COMMISSION-FREE STOCK TRADING AND IMPACT ON INDIVIDUAL STOCK MARKET PARTICIPATION (SMP)

Augustine Akomeah Otchere

A Dissertation

Submitted to Franklin University in partial fulfillment of the requirements for the degree of

DOCTOR OF BUSINESS ADMINISTRATION

November 2023

Committee:

Beverly Smith, Ph.D., Committee Chair

Lewis Chongwony, Ph.D., Committee Member

Timothy Wiseman, DBA, Committee Member

Franklin University This is to certify that the dissertation prepared by

Augustine Akomeah Otchere

"Commission-Free Stock Trading and Impact on Individual Stock Market Participation"

Has been approved by the committee as satisfactory completion of the dissertation requirements for the degree of

Doctor of Business Administration

Dr. Beverly Smith Dr. Beverly Smith (Nov 28, 2023 08:52 EST)	11/28/2023
Dr. Beverly Smith, Committee Chair & Program Chair, Leadership & Management, Franklin University	
Timothy R. Wiseman (Nov 28, 2023 11:03 EST)	11/28/2023
Dr. Tim Wiseman, Committee Member & Doctoral Adjunct, Franklin University	
Lewis Chongwony	11/28/2023
Dr. Lewis Chongwony, Committee Member & Director, Research Core, Franklin University	
Robin Hinkleand (Nov 28, 2023 12:25 EST)	11/28/2023
Dr. Robin Hinkle, DBA Program Chair Franklin University	
Wendell Seaborne Wendell Seaborne (Nov 28, 2023 17:59 EST)	11/28/2023
Dr. Wendell Seaborne, Dean, Doctoral Studies Franklin University	



(THIS PAGE IS INTENTIONALLY LEFT BLANK)

Abstract

This research explores the impact of zero-commission stock trading on individual stock market participation across a spectrum of demographic and socioeconomic factors. The advent of online platforms offering commission-free trades has potentially democratized stock market access, which this study investigates against the backdrop of traditionally low individual engagement in stock investments. The research was a quantitative cross-sectional survey, collecting data from a diverse American demographic. A significant 41% response rate was achieved, resulting in the completion of 495 questionnaires. The analysis reveals that income is the dominant factor influencing stock market involvement, accounting for 21% of the variance in participation rates; higher earners are more likely to invest. The allure of zero-commission trading stands out as a strong predictor of SMP accounting for 15% variance in participation while widespread adoption of smartphones and trading apps accounting for (4%). Financial knowledge and awareness was equally a significant predictor, contributing to 6% variation in SMP. Additionally, gender and age accounted for 3% and 4% variance respectively. The research underscores critical areas for policy and educational interventions, such as increasing financial literacy to bridge the gender gap and extending market access to lower-income groups. By shedding light on these factors, the study provides a comprehensive understanding of the recent shifts in stock market participation dynamics, highlighting the transformative potential of zero-commission trading in an increasingly digital financial landscape.

Keywords: Stock market participation, zero-commissions, prospect theory, equity risk premium.

Dedication

My dedication to this work is a heartfelt tribute to the significant people in my life. I express deep gratitude and admiration for their unwavering support and influence. This dedication is primarily directed to my wife, Ernestina Opoku, who has been a constant source of belief and support throughout my professional and career endeavors. I also acknowledge our three daughters, Kristen Otchere, Michelle Otchere, and Katherine Otchere, highlighting their roles as both advocates and critics, emphasizing the importance of persistence and belief in achieving one's aspirations.

In addition, I express my gratitude to my late father, Mr. JPK Otchere, acknowledging the fundamental support and influence he provided that has shaped my life journey. This tribute serves as a sincere expression of appreciation and inspiration, urging readers—particularly my mentioned family members—to persist in pursuing their dreams and maintaining the faith that their ambitions can manifest into reality. It is a touching tribute to the influential and supportive figures who have played a vital role in my life.

Acknowledgments

I express my heartfelt gratitude to my dissertation committee for their invaluable support and guidance throughout this challenging journey. Dr. Beverly Smith, serving as the Committee Chair, I am deeply thankful for your mentorship and support, which played a pivotal role in carrying me through the entire process. As my academic advisor, you consistently encouraged me not to give up and emphasized the importance of "beginning with the end in mind."

Dr. Timothy Wiseman, your honest and timely feedback is greatly appreciated. Your continual inspiration motivated me to put in extra effort. Dr. Chongwony, I must acknowledge the significant impact of your input and attention to critical details on shaping my work. I appreciate your belief in me, your strong work ethics, as well as the pursuit for greatness.

It is crucial to acknowledge that the insights and suggestions from the committee profoundly influenced both this work and my overall scholarly development, and for that, I am sincerely grateful.

I extend my appreciation to the Franklin University faculty for preparing me for this pivotal point in my learning journey and to all those who have played a significant role in my development.

To my family—my wife, Ernestina, and children Kristen, Michelle, and Katherine—your unwavering support has been my rock, keeping me going.

Finally, I want to express gratitude to my OU family, including Dr. Victor Heh, Dr. Akwasi Agyeman, Dr. Archibald Peters, Dr. Francis Atuahene, Dr. James Agbodzakey, Dr. Erasmus Attah-Gyamfi, and all others not explicitly mentioned here. Your support has made a substantial difference in my academic journey, and I am truly thankful.

Table of Contents

Chapter 1. Introduction
Background of Study 1
Problem Statement
Justification of Study
Purpose of the Study
Research Questions
The hypotheses were:
Sub-questions:
Significance of the Study10
Assumptions, Delimitations, and Limitations11
Definition of Terms
Chapter 2: Literature Review
Evolution of Stock Trading
Theoretical Framework
Equity Risk Premium (ERP) Influence on Stock Market Participation
Stock Trading and Zero Commissioning
Historical Timeline of Stock Trading and Commission Fees
Stock Trading Before Brokers
Brokerage Trading and Fees
Current Online Commission-Free Trading
Stock Market Participation
The Influence of COVID-19 on the Stock Market

Commission-Free Stock Trading	41
Accessibility to Online Trading Platforms and Smartphones	44
Income effect on SMP	45
Financial Knowledge and Awareness	
Gender and SMP	
Effect of Age on SMP	47
Chapter 3: Research Methodology	50
Purpose of the Study	50
Research Method and Design	51
Population and Description of Research Participants	52
Recruitment of Participants and the Role of Qualtrics.	53
Operationalization of Variables	55
Reliability, Validity, and Researcher Bias	58
Data Analysis Procedures	60
Linear Regression Assumptions Testing	62
Data Security Plan	
Chapter 4: Data Collection, Analysis, and Results	66
Restatement of Study's Purpose and Research Questions	67
Data Preparation, Analysis, and Procedure	68
Demographics Characteristics	68
Verification of Linear Regression Assumptions	
Data Analysis and Results	
Additional Analysis and Results	79

One-Way Analysis of Variance (ANOVA) for Selected Variables	79
Analysis of Gender Differences in SMP	79
One-Way ANOVA for levels of Income Differences in SMP	80
One-way ANOVA of Participant Education levels and SMP	83
One-Way ANOVA of Age and SMP	85
Summary of Findings	87
Chapter 5: Results, Discussion of Findings, and Recommendations	89
Summary of the Study	89
Sub-questions:	90
Discussion of Findings	
Income as a Key Factor:	
Significance of Zero Commissions and Access to Smartphones:	
Financial Knowledge and Awareness:	
Gender and Age Disparities:	
Overall Effect of the Regression Model	
Limitations of the Study	
Recommendations for Future Research	
Theoretical Implications and Intellectual Merit	100
Conclusion	101
References	103

List of Figures

Figure	Pag	<u>g</u> e
1	Pie Chart of Educational Level of Participants and SMP7	2
2a	QQ Plot of residuals for Mean SMP7	3
2b	Observed by predicted7	3
3	Normality Curve of Observed Variables7	5
4a	Residual plots of selected independent variables7	15
4b	Predicted values of Residuals for homoscedasticity7	6
5	Outliers and High Leverage Points for the observed data7	/6
6	Distribution of mean SMP for male and female gender8	0
7	Mean Income Level Distribution on SMP8	3
8	Distribution of Wilcoxon Scores for mean SMP for participants' age	37

List of Tables

Table	Pa	age
1	Survey respondents by region	.70
2	Sample Statistics and Description	.71
3	Mean and Standard Deviations of Participants Level of Education	.72
4	Contributions of predictors (IV) on dependent variable	.74
5	Overall Regression Model	.77
6	Male and female means of SMP using the pooled method	.79
7	Levene's Test for Homogeneity of Mean SMP Variance for Income	.81
8	One-way ANOVA of Participants' level of income and SMP	.81
9	Least Square Means of Income Groups	.82
10	Least Squares Means for Income Effect	.82
11	Levene's test for equal variance for mean SMP based on educational level	.83
12	One-way ANOVA of Participants' educational attainment and SMP	.84
13	Least Squares Means for Educational Level Effect	.85
14	Levene's test for equal means of SMP for age groups	.86
15	Kruskal-Wallis One-Way analysis of variance test	.86
16	Results of hypotheses testing	.90

Chapter 1. Introduction

The performance of any country's economy is influenced by the interactions of the various markets in the economy. The market is broadly categorized into several markets, including the product market, whose participants interact via buying and selling goods and services. The money market is another market whose commodity of sale is money. This market dictates and regulates the supply and demand for money (King et al., 2011). These two markets interact, resulting in establishing equilibrium in the economy. Despite these being the major contributors to economies' performance, they rely on financial markets to provide resources and adjustment mechanisms to ensure that the economy operates at full employment and that no inefficiencies are experienced. Financial markets encompass a broad, continually evolving, and not altogether clearly delimited collection of formal and informal institutions that work to facilitate the exchange of assets (Bailey, 2005). Examples of financial markets are the stock market, bonds market, foreign exchange market, and real estate market. The stock market is one of the most influential markets and is thus a significant contributor to the success or failure of any economy. It hosts most of the economy's stronghold and is critical to the growth of any economy and the world's economy (Burtch et al., 2013). This section explores how the stock market influences economic progress, the players in the market, the factors that influence their investment decisions and strategies, and the various factors influencing stock market participation by individuals.

Background of Study

Stock trading is the act of buying and selling shares of any company. The public company must be listed for its stock to be traded. This type of trading takes place in a stock exchange market. The stock market is a platform through which buyers and sellers can meet, interact, and transact, resulting in fair prices, a higher degree of liquidity, and transparency as the market participants compete within the open market. The earliest stock market was the London Stock Exchange, which dates back to 1773 and began in a coffeehouse, allowing the traders to meet and exchange shares (Stringham & Curott, 2015). In the United States, the first exchange occurred in 1790 in Philadelphia (now known as the New York Stock and Exchange Board (Kerimbek et al., 2019). The Philadelphia Stock Exchange was initially a forum for trading government securities but eventually expanded to trade stocks, options, and futures. It is one of the oldest stock exchanges in the world and is still in operation today, primarily as an options exchange.

The stock market participants' objective is to maximize the available market conditions by buying low and selling high (Zhang, 2001). According to Zhang (2001), stock market participants prioritize profits gained in the short term rather than possible profits in the long run. The two categories in this market based on the sellers of the shares (Guiso et al., 2008) are the primary and secondary markets. The listed company sells its stock in the primary market. Participants in these markets are driven by the need to generate capital for the company. The firms sell their stocks in an initial public offering, an opportunity to acquire the necessary wealth (Keting, 2011).

On the other hand, the secondary market sells to fellow investors. Investors who purchased the company's stock in the initial public offering sell the acquired stock to other investors. Operations, logistics, and key players constantly change in the stock exchange sector. The stock market is experiencing changes, one significant development being the introduction of commission-free stock trading, which became widely used after October 2019 (Hu, 2021). Hu (2021) asserted that with the elimination of commission fees of retail brokers, zero-commission trading impacted a variety of individual stock market participants, with retail investors benefiting the most.

Zero-commission stock trading may be a factor that attracts new investors and younger generations to participate in the stock market. With the recent launch of online trading platforms that do not charge trading commissions and do not require a minimum account balance, a new era of stock market participation has begun (Eaton et al., 2021). According to Colliard and Foucault (2011), investors are always better off with zero trading fees than those set by a profit-driven monopolist matchmaker. Essentially, brokers in the market do not charge any separate fee for executing a particular trade. This is an advantage to investors because they do not incur any cost when their business runs (Colliard & Foucault, 2011). However, on the downside, zero-commission trade denies the brokers an opportunity to earn income.

The stock market creates wealth by allowing individuals to invest in companies that can generate wealth and growth over the long term. By investing in the stock market, individuals can earn higher returns than those offered by traditional investment options, such as savings accounts or bonds. By investing in well-performing companies, individuals can earn capital gains and dividend income, which can help them build a more secure financial future. Investing in the stock market allows individuals to diversify their portfolios and reduce risk by investing in various companies and industries. Overall, stock market participation can benefit both individuals and the economy.

Equity risk premium (ERP) is the excess return from investing in the stock market over a risk-free rate. The size of the excess return gained in equity investment is commensurate with the risk one is willing to take in equity. Thus, the greater the proportion of the portfolio invested in equities, the greater the reward. Therefore, the lack of participation in the stock market can lead

to significant welfare loss from equity premiums (Cocco et al., 2005). Though stock holding returns tend to be higher than similar risky assets (Bogan, 2008; Fernández-López et al., 2018), household participation in the stock market has historically been lower than predicted. For this study, SMP is defined as individuals' investment or participation in one of the following: stocks, a self-directed retirement account/an employer-directed retirement account/Other retirement accounts, or a stock mutual fund. The investment or participation can either be active (i.e., actively involved in managing the investment as seen in day trading of stocks) or passive (i.e., no involvement at all as in most company-provided 401K investments). The study's target population is individuals who may or may not participate in the stock market, including those who are currently participating in the stock market. The study will use commission-free and zero-commissions interchangeably to refer to individuals not paying transaction costs to trade or participate in the stock market investment. The main objective of this study is to investigate factors influencing SMP, including commission-free trading. For this study, transaction costs (commission fees and internet costs) deemed to be major entry barriers to the stock market (Bogan, 2008) have been decomposed into (zero commission and accessibility to online trading platforms/apps). The two factors (zero commission and accessibility to online trading platforms/apps) impact SMP separately. The separation of the two factors allows the researcher to determine the magnitude of their impacts on SMP individually.

Problem Statement

Coupled with the changes experienced in the global economy, individuals have been forced to diversify their sources of income (Michelacci & Suarez, 2014). However, very few people are opting for stocks. This is problematic since there are many benefits to be earned from stock market participation. People opt for income generation programs such as agriculture and online jobs, while some opt for odd jobs. All these are entrepreneurial activities. However, they are time-limited and involve risks. The stock market solves some entrepreneurship problems, such as time consumption and delayed income (Spiroska & Broman, 2020). With the introduction of working from home, people have more time to learn about the stock market and make viable investments. This, coupled with the introduction of zero-commission trading and the availability of smartphones, offers more opportunities to expand the stock market and increases individual participation.

Many benefits are derived from the stock market, whether directly or indirectly. Individuals get to receive financial education on their investment decisions. They can invest in safer options and a platform to create their desired wealth. However, recent research shows individuals do not take advantage of these benefits. The stock market participation puzzle is problematic, whereby the participation of individuals in the stock market is minimal despite measures such as zero-commission trading and increased Access to information via the Internet to increase individual involvement. However, the problem continues, as shown by the decreased individual participation in the stock market. This study aims to determine the factors contributing to low individual participation levels in the stock market. This paper also determines why the factors and steps to achieve higher participation do not bear the expected results. In addition, this study will study commission-free stock trading and its impact on individual stock market participation.

Justification of Study

The advances of zero-commission trading started with the Robinhood online brokerage platform, which was introduced in 2013 by Robinhood (Barber et al., 2022). Since then, other brokerages, including E*TRADE, Charles Schwab, and T.D. Ameritrade has also introduced

commission-free trading options to remain competitive in the marketplace. Robinhood's brokerage platform is user-friendly, making it easier for young investors with little or no experience to participate in investing. The zero-commission environment can attract small investors to participate in the stock market. By 2019, commission-free trading had become the norm in America, with almost all brokerage houses, including the bigger firms, offering some form of zero-commission trading (Hu, 2021).

Many stock brokerage firms began launching online platforms without charging trading commissions and removing the minimum account balance restriction, bringing in a new era of stock market participation (Eaton et al., 2021). Eaton et al. (2021) asserted that investors attracted to zero commissions and or user-friendly trading platforms are typically younger and less wealthy than retail investors from previous decades. There are critical impacts that the new introduction of zero commission trading is likely to affect the market. However, the existing literature does not have enough evidence and data to evaluate the impact of eliminating commission fees in stock market trading. While for long-term stock investors, who only refresh their portfolios a few times a year, the elimination of stock trading commissions may not be a major announcement, this announcement could be quite significant for short and mid-term traders who often open and close positions daily, since trading fees could be significant for such investors, soon after the announcement to eliminate stock trading commission fees, other popular brokers, such as T.D. Ameritrade and E-Trade followed suit, and now the practice is widespread. The introduction of zero-commission trading is likely to affect stock market participation. Jain et al. (2020) found that low-cost stock trading processes favored most traders as they sought to ensure maximum profits from their engagements. According to Oxford Analytica (2021),

attempts to use fewer fees for the trading processes allowed more participants to engage in trading and, therefore, allowed for more active investments for retail traders.

Furthermore, the report notes that digitization of the trading processes and introducing fewer costs for the trading processes allowed for the growth of individual investor assets. Eaton et al. (2021) also studied investors' participation in zero-commission trading, high-frequency traders, and stock market quality. The researchers believed that Robinhood ownership changes were unrelated to future returns, which meant that zero-commission traders were behaving as noise traders (making buy-and-sell trades without the support of professional advice). According to the authors, introducing commission-free traders in the market increased market liquidity and low return volatility among the stocks favored by investors (Eaton et al., 2021).

Given that younger and less wealthy investors are drawn to zero commissions, userfriendly online trading platforms, as well as the use of smartphones (Eaton et al., 2021), individual participation in the stock market is expected to increase. Therefore, this study seeks to conduct a survey to investigate the perception of individuals regarding the possible influence of zero commission, Access to trading apps, income, financial knowledge and awareness, gender, and age on SMP. Through this study, the researcher will analyze responses from survey questionnaires to determine whether the introduction of zero-commission fees potentially influenced or is likely to influence or attract new investors into the stock market. Several studies have investigated stock market participants in general. Among the factors impacting stock market participation include internet and transaction costs (Bogan, 2008; Fischer & Jensen, 2015), income, and financial awareness (Greenstone et al., 2004; Guiso & Japelli, 2005; McDonald & Sandada, 2018; Shum & Faig, 2006); however, the researcher found no study that focused on the zero-commission fees on individual SMP. The study will, therefore, close the literature gap by researching commission-free trading's impact on SMP and attract other researchers to add to or expand on this study's findings.

