). Collective individual investors’ decisions (herding behavior) create mispricing in stocks (Rietz 2005) by causing the stock prices to deviate far from their fundamental value, reducing market efficiency (Shleifer 2000), and creating a market bubble that will burst and subsequently create market panic. This circle of negative consequences at the personal, stock price, and market level can be repeated unless the roots of the problem are treated. In Figure 1, we summarize the circle of negative consequences on the personal level and market level due to relying mostly on intuition and heuristics to make investment decisions.

Figure 1: The circle of negative consequences of relying heavily on heuristics

The roots of the negative consequences lie in cognitive psychology. There is a tremendous amount of behavioral finance studies that investigate heuristics behavior of investors. However, most of the main studies rely on experiment, while some use aggregate data from brokerage houses and a few use Likert, but to date, there is still a lack of studies that use multiple methods combining Likert scale and survey questions.
There are four issues related to measuring decision-making from a behavioral finance approach. First, heuristics is an unobserved psychological complex factor. Using one method is questionable in providing an accurate measure. Thus, by combining two different methods (Likert scale and questions with mutually exclusive answers) can provide more accurate results and identify problems in the measurement that may arise. In the multi-method approach, the strength of one method can complement the weakness of the other method and vice versa. In behavioral finance, there is a need to improve a reliable Likert scale to measure the most common heuristics exhibited by an individual. One way to improve is through investigating the influence of heuristics in the stock buying decisions dimension instead of decision-making in general. Third, heuristics and biases in the previous studies are not selected based on clearly defined categories (Pompian 2012). Fourth, the studies conducted on individual investors are mainly in developed, developing, and emerging stock markets where individual investors represent the minority category. Yet, there is a lack of behavioral finance studies in a market where individual investors represent the majority of market participants. This is the case of individual investors in the Saudi Stock Exchange (Tadawul).

6. The stock buying decision of individuals in the Saudi Stock Exchange (Tadawul)

The SSE is the biggest market in the Middle East. The number of the company traded is 162 companies with market capitalization around USD 533 billion. Unlike the other stock markets in the world, individual investors in the SSE represent more than 99% of market participants. Since 2003, many individual investors have preferred to trade in the stock market to make a fast profit. The irrational decisions of individuals in the SSE create stock mispricing that reduces stock market efficiency. This indicates that most stock prices do not reflect fair value. The reduction of market efficiency creates a market bubble that burst in 2006, causing individuals to suffer a huge loss to their portfolios. In addition, an inefficient stock market can result in investors losing confidence in the market, affecting the market’s liquidity.

In lieu of the market condition of the SSE that is dominated by individual investors, it would be interesting to study the investment rationale of those investors. Specifically, is it worthwhile to investigate the relationship between individual investors’ heuristics behavior in their stock buying decisions? The study would be especially helpful taking a multi-method approach, where questionnaires using the Likert scale and mutually exclusive questions are developed.

The multi-method approach measures the same heuristics using different measurement techniques. By comparing the results of two different techniques, the researcher will achieve more accurate results. Any conflict in the results between the two different techniques will help to detect problems associated with the design of the questions and their effectiveness.
Most behavioral finance research is conducted in markets where individual investors are the minority; in the SSE, individuals are the majority. Thus, their buying decisions can have a greater impact on stock prices and the market compared to other markets around the world.

7. Conclusion

Individuals’ decision-making is influenced by cognitive psychology and heuristics. Biased decisions create anomalies and unjustified mispricing in stocks, reduce market efficiency, create higher risk with opportunities, and create market bubbles and panic that affects the majority of individuals. Many studies on individuals’ decisions and their impact on price and market have been conducted in markets where individuals are the minority (e.g. De Long, Shleifer, Summers, & Waldmann 1989) but not in markets that are dominated by individual investors like the SSE. For a future study, there is a need to investigate individuals’ buying decisions in the SSE from a behavioral finance approach. Future studies should start with Micro Behavioral Finance (MIBF) before moving to Macro Behavioral Finance (MABF) studies in the SSE. Understanding the impact of individuals’ decisions on their portfolio, stock prices, and the SSE will be a great contribution to the field of behavioral finance. Findings will allow researchers to gain a deeper understanding of the extreme impact of individuals’ decisions on stock prices and the market when individuals are the majority.

References


