CHAPTER I

INTRODUCTION

1.1 General Description of Research Object

According to Central Bureau of Statistic (BPS) (2020), population is divided into 2 criteria, which are productive age and non-productive age. Based on Bureau of Statistic (BPS) (2020), the productive age in Indonesia is estimated to be between 15 and 64 years. Meanwhile, the non-productive age range is 0-14 years and 65 years or above. According to Humaidi et al. (2020), Population age productive working age population who are already able to produce goods and services. The productive age population has a major contribution to the economy nation by acting as workers, business actors, or capital owners they have the greatest economic potential and play an important role in the workforce because they are also at the peak of their ability to earn income and make important decisions, including those related to investment.

Based on the latest population data in mid-2024 from dataindonesia.id (2024), it shows that most of the population in Indonesia is of productive age. The data shows where the total population of Indonesia in mid-2024 is 282,477,584 people. Meanwhile, the productive age population with an age range of 15-64 years is 196,558,195. Then followed by the non-productive age under 15 years with a total of 64,833,766. Last, the non-productive age population over 64 years with a total of 21,085,623. It can be seen in figure 1.1 below

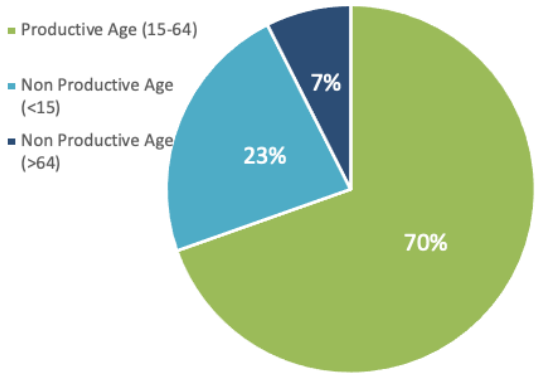

Figure 1.1

Comparison the total population of Indonesia between productive and non-productive age

Source: DataIndonesia.id (2024)

Data on the distribution of productive age in Indonesia, which dominates, is similar to the distribution of investors in Indonesia when linked to productive and non-productive categories. The number of investors in Indonesia is dominated by the productive age group. The data from Indonesia Central Securities Depository (KSEI) (2024) does not provide detailed data according to productive and non-productive categories. However, we can conclude that non-productive age investors do not dominate the number of investors because investors aged ≥ 60 years are only a small part, which is 3% (KSEI, 2024). As we can see on figure 1.2.

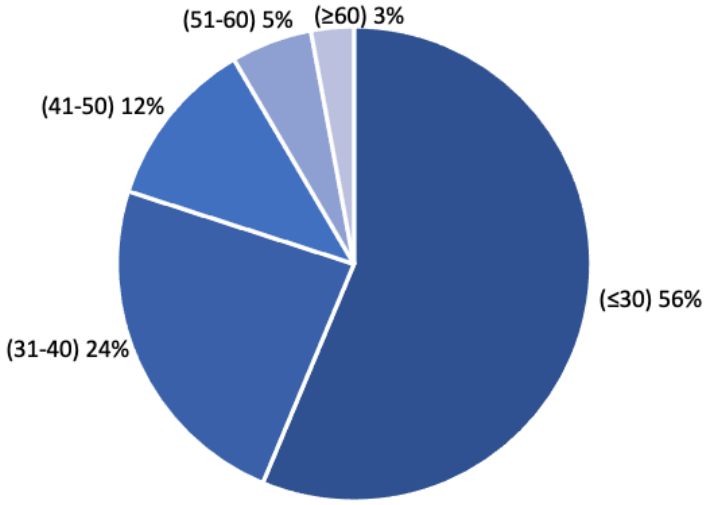

Figure 1.2

Stock Investor Demography of Indonesia in 2024.

Source: Indonesia Central Securities Depository (ksei.co.id, 2024)

If we talk about the investor population, which has previously been explained regarding the division according to age categories, it should be noted that the distribution of investors in Indonesia is dominated by the island of Java. West Java is in the first position with 2,851,366 investors. Jakarta is the second province with the largest investor population in Indonesia with a population of 2,032,067 investors. As we can see in the table below according to ojk.go.id (2024), based on result of population census.