Purpose of the Study

The purpose of this quantitative cross-sectional predictive study was (a) to investigate the relationship between commission-free stock trading, Access to smartphones and trading apps, income, financial knowledge, financial stress, gender, and age on individual SMP (b) to determine the relative contribution of commission-free stock trading, Access to smartphones, income, financial knowledge, financial stress, gender, and age on individual SMP. The study sought to answer the following research questions: What is the relationship between Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)? Research Question *2*. What is the contribution of Zero-Commission stock trading, Access to smartphones, Income, Financial Awareness, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)?

Answering the research questions will allow researchers to better understand how the elimination of major entry barriers to the stock market (trading fees and Access to online trading platforms) has impacted the attitude and perception of consumers towards participating in the equity or stock market in general, as well as the relative impact of the factors on SMP. The research study will add to the literature by examining the factors that affect individuals' participation in the stock market, including commission-free trading.

Research Questions

The objectives of this study are (a) to investigate the relationship between commissionfree stock trading, Access to online stock trading apps, income, financial knowledge, and awareness, gender, and age on individual SMP; (b) Determine relative contribution of commission-free stock trading, accessibility to online stock trading platforms, income, financial awareness, gender, and age to individual SMP. The study will answer the following research questions:

Research Question (R.Q.) 1. What is the relationship between Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Gender, and Age on Stock Market Participation (SMP)?

The hypotheses were:

- H1₀: There is no significant relationship between the independent variables (Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age) and Stock Market Participation (SMP).
- H1_A: There is a significant relationship between the independent variables (Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age) and Stock Market Participation (SMP).
- *Research Question (R.Q.) 2.* What is the contribution of Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)?

Hypotheses for RQ2 were:

H2₀: Commission-free stock trading, smartphone access, Income, Financial Awareness, Financial Stress, Gender, and Age contribute equally to SMP.

H2_A: Commission-free stock trading, smartphone access, Income, Financial Awareness, Financial Stress, Gender, and Age have unequal contributions to SMP.

Sub-questions:

- 1. Does gender influence SMP differently?
- 2. Is there a statistical difference in SMP based on levels of income?
- 3. Does educational attainment influence SMP?
- 4. Do age differences impact SMP?

Answering the research questions will help to better understand how the elimination of major entry barriers to the stock market (trading fees and Access to online trading platforms) has impacted the attitude and perception of consumers towards participating in the equity or stock market in general, as well as the relative impact of the factors on SMP. The research study potentially adds to the literature by examining the factors that affect individuals' participation in the stock market, including commission-free trading.

Significance of the Study

The study potentially contributes to theory, policies by the government, and aid for the non-governmental organizations dealing in this line of service. The study offers empirical insights into the relationship between the variables and how they influence one another. The study enables relevant sectors, such as those dealing in market performance, to make sound decisions and take appropriate measures. The research significantly contributes to the existing theories and fills the gaps within the study. The study also enables the government to formulate and implement more advanced laws to encourage participation. This study determines why individual participation in the stock market is limited while participation has benefits. In addition, the study explores how various factors such as zero-commission, financial literacy, income, education, age, gender, and

Access to smartphones influence individual participation in the stock market. The study also shed light on the unique contributions of the factors influencing stock market participation.

Assumptions, Delimitations, and Limitations

This section discusses the assumptions, limitations, and delimitations of the study. **Assumptions** in this study included the elimination of stock trading fees as a major barrier to individual participation in the stock market, which is the major foundation of the study. Thus, the study assumes investors pay to invest in the stock market regardless of the type of investment they choose to participate in, including employer-sponsored retirement accounts. The study defines SMP as individuals' investment in stocks, retirement accounts, and stock mutual funds. No trading fees are charged for participating in employer-sponsored retirement accounts such as 401K.

Limitations are weaknesses beyond the researcher's control, that could affect a study's results and conclusion. Limitations must be addressed early in the study process (Theofanidis & Fountouki, 2018). Limited of the study includes the following:

Sampling Bias: Despite efforts to apply quotas for demographic representation, the sample may not perfectly reflect the diversity of the entire U.S. population, leading to potential sampling bias. *Self-Reported Data:* The study relies on self-reported data, which can be subject to response bias and may not accurately represent participants' true attitudes and behaviors.

Cross-Sectional Design: This study utilized a cross-sectional design, which provides a snapshot of relationships at a single point in time. Longitudinal studies could offer deeper insights into changes over time.

Survey Design and Wording: The accuracy of responses could be influenced by the survey design, question-wording, and the potential for misinterpretation of questions.

Although the instrument was tested for reliability, untested instruments like the one used can cause ambiguity on the part of respondents and the study's results. Poorly worded or ambiguous questions can confuse respondents and result in inaccurate or inconsistent responses.

Non-Representative Samples: If the sample does not accurately reflect the target population's characteristics, the results may lack external validity. The study was framed as investors' attitudes and perceptions toward stock market participation rather than actual participation. Respondents sometimes answered questions as if they were actual stock market participants. Perceived participation in the stock market can differ from actual participation and thus can affect the study's outcome.

Delimitations, typically under the researcher's influence, define the study's limits to strike a balance that is expansive enough to yield meaningful outcomes yet manageable enough to be realistically attainable (Theofanidis & Fountouki, 2018). These delimitations commonly encompass the study's goals, research inquiries, variables, and the composition of the study sample (Theofanidis & Fountouki, 2018). The delimitation includes the use of convenience survey in gathering the study's data and the use of Qualtrics panel. Qualtrics panel had previously agreed to participate in the research survey and received incentives for participating. However, the incentive was deemed insignificant to cause any bias in the study. Random sampling and opening the survey to the public may provide a more generalized result.

Definition of Terms

- *Stock market participation*: Refers to the involvement of individuals, institutions, or entities in buying and selling financial securities (such as stocks, bonds, and derivatives) within a stock market or stock exchange.
- *Passive Investment:* Passive investors use strategies like index funds or exchange-traded funds (ETFs) to gain exposure to the stock market without actively managing individual securities.
- *Active investment*: Refers to a strategy in which an investor or fund manager actively makes decisions and trades securities to outperform the overall market or a specific benchmark index.
- Zero-commission stock trading, also known as commission-free stock trading, is a pricing model that allows investors to buy and sell stocks and other financial securities without incurring traditional trading commissions or fees charged by brokerage firms.
- *Stock Trading:* Involves the buying and selling individual stocks or shares in publicly traded companies to make a profit.
- *Stock Mutual Fund:* is an investment fund that pools money from multiple investors to purchase a diversified portfolio of stocks and other equity securities. Professional fund managers manage these funds, offering individual investors a way to invest in a diversified portfolio of stocks without having to select and manage individual stocks themselves.
- *Individual Retirement Account (IRA):* IRA is a tax-advantaged retirement savings account that allows individuals to save and invest for retirement in the United States.

- *Self-Directed Retirement Account/IRA:* A Self-Directed Retirement Account, often referred to as a Self-Directed Individual Retirement Account (SDIRA) or Self-Directed Retirement Plan, is a type of retirement account that provides individuals with more control and flexibility over their investment choices compared to traditional retirement accounts like 401(k)s or IRAs.
- 401(k): This is a tax-advantaged retirement savings plan many employers in the United States offer. It allows employees to save and invest a portion of their paycheck for retirement while enjoying certain tax benefits.
- *Quotas:* These are numerical limits or targets set by organizations, governments, or authorities to regulate or control various aspects of economic, political, or social activities. Quotas are often used to achieve specific goals or objectives, manage resources, or address issues related to equity and representation.
- *Financial Stress:* Refers to the emotional and psychological strain individuals experience due to their financial situations. It can result from various factors, including debt, inadequate savings, job loss, unexpected expenses, or a lack of financial stability.
- *Smartphones:* These are versatile mobile devices that combine the functionality of traditional mobile phones with advanced features and capabilities typically associated with computers.

Chapter 2: Literature Review

Introduction

This chapter delves into the literature review of the study. The chapter will be organized into five major sections. The first section will encompass discussions regarding stock trading and zero commissioning. In the succeeding section, the researcher will explore the literature regarding the determinants of stock market trading behaviors. In the third section, explorations will be made into stock market participation. The fourth section will involve synthesized discussions concerning the influences of the Covid-19 pandemic on the stock market. In the last section, there is literature on individuals doing their trading with a discussion on transaction fees. The chapter will end with a summary of the main points covered.

To write the literature review, the following online databases and search engines were used: Google Scholar, IEEE Xplore, Wiley Online Library, Indian Journals, JSTOR: Journal Storage, EBSCOhost Online Research Databases, ELSEVIER, Science Direct, and Journal Seek. The key search terms and combination of search terms that were input to various online databases included the following: stock trading, stock market, zero commission, transaction costs, transaction fees, Covid-19, stockbrokers, stock market participation, trading behaviors, commission-free stock trading, and prospect theory. All the key terms used were able to yield studies that were relevant to the problem and research questions.

Evolution of Stock Trading

Recently, there has been a shift in the stock exchange as individuals transition from traditional stock trading to online stock trading (Bucher-Koenen et al., 2021). As indicated by Zou and Deng (2019), these changes are mainly associated with the COVID-19 pandemic, which affected all industries across the globe. Further, the changes that have taken place in the stock

market can be classified such as stock trading before brokers, stock trading with brokerage and brokerage fees (Ebner et al., 2022), and the recent variety of current online commission-free stock trading (Eaton et al., 2022). One of the most significant developments in stock trading is associated with zero commissioning. As indicated by Hanspal et al. (2021), zero-trading, which took center stage after October 2019, caused commission fees associated with retail brokers to be eliminated, leading to immense benefits for retail investors. According to AlamAlam et al. (2020), investor-related benefits are significant compared to fees determined by monopolistic entities in cases where zero commissions are out in place.

Over the years, the investors performed their analysis. They used the information gathered to determine the opportune investment time (Kerimbek et al., 2019) but were limited trading expenses during this period since the stock market had not expanded. In addition, only some countries participated in the stock market, resulting in limited securities trading, making market analysis easier since the traders did not have multiple securities to analyze (Ebner et al., 2022). Moreover, there was no need to have brokers in the market. The traders had additional tasks to perform as the trade began to expand into different countries and thus attracted more participants. They were required to analyze other securities and determine their profitability (Bansal, G. et al., 2019). The work to be done increased in size and magnitude, resulting in the development of a market gap (Kerimbek et al., 2019). This gap necessitated the emergence of brokers and brokerage firms to help the existing and new traders make better decisions.

Due to the endogenous nature of the trading activity, determining how retail investor trading affects stock market quality is difficult. If the behavior of traders who pay no commission, such as herding, is indicative of future price changes, High-frequency traders (HFTs) may be responsible for keeping an eye on the flow of retail orders and gathering information in a way that creates information asymmetries for other market makers (Takyi & Bentum-Ennin, 2021). Carta et al. (2021) observed that HFTs engage in informed trading at a lower risk when dealing with retail investors, enabling liquidity to be provided at better prices than those found on public markets. Moreover, the ability of HFTs to provide liquidity may be hampered if autocorrelation trading occurs due to a swarm of no investors (Long et al., 2020). There have been significant findings and discoveries on the causes and implications of stock trading. These changes include stock trading before brokers, stock trading with brokerage and brokerage fees, and the recent variety of current online commission-free stock trading (Takyi & Bentum-Ennin, 2021). Several theories have been proposed to offer explanations and a deeper understanding of this subject. Although these theories have had some practical support, they still have some limitations in explaining significant contributions to this trend and how market players can prevent them (Bansal, G. et al., 2019; Kerimbek et al., 2019).

Theoretical Framework

The prospect theory developed by Kahneman and Tversky (2013) informed the theoretical framework for this study. This theory was put forward with the author seeking to shed light on aspects of individual financial decisions. The theory proposes that in cases where uncertainties arise, the fiscal decisions made by individuals differ based on their perceptions regarding possible losses and gains, implying that when loss and gain chances are perceived to be equal, people will opt for certainty rather than risk (Kahneman & Tversky, 2013). Affirming the reliability of this perspective, Barberis (2013) asserted that when faced with a situation where the possibilities of profit-making are linked to greater risks, individuals will forego the opportunity to avoid losses. According to Barberis (2013), the theory suggests that individuals

would rather forego available profit-making opportunities than pursue the opportunities and make losses.

The theory is founded on three assumptions: People make their fiscal decisions based on assumptions encompassing certainty, isolation effect, and loss aversion (Kahneman & Tversky, 2013). Certainties of gain cause people to avoid financial activities associated with growth despite the accompanying risk levels, making them risk-averse (Kahneman & Tversky, 2013). On the other hand, in cases of loss, certain people decide to pursue better fiscal activities, avoiding those marked out as having significant risks. According to Kahneman and Tversky (2013), the isolation effect suggests that in cases where people have diverse items from which they should choose, they are more inclined to remember the unique features associated with each item. As such, the concept indicates the inclination towards simplified decision-making capabilities, made possible by the ability to tell the difference between the available items (Wakker, 2010). However, the concept only works best when minimal dissimilarities exist between the available items.

Another aspect of the theory is loss aversion. According to Barberis et al. (2001), this concept implies that individuals focus more on the fear of losses than the pleasures that stem from profit-making. Consequently, people tend to involve themselves in fiscal endeavors and invest more willingly in activities with more prospects of minimizing losses while heightening anticipated gains. Moreover, the loss aversion concept implies that within everyone is a survival mechanism that, by causing them to have vivid memories of losses associated with their fiscal engagements, protects them from the pain that would stem from similar and future failures (Barberis et al., 2001; Wakker, 2010).

The prospect theory is also criticized for the inadequate framing theory that explains why actors generate the frames they use. According to Chong & Druckman (2007), decision-makers often must deal with competing structures across various issues. People decide based on the framing concept after carefully analyzing the available information. However, most financial decisions are influenced by how the financial information is presented (Chong & Druckman, 2007). Goffman, the sociologist, first postulated this theory in his work on Frame analysis. According to Tewksbury & Scheufele (2019), there are two frameworks whose primary role is to help individuals analyze and interpret the provided data to develop meaningful information and thus make reasonable decisions. The two frameworks are similar but vary in terms of their functionality. Goffman postulates that people interpret what is going on around their world through their primary framework.

Natural and social frameworks have many similarities that overlap. However, the main difference between the two is their distinct perspectives on events (Tewksbury & Scheufele, 2019). For natural frameworks, events are physical occurrences that take natural quotes literally and do not see social forces as the reason behind the occurrence of events. On the other hand, social frameworks view social forces as the driving force for circumstances since individual goals and manipulations affect how they act. According to Levy (2003), social frameworks are founded in natural frameworks, and the two greatly influence how data is interpreted, processed, and communicated. Goffman's underlying assumption is that individuals are daily capable users of these frameworks, whether they know them or not.

Equity Risk Premium (ERP) Influence on Stock Market Participation

The stock or equity market is a collective of buyers and sellers of shares of a particular company or business. It is predicated on selling and buying claims of a business's ownership,

referred to as stocks or equities. Equities are often privately purchased, and companies work to be attractive to investors who aim to buy ownership claims of the business (Bustos & Pomares-Quimbaya, 2020). They attract investors through their performance, measured by the earnings of returns and expansions. Due to various factors, including company performance, business growth, and returns, the buying and selling of stocks is risky. The risk comes from the fact that one cannot predict with certainty if the stock bought will bring any return, depending on how the business performs economically (Gandhmal & Kumar, 2019). Though risky, the stock market thrives on this high-risk investment. The risk is often relative to risk-free investments, such as government bonds and treasuries, which economically carry no risk. They carry no risk as governments cannot, theoretically, default on payments, as governments can borrow money from their central banks or print more money if needed to pay up any debt. The stock market is designed to thrive with higher risks; the riskier it is to buy a stock or equity, the higher the returns. The excess return of buying a stock measured against what one would have received if they bought a government bond is what is referred to as an equity risk premium (ERP).

Equity risk premiums are theoretical, as they are hard to measure and exist solely in the realm of the stock exchange (Damodaran, 2019). ERPs are calculated when one subtracts the expected return of a given asset from the risk-free rate or the current interest rate on the risk-free investments. ERPs are considered "forward-looking," as one estimates the price of a future stock by looking back on its performance. The risk emerges here as one cannot predict how a stock will perform; therefore, one can lose or gain on all their investments. The risk-free rate is when a risk-free asset, such as a government bond, is exchanged or bought in the market. Historically, the ERP has been 5% on average, 5% higher than the risk-free rate (Bansal, R. et al., 2021). Companies whose stocks carry more risk often attract investors because if the business does

well, the investors will gain higher profit margins. The risk estimate in the stock market is often any risk-free investment, such as government bonds or treasuries. Higher ERPs indicate how a company, and the stock market are faring, informing investors where to invest. Lower ERPs dampen investors' interest as they are interpreted as a company failing to meet its targets economically and, therefore, not worth investing in (Eldomiaty et al., 2023). Consequently, though ERPs are theoretical, they are used as measures of the health of a company, the stock market, and the market at large. Higher ERPs encourage the participation of risky investors, as the stock market thrives on risky investments and higher rewards.

Risk-free rates, such as government bonds, are sometimes the safest option for people as they are more specific, especially during uncertain economic times (Fernandez et al., 2020). Therefore, ERPs are an excellent way to measure whether the stock market is healthily moving forward. However, the stock market is virtually unpredictable, especially for private investors, because the economy is not backed up by anything apart from government trust. Therefore, if an economy struggles, it will manifest in the stock market, and ERPs are considered a sure way of determining whether an economy is struggling. As such, ERPs are often used to measure whether a particular stock market in the international market is worth investing in (Paul, 2019). Higher ERPs will likely attract investors, while lower ERPs will discourage investors. Thus, a market with many investors will result in companies gaining access to more capital for growth.

An increase in capital for companies encourages expansion, which is vital for the economy because companies' growth is directly correlated with the economy's growth. Any development of the economy will manifest in the stock market, which means that investors will get their due returns, which will, ideally, make the stock market healthy. Stock market health is measured by economic growth and performance; therefore, it does not necessarily mean stock markets cannot crash. Economic growth attracts investors, and higher ERPs are often seen in emerging equity markets whose potential can be tapped into (Yan et al., 2019). The potential is in the growth potential of the economic system; as such, ERPs are often used to show investors where to invest and which market to tap into, informing their decision-making process.

ERPs may entice investors who want to invest in stocks, with stocks providing an average excess return of about 5% higher than the risk-free rate (Bansal, R. et al., 2021). A higher ERP increases the chances of higher returns available to investors, therefore significantly attracting participation in the stock market.

