Student Name: Nguyen Thanh Hung

Student ID: s3752941

Course Name: Financial Markets

Course Code: BAFI3182

Lecturer's Name: Mr James Murphy

Date Submitted: 5 January 2020

Word Count: 2,386

BEHAVIOURAL FINANCE, PSYCHOLOGICAL BIASES AND FINANCIAL MARKETS: INSIDE THE INVESTOR'S BRAIN DURING THE FINANCIAL CRISIS

Behavioural Finance, Psychological Biases and Financial Markets: Inside the Investor's Brain During the Financial Crisis

HUNG T. NGUYEN

Economics & Finance Student, School of Business & Management, RMIT University Vietnam, Ho Chi Minh City 700000, Vietnam

Abstract

The emergence of behavioural finance has brought a new and fresh breath to the finance field. As the traditional finance is being challenged because of its limitation to some extent in the modern world, behavioural finance is an alternative theory to fill the gap of classical financial theories and to explain the behaviour of humans in the market. With the help of psychological theories, cognitive biases and human errors can explain the root of investor behaviour in the financial markets, especially in time of financial crisis.

1 Introduction

More than 200 years prior, Adam Smith's most famous economic theory—published in his book *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776)—stating that households, firms and market actions are guided by an "invisible hand", which led them to the economic equilibrium and maximise the social welfare as a whole; and that the government interventions distort the market efficiency (Amir-ud-Din & Zaman 2015). This proposition is the most vital foundation for competitive markets in economic theory and is still relevant in the modern world (Leroy 2010). However, to some extent, this proposition cannot explain some occasions in the past century as the market did not alter itself and generated several major global financial recessions, including the Great Depression in the late 1929 and the recent economic downturn in 2008.

Many economists and researchers have spent years to debate, challenge and try to find a better alternative to traditional financial theories, which cannot fully explain the abnormalities in the modern financial markets. Notable works from Kahneman and Tversky (1979), Shefrin and Statman (1994) and Akerlof and Shiller (2009) show that human behaviour and psychology can explain and fill the limitations of classical financial approach, which may be the focus for future researches in the field of finance.

The purpose of this paper is to provide a review of literature of behavioural finance—a field of finance that proposes theories from psychological influence and biases to explain decision-making in business and the abnormalities in the financial market (Bilgehan 2014)—and the application of one of its areas in the modern economy with the focus on the financial market.

Following this introduction, section 2 presents the literature review of the development of behavioural finance theory from neoclassical finance. Section 3 examines different psychological biases and their effects on investors' decision-making in the financial markets. Section 4 analyses how investors think and react to the financial crisis. Concluding remarks and limitations of this paper are delivered in the final section.

2 The emergence of behavioural finance from traditional finance

2.1 Investor Behaviour: A Classical Approach

The mid-eighteen-century marked the period of classical economics, in which, the premiere concept was the expected utility theory. The utility here was considered to be a measurement of satisfaction of individuals as they consumed a good or service (Pompian 2012).

Starting in 1888, economist Ingram, based on the work of the precedented philosopher John Stuart Mill, introduced the term *homo economicus*—"rational economic man" who makes reasonable decisions and tries to maximise his satisfaction and happiness in spite of current constraints (Persky 1995). Researched by Ng and Tseng (2008), Pompian (2012) and Urbina and Ruiz-Villaverde (2019) all shows that the three underlying assumptions for *homo economicus*, which are perfect rationality, perfect self-interest and perfect information, became the basis of traditional finance framework. Pompian (2012) also suggests that because the term is a simple model and can be quantifiable, which allows economists to work easily and elegantly, many of them still focus on these assumptions in the modern world.

With regards to Expected Utility Theory, it is considered as one of the key concepts in neoclassical theory. Szyszka (2013) states that the theory assumes markets participants make their decisions by interpreting correctly information they received and estimating the possible risks to eliminate any irrationalities and optimise their satisfactions. This theory also implies that a loss does not contribute to the utility of the participants, but rather only accounted for a gain in assets' values. After the introduction of utility theory, many other theories appeared to describe the process of choosing the optimal securities and asset portfolios—Markowitz portfolio theory on asset pricing models (Markowitz 1952)—and develop the efficient market hypothesis, which explains how prices of securities fully reflect the available information and the objective judgement of the investors is irrelevant (Fama 1970).