Table 1.1

Top 10 Investor Distribution in Indonesia in 2024

Province	Population
West Java	2.851.366
DKI Jakarta	2.032.067
East Java	1.728.176
Central Java	1.570.768
Banten	782.536
North Sumatera	598.029
South Sulawesi	379.820
South Sumatera	353.105
Lampung	311.933
Bali	273.125

Source: ojk.go.id (2024)

The interesting thing is that when we look at the Jakarta Bureau of Statistic (BPS) census data, it turns out that Jakarta itself is in a demographic bonus condition where the population is dominated by those of productive age. Bureau of Statistic (BPS) stated that the productive age in Jakarta itself is 71.51%, referring to the latest data recap in 2023. A demographic bonus can be achieved if the composition of the productive age population is greater than that of the non-productive age population. As we can see in table 1.2

Table 1.2

Population Grouping by Age in Jakarta

Age Group	Population
0-14	22,06%
15-64 (productive age)	71,51%
>64	6,41%

Source: bps.go.id (2023)

Apart from highlighting the Jakarta area itself, there are now new regulations governing regional divisions where Special Capital Region (DKI) Jakarta has received new enforcement on the surrounding areas. Based on Indonesian Law Number 2 of 2024 concerning the Special Region of Jakarta Province Article 2 paragraph 1, the Special Capital Region (DKI) of Jakarta has been changed to the Special Region of

Jakarta (DKJ). Then based on the Indonesian Law number 2 of 2024 article 51 paragraph (1), An agglomeration area was formed to synchronize the development of Special Region of Jakarta and the surrounding areas. The next paragraph (2) explains the agglomeration area which reads " The Agglomeration Area as referred to in paragraph (1) includes the minimum areas of the Special Region Provinces of Jakarta, Bogor Regency, Tangerang Regency, Bekasi Regency, Cianjur Regency, Bogor City, Depok City, Tangerang City, South Tangerang City and Bekasi City."

Table 1.3

Population of Productive Age in DKJ and its Agglomeration Area

Area	Population
Jakarta	7.632.654
Bogor Regency	3.983.500
Tangerang Regency	3.983.500
Bekasi Regency	3.983.500
Bekasi City	1.886.143
Cianjur Regency	1.679.013
Depok City	1.524.283
Tangerang City	1.347.101
South Tangerang City	993.700
Bogor City	753.238
Total Population	24.434.762

Source: bps.go.id (2023)

Based on the law, the agglomeration area divided into 2 provinces, which are West Java and Banten, which also included into the 10 provinces with the largest investor distribution in Indonesia, which West Java is in the first, then Banten is in the fifth. Due to these indications where a new regional coverage area is formed, and high rates of productive age, the productive age population of Special Region of Jakarta and its agglomeration area were chosen to be the subject of this study.

1.2 Research Background

In the recent 5 years, Indonesia has observed an increase in investment significance. People make investments in the financial markets to increase, protect, and grow their wealth, resulting in an improved financial position. This refers to Indonesia

Central Securities Depository (KSEI) (2024), where there was a rapid increase from 2020 to 2024. Within a period of 5 years, the increase in the number of investors in capital markets, mutual funds, other securities, and government securities ranged from 100% to almost 300%. As you can see in figure 1.3.