Stock Trading and Zero Commissioning

Stock trading has been investigated from the stock exchange's primary and secondary market perspectives. Ozik et al. (2021) engaged in a study exploring stock trading from a company perspective. The researchers defined stock trading as the act of share purchase or selling, adding that public companies must be listed to trade their stock. As indicated by the researchers, players who engage in stock trading intend to take advantage of prevailing conditions in the market, implying that they prefer to spend less when purchasing and selling at higher prices. The researchers hypothesized that the chief focus of participants in the market should be short-term rather than long-term gains. In this study, the researchers noted two categories based on the sellers of the shares, noting that the markets are primary and secondary. Findings obtained from the study revealed that players in stock trading markets are driven by the need to generate capital for the company. These findings are consistent with the results obtained by Zhou, L. et al. (2021) after they engaged in a study investigating secondary markets in stock trading. According to the researchers, the secondary market sells to fellow investors, and the investors who purchased the company's stock in the initial public offering eventually sell the acquired stock to other investors. The study was driven by the literature-based realization that aspects such as logistics, key players, and operations made it imperative for scholars to focus on the zero-commissioning component. Findings obtained from the study revealed that in both primary and secondary trading, zero commissions favor investors when compared to cases where monopolist players determine the trading fees (Zhou, L. et al., 2021).

Discoveries and theories have continued to impact and cause implications in stock trading. Gomes et al. (2021) conducted a study investigating theories that have been proposed to shed light on stock trading. According to the researchers, despite the notable practicality of existing theoretical frameworks, limitations associated with the correlation between market players and market trends were significant. Notably, the researchers focused on the prospect theory, basing their proponent on the assumption that when individuals perceive loss and profit prospects as equal, they prefer to focus on the certainty element instead of perceived risks. Findings obtained from the study revealed that in cases where individuals are presented with both profit-making and loss-related opportunities, they are more likely to opt for the profitrelated opportunity because of the emotional influences associated with losses. These findings are consistent with the results obtained by Feng, L. et al. (2020) after they engaged in a study investigating stock trading from a perspective informed by the prospect theory. The researchers hypothesized that people will tend to pay more attention to loss possibilities rather than possibilities of making a profit indicating that this is why losses have been found to exert more impact on investors when compared to profits. Findings obtained from the study revealed that individuals are more likely to assume situational trends focusing more on loss and gain possibilities.

Zero-commissioning exerts a significant influence on investors. In a recent study, Hu (2021) explored zero-commissioning with a particular focus on the stock market. The study stemmed from the literature-based findings that stock market trends increasingly reflected the impacts exerted by zero commissioning on retail brokers. Findings obtained from the study revealed that liquidity cost merits associated with zero commissioning caused retail brokers to enjoy significant fiscal benefits. These findings are consistent with the results obtained by Eaton et al. (2021) after they undertook a study investigating the money-making phenomenon by stock market brokers. Eaton et al. (2021) defined stock price markups as the difference between the market price of a security held by a customer and the price held by a broker. The researchers indicated that stock price markups constituted one of the chief money-making avenues for brokers. The researchers discovered that zero commissioning was closely linked to additional fiscal benefits for brokers, especially regarding investment products.

Zero-commissioning is associated with commission cost reductions, eventually leading to retail trading improvements. Gao et al. (2020) conducted a study investigating the aspect of zero commission in retail trading. The researchers realized that zero-commission trading created efficiency in the stock market, providing a platform for the market's growth. A review of the literature by the researchers revealed that brokers that lowered their transaction costs by seizing the opportunity offered by zero commissioning attracted more investors than their counterparts. Further, market efficiency due to zero commissioning was found to impede monopoly creation, causing a balance between stock supply and demand. Findings from the study indicated that zero commission led to significant transaction fee reductions and facilitated reductions in pricing. These findings are consistent with the results obtained by Al-Awadhi et al. (2020) after they investigated the stock market expansion phenomenon. According to the researchers, expansions associated with the market were responsible for the availability of resource diversity, leading to increases in both company and individual participation. Therefore, the researchers focused on zero commissioning, wealth creation, and investor returns. Findings obtained from the study revealed that capital investment bases were closely linked to the zero commissioning phenomenon, causing improvements in resource availability, which led to a significant heightening of wealth creation.

Historical Timeline of Stock Trading and Commission Fees

There has been a shift in the stock exchange as individuals transition from traditional stock trading to online stock trading (Bansal, G. et al., 2019). This has resulted in the classification of stock trading into three categories. These categories are (a) stock trading before brokers, (b) stock trading with brokerage and brokerage fees, and (c) the recent variety of current online commission-free stock trading.

Stock Trading Before Brokers

Traditional stock trading takes the form of active trading. Active trading is buying and selling securities or stocks based on short-term movements. In active trading, profits are made from the price movements of a short-term stock movement. Traditional stock traders believe that to make any profit in the stock market, one must rely on the short-term trends of the stock. They can buy low and sell high during these movements, creating profit. Over the years, investors have analyzed and used the information gathered to determine the opportune investment time (Kerimbek et al., 2019). There were limited trading expenses during this period, as the stock market had not expanded. In addition, few countries participated in the stock market, resulting in limited securities trading. This made market analysis easier because the traders needed multiple securities to analyze.
Moreover, there was no need to have brokers in the market. As trade began to expand into different countries and thus attract more participants, the traders had additional tasks to perform. They were required to analyze other securities and determine their profitability. The work to be done increased in size and magnitude, resulting in the development of a market gap. This gap necessitated the emergence of brokers and brokerage firms to help the existing and new traders make better decisions.

Brokerage Trading and Fees

The stock market started as a small venture where individuals could purchase securities of different companies and, thus, provide capital to these entities. However, the stock market's success attracted more participants, including both the seller (i.e., the companies) and the securities buyers (i.e., the investors). This development enabled the stock market's expansion into many different countries, thus increasing the traders' work. Because most traders could not do all the research, a group that offered to analyze the market for them emerged. This was the beginning of brokerage trading and the introduction of brokerage fees. Brokerage fees refer to the amount a broker charges for his services (Goldstein et al., 2009). Brokers' services include advice on which stock to invest in, information on when the best investing time, loans, and other money lending services are available, and the execution of trading transactions. Several brokerage fees depend on the services offered (Li et al., 2019). First, some brokerage firms and brokers may require one to deposit a certain amount of money in an account with them. The broker requires this minimum amount for the individual to hold an account with them. Secondly, they may charge transaction fees for the trading transactions they execute on your behalf. There is a transaction fee as a percentage of the total amount transacted. This means that the payment increases as the amount transacted increases. A stock trade fee based on a flat fee is the amount

charged by brokers and is independent of the size and magnitude of the transactions. The amount charged is set at a fixed rate predetermined by the broker (Loertscher & Niedermayer, 2008). Based on per share, the stock fee is charged for every share traded and is determined based on the type of share, as some claims have a higher value than others. The brokers take advantage of the difference in share prices and use the opportunity to make extra income.

Current Online Commission-Free Trading

According to Devkota et al. (2021), ongoing technology advancements in the stock market have made Internet trading more practical. Online trading allows people to buy securities from the comfort of their own homes, which was helpful during the COVID-19 pandemic period of isolation and lockdowns. Furthermore, individuals can now evaluate the performance of any particular security without involving brokers. The Internet has simplified the research process and allowed for quick market analysis due to the introduction of trading bots and other artificial intelligence programs into the stock market. This technology can quickly process enormous amounts of data, saving money and time while ensuring the accuracy of its market analysis (Yong et al., 2017). Because consumers, artificial intelligence, and machine learning can efficiently execute most of the services brokers provide, brokers and brokerage firms have been compelled to diversify their fees. As a result, new brokerage fees have emerged based on the services provided. Online brokerage accounts have been introduced, and only those with a statement with the designated brokerage business are permitted access. Because customers must deposit the specified amount into these accounts before any services are provided, the fee for this account is comparable to the fee for the minimum deposit account.

Additionally, broker-assisted fees are becoming more common, which refer to the fees online brokers charge their clients for guidance. According to Meyrav (2019), online trading has

made zero-commission trading possible. Brokers charge commissions as compensation for any trades they complete. The commission charged has been eliminated because buyers and sellers can complete these transactions without a broker's assistance. Thus, individual brokers and brokerage firms have had to create new means of making money to cover their expenses. These tactics include offering loans to buyers with predetermined interest rates. They also alter management costs for individuals who have purchased shares of investment funds.

In conclusion, the evolution of the fintech sector over time can be ascribed to technological advancements, as shown in the changes in the stock exchange market over time. The stock market is one area where change has occurred and impacted the world. The three key developments—stock trading without brokers, trading with brokers and paying brokerage fees, and online no-commission trading—have led to several alterations. As mentioned in the research above, there have been variations in brokerage costs during different periods. It has been discovered that stock trading and the stock market accept change by adjusting to changes over time.

In the past, researchers have looked for several approaches to reduce the costs associated with trading stocks. For instance, research on efficient strategies for lowering the cost of trading had already started in the 1970s. According to Jain et al. (2020), most traders preferred low-cost stock trading operations to make the most money possible from their transactions. Conversely, Oxford Analytica (2021) discovered that efforts to employ lower costs for trading processes allowed for more trading participation and more active investments from retail traders. The research claims that the development of individual investor assets was made possible by the digitization of trading operations and the introduction of lower trading process expenses.

Eaton et al. (2021) also investigated the quality of the stock market, high-frequency traders, and investor engagement in zero-commission trading. According to the researchers, changes in Robinhood ownership had no bearing on future results, indicating that zero-commission dealers acted as noise traders. The authors claimed that market liquidity increased after commission-free traders entered the market, and investor-favored equities saw low return volatility (Eaton et al., 2021). The introduction of zero commissions has led to an evolution in stock market trading platforms, becoming more automatic, user-friendly, convenient, and reasonably priced (Nguyen, n.d.). Nguyen (n.d.) concluded that introducing zero-commission commerce increased the tendency to herd. This can be explained by how individuals arrange, assess, and keep track of their financial activities using a specific set of cognitive functions. Therefore, more people will likely engage in more trades, given that the traders' overall profit grows with lower commissions. The author of this study will employ psychological justifications to aid researchers in comprehending how reduced commissions affect consumer behavior. The advances of commission-free stock trading gained popularity with the Robinhood online brokerage platform, which was introduced in 2013 by Robinhood (Barber et al., 2022). Since then, zero-commission trading has made it easier for small investors to participate in the stock market.

The growth of Robinhood, a commission-free trading platform, has contributed significantly to the increase of stock market participation in numerous ways. For example, commission fees can be a significant challenge to entry for small investors, discouraging them from participating in the stock market. However, Robinhood's commission-free trading has eliminated this barrier, making it easier and more affordable for individuals to invest in the market (Steib, 2021). Furthermore, commission-free trading has made it more accessible for novice investors. Traditional brokerage platforms can be intimidating, with complicated fee structures and

obscure interfaces that can be difficult for new investors to navigate. However, commission-free trading platforms, such as Robinhood, have offered a more user-friendly interface, making it easier for new investors to participate in the market.

In addition, commission-free trading has also enabled investors to make smaller trades without incurring fees, making it more affordable for investors to experiment with different stocks and trading strategies, encouraging more individuals to enter the market. Overall, commission-free stock trading has significantly contributed to stock market participation by eliminating barriers to entry, making it more accessible for new investors, enabling small trades, and increasing investors' engagement in the market.

Determinants of Trading Behaviors

Competition and Internet

Competition has been deemed a chief determinant when it comes to trading behaviors. Xue et al. (2021) undertook a study investigating competition among brokerage firms and investors, focusing on commission cost. The researchers engaged in the study owing to the literature-based realization that unfair competition and domination by some firms made it challenging for investors to reap benefits associated with their participation. The researchers also noted that owing to the elimination of commission costs, fair competition was introduced, forcing the brokers to diversify their methods of getting clients. The findings obtained from the study were diverse. For instance, the researchers found that with the introduction of zerocommission trading, big firms' only metric and added advantage over individual and small firms were eliminated, implying that they now had an equal opportunity to convince investors to work with them. Additionally, the researchers discovered that companies that charged fewer trading fees had started acquiring more market power, establishing monopolies. These findings are consistent with the results obtained by Jiménez-Rodríguez (2019) after a study in which explorations were made regarding market anomalies in the stock exchange market. The researcher hypothesized that establishing trusts created market anomalies where the firms could not efficiently meet investors' needs. Findings obtained from the study revealed that investors charged higher prices and interest rates on their services, leading to market inefficiencies. Further, the study's findings revealed that monopolies make it difficult for firms to enter the market since they have a competitive advantage over the new firms.

The Internet has significantly influenced trading behaviors, especially in the stock market. Xiao (2017) engaged in a study exploring developments in stock market trading, focusing on elements associated with the Internet. The researcher realized that new transaction engagements were primarily related to internet usage. Further, the researcher noted that improvements in trading precision were closely related to algorithmic trading, which made online trading more attractive and efficient. Findings obtained by Xiao (2017) indicated that the ability of the Internet to facilitate Big Data usage heightened market flexibility, making it possible for individual brokers to benefit from increased income-making possibilities. These findings are consistent with the results obtained by Batmunkh et al. (2020) after they explored trading behaviors associated with social media platforms. The researchers hypothesized that trading targets associated with maximizing reach using social media could be achieved at relatively lower costs, which explains the impacts of the Internet on modern-day trading behaviors. Findings from the study indicated that brokers can expand their activities to areas that host most clients, enhancing possibilities for the globalization of stock trading through The Internet of Things (IoT).

Stock Market Participation

Income, Wealth, and Financial Literacy

Income, wealth, and financial literacy are chief determinants of participation in the stock market. Takyi and Bentum-Ennin (2021) engaged in a study in which they explored stock market participation. Mainly, the researchers focused on wealth, income, and fiscal literacy. The researchers hypothesized that stock market participation is dependent on the amount of wealth and income, stating that those earning low-income levels are limited since most of their income is absorbed in day-to-day transactions. Findings obtained from the study indicated that most people find it challenging to participate in the stock market because they need more funds to meet their transactions and speculative demand. Additional findings revealed the need for more sufficient funds has contributed to continued receipts of low-income and decreased investments. These findings are consistent with the results obtained by Thomas and Spataro (2018) after they undertook a study exploring the correlation between income, financial literacy, and stock market participation. The researchers noted that to participate in the stock market; one must know how it works and how one can manipulate it to work in their favor. Findings from the study revealed that apart from having the wealth and income requisites, financial literacy is essential in maximizing profits and identifying the best investment plan, given that information significantly influences the decisions being made in the market.

Trust

The element of trust plays a significant role in determining stock market participation. Zou and Deng (2019) undertook a study exploring trust in stock market participation, focusing on the possibility of being cheated while carrying out stock market participation. According to the researchers, trust is fundamental when it comes to how fiscal institutes present themselves to potential clients in ways founded on the need to establish trust. The researchers hypothesized that the element of trust induces investors to participate in the stock market by profligate expectation of returns. It also explains why rich people may decide to stay out of the market even though they can afford to pay participation costs. Findings from the study revealed that generalized and personalized trust determines the extent to which individuals are willing to participate in the stock market. These findings are consistent with the results obtained by Yenkey (2018) after investigating personalized and generalized trust about individual participation in the stock market. According to the researcher, generalized trust entails the fixed ideas people of one group have for people from another group, while personalized concerns the evolving relationship between two specific agents. Findings from the study indicated that a client would only accept vulnerabilities associated with the stock market in the presence of strong expectations of a positive future.

Other researchers in similar studies have further corroborated these findings. For instance, Thomas and Spataro (2018) conducted a study investigating the correlation between trust and individual participation in the stock market. According to the researchers, trust often determines the relationship between stock market firms and clients willing to participate. In contrast, only a few relationships are marked by complete trust and certainty of contractual completion. Findings obtained from the study indicated that generalized and personalized trust are often concerned with an individual's willingness to accept vulnerability on the grounds of positive expectations about the intentions or behavior of another in a situation characterized by interdependence and risks associated with investing in the stock market. These findings are consistent with the results obtained by Sivaramakrishnan et al. (2017) after they engaged in a study in which explorations were made into the trust element of stock market investment. The researchers hypothesized that trust and stock market participation were closely linked to fixed notions about gains and vulnerability. Findings obtained from the study revealed that given the variety of investment products in the stock market, trust was essential in determining whether individuals would be willing to participate in stock market transactions.

Cognitive Skills levels

The complexity of the financial decisions involved in stock market participation implies that individual cognitive skill levels determine participation. Dohmen et al. (2018) undertook a study in which they investigated the correlation between cognitive skills and participation in the stock market. The researchers hypothesized that the complexities involved in financial decisions associated with the management of equity portfolios require time, investment, and effort for the investors to familiarize themselves with the stock and arrive at justifiable decisions. Therefore, the researchers focused on studying the relationship between cognitive reflection and time and preference risks. Findings obtained from the study indicated that individuals with high scores on the Cognitive Reflection Test (CRT) were more patient and appeared to have been more willing to participate in stock market transactions. These findings are similar to the results obtained by Gomes et al. (2021) after they carried out a study seeking to relate financial decisions in the stock market to cognitive skills. The researchers noted that managing a portfolio involves a specific human capital investment in terms of the investor's effort and time to familiarize himself or herself with the concepts involved in investing and follow the market development to make justifiable financial decisions. Findings obtained from the study revealed that cognitive skills significantly determined stock market participation because information costs can be a

significant barrier to entry into the stock markets, and low cognitive abilities are likely to increase these costs further.

Awareness and Perceptions

Awareness of costs and perceptions regarding transaction costs determine the extent to which individuals will take part in the stock market. McDonald and Sandada (2018) undertook a study exploring the contributions of awareness and access to the Internet towards individual participation patterns in the stock market. The researchers' intention to engage in the study stemmed from the literature-based realization that individuals were increasingly becoming aware of zero commissioning. The researchers hypothesized that most individuals, because of their lack of awareness, continued to keep away from trading. Findings obtained from the study revealed that individuals who felt that they lacked sufficient knowledge and information regarding happenings in the financial market were less likely to participate in the stock market. These findings are consistent with the results obtained by Eaton et al. (2021) after they engaged in a study investigating zero-commission knowledge about the participation of individuals in the stock market. The discovery triggered the scholarly investigation that lack of awareness was the chief factor impeding individuals from participating in the stock exchange market. Findings obtained from the study indicated that owing to the inability to acquire sufficient information, awareness levels were still low and that stock market participation was yet to reach the anticipated levels.

The perception of investors determines whether they will participate in the stock market. Akhtar and Das (2019) conducted a study exploring the correlation between investor perceptions and their willingness to participate in stock market transactions. According to the researchers, investors who perceive high levels of uncertainty are more likely not to participate in the stock market owing to negative perceptions. Therefore, the researchers focused on exploring the phenomenon by considering investor perceptions related to welfare loss and exposure to equities. Findings obtained from the study revealed that investors are roughly twice as sensitive to losses as they are to gains and are thus likely to withdraw from stock market engagement when they have negative perceptions regarding profitable transaction completion. These findings are consistent with the results obtained by Choi and Robertson (2020) after they conducted a study investigating the extent to which investor perceptions determine stock market participation. Notably, the researchers focused on the equity premium element as a determinant of individual savings in the long run. Findings obtained from the study indicated that perceptions determine stock market involvement by aiding in evaluating the possibilities of losses and gains.