These works became a great success in the neoclassical finance era (see Figure 1). However, since there were some limitations in the application of the concepts to reality, Markowitz and Fama's studies became an issue for debate and criticism for a few decades later. It was Fama (1997), who questioned his work on market efficiency due to newly discovered long-term

return abnormalities in the financial market. This unfulfilled gap in classical finance leads to an urge to find a new method to understand the problem of abnormalities.

2.2 Development of Behavioral Approach in Finance

As mentioned above, traditional financial theories were constructed based on the assumption of rational economic man to estimate correctly financial decisions on the markets. With the perfect information and rational act, there should not have been any disruption in stock prices which led to various market collapses. However, these abnormalities existed and transpired from time to time in the past hundred years in forms of "stock market bubbles, market overreaction or under reaction and momentum and reversals." (Kapoor and Prosad 2017). In light of these events, behavioural finance started to become the focus of some economists and psychologists as it tried to use behaviour concept to examine the distortions in the financial market.

The most important concept of this field is properly the prospect theory for analysis of decision making under risk, which was introduced by Kahneman and Tversky (1979). By calculating and estimating the new value function, which indicates the satisfaction of individuals when investors gain or lose their assets, Kahneman and Tversky (1979) proposed that the pain of the loss of an individual is greater than the happiness he feels when receiving a relative gain (as illustrated in Figure 2). This indicates the concept of loss aversion, meaning that human beings are more likely to take things into consideration in order to prevent losses, rather than seeking gains. The prospect theory shredded a new light into the later works on behavioural finance as it provides an alternative for the expected utility theory.

Later on, Shefrin and Statman (1994) developed two theories, which challenged the studies in traditional finance: the behavioural asset pricing model (BAPM) and the behavioural portfolio theory (BPT). The BAPM explains a theory which illustrates the interaction between noise traders—who commit cognitive errors—and information traders—who are free of cognitive errors. The BPT states that the investors construct their investment portfolio in pyramid shapes, with each layer of the pyramid associated with a specific goal and risk attitude, which differs from the portfolio theory introduced by Markowitz as it only suggests

investors to build a wide range of assets in order to optimise the risk-return (Kapoor and Prosad 2017).

In 2002, American economist Robert J. Shiller challenged the market efficiency theory as he argues that the prices of stocks fluctuate more than expected in the classical finance theory and that the returns over the long run should not be unchanged. Thus, he pointed out that the impact of investor behaviour, along with personal judgements and social factors in generating the bubbles in the stock markets.

With the criticisms and challenges of behavioural economists towards the fundamental of traditional financial theories, behavioural finance is emerging these days as an alternative tool to explain and solve the limitations of past theoretical approach on the markets.

3 Psychological biases in financial markets: investors' perspective

As noted by Shefrin (2000), investors are likely to commit some specific errors, which can do serious harm to investors' wealth, regardless of their significance (cited in Baker & Nofsinger 2002). This is true as behavioural finance takes into account the emotion weaknesses and cognitive biases that a normal person can be affected when making a decision. Furthermore, by being prone to these biases, investors will anticipate unacknowledged risks and unexpected outcomes, which adversely influence their trading and investing strategies, resulting in blaming themselves or others when the outcomes are unfavourable (Kahneman & Riepe 1998).

This section will analyse two of the most common psychological biases and errors arise investor thinking, under 'heuristic-driven bias' theme developed by Shefrin (2002), which are overconfidence and greed and fear.

3.1 Overconfidence

Overconfidence is a common bias among people. As noted by Nofsinger (2008), overconfidence causes people to overestimate their knowledge and exaggerate their ability to control the outcomes of events. In investment, it causes investors to wrongly assume the accuracy of the available information and therefore overestimate their skills on analysing the numbers and fail to make the proper decision. It may be a tool to explain irregularities in

trading volume as researched by Oden (1998), overconfidence increase trading volume, volatility and reduce the market efficiency, leading to the decrease in expected utility of overconfident traders. This is because when the market increases, investors begin to claim their success based on their skill and performance, not regard to the market itself. This leads to overconfidence; and when the market declines, investors self-doubted their ability and become less confident.

There are several factors contribute to overconfidence. One of which is the illusion of knowledge. It is commonly believed that more information increases one's knowledge and improves one's decisions. However, according to Nofsinger (2008), 'this is not always the case'. He argues that most investors lack the training to be able to analyse and interpret vast quantities of information on historical data, real-time news and prices. Therefore, when they have access to such massive of information—even If they think they are capable of processing it or use helps from the Internet, analyst recommendations—those investors do not gain much knowledge about the current situation as they expected.