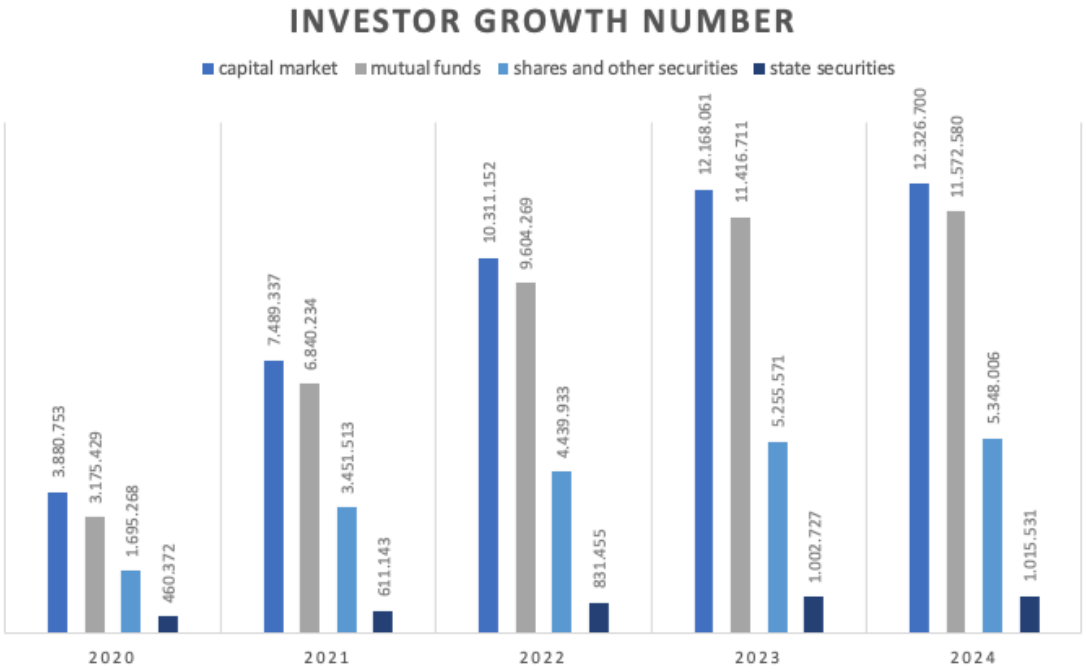

Figure 1.3

Investor Growth Number

Source: Indonesia Central Securities Depository (KSEI) (2024)

Nonetheless, this growth in the number of investors has come with some challenges especially in the current situation. Along with the increasing number of investors, the problem is that many investors are wrong in carrying out the investment decision making process. Among the many causes, one of them is emotional and psychological elements that can have a significant impact on financial decisions. Based on a report from the Financial Services Authority (OJK), the highest total public losses due to illegal investments in Indonesia have reached IDR 120.79 trillion in 2022. This jump was caused by the Indosurya cooperative case. The value of these losses has reached a record high in the last decade. The amount of investment losses in 2022 even

jumped to 4,655.51% compared to the previous year's period (year-on-year) which amounted to IDR 2.54 trillion. As we can see in figure 1.4 below

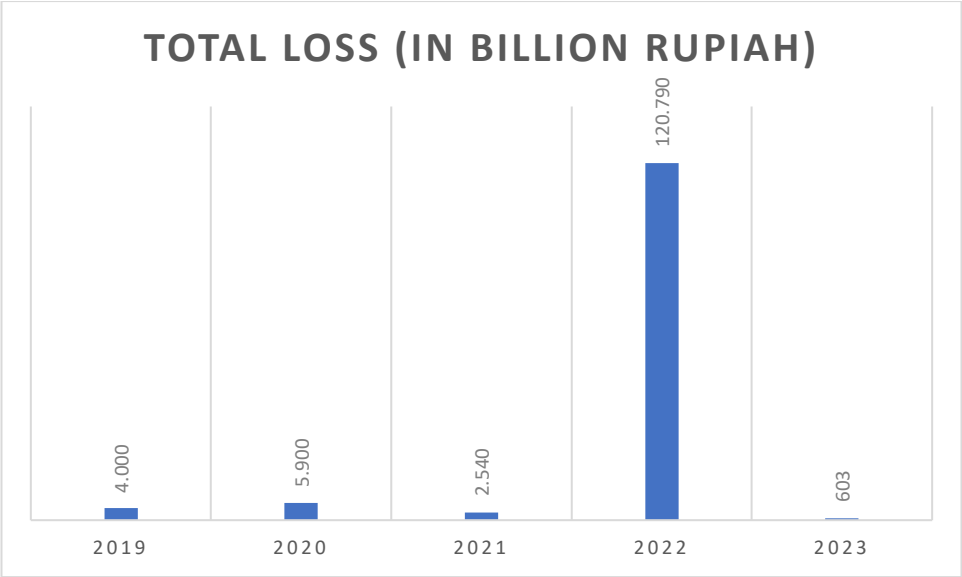

Figure 1.4

Total Loss of Illegal Investment

Source: Financial Services Authority (OJK) (2024)

According to the Financial Services Authority (OJK), there are several characteristics of illegal investment, and one of the characteristics of illegal investment is promising unreasonable profits in a short time. Investors act impulsively because of anxiety that they will miss out on big opportunities. Potential for fast money also escalates this stress making them more vulnerable to improper investment choices. And so, it appears, the Fear Of Missing Out (FOMO) phenomenon takes place. Furthermore, high Fear Of Missing Out (FOMO) in investing is common more and more. They like those influencers, and a large number of people also start doing those things and they get scared that they are out of trend. In an investment perspective, Fear Of Missing Out (FOMO) is an emotion that is characterized by a feeling that one will potentially lose an opportunity to invest in a good stock (Bizhare.id, 2023).