Transaction Costs and Zero Commission

Transaction costs and zero commission have been related to eliminating communication barriers and significant impacts on individual traders within the stock market. Conegundes and Pereira (2020) conducted a study investigating the impact of zero commissioning on the stock market. According to the researchers, zero commission significantly influences stock market trends due to the notable influences on individual traders. Findings from the study revealed that more individuals have started to engage in the stock market owing to doing away with transaction costs, which serves as the chief motivation factor since people are increasingly focused on expanding their online ventures. In addition, the researchers discovered that individual stock market traders have benefited from the availability of information regarding the market, increasing their trading possibilities because they are concerned about making informed and appropriate decisions. These findings were corroborated by Leippold et al. (2022) after they engaged in a study in which they explored zero commissioning relative to transaction costs and communication barriers. The study was driven by the literature-based realization that diversification of purchase and selling opportunities is determined by capital availability and wealth creation pursuit. Findings obtained from the study revealed that the equality of opportunity availed by transaction cost elimination reduced the threat effect of large firms, causing an increase in the number of individual brokers.

Investment fees and commissions significantly influence individuals' willingness to participate in activities associated with the stock market. Kogan et al. (2020) engaged in a study exploring stock market participation from a perspective informed by financial literacy, investment fees, and trading commissions. The researchers also explored the underlying causes of a shockingly low stock market participation rate. Initial findings from the study revealed that fiscal literacy issues, the inability to tolerate risks, and the inability of fiscal institutions to promote trust can be explored to gain insights into the stock market participation enigma. Additional findings obtained by Kogan et al. (2020) revealed that the wealth accumulation slowness and purchase power decline pose severe challenges for the fiscal sector.

Further, the researchers discovered that the fees charged by brokers to brokers as financial advisors determined the willingness of individuals to participate in the stock market. These findings are consistent with the results obtained by Yao et al. (2022) after they undertook a study investigating the correlation between stock market participation and commissions charged by brokers and financial advisors. Findings from the study indicated that before deciding to use a brokerage's services and to participate in the stock market, customers must confirm the cost schedule because commission rates differ amongst companies.

The Influence of COVID-19 on the Stock Market

The Covid-19 pandemic has also influenced trading behaviors. In a recent study, Baker et al. (2020) explored the influences of the pandemic on trading activities. The researcher observed that changes in trading behaviors were imminent since some companies were closed, their stocks were taken away from the exchange market, and due to COVID-19 restrictions, people could no longer meet face-to-face; hence, the occasional exhibitions and workshops about stocks were halted. Initial findings from the study revealed that trading behaviors changed drastically because the pandemic had led to experiences that decreased costs for investors who had put their capital in these stocks. Additional findings indicated that trading behaviors led to unprecedented growth in the stock exchange because most individuals who lost their jobs due to the pandemic turned to online trading. These findings are consistent with the results obtained by Mazur et al. (2021) after they engaged in a study investigating capital investment in the stock market in light of the COVID-19 pandemic. The researchers carried out the study after having observed that the diversion of funds by governments and other social institutions toward funding research and treatment programs affected every industry across the globe. Additionally, the researchers noted that although the crude oil and stock markets gradually returned to normal at a certain period, they remained unstable as the COVID-19 pandemic continued. Findings from the study revealed that trading behaviors associated with the price-stock nexus around oil prices led to declines of approximately 89% in COVID-19 compared to pre-COVID-19.

The pandemic's shock effects also influenced the financial stock market. Zhen et al. (2021) undertook a study seeking to determine the impacts of the pandemic on purchasing and selling patterns in the stock market. According to Zheng et al. (2021), people tend to buy more annuities and invest riskier assets under financial market shock. The researchers noted that the

world pandemic presented a period of significant economic shock with a halt to many activities, forcing many institutions to change their mode of operation. Findings obtained from the study revealed an unexpected phenomenon of increased household equity share value compared to retail investors' trading volume and domestic market capitalization experienced during the pandemic. Zheng et al. (2021) attribute the increase in household stock market participation to the inverse S-shaped probability distortion function during the economic downturn. These findings are consistent with the results obtained by D' Amuri (2022) after exploring the pandemic's uncertain effects on the stock market. As indicated by the researcher, people responded to this unusual time by investing more heavily in risky assets while reducing their savings in risk-free accounts by purchasing more annuities. Findings obtained from the study indicated that due to the shock effects, online trading platforms became the norm, and players started relying on the Internet for information about which stocks to invest in and which not to. D'Amuri (2022) concluded that this heavy reliance on online trading platforms significantly decreased participation among older individuals who opted for earlier retirement because they were not tech-savvy.

Own Trading with a Transaction Fee

Following the loss of livelihood after the COVID-19 pandemic outbreak, most people had to find alternative methods of making a living. Most people turned to the online trading business since they could comfortably trade their merchandise in the comfort of their houses, and thus, they were not endangering their lives by having to move up and down (Hsiao & Tsai, 2018). The online trading business involves clients looking for available stock over different exchanges, finding a broker with the best prices and trading experience and venturing into the business (Lussange et al., 2021). Online stock trading takes two forms: principal trading and Agency trading (Venkataraman, 2019). In principal trade, the inventory belongs to the broker, and he/ she completes the trading business on behalf of the client at a fee.

On the other hand, agency trading involves investors trading amongst themselves or with other brokers (Arifin & Soleha, 2019). It may also assume the form of clients of different brokers trading amongst themselves. Thus, the brokers help the client identify the clients willing to be in the opposite direction, either buying or selling (Venkataraman, 2019). The party on the opposite side must agree on the stated price for the transaction. Once all policies of the trade have been met, the transaction is completed and documented on the exchange (Lussange et al., 2021). This process is followed by a clearing step matching the buys and the sales executed by a larger body.

Venkataraman (2019) explained that most clients prefer participating in agency transactions whereby they are directly involved in the trade, unlike in the principal trade, whereby a broker completes the trade on behalf of an investor at a fee and a commission per every trade. In agency trade, there are no transaction costs or commissions involved. With no transaction costs and commissions involved in the trade, most people have started engaging in the vice to make money (Arifin & Soleha, 2019). Everyone is after wealth creation; thus, elimination of the transaction cost increases their ability to accrue more wealth, thus being motivated to participate in the trade. Kogan et al. (2020) affirmed that transaction costs and commission fees significantly impacted individuals' willingness to participate in the online stock exchange market as they felt their earning rate was significantly reduced by the fees they must pay.

With the new trend of individuals trading with transaction fees, people are now highly motivated to find details about financial literacy. Research has proven that financial literacy has pushed stocks up for people's involvement in the stock exchange market (Blankespoor et al.,

2019). Other control variables noted to influence involvement in the stock exchange business include age, gender, race, and educational level, with men taking the lead in participation in the business (Venkataraman, 2019). Investors benefit highly from online applications such as the Robinhood application to find information regarding financial literacy and also benefit by participating in the financial market at a low cost (Arifin & Soleha, 2019). However, the ease of accessing financial markets presents investors with the challenge of dealing with financial risks involved in the vice, thus stressing the need for investors to sort for financial literacy.

To increase financial literacy amongst investors, countries have created platforms that teach the basics of investing in the stock exchange market to learners of higher learning institutions and provide a virtual platform whereby they can practice the acquired skills by investing for a specified period (Venkataraman, 2019). Other engagements include annual competitions where participants compete for specific awards (Arifin & Soleha, 2019). All these attempts are geared towards increasing stock market participation by individual investors at a profit. According to Blankespoor et al. (2019), the current observed trend of individuals increasingly doing their trading with a transaction fee in the stock exchange market can be attributed to the heightened financial literacy that investors have accrued over the years, enabling them to evade the risks associated with the stock exchange market and make decisions that enable them to acquire wealth.

Commission-Free Stock Trading

Transaction costs refer to all the expenses incurred in purchasing and selling goods or services. In the financial sector and the stock market, transaction costs refer to the commissions earned by brokers or paid by the investor (Jones, 2002). Commission-free stock trading or zerocommission occurs when a broker does not charge their fees for executing a trade.

41

Commission fees charged by brokers have been one of the main barriers to SMP (Bogan, 2008). Commission fees are the most significant contributor for the lower-than-expected individuals SMP (Bogan, 2008; Fischer & Jensen, 2015; Greenstone et al., 2004; Guiso & Japelli, 2005; McDonald & Sandada, 2018; Shum & Faig, 2006). Fischer and Jensen (2015) explained that lower-than-expected SMP is due to stock market frictions, such as transaction and market entry costs.

According to Colliard and Foucault (2011), investors are always better off with zero trading fees than fees set by a profit-driven monopolist matchmaker. Concerning stock trading and zero commission, the literature has indicated that investors consider zero commissioning a chief advantage because they do not incur any cost when their business runs in both primary and secondary stock trading (Feng et al., 2020; Zhou et al., 2021). Zero commissioning was found to be associated with retail investor benefits (Eaton et al., 2021; Hu, 2021).

Transaction costs impact the number of returns the investor receives if they decide to invest in the stated stock or security. Transaction costs diminish returns, and, over time, high transaction costs can result in thousands of dollars lost from the costs themselves because the costs reduce the amount of capital available to invest (Chan et al., 2009). Fees, such as mutual fund expense ratios, have the same effect. Different asset classes have varying ranges of standard transaction costs and fees. All else being equal, investors should select assets whose costs are at the low end of the spectrum for their types.

Hu (2021) asserted that introducing zero-commission trading by eliminating commission costs improved retail trading and increased stock market efficiency. This situation provides a platform for the market's growth. Efficiency has been established by eliminating the metric investors use to differentiate between brokers (Lim & Brooks, 2011). Previously, investors had a

high affinity for brokers whose transaction costs were lower than those of other brokers. Market efficiency hinders the creation of monopolies and ensures that the available stock supply meets the stock demand in the market. Transaction costs are included in the stock price, leading to increased stock prices. Zero-commission trading reduced these transaction fees and the stock price respectively (Hu, 2021). This has, in turn, increased the number of investors. In addition, the total demand in the stock market has increased over time. Expansion of the stock market creates a vast pool of resources for companies because they can now sell their shares to many people and, thus, gather a larger size of finances. The introduction of zero-commission trading has expanded the capital base for investment. As a result, more resources are made available to facilitate wealth creation (Hu, 2021). Transaction costs reduce the return investors earn, meaning the possible amount available to be reinvested in the market is reduced. In addition, investors with little capital are not allowed to invest, as their money is insufficient to meet the commission cost and make the investment.

According to Liu and Zhu (2009), zero commission has impacted the stock market and individual traders. Eliminating transaction costs has presented the opportunity for individual trades to expand their business, as they have more finances. In addition, they have access to market information and can, therefore, rely on their analysis to make informed decisions. In addition, they have been allowed to create and store more wealth because they can now purchase more significant amounts of their preferred stock or even diversify their purchase (Liu & Zhu, 2009). With the elimination of transaction costs, individual brokers are given an equal opportunity to carry out their activities without feeling threatened by larger firms. Additionally, they have an equal opportunity to be chosen by investors to execute trades now that the metrics investors use to select brokers have been eliminated.

Accessibility to Online Trading Platforms and Smartphones

Access to online trading platforms and smartphones facilitating stocks and investment transactions can influence SMP. With the recent launch of trading platforms without trading commissions and a minimum account balance restriction, a new era of SMP has begun (Eaton et al., 2021). Eaton et al. (2021) found that investors drawn to zero-commission platforms are often younger and less wealthy than retail investors from previous decades.

The researcher conceptualizes and measures accessibility to online trading platforms and smartphones through a series of survey questions asking respondents to indicate how much access to online trading platforms or smartphone access has impacted or will influence their decision to invest in the stock market. According to the literature, the Internet is considered one of the main barriers to stock market entry as it can reduce friction costs and increase SMP (Bogan, 2008; Guiso et al., 2016). There has been a shift in the stock exchange as individuals transition from traditional stock trading to online stock trading (Bucher-Koenen et al., 2021). Another benefit to the increased use of the Internet in reducing stock transaction costs is the indirect effect the Internet has on the reduction of information costs. Online trading platforms and easy smartphone access have enabled investors to perform their analysis and use the information gathered to determine the opportune investment time (Kerimbek et al., 2019). The Internet offers sufficient information for players in the stock market to determine areas that provide an opportunity for growth and expansion (Kraemer & Dedrick, 2002).

Kraemer and Dedrick (2002) asserted that the Internet of Things (IoT) had revolutionized the speed at which investors reach decisions. There are numerous platforms for individual brokers and investors to compare the available market data and the price offerings around the globe. This allows them to determine which market serves their best interests. The Internet

44

eliminates the entry barrier and creates a level playing field, which should encourage stock participation and ownership (Sebastiao, 2010; Shum & Faig, 2006). According to Bogan (2008), the increased availability of the Internet has mitigated three of the proposed impediments to lower-than-expected stock market participation: transaction costs, limited access, and cost of information.

Income effect on SMP

Income, wealth, and financial literacy determine stock market participation. To participate in the stock market, one should have a minimum disposable income beyond what is needed for daily survival. Takyi and Bentum-Ennin (2021) conducted a study exploring SMP, which focused on wealth, income, and fiscal literacy. The researchers hypothesized that SMP is dependent on the amount of wealth and income, stating that those earning low-income levels are limited, as most of their income is absorbed in day-to-day transactions. Findings obtained from the study indicated that most people find it challenging to participate in the stock market because they need more funds to meet their transactions and speculative demand. Additional findings revealed the need for more sufficient funds has contributed to continued receipts of low-income and decreased investments. These findings are consistent with the results obtained by Thomas and Spataro (2018), who explored the correlation between income, financial literacy, and SMP. The researchers noted that to participate in the stock market, one must know how it works and how to manipulate it to work in their favor. The findings revealed that apart from having the wealth and income requisites, financial literacy is essential in maximizing profits and identifying the best investment plan, given that information significantly influences the decisions being made in the market.

Financial Knowledge and Awareness

Financial awareness refers to individuals' knowledge of investment options, while financial literacy refers to their knowledge and understanding of basic personal financial principles and investment concepts (Sivaramakrishnan et al., 2017). Different definitions of financial awareness exist. Huhmann and McQuitty (2009) defined financial awareness as financial numeracy. Guiso and Japelli (2005) found that a lack of education and financial awareness contributes to the lack of individual participation in the stock market. The researchers considered barriers to SMP to include a need for more awareness of investment options, such as stocks and mutual funds that are available to people. Guiso and Japelli (2005) suggested that current individual stock ownership may double if people are aware of stocks. Thomas and Spataro (2018) found that financial literacy, the level of human capital, and social interaction have a positive and significant effect on SMP. According to the researchers, household stock market participation significantly impacts savings, economic development, and performance.

Gender and SMP

The wage gap between men and women in SMP is apparent in many situations. In general, men are more likely to invest in the stock market than women, as shown by Gebre et al. (2020). Cultural, social, and economic power systems may assign men and women differing reproductive and productive obligations, affecting their market participation. In underdeveloped countries, for instance, women account for around 43 percent of the agricultural labor force. Women's agricultural output is often lower than men's due to limited access to training, land, labor, extension services, technology, and finance. Due to these shortages, fewer women participate in the economy (Gebre et al., 2020). Furthermore, the gender gap in SMP has been attributed to several factors, including a lack of risk tolerance, financial illiteracy, and selfassurance.

Avoidance of risk is a significant contributor to the gender gap in SMP. Because they are less willing to take risks than men, women are underrepresented in the stock market. The stock market is where men dominate because women are less likely to take financial risks. In addition, Niu et al. (2020) note that households in low-income countries may be hesitant to take financial risks due to apprehensions about having inadequate insurance coverage because of the absence of social safety nets and the lack of a mature formal insurance industry. To succeed in SMP, financial literacy is also essential. Women consistently score worse on financial literacy tests than men (Goyal & Kumar, 2020). As a result of their lower financial literacy and greater aversion to taking risks, women are less likely to invest in the stock market and have less confidence in their own investment decisions when they do.

Effect of Age on SMP

Age also has a role in determining SMP. Kaustia et al. (2023) note that in the rapidly expanding industry of house financing, insufficient stock market participation has been the primary concern. Younger individuals have a higher stock market participation rate than older ones. For instance, people between 18 and 34 are more likely to engage in stock trading than those aged 55 and above (Yu et al., 2020). The same holds for the stock market, where investors under the age of 35 outnumber those over the age of 55. Many factors, including socioeconomic status, education level, and familiarity with financial matters, contribute to the generation gap in SMP.

Income is a critical issue in SMP and impacts people of all ages regarding how they participate in the stock market. People who make more money tend to invest more in the stock

market than those who make less. This is so because those with higher wages may have the financial freedom to experiment with different strategies. Additionally, the level of education also affects SMP. People with outstanding education are likelier to invest in the stock market than those with less (Frisancho, 2019). This is true since learning about money and investing inspires optimism among the populace. Financial literacy is critical in SMP. When comparing people with different levels of financial literacy, those with higher levels are more likely to engage in stock trading.

The SMP affects individuals of all ages and sexes, making it essential to financial inclusion. Age and gender are significant factors that affect SMP. Women are statistically less likely to participate in the stock market than men due to a combination of factors, including a lower tolerance for risk, less familiarity with financial matters, and lower self-esteem. In contrast, younger individuals are more likely to invest in the stock market than older ones, which may be attributable to income, education, and financial literacy. The gender and age gaps in SMP may be reduced if the government and financial institutions work to increase women's and seniors' financial literacy and self-assurance.

Summary

The study investigated the impact of commission-free stock trading on individual stock market participation. The prospect theory by Kahneman and Tversky (2013) was used to inform the study's theoretical framework. The theory was deemed suitable because it embodies assumptions related to fiscal decisions made by individuals based on the precepts of certainty, isolation effect, and loss aversion (Kahneman & Tversky, 2013), thus making it expedient to attain the study objective. Regarding stock trading and zero commissioning, the literature indicates that investors consider zero commissioning a chief advantage because they do not incur

any cost when their business runs in primary and secondary stock trading (Feng et al., 2020; Zhou et al., 2021). Moreover, zero commissioning was associated with retail investor benefits (Eaton et al., 2021; Hu, 2021). On the other hand, trading behaviors were found to be extensively determined by commission cost charges (Ifeanyi & Iwiyisi, 2019), transaction costs, and trading fees (Eaton et al., 2022; Osipovich, 2020), remote work (Lund et al., 2020), capital and wealth creation (Fiordelisi et al., 2020; Metghalchi et al., 2019), as well as competition and the Internet (Batmunkh et al., 2020; Jiménez-Rodríguez, 2019; Xu et al., 2021). In matters related to stock market participation, existing studies revealed that aspects such as income, wealth, and financial literacy (Thomas & Spataro, 2018; Takyi & Bentum-Ennin, 2021), awareness and perceptions (Eaton et al., 2021; McDonald & Sandada, 2018), and transaction costs and zero commissioning (Conegundes & Pereira, 2020; Leippold et al., 2022) determine behaviors by individuals and brokers. The influence of COVID-19 was also explored, with findings revealing that the pandemic significantly impacted the stock market (Baker et al., 2020; Mazur et al., 2021). Limited research has examined the market impact of zero-commission stock trading since its introduction. This study contributes to the field of SMP and initiates discussions for future research, bridging a significant research gap.