Another factor that influences overconfidence is the illusion of control in investors. Researches by Baber and Odean shows that people often believe that they can influence the outcomes of uncontrollable events. For example, some investors overestimate their interpretation of information and strongly believe that their valuation of the stocks is correct and concern their analysis as superior to other people's beliefs. This suggests that overconfidence exists as investors concerns too much on their personal opinions to predict the market, which therefore forming the excessive trading volume in many circumstances (cited in Baker & Nofsinger 2002).

3.2 Greed and fear

The greed and fear of individual investors play a vital part on their decision-making in the market like Warren Buffett, one of the most famous investors, one remarked: 'we only attempt to be fearful when others are greedy and greedy when others are fearful' (Heller 2000, cited in Chandra 2008). Investors can be greedy when they think there is an opportunity to receive an attractive benefit in short-term, which leads to an excessive trading volume on the stock market. Simultaneously, their fear, which is baseless, can affect investors' decision

to buy or sell, without giving any logical and reasonable thought or consideration (Chandra 2008). These situations can badly affect not only the final outcomes of the investments but also the performance and the stability of the market, especially during the financial crisis.

4 Investor behaviour during the financial crisis

After the 2008 financial crisis, many researchers have turned their attention into behavioural finance as an alternative perception of explaining what had happened in the investors' thinking and actions during the crash of the market.

In the years prior to the crisis, the stock market witnessed a gradual bull trend. This led to many biases and errors that investors made during this time such as greed, overconfidence and unrealistic optimism.

During the long period of market prosperity, investors were proved to become familiar with easy and high profits. This led to the self-attribution effect as many investors contributed their success mainly on their own skills and strategies, rather than looking for the problem which was happening in the market (Szyszka 2011). As a result, investors were overconfident and took the even higher risk to continue investing with the faith that the bull-market would never end. Thus, when the market crashed, they lost their confidence and blamed themselves.

Since the investors then are used to high profits, they were also expected higher and higher returns after each investment. Therefore, many investors were led by their emotional part and became greedy at this time. As to them, risks were often forgotten in consideration after receiving such high returns (Szyszka 2011); hence, indirectly contributed to the financial crisis.

Furthermore, because of the increases in the stock prices and the overconfidence effect, investors who were optimistic about the markets were the winner at first, since their investments were well paid off; while the pessimistic ones lost their bets. Therefore, the shift in wealth came to the optimist. Shefrin and Statman (2012) argued that if the optimistic investors remain optimistic, the shift in wealth even made them become wealthier. This assumption leads to a continued increase in stock prices, which eventually will surpass the securities' intrinsic value and create bubbles. At this time, pessimistic investment realised that they were wrong to be pessimistic at this time and turned themselves into optimistic investors (Shefrin & Statman 2012). Again, this exaggerated the significance of the bubbles; and when

most of the investors became optimistic about the high returns of the market, it was then the bubbles busted. This situation only occurred in the stock markets only but also in other asset markets such as houses.

5 Conclusion

Behavioural finance is a new field of studying and have only been the focus of some economists and psychologists in the last few decades. As neoclassical financial theories are being questioned, challenged and criticised due to its limitations in some aspects of the modern economy, the development of behavioural finance plays an important role to provide an alternative tool to fill the gap of traditional finance. It also helps to explain the behaviour of investors in financial markets, especially when it comes to the market crashes or bubbles busted, via the use of psychological biases theories and observations.

The application of psychological biases in finance is extensive, therefore, cannot be fully discussed in the scope of this paper, but rather remains an interesting area of future researches. The focus of this paper only lies upon how investors think and make decisions on financial markets as human beings, who are not free from cognitive errors as in *homo economicus* assumption, with the use of some cognitive biases.

Based on the information collected, it can be concluded that psychology has a great impact on explaining how traders and investors behave on the market. Although they think their strategies are merely based on logical thinking and determination, they cannot escape the biases existing inside each person.

I believe the combination of finance and psychology will help the investors avoid making mistakes and human errors, which will partly reduce the chance of an upcoming financial crisis.

References

Akerlof, GA & Shiller, RJ 2009, *Animal Spirits*, Princeton University Press, New Jersey.

Amir-ud-Din, R & Zaman, A 2015, 'Failures of the "Invisible Hand"', *Forum for Social Economics*, March, vol. 45, no. 1, pp. 41-60.

Baker, HK & Nofsinger, JR 2002, 'Psychological Biases of Investors', *Financial Service Review*, Summer, vol. 11, no. 2, pp. 97-116.

