COGNITIVE BEHAVIOUR AND INVESTMENT DECISION: A NOVEL APPROACH IN NEUROSCIENCE

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ABSTRACT

In the competitive world, investments are challenging device for investors. Investing a small amount for the long term, can yield considerable profits, at the same time the investors need to make the decision on how much to invest? Where to invest? What investment options are available? But generally there will be a dilemma among the investors for selection of best investment avenues and this act as a major problem of the investors. Financial decisions have a big influence on people's lives and these decisions are made at many levels in the economy. How well this financial ecosystem works is sensitive to cognition at all levels of investors' decision making and recently, there has been limited cognitive and neuroscience evidence regarding the mechanisms that underlie financial decisions.

Keywords: Neuroscience, Financial Decisions, Challenging's, Investments.

INTRODUCTION

A brief history of financial economics will set the stage. In the early 1950s, Modern Portfolio Theory (MPT) began to formalize ideas of how a rational investor would invest in a set of assets by accepting risk to earn higher "*returns*" (which are percentage changes in asset prices). This theory formed the foundation of financial economics for several decades and made many surprising and sharp predictions; for example, about how investors choose which stocks to hold and what market prices would result from these decisions. By the early 1980s, some researchers began to uncover facts about the aggregate stock market that were difficult to explain with this fully rational view of the world. For example, a classic paper that is often cited as the beginning of behavioral finance demonstrated that stock prices fluctuate too much to be justified by a rational theory of stock valuation. This set of anomalous facts only grew stronger. More financial economists then began to create new mathematical models where investor behavior was governed by increasingly realistic psychological forces (Broomhead et al., 2021). Over the past 30 years, researchers have made significant progress in rigorously testing these behavioral models of finance, often incorporating principles and methods from the cognitive psychology of judgment and choice.

Most recently, research in financial decision making has begun to use emerging sources of data such as fMRI, Google searches, and logins to online trading brokerages (Lan et al., 2018). The neoclassical economics has traditionally looked at how people should behave, other disciplines, such as psychology and cognitive science, have tried to answer the question of why people act the way they do. A new discipline, referred to by some as neuro economics, has

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sought to meld theory and methodology from diverse areas such as economics, psychology, neuroscience, cognitive science, cognitive neuroscience, mathematics, statistics, behavioral finance and decision theory in order to create a model of human behavior that not only explains but also predicts how people make decisions.

Psychology has sought to investigate the "*black box*" of the human mind. Cognitive psychology, and more recently cognitive neuroscience, has introduced new tools that allow researchers to capture and measure data from brain activity related to a specific function and behavior. This new type of data has created new directions of research that combine neuroscience, psychology, and decision theory to better understand the complexities of human decision-making.

Neuroscience looks at the structure, function and development of the nervous system and brain, while cognitive neuroscience studies how behavior and the nervous system work together in humans and animals. In other words, cognitive neuroscience is the study of the neural mechanisms of cognition. At the nexus of neuroscience, economics and psychology, there is an area that has tentatively been coined neuroeconomics which uses neuroscience techniques to look specifically at how human subjects make choices. Neuroeconomics is not only interested in exposing brain regions associated with specific behavior, but also in identifying neural circuits or systems of specialized regions which control choice, preference, and judgment.

India has the highest saving rate of households than the rest of nations in the world. Around 50 percent of all savings locked in real estate and gold and the remaining 50 percent in financial assets, which includes only 4 percent of the total household savings in the equity market. According to the survey of SEBI sponsored household report, only 11 percent of Indian households invest in equity, mutual funds, debt, derivatives and the other financial instruments in the market. Remaining 89 percent of household savings diversified into non-risky investments of banks, insurance, post office deposits, etc. Out of 11 percent of total household investors, 20 percent of investors belong to urban and 6 percent belong to rural India. Low level of awareness, adequacy of financial support, non-availability of brokerages and various psychological factors, like Cognitive factors, Personality traits, Emotions, Moods etc.

The SEBI Investor survey 2015 showed that saving rate and awareness of rural investors had significantly increased while comparing the previous SEBI investor survey 2011, at the same time, the investment in securities market still lower among the rural population. According to the All India Debt and investment survey data, the percentage of share and other markets related assets of total value of household assets in rural areas is only 0.07 percent while the SEBI investor survey SIS 2015 data shows that just 0.23% of rural households invest in securities markets assets and only 15% of the urban households invested in stock markets. Although the SIS data showed a high propensity to save, these potential investors do not participate in the securities markets possibly, due to a lack of awareness.