Chapter 3 focuses on the methodology employed to investigate zero-commissions impact on SMP.

Chapter 3: Research Methodology

In this chapter, the research methodology used to investigate factors influencing stock market participation and to determine relative contributions of these factors (commission-free stock trading, accessibility to equity trading platforms, income, financial knowledge, awareness, and financial stress are detailed. The section contains the research method and design used, research questions and hypotheses, population and sample data source, data collection, instrumentation, operationalization of variables, reliability and validity, and data analysis.

Purpose of the Study

The purpose of this quantitative cross-sectional predictive study was (a) to investigate the relationship between commission-free stock trading, access to smartphones and trading apps, income, financial knowledge, financial stress, gender, and age on individual SMP (b) Determine relative contribution of commission-free stock trading, access to smartphones, income, financial knowledge, financial stress, gender, and age on individual SMP. The study sought to answer the following research questions: What is the relationship between Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)? Research Question *2*. What is the contribution of Zero-Commission stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)?

Answering the research questions provided insights onto how the elimination of major entry barriers to the stock market (trading fees and access to online trading platforms) has impacted the stock market by attracting younger and less wealthy investors, as well as the relative impact of the factors on SMP. The research study adds to the literature by examining the factors that affect individuals' participation in the stock market, including commission-free trading.

The hypotheses proposed by the researcher to answer the research questions were:

H1₀: There is no significant relationship between commission-free stock trading, Access to smartphones, Income, Financial Awareness, Gender, and Age on Stock Market Participation (SMP).

H1_A: There is a significant relationship between commission-free stock trading, Access to smartphones, Income, Financial Awareness, Gender, and Age on Stock Market Participation (SMP).

H2₀: There is no significant unique contribution of Zero-Commission stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP).

H1_A: There is a significant unique contribution of Zero-Commission stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP).

Research Method and Design

Participants answered survey questionnaires for this quantitative cross-sectional predictive study. A quantitative technique was used because the research questions required identifying statistical predictive relationships between variables, which could not be done in a qualitative study. The researcher chose a cross-sectional relationships study method to measure the strength and predictive relationships between variables such as participants' perceptions of the zero-commission stock trading environment and consumers' attractiveness to participate in the stock market (SMP). A disadvantage of a correlational design is that, unlike experimental

methods, it is more difficult to draw conclusions about cause and effect (Rezigalla, 2020). Primary data was used in this study, and study participants answered questions about their understanding and perception of the stock market, how commission-free stock trading potentially influenced or will likely influence their decision to invest in the equity or stocks market, and how the elimination of entry barriers impacted their perception about stock market participation. Survey participants answered carefully designed questions, which were analyzed to investigate commission-free stock market trading and its impact on individual participants. Primary data collection was critical because it allowed the researcher to frame survey questions to answer specific research questions that could not be obtained using the secondary data method. Research participants received questionnaires to complete to collect the data. Using primary data for the research allowed the researcher to pose direct questions to respondents, directly answering the research questions, instead of using secondary data intended for different purposes. Primary data is also a reliable research technique for obtaining facts from different statements. The use of primary data in new research adds to the existing store of social knowledge (Hox & Boeije, 2005), which in turn is made available for reuse by the research community.

Population and Description of Research Participants

The goals of this study were (a) to investigate factors influencing SMP, including commission-free trading, and (b) to determine relative contributions of the predictors (commission-free stock trading, accessibility to equity trading platforms, income, financial knowledge, and awareness to stock market on individual SMP). To investigate participants' attitudes and perceptions towards commission-free stock trading and how the attitude impacts their participation in the stock market, participants were drawn from a population with similar characteristics to the recent U.S. population census. The population for the research included

U.S. residents who currently either participate in the stock market or not. Adult populations in the United States who were 18 years of age and older were surveyed to answer questions of interest to the researcher. The survey was designed to have similar characteristics to the recent United States population census by applying quotas to survey respondents to ensure a broader representation of samples and to avoid skewness of the data. Quotas were placed for gender, age, income, and region to match U.S. recent census data. Qualtrics' data recruitment services were used, and study participants were chosen from the Qualtrics panel using convenience sampling techniques.

Recruitment of Participants and the Role of Qualtrics.

Qualtrics' recruitment services and Qualtrics Panel were used to collect the study's data. Qualtrics services for data recruitment provided several benefits, including timely data collection that helped the researcher avoid study delays. Additional benefits included using quotas to reach a larger audience geographically and avoiding data being skewed to one gender or age. Furthermore, using Qualtrics's services to recruit survey participants allowed the survey to reach a larger audience and shortened the recruitment time to a few days.

Participants taking part in this study from the Qualtrics panel received incentives, with a monetary value equivalent not exceeding five dollars (\$5) for a completed survey. Of the \$5 fee paid by the research for a completed survey, participants received 35%, with Qualtrics using the rest for administration costs. Qualtrics' incentives paid to survey respondents are based on the length of the survey and for a completed survey. Given the amount of money received by survey respondents was to be at most \$5, the researcher was confident that the incentive paid to survey respondents was not material to cause respondents' bias.

Qualtrics panel members received invitations to participate in the survey via email, inapp notification, SMS, or a prompt on the appropriate survey platform chosen by the member. The survey invitations were extremely straightforward and generic. The link to the survey directed the responders to the study and highlighted the reward offered for participation.

Participant recruitment for Qualtrics comes from various channels, such as social media, member referrals, targeted email lists, gaming websites, customer loyalty web portals, and permission-based networks. Before joining a panel, members of consumer panels often have their names, addresses, and dates of birth verified by a third party. B2B participants are additionally subject to quality control checks, including LinkedIn matching, phone calls to the participant's workplace, and other third-party verification procedures (e.g., TrueSample, RelevantID, Verity). According to their service agreement, Qualtrics has security to monitor the sample stream and panelist activity closely and places weekly and monthly limits and quotas on participants' activities. Thus, participants cannot engage in responding to surveys with the intent of making significant money.

Determination of Sample Size

The target sample size for the study was determined based on a proposed regression analysis. The analysis included seven predictors: commission-free stock trading, accessibility to online trading platforms, financial knowledge, income, gender, age, and financial stress. Three approaches were considered to determine the required sample size for the study, and the largest sample size among them was chosen. Among the approaches used to calculate the required sample size for the study was G*Power, based on the study's planned regression analysis (Faul et al., 2020). Under the assumption of a medium effect size of 0.15, an alpha of 0.05, a power level of 0.80, and seven predictors, the calculation indicated the minimum required sample size was 98. According to Bujang et al. (2018), a general guideline for sample size in regression is 100 + 50 times the number of predictor variables. The suggested sample size according to this method for six predictor variables is 450. Bujang et al. (2018) further explained that a sample size of 500 can generate estimates that may be applied to large populations. Based on the calculations, the proposed sample size was 500, with an actual sample size of 495 used for the study.

Operationalization of Variables

The participants in the study completed questionnaires and submitted them to the Qualtrics website. The researcher then downloaded and compiled the data from the Qualtrics website for review and analysis. The study constructs were measured using participants' answers to specific questions.

Dependent Variables

The study's dependent variable was stock market participation (SMP). This study defines SMP as individuals' investment or participation in stocks, a self-directed retirement account/employer-directed retirement account/Other retirement account, and stock mutual fund. Individual's participation in the stock market was either active (i.e., actively involved in the management of their investment) or passive (i.e., no involvement at all). Participants answered three questions which were used to construct the dependent variable (SMP). Three variations of the survey questions asked participants to indicate the extent of their agreement with the statements "I currently participate or invest in stocks, stock mutual funds, and retirement account."Answers to these three questions were used to measure stock market participation (SMP). A five-point Likert scale format was used with 1 = Strongly disagree to 5 = Strongly agree. Mean scores for the variables based on the five-point Likert scale questions were computed for each variable.

Independent Variables

The independent variables in the study were defined as follows:

Commission-free stock trading: This is where a trader buys or sells stocks without paying a trading fee. *Accessibility to smartphones:* The availability of online trading platforms, smartphones, and apps to facilitate stock trading. *Income:* Income in the context of the study refers to individuals' annual gross income. *Gender:* In this study refers to individuals' gender orientation and can either be male, female, or non-binary. *Age:* Refers to individuals' chronological age from birth to the current year. *Race* is defined as people sharing physical characteristics, such as skin color and facial features. *Education level:* This is defined as the level attained in formal education in an institution of study. Financial Stress is difficulty meeting basic financial commitments due to a shortage of money. While Financial knowledge and awareness refers to individuals' knowledge of investment options and ability to make basic financial calculations, balance basic check books, and understanding of how interest rates affect investment.

Participants' perceptions of independent variables, including commission-free stock trading, accessibility to trading platforms, financial knowledge, financial stress, income, gender, and age, constituted the independent variables. Additional demographic questions such as race and education level of participants were collected and formed part of the study's analysis. The study's premise was based on participant's perceptions and attitudes toward stock market participation. For the independent variables, participants answered the survey questions based on their agreement or disagreement with questions intended to measure the given constructs. For example, participants were asked to what extent they agree or disagree on a given statement, with answer choices on a five-point Likert scale from 1. Strongly disagree to a 5. Strongly agree. To measure commission-free stock trading as an example, participants indicated their agreement or disagreement with the statement "*Commission-free trading has made it easier to invest in the stock market*" and "*I have a positive overall opinion of commission-free trading*."

Similarly, access to online trading platforms or smartphones was measured with participants' agreement or disagreement to the statement "*I believe commission-free trading has made investing in the stock market more accessible to the general public*" and "*I prefer to use online trading platforms or smartphone to trade stocks or make investments*". A five-point Likert scale indicated agreement or disagreement with the statement. For this study, financial knowledge and awareness refers to individuals' understanding of their available investment options and how to use them. The following statements were asked to measure participants' financial knowledge and awareness in the stock market. "*I feel confident in making stock investment decisions*." and "I *stay informed about the stock market or investing through social media or financial news*." Participants also answered, "How would you assess your investment *knowledge in the stock market*?" and participants picked from pre-determined answers.

Participants indicated their current annual gross income in a pre-determined income range. Financial stress variables were also used to measure an individual's financial situation. Participants answered three questions used to determine financial conditions or ability to participate or invest in the stock market. The financial stress variable goes beyond income as one can have a higher income and be financially stressed and, therefore, cannot participate in the stock market as defined in this study. Participants agreed or disagreed with the following questions: "*I frequently find myself just getting by financially and living from one earnings cycle to the next or from one paycheck to paycheck?*" "*I am not confident that I can find the money to pay for a financial emergency that costs about \$1,000,*" and "*I feel stressed about my finances in* *general.*" Participants self-reported their age by choosing from a pre-determined age range and reported on their gender by choosing from the options male, female, and non-binary. Finally, the demographic survey questions covered race and education, which participants chose from a given list.

Reliability, Validity, and Researcher Bias

The researcher created the instrument for the study due to a lack of existing survey instruments for the variables of interest. The reliability of a study refers to the degree to which the methods used by researchers can provide stable and consistent results. Reliability helps determine the study's replicability and consistency of findings, where a high level of reliability indicates that the study can be effectively replicated. Hays and Revicki (2005) defined reliability as a measure that yields the same results or scores every time the measure is repeated under the same conditions. Therefore, to ensure the reliability of this study, the instruments used were evaluated using the internal consistency method. The internal consistency method assessed the correlation between multiple items or questions in the survey intended to measure the same construct or yield the same response. The reliability of the research was conducted using the internal consistency method. Under the internal consistency method, the Cronbach's coefficient alpha scores of the survey responses for the constructs or independent variables (zero commission, access to smartphones, financial knowledge, financial stress) were calculated to ensure the questions that constituted each construct or variable had an acceptable Cronbach's coefficient alpha value. The Cronbach's coefficient alpha values for mean zero commission was 0.82, access to smartphones was 0.73, financial knowledge was 0.81, and financial stress was 0.74. According to the literature, Cronbach alpha values above 0.70 or 70% are considered good, 0.8 and above are better, and 0.9 and above are best. Cronbach's alphas for the constructs in this study were 0.70 and above and therefore considered good for the reliability of the study.

Prior to data collection for the main study, the research instruments went through a validation process. The validation process included a pilot test of the survey questions. The researcher performed a pilot study, with survey questions having the same characteristics as the main study, by reaching out to the public using the same convenient sampling method. Responses from 30 participants were solicited, and their feedback was evaluated to ensure the appropriateness of the questions and address any ambiguities or misconceptions in the questions. While there was no meaningful feedback from pilot participants, three questions from the pilot study that required reverse coding were revised for the full launch of the survey to avoid reverse coding those three questions for the analysis. The pilot was opened to everyone who meets the age criteria of 18 years and over. The results of the pilot study were reviewed before the final questionnaires were sent to participants for the full launch of data collection.

Validity refers to how well the instruments used in a study measure constructs they are intended to measure. The researcher proposed to use available validation approaches for the pilot study and used construct validity to address any validity concerns. Content validity of the questionnaires was used by reviewing respondents' answers to the questions for consistency. Expert opinion from a panel of methodological experts, including research committee members, was engaged to provide feedback on the appropriateness of the questions prior to administering the pilot study. The same research methodology experts were consulted on the review of the responses from the pilot study for any signs of ambiguity in the questions, and the feedback received included a revision to survey questions to avoid reverse coding. Based on expert feedback, the researcher made modifications to the questions from the pilot study and addressed any validity concerns.

Data Collection Plan and Procedure

Participant recruitment was facilitated through Qualtrics. Qualtrics Panel was used for gathering the study's data collection, and those who participated in the study received incentives of less than \$2 to answer 26 survey questions that took an average of 4 minutes to answer. Prior to the full launch of the survey, a pilot study was conducted using the Qualtrics platform and panel. The pilot was opened to everyone who meets the age criteria of 18 years and over and resides within the U.S. 30 participants responded to the pilot survey with their feedback, which was analyzed to help shape the full launch of the survey. Responses to the pilot survey were used to calculate the study's reliability and validity. Cronbach's coefficient alpha values were calculated for the study's constructs with values between 0.73 and 0.82. Three questions from the pilot survey had to be restated to avoid a negative recoding of the responses during the final launch. The proposed sample size for the study was 500, and 495 participants responded to the survey. The survey was open to participants for four days and closed after obtaining the required sample size. Of the 495 responses, there were no missing data, and 2 data were removed from the analysis due to their insignificance for analysis.

Data Analysis Procedures

The researcher downloaded an electronic spreadsheet file containing the results of the online survey from the Qualtrics platform in an Excel format and imported it into a statistical software program (SAS® Studio OnDemand for Academics) for analysis. The downloaded data from the survey instrument did not contain any personally identifiable information. The survey data was stored in the researcher's password-protected computer, and a copy of the Excel file

was also saved in the researcher's folder on Franklin University's cloud system, which is only accessible by the researcher with the use of a password.

The researcher began checking the data for any missing data and used tools within Excel to score the data. The continuous variables were coded from a five-point Likert scale of 1-Strongly disagree to 5-Strongly agree for use with student (SAS® Studio OnDemand for Academics). The scores for survey questions that formed a given construct were computed using an average formula within Excel, after which the researcher uploaded the scored data into (SAS® Studio OnDemand for Academics) for analysis. For example, the mean score for questions 6,7 and 8, intended to measure the variable for stock market participation (Mean SMP), was computed next to question 8. The same exercise was repeated to calculate the mean scores for access to smartphones (Mean AccessToSmartPhones), Commission-free trading (Mean ZeroCommission), financial knowledge (Mean FinancialKnowledge), and financial stress (Mean FinancialStress). Categorical variables such as age, gender, and income groups were also coded and scored appropriately before uploading to SAS Studio for analysis.

A descriptive statistic was generated and provided for each variable. The descriptive statistics summarized the participants' characteristics, including demographic variables gender, income, age, and ethnicity and the predictor variables. Frequency and percentage information were computed for all categorical variables.

A predictive multiple regression analysis was run to address research question 1. Stock market participation (SMP) is the dependent variable in this analysis. The independent variables included perceptions of commission-free stock trading, smartphone access, financial knowledge, financial stress, income, gender, and age.
Linear Regression Assumptions Testing

Linear regression assumptions were tested on the data to ensure that linear regression assumptions were not violated and that parameter estimates were unbiased. The linear regression assumptions were also checked by selecting different tests as part of the regression analysis. Individual plots and statistics from the regression outputs were used to verify the validity of the assumptions. The data was checked to address multicollinearities using variance inflation factors to estimate the predictors.

From the regression output, the variance inflation factors for the parameter estimates were all less than 3, indicating a lack of multicollinearity among the variables. In general, a variance inflation factor of less than 10 is considered an acceptable level of multicollinearity among the variables. The parameter estimates were also confirmed to have appropriate directions. For example, parameter estimate for income was expected to have a positive relationship with stock market participation by theory, while financial stress, however, was expected to have a negative relationship with stock market participation, and both parameters were confirmed from the regression output.

An F-test was used to determine the statistical significance of the overall regression model. For the analysis of coefficients, individual t-tests were computed to determine the significant contributions of the predictors. The coefficient of determination (R-squared) value was used to determine the overall regression model's fit to predict an outcome. An alpha level of 0.05 was used to evaluate the significance testing level. The null hypothesis may be rejected if perceptions of commission-free stock trading or any of the predictors are significant predictors. A semi-partial correlation was computed from the regression. To answer Research Question 2, What is the contribution of Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)? A semi-partial correlation analysis was used to evaluate the contributory impact and direction of the individual predictors. A semi-partial correlation measures the correlation between the independent variables and the dependent variable (SMP) after controlling for the influence of the other variables. With the use of a t-test, the null hypothesis may be rejected if at least one of the predictors (i.e., perceptions of commission-free stock trading, access to smartphones, financial awareness, financial stress, income, age, and gender) was found to be significantly correlated to the dependent variable SMP. P values were used to determine the statistical significance of the independent variables (predictors). Suppose the p-value is less than or equal to the 5% significance level. In that case, it can be concluded that there is a statistically significant association between the SMP and the independent variables (predictors).

Data Security Plan

Before any data was collected, the Institutional Review Board (IRB) examined and approved all study protocols. The study posed no additional hazards to participants than they would otherwise encounter in their daily lives because the research was carried out through a survey using an online questionnaire. The study participants were provided with an informed consent form as part of the survey and had to provide consent to continue to take the survey. The following were included in the informed consent: the goal of the study, the type of questions that were asked, the risks and advantages of the research, and the participants' rights to continue or stop the survey at any point in time. Only respondents who provided permission and agreed to the informed consent took part in the survey. For eligibility to participate in the study, participants had to undergo initial screening and indicate their age as 18 years or older. Survey participants had their privacy protected, and no information about them was given to any parties. No personal information was gathered as part of the survey, and the gathering of information was handled in the strictest confidence to guarantee participants' anonymity. The survey data was encrypted and coded by the researcher before being stored in password-protected computer analysis. The data encryption helped reduce the dangers of the data being obtained by unauthorized parties.