Bilgehan, T 2014, 'Psychological biases and the capital structure decisions: a literature review', *Theoretical and Applied Economics*, vol. 11, no. 12, pp. 123-142.

Chandra, A 2008, 'Decision Making in the Stock Market: Incorporating Psychology with Finance', *working paper presented to National Conference on Forecasting Financial Markets of India*, India, viewed 5 January 2020, SSRN Database.

Fama, EF 1970, 'Efficient Capital Markets: A Review of Theory and Empirical Work', *Journal of Finance*, May, vol. 25, no. 2, pp. 383-417.

Fama, EF 1997, 'Market efficiency, long-term returns, and behavioral finance', *Journal of Financial Economics*, vol. 49, no. 3, pp. 283-306.

Kahneman, D & Riepe, MW 1998, 'Aspects of investor psychology', *Journal of Portfolio Management*, Summer, vol. 24, no. 4, pp. 52-65.

Kahneman, D & Tversky, A 1979, 'Prospect Theory: An Analysis of Decision under Risk', *The Econometric Society*, March, vol. 47, no. 2.

Kapoor, S & Prosad, JM 2017, 'Behavioural Finance: A Review', *Procedia Computer Science*, vol. 122, pp. 50-54.

Leroy, S 2010, 'Is the "Invisible Hand" Still Relevant?', *FRBSF Economic Letter*, May, vol. 2010-14, viewed 4 January 2020, Federal Reserve Bank of San Francisco.

Markowitz, HM 1952, 'Portfolio Selection', *Journal of Finance*, March, vol. 7, no. 1, pp. 77-91.

Ng, ICL & Tseng, L-M 2008, 'Learning to Be Sociable The Evolution of Homo Economicus', *The American Journal of Economics and Sociology*, April, vol. 67, no. 2, pp. 265-286.

Nofsinger, JR 2008, *The Psychology of Investing*, 3rd edn, Pearson Education, New Jersey.

Odean, T 1998, 'Volume, Volatility, Price, and Profit When All Traders Are above Average', *Journal of Finance*, December, vol. 53, no. 6, pp. 1887-1934.

Persky, J 1995, 'Retrospectives: The Ethology of Homo Economicus', *Journal of Economic Perspectives*, Spring, vol. 9, no. 2, pp. 221-231.

Pompian, MM 2012, *Behavioral finance and wealth management: How to build investment strategies that account for investor biases*, 2nd, Wiley Finance, viewed 5 January 2020, ProQuest Ebook Central.

Shefrin, H & Statman, M 1994, 'Behavioral Capital Asset Pricing Theory', *Journal of Financial and Quantitative Analysis*, September, vol. 29, no. 3, pp. 323-349.

Shefrin, H & Statman, M 2012, 'Rethinking the Financial Crisis', *Behavioral Finance in the Financial Crisis: Market Efficiency, Minsky, and Keynes.*, in AS Blinder, AW Lo & RM Solow (eds), Russell Sage Foundation, New York, pp. 99-135.

Shiller, RJ 2002, 'Bubbles, Human Judgment, and Expert Opinion', *Financial Analysis Journal*, May, vol. 58, no. 3, pp. 18-26.

Szyszka, A 2011, 'Behavioral Anatomy of the Financial Crisis', *Journal of CENTRUM Cathedra*, April, vol. 3, no. 2, pp. 121-135.

Szyszka, A 2013, *Behavioral Finance And Capital Markets*, Palgrave Macmillan, New York.

Urbina, DA & Ruiz-Villaverde, A 2019, 'A Critical Review of Homo Economicus from Five Approaches', *The American Journal of Economics and Sociology*, January, vol. 78, no. 1, pp. 63-93.

Appendix

Author	Year	Finding
John Stuart Mill	1844	Introduced the concept of Economic Man or *homo economicus.*
Bernoulli	1738, 1954	
Von Neumann and Morgenstern	1944	
Harry Markowitz	1952	Markowitz portfolio theory
Treynor, Sharpe and Lintner	1962,1964, 1965	
Jan Mossin	1966	
Eugene Fama	1970	Efficient market hypothesis

Figure 1: Chronological development of classical finance. Reproduced from: Kapoor & Prosad (2017).[i]