Based on the previous research, anxiety and investment decision making has a correlation. According to Singh & Sidharth (2023), in investment decision making, investors experience emotions such as anxiety, fear, joy, satisfaction, or dissatisfaction

with the returns resulting from the investment. The Fear Of Missing Out (FOMO) case, which is correlated with anxiety, is related to the field of neurofinance.

Talk about Fear Of Missing Out (FOMO) case on investor in Indonesia, this indicates a link between a person's investment decisions and psychological matters. This has a connection to field of neurofinance. According to Khan & Mubarik (2022), neurofinance is an emerging area of neuroeconomic finance, explaining the connection between human brain activity and financial behavior from interdisciplinary fields, including neurology, psychology, and finance. While according to Rashid et al. (2022), Neurofinance investigates the neural underpinnings of financial decision-making using brain imaging. So, it can be explained that neurofinance is a mixture of medical science and psychology with finance. Neurofinance is a relatively new area of research that strives to understand financial decision making by combining insights from psychology and neuroscience with theories of finance (Miendlarzewska et al., 2019).

Neurotransmitters are chemical messengers in the human brain that produce signals from neuron to neuron that may be related to elements of an individual investor's behavior (Khan & Mubarik, 2022). Neurotransmitters play an important role in the transmission of nerve signals and the regulation of cognitive and emotional functions in the human brain. The eight indicator of neurotransmitters (Adrenaline, Noradrenaline, Dopamine, Serotonin, Gamma-Amino Butyric Acid (GABA), Acetylcholine, Glutamate, and Endorphins) responsible for tension, attention, mood, calming, learning, memory recall, and euphoria (pain and positive sensations) (Khan & Mubarik, 2022). The lack of similar research in Indonesia especially Jakarta because most studies related to neurofinance or the influence of neurotransmitters on investment decisions are more often focusing on another countries or in a global context. Indonesia's environment, especially Jakarta as a highly dynamic economic center, provides a unique context that may influence how neurotransmitters and demographic factors work in investment decisions. Especially with the enactment of a new law which states that currently Jakarta is a Special Region which is included in 9 agglomeration areas, including Bogor city, Bogor regency, Bekasi city, Bekasi

regency, Tangerang city, Tangerang regency, South Tangerang city, Depok city, and Cianjur Regency.

Research in neurofinance has revealed that financial decisions made by individuals are often influenced by neurobiological factors, including neurotransmitters activity in the brain. Latest research studies related to neurotransmitters investor elements emerging in developing countries and suggests a relationship between Adrenaline, Noradrenaline, Dopamine, Serotonin, Gamma-Amino Butyric Acid (GABA), Acetylcholine, Glutamate, Endorphins, and purchases, as well as trading on the stock market. The phenomenon of the impact of neurotransmitters on investment decision has revealed with research conducted by Khan & Mubarik (2022) with the result of neurotransmitters having an influence on investment decision.

The field of finance is constantly evolving, incorporating knowledge and ideas from other social sciences like psychology and sociology. This demonstrates how emotions, psychological biases, stress, and individual differences can affect an investor's financial decisions. The insights gained and their impact on financial theories caused some researchers to go one step further and ask how and why these violations arise in the brain and whether incorporating findings from neuroscience could further improve existing models, thus giving rise to the field of neurofinance (Miendlarzewska et al., 2019). Neurofinance attempts to provide a greater knowledge of the neurological elements that can influence financial behavior by merging methods from several scientific disciplines. By doing this, scientists and industry professionals want to understand the biological underpinnings of financial decisions, which will aid in the development of more sensible risk management, financial planning, and investing strategies.