Data security was of utmost importance to the researcher. From the first point of contact with survey participants to the end of the research, participants' data were encrypted and stored in a secure environment. Qualtrics provided data recruitment services by collecting participants' data and storing it in its secured cloud.

Qualtrics database does not hold sensitive or confidential panelist information; however, Qualtrics does hold all survey responses in its data centers. Qualtrics data centers utilize many security measures, including database access restrictions requiring authorization. According to Qualtrics, all computer equipment (servers, SANs, switches, routers, etc.) is redundant and is located in secure, environmentally controlled data centers with 24/7 monitoring. Web traffic does not directly access the database, and database requests are reversed proxy via an application server to the database. All information is secured via industry-standard firewalls and stringent IT security policies and procedures. Qualtrics utilizes industry-standard web application firewalls and DDOS protection. Qualtrics also leverages sample partners who are meticulous in their multiple levels of security that include redundant data centers, secure servers, encryption which includes one-way encryption, numeric IDs, secure .NET platforms, security clearance, industrystandard firewalls, 24/7 monitoring of data centers, confidentiality agreements, and physical, electronic, and managerial procedures. Qualtrics sample providers leverage strict confidentiality programs by incorporating tools that do things such as disabling screenshots and circumventing the saving of images, video, or audio files. In addition, the forwarding function, copy-pasting, and web browser storage were disabled to prevent participants from saving any data. The survey itself was unanimous, so no personally identifiable information was collected, further making participants' data meaningless or irrelevant for any purpose outside of the study project.

After collecting the data from Qualtrics' cloud, it was then downloaded by the researcher, encrypted, and analyzed using a secured computer with password protection. The data analysis was performed using the (SAS® Studio OnDemand for Academics) provided by Franklin University, also password protected using the researcher's single sign-on password. The SAS software is securely protected in Franklin University's cloud, and participant's data was not exposed any more than other important data the University stores on the cloud. The data encryption used by the researcher reduced the dangers of the data being obtained by unauthorized parties.

Chapter 4: Data Collection, Analysis, and Results

This pivotal chapter embarks on a comprehensive exploration of the data collection and analysis process that underpins this research. To understand the complex interplay of factors influencing individual stock market participation, this chapter elucidates the meticulous steps taken to gather and scrutinize the data. The instrumentation employed in this study involved an online questionnaire created by the researcher, carefully designed to assess various facets of participants' attitudes and perceptions related to commission-free stock trading, smartphone accessibility, income, financial awareness, gender, age, and financial stress, and their implications on stock market participated in the survey. This chapter also delineates the methodological approach to the study, data collection procedure, quality assurance through a pilot study, and the robustness of the sample.

Furthermore, it provides an in-depth examination of the characteristics of the participants, laying the foundation for the subsequent analytical journey. The data collected underwent rigorous preparation, including coding and transformation into a format compatible with statistical analysis. In the following sections, the chapter delves into the statistical techniques applied, revealing the relationships and contributions of various predictors to individual stock market participation, ultimately advancing our comprehension of this intricate financial landscape.

The instrumentation in this study consisted of an online questionnaire created by the researcher. Participants answered approximately 26 questions in total, which took an average of 5 minutes to complete. The survey included 10 questions covering variables pertaining to the independent variables (commission fees, access to trading platforms, income, financial

awareness, and financial stress) and three questions on the dependent variable, stock market participation (SMP). The rest of the questions were demographic questions, including questions on respondents' age, race, education, and gender. The first five questions of the survey covered the demographic questions and were followed by the rest of the questions.

Restatement of Study's Purpose and Research Questions

The study's purpose was to use quantitative cross-sectional methods (a) to investigate the relationship between commission-free stock trading, access to smartphones and trading apps, income, financial knowledge, financial stress, gender, and age (predictors) on individual SMP (b) Determine relative contribution of predictors on individual SMP.

The two main research questions answered by the study were:

- RQ1. What is the relationship between Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)?
- H1_A: There is a significant relationship between the independent variables (Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age) and Stock Market Participation (SMP).
- RQ2. What is the contribution of Zero-Commission stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)?
- H2_A: At least one of the predictors makes a unique contribution to SMP.

The data collection plans and procedures outlined in the previous chapter unfolded seamlessly and as anticipated, without any unexpected incidents or necessitating adjustments.

This successful execution of the planned data collection process provided a solid foundation for the study, ensuring the reliability and consistency of the collected data.

Data Preparation, Analysis, and Procedure

After the closure of the survey, the data was downloaded from the Qualtrics platform to Excel, exported, and saved in a password-protected computer for further analysis. The data was checked for accuracy, and any missing values and tools within Excel were used to score the data. The continuous variables were coded from a five-point Likert scale of 1-Strongly disagree to 5-Strongly agree for use with student (SAS® Studio OnDemand for Academics). Using Excel, the data was coded and prepped for SAS readable format. For non-categorical constructs/variables, simple averages were calculated. For example, if there were three questions that made up the construct, the average score for the three questions was computed and labeled as the mean score. The process was repeated for all the constructs, and the final scored data was uploaded into (SAS® Studio OnDemand for Academics) for analysis.

Demographics Characteristics

This quantitative cross-sectional predictive study investigated participants 'attitudes and perceptions towards commission-free stock trading, access to smartphones and apps, income, financial knowledge and awareness, gender, age, and financial stress to the degree of their participation in the stock market. The population for the research included U.S. residents who currently either participate in the stock market or not. Adult populations in the United States who were 18 years of age and older were surveyed to answer questions of interest to the researcher. The survey was designed to have similar characteristics of the recent United States population census by applying quotas to survey respondents to ensure a wider representation of samples and to avoid skewness of the data. Quotas were put in place for gender, age, income, and region.

The survey achieved a response rate of 41%, with 495 completed responses out of 1195 invitation to participants. Descriptive statistics of the target sample of 495 respondents are available in Table 2. Of the total sample of 495, 253(51.11%) of them were females, 240 were males, constituting 48.48%, and 2 (0.40%) identified as non-binary. Given the smaller number of non-binary 2(0.004%), the researcher decided to remove the non-binary data for a simplified analysis.

Majority of the sample were older than 35 years, 348(70.58%), and reported earning income of \$50,000 or more 322(65.31%). 171(34.69%) reported earning \$50,000 or less.

The ethnicity make-up of the sample consisted of Whites or Caucasians 368(74.64%), which was more than half of the sample, with Blacks or African Americans 73(14.81%), followed by Hispanics or Latinos 27(5.48%). The rest of the sample, 25(5.07%), consisted of Asians, two or more races, and other minority groups.

The regional distribution of the sample consisted of four (4) main geographic areas of the United States. The South has the highest sample of 185(37.53%), West 116(23.53%), Midwest 107(21.70%), and Northeast 85(17.24%). Table 1 and Table 2 consist of summary demographics data. Less than half of the sample, 232(47.05), have a bachelor's degree or higher, with 387(78.5%) reported having some college degree or higher. Only 9(1.83%) of the sample reported to have no high school diploma or graduate (Table 3 and Figure 1).

Table 1. Survey respondents by region

	Frequency (n)	Percentage (%)
Region		
Midwest	107	21.70
South	185	37.53
West	116	23.53
Northeast	85	17.24
Total	493	100

Table 2. Sample Statistics and Description

Variables		N(%)
Gender	Female, n(%)	253 (51.11)
	Male. n(%)	240 (48.48)
	Non-Binary*	2(0.004)
	10.24 (0/)	145(20,41)
Age	18-34, n(%)	145(29.41)
	35-54, n(%)	154(31.24)
	55+	194(39.35)
Income	\$0-\$50,000, n(%)	171(34.69)
	\$50.001 - \$100.000, n(%)	171(34.69)
	\$100001 -\$150,000, n(%)	80(16.23)
	\$150,001 or more, n(%)	71(14.4)
Ethnicity	White or Caucasion, n(%)	368(74.64)
	Black or African American, n(%)	73(14.81)
	Hispanic or Latino, n(%)	27(5.48)
	Asian or Asian American, n(%)	11(2.23)
	Native American or Alaskan Native, n(%)	4(0.81)
	Native Hawaiian or Pacific Islander, n(%)	2(0.41)
	Two or More Races, n(%)	5(1.01)
	Prefer not to disclose, n(%)	3(0.61)
Education	Not a high school graduate, n(%)	9(1.83)
	High school graduate, n(%)	97(19.68)
	Some college degree, n(%)	90(18.26)
	Associate degree, n(%)	65(13.18)
	Bachelors degree, n(%)	122(24.75)
	Some college bachelor's degree, n(%)	11(2.23)
	Master's degree, n(%)	77(15.62)
	Doctoral degree, n(%)	10(2.03)
	Professional degree, n(%)	12(2.43)
SMP, mean(Ste	d Dev)	2.72(1.21)
Zero Commissi	ion, mean(Std Dev)	3.48(0.93)
Access to Sma	rt Phones, mean(Std Dev)	3.67(0.80)
Financial Know	vledge, mean(Std Dev)	3.66(0.81)
Financial Stres	s, mean(Std Dev)	3.21(1.09)
Total		493(100)

		Mea	n_SMP
Level of Education	Ν	Mean	Std Dev
1. Not a high school graduate	9	1.62962963	0.5386311
2. High School graduate	97	2.21993127	1.16556158
3. Some college degree	90	2.13703704	0.98667077
4. Associate degree	65	2.46666667	1.10365554
5. Bachelor's degree	122	2.97540984	1.04899973
6. Some college bachelor's degree	11	3	1.39044357
7. Master's degree	77	3.67532468	1.08279207
8. Doctoral degree	10	3.9	0.94346354
9. Professional degree (e.g., law, MB, MPA, DMA, DVM, MD, DO, MSW, etc.,)	12	3.38888889	1.11765748

Table 3. Mean and Standard Deviations of Participants Level of Education

Figure 1. Pie Chart of Educational Level of Participants and SMP



Verification of Linear Regression Assumptions

Multiple linear regression assumptions were tested on the data to ensure that linear regression assumptions were not violated and that the parameter estimates were unbiased.

The linearity assumption was tested with QQ plots in Figures 2a and 2b. The residuals plot for the mean SMP (the dependent variable) shows data points wrapped around the 45-degree line, indicating data does not violate linearity assumptions.



Figures 2b. Plot of Observed by predicted for mean SMP



The multicollinearity assumption was checked using the variance inflation factor obtained from the regression output. From the regression output Table 4, the variance inflation factors for the parameter estimates were all less than 3, indicating a lack of multicollinearity among the variables. In general, a variance inflation factor of less than 10 is considered an acceptable level of multicollinearity among the variables. Thus, the data provides stability for the regression model.

Parameter Estimates							
Variable	Parameter Estimate	Standard Error	t Value	Pr>(t)	Squared Semi- Partial Corr	Tolerance	Variance Inflation
Ntercept	-0.22669	0.28148	-0.81	0.421			0
Age	-0.18875	0.04891	-3.86	0.0001	0.04789	0.85693	1.16696
Gender	-0.19872	0.07883	-2.52	0.012	0.02601	0.89498	1.11734
Income	0.33171	0.03894	8.52	<.0001	0.21358	0.85309	1.1722
ZeroCommissions	0.22628	0.05591	4.05	<.0001	0.14697	0.51585	1.93854
AcessToSmartPhones	0.15607	0.07603	2.05	0.0406	0.04315	0.37303	2.68077
FinancialKnwledge	0.5195	0.06565	7.91	<.0001	0.0592	0.48983	2.04153
FinancialStress	-0.09797	0.03517	-2.79	0.0056	0.00729	0.95027	1.05234

Table 4. Contributions of predictors (IV) on dependent variable (SMP)

The parameter estimates were also confirmed to have appropriate directions. For example, parameter estimate for income was, by theory, expected to have a positive relationship with stock market participation (Takyi and Bentum-Ennin (2021), while financial stress, however, was expected to have a negative relationship with stock market participation since the more stress you are financially, the less likelihood you are to participate in the stock market and both parameters were confirmed from the regression output.

The normality assumption was verified using the distributions of the mean SMP.

Figure 3 shows outcome variables were normally distributed with a normal bell curve peaking in the middle.



Figure 3. Normality Curve of Observed Variables

Homoscedasticity assumption check was done by observation of the residual plots of the independent variables to ensure equal variance of residuals. Figures 4a and 4b show residuals of observations for predictors centered along the zero line.



Figures 4a. Residual plots of selected independent variables



Figure 4b. Predicted values of Residuals for homoscedasticity

Outliers and high leverage points were checked using Figure 5. The observations did not exhibit any serious high leverage points or outliers. The data had no missing values, and there were no significant outliers in the data that were of concern to the researcher.

Figure 5. Outliers and High Leverage Points for the observed data



Data Analysis and Results

The following research questions guided the research in investigating the research problem.

RQ1: What is the relationship between Commission-free stock trading, Access to

smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)? The hypotheses were:

- H1₀: There is no significant relationship between the independent variables (Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age) and Stock Market Participation (SMP).
- H1_A: There is a significant relationship between the independent variables (Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age) and Stock Market Participation (SMP).

The researcher proposed multiple linear regression analysis to answer the research questions 1 and 2.

SAS® Studio OnDemand for Academics was used to conduct the regression analysis. Number of observations in the analysis, n= 493. The regression results are shown in Tables 4 and 5. From Table 5, F-statistic F(7,492) = 82.69, p < 0.0001), indicating the overall regression model was statistically significant at a 5% significance level. Thus, the null hypothesis is rejected in favor of the alternative hypothesis that there is a significant relationship between the independent variables and SMP. The R² and adjusted R² were 0.54 and 0.53, respectively, indicating the model explains about 54% of the variation in the dependent variable (DV).

 Table 5. Overall Regression Model

Analysis of Variance					
Source	DF	Sum of	Mean Square	E Value	Pr > F
Model	7	396.524	56.64	82.69	<.0001
Error	482	332.255	0.6851		
Corrected Total	492	728.779			

R-Square and Adjusted R-Square of Dependent Variable.

R-Square = 0.5441 and Adjusted R-Square = 0.5375

Research Question (RQ2): What is the contribution of Zero-Commission stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)?

To answer research question 2 (RQ2), the researcher used the t-values from the regression and their respective p-values to determine the significance of the predictors. A semi-partial correlation analysis was also used to evaluate the contributory impact of the individual predictors. A semi-partial correlation measured the correlation between the independent variables and the dependent variable (SMP) after controlling for the influence of the other variables.

Hypotheses for RQ2 were:

H2₀: Individual predictors do not make unique contributions to SMP.

H2_A: At least one of the predictors makes a unique contribution to SMP.

From Table 4 of contributions of predictors (IV) on dependent variable, the t values for Age, Gender, and Financial Stress were (t (492) = -3.88, p < .0001), (t (492) = -2.52, p = .012), and (t(492) = -2.79, p = .0056) respectively, indicating significant negative relationships between age, gender, and financial stress and SMP at 5% alpha level. Similarly, the t values for Income, Zero-Commission, Access to smartphones, and Financial Knowledge were (t(493) =8.52, p < .0001), (t(492) = 4.05, p < .0001), (t(492) = 2.05, P = .0406), and (t(492) = 7.91, p < .0001) respectively, indicating a significant positive relationship between Income, zero commission, Access to smartphones, Financial Knowledge, and SMP. The unique contributions of the variables from Table 4 show that income had the largest contribution of 21% on SMP, followed by zero commissions with a contribution of 15%. The rest of the independent variables had contributions of 6% or less, with financial stress contributing the least of 1%.

Additional Analysis and Results

One-Way Analysis of Variance (ANOVA) for Selected Variables

Additional analyses were performed to investigate how age groups, gender, income levels, and educational achievements of the participants influence stock market participation (SMP). The statistical tools used for this analysis included one-way ANOVA and t-tests, with data analyzed using the SAS software. These analyses aimed to uncover any significant differences or associations between these predictor variables and their influence on individuals' participation in the stock market.

Analysis of Gender Differences in SMP

The researcher investigated if there was a difference between the male and female gender in SMP using t-test. The two hypotheses which guided the investigation were:

H30: There is no difference between males and females in SMP.

H3_A: There are differences between males and females in SMP.

The following assumptions for t-test were met before carrying out the analysis: random, independence, and normality of the variables.

Table 6. Male and female means of SMP using the pooled method.

Gender	Method	Ν	Mean	Std Dev	Std Err
1		240	2.9819	1.268	0.0818
2		253	2.473	1.1138	0.07

Diff (1-2)	Pooled	0.509	1.1913	0.1073

Method	Variances	DF	t value	Pr > t
Pooled	Equal	491	4.74	<.0001

From table 6, (t (491) = 4.74, p < 0.0001) for the pooled method. Thus, the null

hypothesis was rejected. This means differences existed between males and females in SMP with males exhibiting a high mean score of (M = 2.98, SD = 1.26) as compared to females with a mean score of (M = 2.47, SD = 1.11). This result means males are more likely to participate in stocks than females, holding all the other variables constant. Figure 6 shows the distribution of mean SMP for males (1) and females (2), with the mean SMP for males higher than the mean SMP for females.





One-Way ANOVA for levels of Income Differences in SMP

One-way ANOVA was used to analyze data on income levels to answer the following research question. Is there a statistical difference in SMP based on the levels of income? Two hypotheses that guided the question were:

H40: There is no difference in the SMP-based income levels of participants.

H4_A: There is a difference in SMP based on the income levels of participants.

The assumptions for one-way ANOVA were then verified to ensure there was no violation. Levene's test for homogeneity of variance was conducted, given that other assumptions, such as normality and linearity, had already been verified. From Table 7, F(3,489) = 1.64, p = .17, which confirms the equality of variance assumption given by Levene's test of equality of variance assumption.

Table 7. Levene's Test for Homogeneity of Mean SMP Variance for Income

Levene's Test for Homogeneity of Mean_SMP Variance					
ANOVA of Squared Deviations from Group Means					
Mean					
Source	DF	Sum of Squares	Square	F Value	Pr > F
Income	3	8.9933	2.9978	1.64	0.1785
Error	489	892.2	1.8245		

From Table 8, a one-way ANOVA test resulted in rejection of the null hypothesis in favor of the alternative hypothesis that there are statistical differences in SMP based on participants' levels of income (F(3, 489) = 57.79, p < .0001).

Table 8.	One-way ANC	VA of Pa	rticipants'	level of income	and SMP
	-		1	2	

Dependent Variable: Mean_SMP					
			Mean		
Source	DF	Sum of Squares	Square	F Value	Pr > F
Model	3	190.7430232	63.581008	57.79	<.0001
Error	489	538.036783	1.1002797		
Corrected Total	492	728.7798062			

Income	Mean_SMP LSMEAN	LSMEAN Number
1	1.91812865	1
2	2.90838207	2
3	3.32916667	3
4	3.51643192	4

Least Squares Means Adjustment for Multiple Comparisons: Tukey-Kramer

From Table 9, mean SMP increases with an increase in income levels from groups 1 to 4, indicating the more you earn, the higher the likelihood of participating in SMP, as given by a higher score of mean SMP.