Researcher Name	**Year**	**Theory/ Concept/ Model**
Herbert Simon	1955	Models of bounded rationality
Festinger, Riecken and Schachter	1956	Theory of cognitive dissonance
Tversky and Kahneman	1973, 1974	Introduced heuristic biases: availability, representativeness, anchoring and adjustment
Kahneman and Tversky	1979	The prospect theory, introduced loss aversion bias
Tversky and Kahneman	1981	Introduced Framing Bias
Richard Thaler	1985	Introduced mental accounting bias
De Bondt and Thaler	1985	Theory of overreaction in stock markets
Barberis, Shleifer and Vishny	1998	Investor sentiment model for underreaction and overreaction of stock prices
Meir Statman	1999	Behavioural asset pricing theory and behavioural portfolio theory
Andrei Shleifer	2000	Linkage of behavioural finance with efficient market hypothesis to find that stock markets are inefficient
Barberis, Huang and Santos	2001	Incorporation of prospect theory in asset prices
Grinblatt and Keloharju	2001	Role of behavioural factors in determining trading behaviour
Hubert Fromlet	2001	Importance of behavioural finance. Emphasis on departure from '*homo economicus*' or traditional paradigm to more realistic paradigm
Barberis and Thaler	2003	Survey of Behavioural Finance
Coval and Shumway	2006	Effect of behavioural biases on stock prices. The price reversal for biased investors is quicker than unbiased investors
Avanidhar Subrahmanyam	2008	Normative implications of behavioural finance on individual investors and CEO's
Richard Thaler	2008	Impact of mental accounting on consumer choice behaviour
Robert Bloomfield	2010	Compares the behavioural and traditional finance approach in explaining market inefficiencies
Parag Parikh	2011	Practical implications of behavioural finance and investor sentiments in value investing
Uzar and Akkaya	2013	Explores the evolution of behavioural finance from traditional finance

Figure 2: Chronological development of behavioural finance. Reproduced from: Kapoor & Prosad (2017).

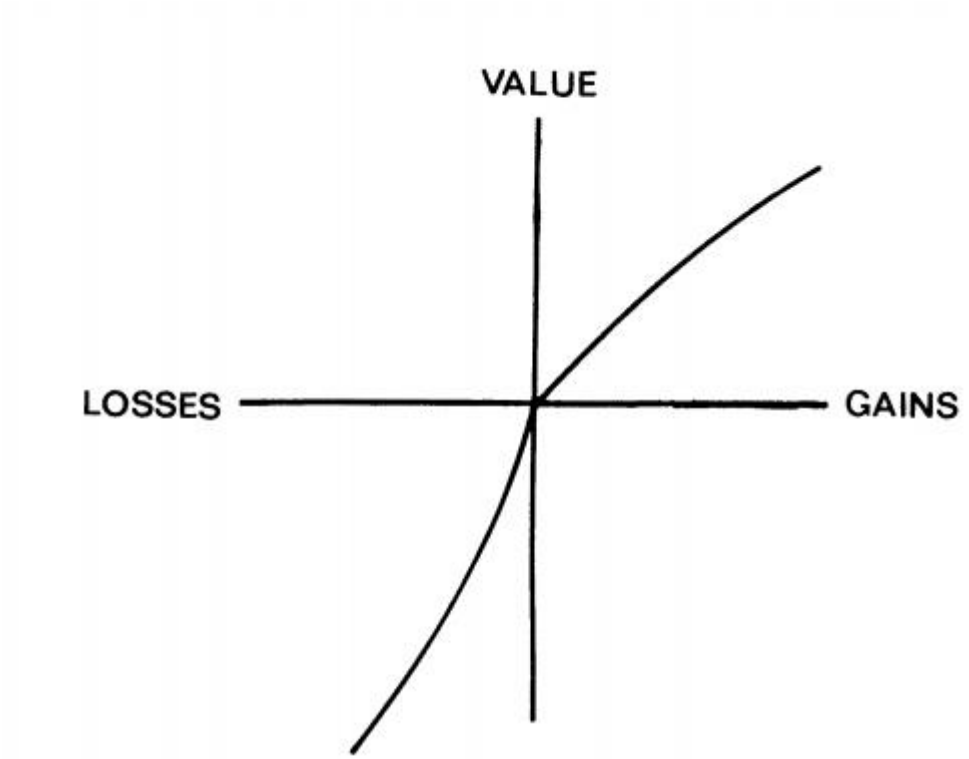

Figure 3: Value function hypothesis. Reproduced from: Kahneman & Tversky (1979).[ii]

[i] Kapoor, S & Prosad, JM 2017, 'Behavioural Finance: A Review', Procedia Computer Science, vol. 122, pp. 50-54.

[ii] Kahneman, D & Tversky, A 1979, 'Prospect Theory: An Analysis of Decision under Risk', The Econometric Society, March, vol. 47, no. 2.