According to cgsi.co.id (2023) there was a sharp increase in new investors in the year 2020. This cannot be explained separately from social media, the convenient access to information also affects lifestyles, and attitudes toward investment. Yes, thus in the end, many novice investors simply do not know what shares to invest in, and blindly copy all the stock movements without much actual thought. More recently, Fear Of Missing Out (FOMO) has become a usual reaction to which many investors,

particularly those novices, tend to fall for. As a rule, Fear Of Missing Out (FOMO) are characterized by symptoms that are out of a person's control emotionally because of the presence of the word 'fear', which means facing risks or losses.

Everyone can be afraid even experienced investors be afraid if they had losses before. It can cause some choices regarding investments to be hard, and in some cases, illogical, for example, selling shares because their price has dropped without the proper analysis. On the other hand, other symptoms of Fear Of Missing Out (FOMO) also lead to doing irrational things in investing; People investing like to make big profits in the shortest time possible. The internal motivation is a stronger driving force for less rational, and high risk investments. Many individuals aim for substantial returns in the shortest time, pushing them toward high-risk decisions without a realistic strategy.

They don't want to pass up the opportunity. It has been observed that investors who make investments out of fear of missing out on profits are lacking a solid investment strategy and analysis before deciding which investments to make based on advice from friends, medias, or influencers. On the other hand, for people who often experience mood swings, investment decisions can become more impulsive and less rational. According to tempo.co (2020), the opening of Indonesia Composite Index (IHSG) is higher due to the sentiment about the Covid-19 vaccines. Meanwhile according to Rahmayani & Oktavilia (2020), many investors will sell their portfolio investments and convert it to safe assets in uncertain conditions. It can be concluded that when an individual is in a good mood and feels safe, he can be confident to put his money in riskier assets. On the other hand, if individuals are in a state of uncertainty, they tend not to be aggressive or choose a low-risk instruments.

Talking about the case that occurred in Indonesia regarding individual investors, it is important to remember that the investor population in Indonesia is dominated by the productive age group 15-64 years. According to Central Bureau of Satistic (BPS) (2020), the productive age group plays a major role in driving the economy, both as contributors to the workforce and as active consumers. Individuals in this group are heavily involved in economic activities, often working and earning income that drives the economy. This group represents the peak of their professional

and social lives, during which they face various pressures from work, family, financial responsibilities, and living in a fast-paced urban environment like Jakarta can expose this group to high levels of stress due to things such as traffic jams, work pressure and a high living cost. Stress directly affects mood and emotional stability, often resulting in fluctuations of neurotransmitters levels.

These stresses can have a significant impact on their psychological and emotional well-being, which turnout to be closely linked to fluctuations in neurotransmitters levels in the brain. This matters particularly in Special Region of Jakarta (DKJ), where those in the productive age group face among the highest levels of stress in the nation because of the rapid urban lifestyle. Jakarta is in the top 10 cities with high levels of stress as in research on The Least and Most Stressful Cities Index 2021 by Vaay. The continual stressors present in Jakarta make it a compelling setting for this research, since the high-tension environment allows us to study how mood, emotional health, and neurotransmitters variations impact financial decisions.

By targeting this demographic, we can uncover the ways in which neurobiological factors shape the financial behavior of people experiencing high levels of stress, which offers useful knowledge for building financial literacy strategies and improving investment results. As a result, the dynamic nature of stress in Jakarta not only affects mental well-being but also plays an important role in shaping the way individuals in this productive age group make financial decisions, including their willingness to invest in any investment instruments.

Additionally, this may result in poor or illogical investment decisions. Neurotransmitters research can help increase the financial literacy of future investors and can help us understand how neurotransmitters affect investors' emotions and behaviour. The purpose of this article is to explain the connection between neurotransmitters and investment decisions. This contributes to a better understanding of the extent to which neurobiological elements influence risk preferences, uncertainty, and emotional reactions to investments, as well as having major implications for the development of better investment strategies and more effective risk management.

1.3 Formulation of Problem

In recent years, Indonesia has experienced a significant rise in the number of retail investors, particularly in the capital markets, as noted by the Indonesia Central Securities Depository (KSEI) (2024). This surge has been largely driven by increased access to financial markets through digital platforms and a growing awareness of investment opportunities. However, this rapid growth in the number of investors, has raised concerns regarding the investors' behavior and decision-making processes. This phenomenon proven by the data from Financial Services Authority (OJK) (2023), that shows in the recent 5 years, the total loss of investment reach IDR 133.23 trillion. Financial Services Authority (OJK) categorizes the investments here as illegal investment losses, one of the characteristics of which is the promise of large profits from the service provider in a short time which gives rise to feelings of anxiety about missing out on opportunities.