The differential effects of income on SMP (Table 10) indicates a pair of income groups (1,2,3 and 4) with their significant p-values. From the table, there is no statistical difference in SMP between income levels 3 and 4, given by an insignificant p-value of 0.6928. This means there is no difference in SMP for higher income earners between \$100,000 -\$150,000 (3) and \$150,001 and above (4) in their SMP score. All other pairs of income groups are significant with significant p-values of less than 0.05 alpha level. Figure 7 shows distribution of mean income level on SMP.

 Table 10. Least Squares Means for Income Effect
 Particular
 Paritile
 Particular

Least Squares Means for effect Income

Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Mean_SMP

	Dependent Fanable: mean_enn			
i/j	1	2	3	4
1. 0-\$50,000		<.0001	<.0001	<.0001
2. \$50,001-\$100,000	<.0001		0.0169	0.0003
3. \$100,001 -\$150,000	<.0001	0.0169		0.6928
4. 150,001+	<.0001	0.0003	0.6928	
2. \$50,001-\$100,000 3. \$100,001 -\$150,000 4. 150,001+	<.0001 <.0001 <.0001	0.0169 0.0003	0.0169	0.00



Figure 7. Mean Income Level Distribution on SMP

One-way ANOVA of Participant Education levels and SMP

Similarly, a one-way ANOVA was used to analyze data on participants' level of educational to answer the following research question. Is there a significant difference in the level of SMP based on educational level?

The two hypotheses used to answer the stated question were:

H50: There is no difference in SMP based on education levels.

H5_A: There is a difference in SMP based on education levels.

Levene's test of equality of variance was used to test the one-way ANOVA to ensure there was no violation. The test confirmed that the homogeneity of variance assumption was met (Table 11), F(8, 484) = 1.4, p = .19. The p-value is not significant, so we failed to reject the null hypothesis of equality of variance.

Table 11. Levene's test for equal variance for mean SMP based on educational level

Levene's Test for Homogeneity of Mean_SMP Variance					
ANOVA of Squared Deviations from Group Means					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Education	8	19.7703	2.4713	1.4	0.1951
Error	484	856.2	1.769		

A one-way ANOVA test (Table 12) resulted in rejection of the null hypothesis in favor of the alternative hypothesis that there are statistical differences in SMP based on participants' levels of education F(8,484) = 18.14, p < .0001.

 Table 12. One-way ANOVA of Participants' educational attainment and SMP

Dependent Variable: Mean SMP					
	Sum of				
DF	Squares	Mean Square	F Value	Pr > F	
8	168.1018331	21.0127291	18.14	<.0001	
484	560.6779731	1.1584256			
492	728.7798062				
	DF 8 484 492	Dependent Variable: Sum of DF Squares 8 168.1018331 484 560.6779731 492 728.7798062	Dependent Variable: Mean SMP Sum of DF Squares Mean Square 8 168.1018331 21.0127291 484 560.6779731 1.1584256 492 728.7798062	Dependent Variable: Mean SMP Sum of F Squares Mean Square F Value 8 168.1018331 21.0127291 18.14 18.14 484 560.6779731 1.1584256 492 728.7798062 728.7798072 728.7798072 728.77980	

From Table 3, distribution of participants' education indicates that the mean SMP scores increased with an increase in the level of education from high school level to Doctoral degree and professional certificate holders. Participants holding either some bachelor's level education or above had a mean SMP score of 3 and above. Given the 5-point Likert scale questions, with 1 being strongly disagreed to agree 5-strongly, a score of 3 and above means participants responded from neutral to strongly agree with education playing role in SMP.

Table 3. Mean and Standard Deviations of Participants Level of Education.

		Mea	n_SMP
Level of Education	Ν	Mean	Std Dev
1. Not a high school graduate	9	1.62962963	0.5386311
2. High School graduate	97	2.21993127	1.16556158
3. Some college degree	90	2.13703704	0.98667077
4. Associate degree	65	2.46666667	1.10365554
5. Bachelor's degree	122	2.97540984	1.04899973
6. Some college bachelor's degree	11	3	1.39044357
7. Master's degree	77	3.67532468	1.08279207
8. Doctoral degree	10	3.9	0.94346354
9. Professional degree (e.g., law, MB, MPA, DMA, DVM, MD, DO, MSW, etc.,)	12	3.38888889	1.11765748

	Dependent Variable: Mean_SMP								
i/j	1	2	3	4	5	6	7	8	9
1		0.8186	0.916	0.4161	0.0098	0.1086	<.0001	0.0002	0.0072
2	0.8186		0.9999	0.8858	<.0001	0.3575	<.0001	0.0001	0.0125
3	0.916	0.9999		0.6269	<.0001	0.2295	<.0001	<.0001	0.0054
4	0.4161	0.8858	0.6269		0.0558	0.8459	<.0001	0.0032	0.1411
5	0.0098	<.0001	<.0001	0.0558		1	0.0003	0.1844	0.9396
6	0.1086	0.3575	0.2295	0.8459	1		0.5816	0.6045	0.9946
7	<.0001	<.0001	<.0001	<.0001	0.0003	0.5816		0.9995	0.9949
8	0.0002	0.0001	<.0001	0.0032	0.1844	0.6045	0.9995		0.9728
9	0.0072	0.0125	0.0054	0.1411	0.9396	0.9946	0.9949	0.9728	

Table 13. Least Squares Means for Educational Level Effect

Least Squares Means for effect Education Pr > |t| for H0: LSMean(i)=LSMean(j)

Two main observations were made from results in Table 13.

- The differential effects of education on SMP indicates levels of education 1, 2, and 3, representing no high school, high school, and some college degrees were significantly different from educational levels 5, 7, and 8 (bachelor's degree, master's degree, and Doctorate degrees) in SMP given by significant p-levels of less than 0.05.
- There was significant difference in SMP based on education between education level 5 (bachelor's and 7, Masters), but no significant difference in SMP between Bachelor's and Doctorate degree, as well as no statistical difference in SMP between Masters and Doctorate).

One-Way ANOVA of Age and SMP

A one-way ANOVA was used to compare participants' age groups and their perceptions and attitudes toward SMP. The two hypotheses were:

H6₀: There is no difference in SMP based on age groups.

H6A: There is a difference in SMP based on age groups.

Levene's test for homogeneity of mean-variance was used to test the assumption of ANOVA prior to the analysis. From Table 14, the F(2,490) = 6.55, p = 0.0016, indicating rejection of the equality of variance and a violation of the assumption required to use the ANOVA method. A non-parametric test (Kruskal-Wallis test) was employed in place of the ANOVA method.

Table 14. Levene's test for equal means of mean SMP for age groups

Levene's Test for Homogeneity of Mean_SMP Variance						
ANOVA of Squared Deviations from Group Means						
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F	
Age	2	21.7535	10.8767	6.55	0.0016	
Error	490	813.5	1.6602			

The Kruskal-Wallis method test results (Table 15), with ($\chi 2 = 39.39$, p < .0001, DF = 2)

indicated significant from 0.05 alpha level and thus the null is rejected in favor of the alternative hypothesis that there is significant difference in the age groups.

Figure 8 shows the distribution of mean scores of age groups, with age group 2 having the largest mean SMP.

 Table 15. Kruskal-Wallis One-Way analysis of variance test

		Sum of	Expected	Std Dev	Mean
Age	N	Scores	Under H0	Under H0	Score
1. 18-34	145	38843	35815	1432.9801	267.88276
2. 35-54	154	44454	38038	1457.561	288.66234
3. 55+	194	38474	47918	1536.3954	198.31959

Kruskal-Wallis Test					
Chi-Square DF Pr > ChiSq					
39.3912	2	<.0001			



Figure 8. Distribution of Wilcoxon Scores for mean SMP for participants' age

Summary of Findings

In Chapter 4 the researcher presented the statistical analyses, addressed the research questions, and tested the accompanying hypotheses. This study used a quantitative crosssectional predictive study to investigate the relationship between commission-free stock trading, access to smartphones, income, financial knowledge, financial stress, gender, and age (predictors) on individual SMP and determined the unique contributions the predictors have on SMP. A total of 495 participants took part in the main launch of an online survey, which lasted three days. Qualtrics provided data recruitment services, with survey respondents also from the Qualtrics panel. Prior to the main launch of the survey, a pilot study was conducted. The pilot study consisted of the same questions and used the Qualtrics platform and panel responses. Thirty participants took part in the pilot study, which the researcher used to calculate the study's reliability and validity and ensured no ambiguities in the survey questions. The pilot study was also used to solicit feedback from survey participants prior to the main launch of the survey. Of the 495 total responses for the completed survey, 2 of the responses were removed because of insignificance in the analysis. There was no missing data in the 495 total data obtained from the survey. The data was coded using Excel, and SAS® Studio OnDemand for Academics was used to conduct the regression analysis. Linear regression assumptions tests, including normality, linearity, homoscedasticity, and multicollinearity, were conducted to ensure linear regression assumptions were not violated. Sample and population demographics were determined using descriptive statistics. Additional analyses on the categorical variables were conducted to support the two research questions using ANOVA.

The null hypothesis for research question 1 was rejected in favor of the alternative hypothesis that there is a significant relationship between the independent variables (Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age) and Stock Market Participation (SMP). A t statistic values from the regression output and their respective p values were used to test the hypothesis that the independent variables make a significant unique contribution to explaining the variance in the dependent variable to the overall regression model. To answer research question 2 and to determine the significance of the predictors, a semi-partial correlation analysis was used to evaluate the contributory impact of the individual predictors. A semi-partial correlation measured the correlation between the independent variables and the dependent variable (SMP) after controlling for the influence of the other variables.

The semi-partial correlation analysis found income contributed the most (21%), followed by zero commissions (15%), and the predictor that contributed the least was financial stress (1%). Chapter 5 concludes the dissertation by discussing the research's findings, the theoretical underpinnings, recommendations, implications, and recommendations for future studies.

Chapter 5: Results, Discussion of Findings, and Recommendations

Chapter 5 summarizes the entire research study, focusing on key findings, implications, limitations, future recommendations, and theoretical underpinnings. This summary aims to distill the study's essence into a concise overview.

The central objective of this research was to investigate the factors influencing individual

stock market participation (SMP), with a particular emphasis on the impact of commission-free

stock trading. Chapter 4 presented the research's key findings, which can be summarized as

follows:

Summary of the Study

The results of the hypotheses testing are presented in Table 16.

Table 16. Summary results of hypotheses testing

Summary of Results

	Hypotheses	Test	Results
H1 ₀	There is no significant relationship between the independent variables (Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age) and Stock Market Participation (SMP).	Multiple Regression	Reject
H2 ₀	Individual predictors do not make unique contributions to SMP.	Semi-Partial	Reject
112		Con	
H3 ₀	and female).	t-test	Reject
$H4_0$	There is no difference in the SMP-based income levels of	One-Way	Deject
	participants.	ANOVA	Reject
H5 ₀	There is no difference in SMP based on education levels.	One-Way	Deiest
Ŭ		ANOVA	Reject
H6 ₀	There is no difference in SMP based on age groups.	Kruskal -	Deiest
-		Wallis test	кејест

The purpose of the study was to use quantitative cross-sectional method (a) to investigate the relationship between commission-free stock trading, Access to smartphones, income, financial

knowledge, financial stress, gender, and age on individual SMP, and (b) to determine the relative contribution of these predictors on individual SMP. The study sought to answer the following research questions and additional sub-questions:

- *RQ1.* What is the relationship between Commission-free stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)? Research Question
- *RQ2*. What is the contribution of Zero-Commission stock trading, Access to smartphones, Income, Financial Awareness, Financial Stress, Gender, and Age on Stock Market Participation (SMP)?

Sub-questions:

- 1. Does gender influence SMP differently?
- 2. Is there a statistical difference in SMP based on income levels?
- 3. Does educational attainment influence SMP?
- 4. Do age differences impact SMP?

The study addresses the problem of low stock market participation, given the benefits of higher average returns from stocks compared to other investment options (Bansal, R. et al., 2021; Bogan, 2008; Fernández-López et al., 2018). Bogan (2008); Fernández-López et al., (2018), asserted that although stock holding returns tend to be higher than similar risky assets, household participation in the stock market has historically been lower than predicted. Thus, the lack of participation in the stock market can lead to significant welfare loss from equity premiums (Cocco et al., 2005).

The study sought to close the literature gap by researching commission-free trading's impact on SMP and attract other researchers to add to or expand on this study's findings.

Existing research focuses on factors impacting stock market participation, including internet and transaction costs (Bogan, 2008; Fischer & Jensen, 2015), income, and financial awareness (Greenstone et al., 2004; Guiso & Japelli, 2005; McDonald & Sandada, 2018; Shum & Faig, 2006). However, the researcher found no study focusing on the zero-commission fees on individual SMP.

Discussion of Findings

Income as a Key Factor: One of the study's central findings was the substantial impact of income on SMP. Participants with higher income levels exhibited a greater likelihood of participating in the stock market. This result aligns with previous research emphasizing the role of financial resources in investment decisions (Takyi and Bentum-Ennin (2021); Thomas and Spataro (2018). According to the researchers, higher income provides individuals the means to invest and a buffer against the inherent risks associated with stock trading. To participate in the stock market, one should have a minimum disposable income beyond what is needed for daily survival. Takyi and Bentum-Ennin's (2021) study explored SMP, focusing on wealth, income, and fiscal literacy. The researchers hypothesized that SMP is dependent on the amount of wealth and income, stating that those earning low-income levels are limited, as most of their income is absorbed in day-to-day transactions. Additionally, the results found no statistical difference in SMP between higher income levels over and above \$100,01. This finding means there is no difference in SMP for higher-income earners beyond the minimum income level. One plausible explanation for lack of differences between the two income levels could be that it's possible once individuals reach a certain income threshold, in this case, \$ 100,001 and above, their basic financial needs and goals are already met, and the increment income or earnings do not affect the ability to invest in the stock market.

Significance of Zero Commissions and Access to Smartphones: The research also highlighted the significance of zero commission trading as a factor influencing SMP (Bogan, 2008). According to Bogan (2008), broker commission fees have been one of the main barriers to SMP. Participants indicated that removing transaction costs motivated them to engage in stock trading. This finding resonates with the industry's transition towards commission-free trading, especially after 2019. Studies have shown that commission fees are the most significant contributor to the lower-than-expected individuals SMP (Bogan, 2008; Fischer & Jensen, 2015; Greenstone et al., 2004; Guiso & Japelli, 2005; McDonald & Sandada, 2018; Shum & Faig, 2006). According to Colliard and Foucault (2011), investors are always better off with zero trading fees than fees set by brokers. Zero commissions have democratized stock market participation, making it more accessible to a broader spectrum of investors (Eaton et al., 2021; Hu, 2021).

The prevalence of smartphones has complemented the impact of zero commissions in stock trading. The availability of smartphones allows for easy access to stock market information and the ability to execute trades at any time. Eaton et al. (2021) found that investors drawn to zero-commission platforms are often younger and less wealthy than retail investors from previous decades. According to the literature, the Internet was considered one of the main barriers to stock market entry (Bogan, 2008; Guiso et al., 2016), and the available Access to smartphones has contributed to reducing friction costs and increasing SMP. The shift in the stock exchange with individuals transitioning from traditional stock trading to online stock trading (Bucher-Koenen et al., 2021) is in part due to the availability of smartphones. The study found statistical significance for smartphones use, providing a unique contribution of about 4 percent to SMP. The study reinforces the literature that access to smartphones (online trading), a critical

component that broke down barrier to SMP (Bogan, 2008), led to individual involvement in stocks.

Financial Knowledge and Awareness: Financial knowledge and awareness emerged as a significant predictor, contributing to 6% variation in SMP. The significant 6% contribution of financial knowledge and awareness in SMP underscores the role of financial literacy and knowledge in investment decisions. Financial awareness refers to individuals' knowledge of investment options, while financial literacy refers to their knowledge and understanding of basic personal financial principles and investment concepts (Sivaramakrishnan et al., 2017). According to Guiso and Japelli (2005) the lack of education and financial awareness contribute to lower or lack of individual participation in the stock market. The researchers considered barriers to SMP, including a need for more awareness of investment options, such as available stocks and mutual funds. They suggested that current individual stock ownership may double if people know about stocks. Thomas and Spataro (2018) found that financial literacy, the level of human capital, and social interaction positively and significantly affect SMP, adding that household stock market participation significantly impacts savings, economic development, and performance. Thus, financially literate individuals are better equipped to evaluate investment opportunities, manage risks, and navigate the complexities of the stock market. The finding is consistent and reinforces what the literature says about financial literacy and SMP.

Education: To further emphasize the impact of participants' educational attainment on their SMP, the effect of education was examined independently using a one-way ANOVA. The researcher wanted to discover differences in SMP based on educational attainment, even though the regression did not consider education as a predictor of SMP. The analysis concluded that education—more specifically, a higher education—influences each person's SMP. Higher education levels, such as those holding bachelor's, master's, doctorate, and professional degrees, appear to be strongly associated with a greater propensity to trade stocks, according to Table 3 data. The higher mean SMP scores for these people with advanced education demonstrate this, suggesting a greater likelihood of stock market participation. The finding aligns with research by Baihaqqy & Sari (2020), which highlights a noteworthy correlation between investor's education level and their grasp of financial literacy. This correlation in turn, influences investors' financial decisions-making and SMP.

Gender and Age Disparities: Gender disparities in stock market participation were evident, as the data revealed that males were more inclined to participate in stocks than females. Statistical tests confirmed a significant difference in Stock Market Participation (SMP) between male and female participants, with a t-statistic of (t (493) = 4.74, p < .0001), and mean of male (M = 2.98, SD = 1.26) and mean of female (M = 2.47, SD = 1.11), indicating that the gender gap in stock market engagement was statistically significant.

The findings were consistent with Gebre et al. (2020) study that found that, in general, men are more likely to invest in the stock market than women. These findings warrant attention and may indicate the existence of gender-specific barriers or biases in the investment landscape. Avoidance of risk is a significant contributor to the gender gap in SMP. Because they are less willing to take risks than men, women are underrepresented in the stock market (Niu et al., 2020).

Moreover, age played a role, with variations in SMP across different age groups (Kaustia et al., 2023). Younger participants exhibited greater stock market participation, which may be attributed to factors like familiarity with digital platforms and a longer investment horizon. A study by Yu et al. (2020) found that younger individuals have a higher stock market participation

rate than older ones. For instance, people between 18 and 34 are more likely to engage in stock trading than those aged 55 and above. Results obtained by this study were consistent with Yu et al. (2020), with findings indicating higher mean scores for age groups 1(18-34) and 2(35-54) compared to age group 3 (55+). The study's finding challenges the common belief that income and stock market participation increase with age. It suggests that younger individuals are more engaged with social media platforms (access to smartphones) related to stock trading despite their typically lower incomes. This might be because younger and less affluent individuals are drawn to the stock market but invest less than older and higher-income individuals. Notably, income plays a more significant role (21%) in SMP compared to age (5%), highlighting the substantial influence of income in the context of SMP engagement.