The most crucial challenge faced by the investment is perhaps in the area of taking investment decisions. Every investor differs from the others in all aspects due to various factors like demographic factors, socio economic factors, lack of awareness, various behavioral factors, etc. An educated person's decision making differs from an uneducated one. A young bachelor, for instance, prefers less risky avenues; whereas a matured person with a family dependability prefers less risky and stable income generating avenues. Similarly rural and urban back ground of individuals, availability of information, accessibility of avenues, etc. Play key role in investment decision making. Thus the study plans to investigate the investment decision of rural and urban investors on various investment avenues.

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Financial decision is the most important decisions to the people for their life-shaping. This proposed research will focus the financial decisions and what cognitive and neural processes influence them. Because of cognitive constraints and a low average level of financial literacy, many household decisions violate sound financial principles. Even typically highly educated persons decisions also affected by overconfidence and personal history. Many of the behaviors can be explained by well-known principles from cognitive science. Households typically have under diversified stock holdings and low retirement savings rates. Investors over extrapolate from past returns and trade too often. Many of these behaviors can be explained by well-known principles from cognitive science.

The main objective of the study is to investigate the impact of cognitive behavior of investors on their investment decision making with the help of neuroscience. For the purpose the study formulate the following additional objectives.

1. To study the influence of personality traits on investment decision of investors.
2. To test the influences of behavioral biases of investors on their investment decision making.
3. To study the impact of cognitive behavior, genetics of investors on their investment decision making.

Sekscinska & Rudzinska-Wojciechowska (2021) analyzed the influence of cognitive process on financial decisions making of household investors with the use of neuroscience. The study used fMRI, hormones, and genetics data of sample respondents and found that the cognitive process influenced the financial decisions of the investors. Complement the information describing that a wide network of neural circuits is involved in risk assessment, benefits, conflicts, and the intent to make a purchase or to sell. Understanding the functionality of these circuits is very important in discovering the dynamics of investment in financial markets. Also in a financial decision making setting, find that the brain area called the nucleus accumbens is activated before investors make risky choices as well as risk-seeking mistakes, and the anterior insula activation proceeds riskless choices as well as mistakes in assessing risk-aversion and concludes that emotions play an important role when people make decisions under risk. Found that a positive emotional state induces people to take risk and to be confident to evaluate investment options, whereas negative emotions, like anxiety, reduce the propensity to take risk. Complement all this information arguing that brain activity increases at exactly the moment at which subjects issue orders to sell stocks knowingly realizing a gain that the financial decision process changes over lifetime and older adults make more suboptimal choices, in terms of risk-seeking mistakes, than younger adults when choosing between risky assets. Argue that, on average, male brain volume is higher than for women, but when controlling for total volume, women have a higher percentage of gray matter, and men a higher percentage of white matter. They also found that women have a higher global cerebral blood flow than men. Also argue that, after correcting for cranial volume, men and women have identical volumes of amygdala and hippocampus, as well as dorsal prefrontal cortex, but women have larger orbital frontal cortices than men. Using short videos that present angry and neutral faces, found that the right amygdala was more strongly activated than the left amygdala in males but not in females and this happened in adults and not in adolescents. Found that males and females have a different response pattern. Females tended to choose cards associated with immediate wins and males tended to choose cards related with long-term outcome meaning that women prefer investments that produce short terms outcomes (Zeng et al., 2017). This finding is prominent who find that differences in

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optimism across gender can explain differences in asset allocation across gender (Milsom et al., 2021).

1. This study provides valuable information about the investment behavior of rural and urban investors who access various investment avenues.
2. The findings of the study will be helpful for rural and urban investors to find out their cognitive process and biases, which influence the investment decision making.
3. Indians have desired to save and invest more than the other countries in the world. Even the developed countries are struggling during the global crisis of 2008; India is standing alone to face the recession without having much adverse effect. Though, we have sustainable development in different areas, capital market investments are still lagging behind the other developing countries. The main reason for this lagging is less awareness among the investors. Thus the present study will be help the governments and policy makers to know the rural and urban investors awareness level towards various investment avenues.
4. The research will be use for the financial advisors, portfolio managers to identifying the investors' mindset and personality traits, while marketing their products.
5. The study socially helps to know the differences of rural and urban peoples' awareness levels, personality traits, biases, cognitive and genetic factors towards investment decision making.

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