Continuing from the previous phenomenon, it indicates psychological biases that could adversely impact their investment decisions. It suggest that many investors experiencing anxiety in investing. A common psychological factor among Indonesian investors is Fear Of Missing Out (FOMO). Fear Of Missing Out (FOMO) drives investors to follow trends and make hasty investments based on hype rather than solid analysis. In recent years, many new investors, driven by Fear Of Missing Out (FOMO) and social media hype, bought small-cap stocks without proper research, resulting in heavy losses when the market corrected.

From the above phenomena, it is also shown that theoretically the effect of neurotrasnmitters on investment decision making is still under debate. Based on literature, there is still very little research about the neurotransmitters research on investment decision making. Beside that, based on research by Senda et al. (2020); Quang et al. (2023); Santosa et al. (2023) show that age variable affect investment decision making. Then, research by Srijanani & Vijaya (2020); Susanto et al. (2022); Bernaola et al. (2020) shows that gender variables affect investment decision making. Meanwhile research by Radianto et al. (2020) shows that gender does not has a significant effect on investment decisions. Meanwhile, there is also still very little research about moderating the age and gender to investment decision making.

Due to the phenomena in the research field and variations result in previous research, the research problem can be formulated as follows:

1. How does neurotransmitters (Adrenaline, Noradrenaline, Dopamine, Serotonin, GABA, Acetylcholine, Glutamate, and Endorphins) significantly influence investment decisions among productive age in Special Region of Jakarta?
2. How does age significantly influence investment decisions directly among productive age in Special Region of Jakarta?
3. How does gender significantly influence investment decisions directly among productive age in Special Region of Jakarta?
4. How does demographic factor such as age significantly moderate the influence of neurotransmitters on investment decisions among productive age in Special Region of Jakarta?
5. How does demographic factors such as gender significantly moderate the influence of neurotransmitters on investment decisions among productive age in Special Region of Jakarta?

1.4 Research Purpose

Referring to the problem formulation, the purposes of this research are:

1. To analyze the impact of Neurotransmitters on Investment Decision Making among productive age investor in Special Region of Jakarta
2. To analyze the impact of Age on Investment Decision Making among productive age investor in Special Region of Jakarta
3. To analyze the impact of Gender on Investment Decision Making among productive age investor in Special Region of Jakarta
4. To analyze the impact of neurotransmitters on Investment Decision Making moderated by age among productive age investor in Special Region of Jakarta
5. To analyze the impact of neurotransmitters on Investment Decision Making moderated by gender among productive age investor in Special Region of Jakarta

1.5 Research Benefit

This research is expected to provide benefits, including:

1. **Theoretical Aspect.** This research proposal seeks to contribute to the neurofinance literature more specifically by synthesizing the nature and impact of neurotransmitters to investment decision-making among people of productive age. It deepens scholarly knowledge of how biological aspect, including neurotransmitters, play a role in decisions over money together with demographic factors to behavioral finance theory, providing a new line of research to scholars in this up-and-coming field of study.
2. **Practical Aspect.** By providing insight into the neurobiological and demographic factors that influence investment behavior, this research can help investors in the productive age group become more aware of the physiological factors that influence their financial decisions. Financial professionals, including advisors and educators, can use these findings to develop targeted educational strategies and programs that encourage good investment practices, thereby supporting better decision making and encouraging financial literacy in this demographic.

1.6 Systematics of Research Writing

There are research writing systematics on this thesis that are primarily composed of the following five chapters:

1. **Chapter 1 (Introduction):** There are six subchapters in this chapter, beginning with overview of research object, research background, formulation of problem, research purpose, research benefit, and systematic of research writing.
2. **Chapter 2 (Literature Review):** This chapter determines theoretical review, prior research, theoretical framework, and study hypothesis.
3. **Chapter 3 (Research Methodology):** This chapter consists of research characteristic, demographic and sample, variable operationalization, data collecting, validity and reliability tests, and data analysis methodology are covered in this chapter.
4. **Chapter 4 (Result and Discussion):** This chapter discuss respondent characteristics, result, and discussion.

5. **Chapter 5 (Conclusion):** This chapter consists of conclusion and recommendation.