Financial Stress refers to the challenge individuals encounter in meeting essential financial obligations due to insufficient financial resources. This study shed light on their financial circumstances by classifying participants' yearly gross income into predefined income groups. In addition to income, the study evaluated an individual's capacity to engage in or make investments in the stock market using three questions on financial stress. Interestingly, the study's definition of financial stress states that it transcends income levels, with higher earners potentially still experiencing financial stress that restricts their capacity to engage in the stock market. The results are consistent with the common notion that an individual facing financial stress would lack surplus disposable income for stock investments.

The study's findings showed that, although it was statistically significant with a much lower predictive power as compared to the other predictors—it accounted for just 1% of the variation in SMP overall. The statistical study results showed a strong negative significant correlation between financial stress and stock market participation, as evidenced by the t statistic of (t(492) = -2.79, p = .0056). It appears that the stronger effect of income overshadows the impact of financial stress. Earlier research examined income as a predictor in SMP, while some focused on financial stress. However, this study examines the effect of these variables separately, recognizing that it's possible to have a higher income and still undergo financial stress. As such, it is recommended to utilize either variable, as income and financial stress exert contrasting influence on SMP.

In conclusion, the results validate that those under financial strain have lower stock market participation rates (Soltani & Abbes, 2023). This realization emphasizes how financial stress plays a big part in affecting people's participation in the stock market.

Overall Effect of the Regression Model

As shown in Table 5, the overall regression model demonstrated statistical significance at a 5% significance level, with a statistic F(7,492) = 82.69, p < .0001). The results mean that the null hypothesis, suggesting no relationship between the independent variables and stock market participation (SMP), was rejected in favor of the alternative hypothesis, indicating a significant relationship between these variables.

The model's R-squared (R²) value of 0.54 indicates that the included predictors collectively account for approximately 54% of the variability observed in stock market participation (SMP). This R-squared value is considered moderate, signifying that the independent variables in the model (zero commissions, access to smartphones, financial knowledge, financial stress, income, age, and gender) did contribute to understanding why some individuals participate in the stock market while others do not. In regression models, adding more predictors tends to increase the R-squared, even if some of these predictors do not have substantial relationships with the dependent variable. This can lead to overfitting the model and artificially inflating the R-squared value.

The remaining 46% of variability not explained by the variables in the model represents aspects that are unaccounted for. This unexplained variability could be attributed to other factors not considered in the study, measurement errors, or unique individual characteristics that were not part of the analysis.

In essence, the regression model's significant statistics and the moderately high Rsquared value indicate a correlation between the variables (predictors) and stock market participation (DV). Yet, it's important to be cautious about adding more predictors to prevent overfitting. Additionally, it's crucial to acknowledge that other unmeasured factors might also impact this phenomenon.

Limitations of the Study

While the study provided valuable insights, it is essential to acknowledge its limitations. These limitations include using a cross-sectional design, which limits its ability to establish causal relationships between variables, and the reliance on self-reported data, which may introduce response bias. Combining survey data with objective measures could enhance data quality. The study's focus on U.S. residents, may limit its generalizability to other countries.

The sample may not accurately reflect the target population's characteristics and can make the results not an accurate representation of the population being represented. The study was framed as investors' attitudes and perceptions toward stock market participation rather than participants' actual experiences. Respondents sometimes answered questions as if they were actual stock market participants. Perceived participation in the stock market can differ from
actual participation and thus can affect the study's outcome. Finally, the study's use of a convenience survey in gathering the data in the form of panel participants may not be a U.S. representation the study sought to achieve. Therefore, the study findings may not be extrapolated as intended.

Recommendations for Future Research

Future research endeavors could enhance our understanding of stock market participation by employing longitudinal study designs, thus enabling the exploration of causal relationships between variables. A longitudinal study would build upon the current research and provide more robust insights into how various factors impact stock market participation over time.

Additionally, there is room for investigation into the effectiveness of specific financial education programs in influencing stock market participation. Such research could yield actionable insights for policymakers and educators, ultimately helping individuals make more informed investment decisions.

Gender-related barriers and the influence of risk perceptions on investment decisions present avenues for further study. A deeper dive into these aspects could shed light on genderspecific disparities and offer strategies to address them.

Expanding the study to international contexts would offer a more comprehensive understanding of the factors influencing stock market participation. Comparing and contrasting these factors across countries and cultures could reveal valuable insights.

While the age groupings used in the study facilitated responses, allowing participants to specify their actual ages, annual income, and education levels would have provided more precise data for regression analysis and result interpretation. For instance, this would have allowed for a more accurate assessment of the influence of age on stock market participation. The same applies to income, as the study could not distinguish participants earning no income from those who earned \$50000, given the income range of (0 - 50,000).

Using Qualtrics for participant recruitment yielded clean data without missing values, which is a significant advantage. Substantial missing data can compromise the statistical power of a study and lead to biased results. Furthermore, the ability to create quotas for data collection ensured that the study achieved the desired demographic representation. The quotas approach not only streamlined data collection but enabled the survey to reach a broader range of participants within the United States. Finally, given the counter effects of income and financial stress on SMP, it is recommended further research is conducted on the use of the two variables as predictors.

Practical Implications

From a practical standpoint, financial institutions and policymakers can leverage the findings to design targeted interventions to promote stock market participation. By focusing on initiatives to improve financial literacy, address gender-related disparities, and enhance accessibility to stock trading for individuals with varying income levels, market participation can be increased. One noteworthy finding is that financial knowledge accounted for 6% of the variability in stock market participation, while access to smartphones accounted for 4%. While these percentages may appear relatively small, they hold statistical significance. It underscores the importance of individuals using smartphones to access timely financial information. Therefore, implementing educational programs in school curriculums, even at the elementary level, to teach financial literacy, including concepts such as investments and interest rates and

making internet widely available to everyone could be crucial in elevating stock market participation among individuals. Furthermore, the study highlights the importance of regulatory initiatives to enhance accessibility within financial markets. These measures can help bridge the gaps in stock market participation by making it more accessible to a broader demographic.

In summary, stock market participation has a far-reaching impact on individual financial well-being and broader economic growth. Encouraging participation through various means, including financial education, accessibility, and reducing financial stress, can contribute to a more prosperous society.

Theoretical Implications and Intellectual Merit

The study's findings support existing knowledge about individual stock market participation surrounding the roles of income, education, financial knowledge, gender, and age. More importantly, the study provides unique insights into the role of zero-commissions, access to smartphones, and financial stress in individuals stock markets participation that had not been investigated before. These results align with prospect theory and behavioral economics, which suggest that individuals make investment decisions based on their perceptions of risk and gain.

For instance, about half of the respondents indicated that they own investments other than stock market and about a third of the responded participating or trading in stocks even though the returns from stocks are substantially higher than other assets investments. The plausible explanation for more people investing in other assets than stocks could be attributed to the risk perceived in the stock market than other investments. The theoretical implications underscore the complex interplay of psychological and economic factors in investment choices (Kahneman & Tversky (2013); Barberis (2013). The field of fintech may greatly benefit from this study. Few studies have examined the market effects of zero-commission stock trading since its debut. Therefore, this study adds to the body of knowledge in SMP and begins the conversation for future studies while filling the research gap.

Conclusion

Chapter 5 provides a comprehensive discussion of the study's findings, considering their practical and theoretical implications. It also highlights limitations and offers recommendations for future research, ultimately contributing to our understanding of individual stock market participation dynamics. The study contributes valuable insights into the intricate factors influencing stock market participation and opens avenues for further exploration in finance.

The purpose of the study was to investigate the relationship between commission-free stock trading, Access to smartphones and trading apps, income, financial knowledge, financial stress, gender, and age on individual SMP and to determine the relative contribution of these predictors on individual SMP. Literature on SMP suggested that commission fees charged by brokers have been one of the main barriers to SMP (Bogan, 2008; Fischer & Jensen, 2015; Greenstone et al., 2004; Guiso & Japelli, 2005) and that availability and Access to the Internet was the breakthrough to increase individual SMP. Today, the Internet is readily accessible through smartphones, and stock trading fees have become a thing of the past. The study thus provides insights into factors affecting SMP based on literature and the current environment.

SMP provides benefits, including retirement income and tax savings, yet participation remains low (Bogan, 2008; Fischer & Jensen). Compared to similar risky assets, returns from holding stock tend to be higher (Bogan, 2008; Fernández-López et al., 2018), yet fewer people take advantage of the stock market as an alternative form of investment. The non-participation in the stock market leads to significant welfare loss from equity premiums (Cocco et al., 2005).

101

The study findings significantly contribute to the literature on individual stock market participation, emphasizing the roles of income, zero commissions, education, gender, and age. Also, the study provided the instrument for measuring SMP, zero commissions, and other variables that can be used for further research studies.

In summary, the study's findings offer actionable insights for stakeholders in education, policymaking, and the financial sector. These insights can inform the development of educational programs, policy initiatives, and financial services that facilitate greater stock market participation among diverse populations. Ultimately, this can lead to improved financial literacy, increased Access to investment opportunities, and more inclusive financial markets.

References

AlamAlam, M. N., Alam, M. S., & Chavali, K. (2020). Stock market response during COVID-19 lockdown period in India: An event study. *The Journal of Asian Finance, Economics, and Business*, 7(7), 131-137. https://koreascience.kr/article/JAKO202020952022430.page.

Al-Awadhi, A. M., Alsaifi, K., Al-Awadhi, A., & Alhammadi, S. (2020). Death and contagious infectious diseases: Impact of the COVID-19 virus on stock market returns. *Journal of Behavioral And Experimental Finance*, 27(2), 10-32.

https://doi.org/10.1016/j.jbef.2020.100326.

- Arifin, Z., & Soleha, E. (2019). Overconfidence, attitude toward risk, and financial literacy: A case in Indonesia stock exchange. *Review of Integrative Business and Economics Research*, 8, 144-152. http://sibresearch.org/uploads/3/4/0/9/34097180/riber_8-s4_10_k19-110_144-152.pdf.
- Baihaqqy, M. R. I., & Sari, M. (2020). The Correlation between Education Level and Understanding of Financial Literacy and Its Effect on Investment Decisions in Capital Markets. Journal of Education and e-Learning Research, 7(3), 303-313.

Bailey, R. E. (2005). The economics of financial markets. Cambridge University Press.

- Baker, S. R., Bloom, N., Davis, S. J., Kost, K., Sammon, M., & Viratyosin, T. (2020). The unusual stock market reaction to COVID-19. *The Review of Asset Pricing Studies*, 10(4), 742-758. https://doi.org/10.1093/rapstu/raaa008.
- Bansal, G., Hasija, V., Chamola, V., Kumar, N., & Guizani, M. (2019). Smart stock exchange market: A secure predictive decentralized model. In 2019 IEEE Global Communications Conference (GLOBECOM) (pp. 1–6). IEEE.

- Bansal, R., Miller, S., Song, D., & Yaron, A. (2021). The term structure of equity risk premia. *Journal of Financial Economics*, *142*(3), 1209–1228.
- Barber, B. M., Huang, X., Odean, T., & Schwarz, C. (2022). Attention-Induced Trading and Returns: Evidence from Robinhood Users. The Journal of Finance, 77(6), 3141-3190.

Barberis, N. C. (2013). Thirty years of prospect theory in economics:

A review and assessment. Journal of Economic Perspectives, 27(1), 173-96.

Barberis, N., Huang, M., & Santos, T. (2001). Prospect theory and asset prices.

The quarterly journal of economics, *116*(1), 1-53.

- Batmunkh, M. U., Choijil, E., Vieito, J. P., Espinosa-Méndez, C., & Wong, W. K. (2020). Does herding behavior exist in the Mongolian stock market? *Pacific-Basin Finance Journal*, 62(1), 10-15. https://doi.org/10.1016/j.pacfin.2020.101352.
- Blankespoor, E., Dehaan, E., Wertz, J., & Zhu, C. (2019). Why do individual investors disregard accounting information? The roles of information awareness and acquisition costs. *Journal of Accounting Research*, 57(1), 53-84.
- Bogan, V. (2008). Stock market participation and the internet. *Journal of Financial and Quantitative Analysis*, *43*(1), 191–211.
- Bucher-Koenen, T., Alessie, R. J., Lusardi, A., & Van Rooij, M. (2021). Fearless woman: Financial literacy and stock market participation (No. w28723). National Bureau of Economic Research.
- Bujang, M. A., Sa'at, N., Bakar, T. M. I. T. A., & Joo, L. C. (2018). Sample size guidelines for logistic regression from observational studies with large population: Emphasis on the

accuracy between statistics and parameters based on real life clinical data. *The Malaysian Journal of Medical Sciences*, *25*(4), 122–130.

- Burtch, G., Ghose, A., & Wattal, S. (2013). An empirical examination of the antecedents and consequences of contribution patterns in crowd-funded markets. *Information Systems Research*, 24(3), 499-519.
- Bustos, O., & Pomares-Quimbaya, A. (2020). Stock market movement forecast: A systematic review. *Expert Systems with Applications*, *156*, Article 113464.
- Carta, S., Ferreira, A., Podda, A. S., Recupero, D. R., & Sanna, A. (2021). Multi-DQN: An ensemble of Deep Q-learning agents for stock market forecasting. *Expert Systems With Applications*, 164(2), 11-20. https://doi.org/10.1016/j.eswa.2020.113820.
- Chan, K. C., Seow, G. S., & Tam, K. (2009). Ranking accounting journals using dissertation citation analysis: A research note. *Accounting, Organizations and Society*, 34(6-7), 875– 885.
- Choi, J. J., & Robertson, A. Z. (2020). What matters to individual investors? Evidence from the horse's mouth. *The Journal of Finance*, 75(4), 1965-2020. https://doi.org/10.1111/jofi.12895.
- Chong, D., & Druckman, J. N. (2007). Framing theory. Annu. Rev. Polit. Sci., 10, 103-126
- Cocco, J. F., Gomes, F. J., & Maenhout, P. J. (2005). Consumption and portfolio choice over the life cycle. *Review of Financial Studies*, *18*(2), 491–533.
- Colliard, J. E., & Foucault, T. (2011). Securities market structure, trading fees and investors' welfare [Working paper, HEC Paris].

- Conegundes, L., & Pereira, A. C. M. (2020). Beating the stock market with a deep reinforcement learning day trading system. In 2020 International Joint Conference on Neural Networks (IJCNN) (pp. 1-8). IEEE. https://doi.org/10.1109/IJCNN48605.2020.9206938.
- Damodaran, A. (2019). Equity risk premiums (ERP): Determinants, estimation and implications-The 2019 Edition. NYU Stern School of Business.
- Devkota, N., Budhathoki, A., Paudel, U. R., Adhikari, D. B., Bhandari, U., & Parajuli, S. (2021).
 Online trading effectiveness in Nepal share market: Investors awareness, challenges and managerial solution. *Asian Journal of Economics, Business and Accounting*, 21(5), 90–98.
- Dohmen, T., Falk, A., Huffman, D., & Sunde, U. (2018). On the relationship between cognitive ability and risk preference. *Journal of Economic Perspectives*, *32*(2), 115-34.
 10.1257/jep.32.2.115.
- Eaton, G. W., Green, T. C., Roseman, B. S., & Wu, Y. (2022). Retail trader sophistication and stock market quality: Evidence from brokerage outages. *Journal of Financial Economics*, 146(2), 502-528. https://doi.org/10.1016/j.jfineco.2022.08.002.
- Eaton, G. W., Green, T. C., Roseman, B., & Wu, Y. (2021). Zero-commission individual investors, high frequency traders, and stock market quality. *High Frequency Traders, and Stock Market Quality (January 2021)*.
- Ebner, A., Horneff, V., & Maurer, R. (2022). Life-Cycle Portfolio Choice with Stock Market
 Loss Framing: Explaining the Empirical Evidence. *Wharton Pension Research Council Working Paper*, (2022-02). http://dx.doi.org/10.2139/ssrn.4030051 *Economics*, 57, 113147. https://hal.science/hal-03055070/file/Lussangeetal-ComEcon2020.pdf.

- Eldomiaty, T., Apaydin, M., Yusuf, M., & Rashwan, M. (2023). How do stock market development and competitiveness affect equity risk premium? Implications from world economies. *International Journal of Financial Studies*, *11*(1), 30.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2020). G*power version 3.1.9.6. Computer software. Universitat Kel, Germany.
- Feng, L., Zhang, M., Li, Y., & Jiang, Y. (2020). Satisfaction principle or efficiency principle? Decision-making behavior of peasant households in China's rural land market. *Land Use Policy*, 99(4), 10-94. https://doi.org/10.1016/j.landusepol.2020.104943.
- Feng, Y., Lai, K. H., & Zhu, Q. (2020). Legitimacy in operations: How sustainability certification announcements by Chinese listed enterprises influence their market value? *International Journal of Production Economics*, 224, Article 107563.
- Fernandez, P., de Apellániz, E., & F Acín, J. (2020). Survey: Market risk premium and risk-free rate used for 81 countries in 2020. *IESE Business School Working Paper No. WP-1244-E*.
- Fernández-López, S., Rey-Ares, L., & Vivel-Búa, M. (2018). The role of Internet in stock market participation: Just a matter of habit? *Information Technology & People*, *31*(3), 869–885.
- Fiordelisi, F., Minnucci, F., Previati, D., & Ricci, O. (2020). Bail-in regulation and stock market reaction. *Economics Letters*, *186*(2), 10-21.

https://doi.org/10.1016/j.econlet.2019.108801.

- Fischer, M., & Jensen, B. A. (2015). Taxation, transfer income and stock market participation. *Review of Finance*, *19*(2), 823–863.
- Frisancho, V. (2019). The impact of financial education for youth. *Economics of Education Review*, 78, 101918. https://doi.org/10.1016/j.econedurev.2019.101918.

- Gandhmal, D. P., & Kumar, K. (2019). Systematic analysis and review of stock market prediction techniques. *Computer Science Review*, Article 100190.
- Gao, Z., Gao, Y., Hu, Y., Jiang, Z., & Su, J. (2020, May). Application of deep q-network in portfolio management. In 2020 5th IEEE International Conference on Big Data Analytics (ICBDA) (pp. 268-275). IEEE. https://doi.org/10.1109/ICBDA49040.2020.9101333.
- Gebre, G. G., Isoda, H., Rahut, D. B., Amekawa, Y., & Nomura, H. (2020). Gender Gaps in Market Participation Among Individual and Joint Decision-Making Farm Households: Evidence from Southern Ethiopia. *The European Journal of Development Research*, 33(3), 649–683. https://doi.org/10.1057/s41287-020-00289-6.
- Goldstein, M. A., Irvine, P., Kandel, E., & Wiener, Z. (2009). Brokerage commissions and institutional trading patterns. *The Review of Financial Studies*, *22*(12), 5175–5212.
- Gomes, F., Haliassos, M., & Ramadorai, T. (2021). Household finance. *Journal of Economic Literature*, *59*(3), 919-1000. 10.1257/jel.20201461.
- Goyal, K., & Kumar, S. (2020). Financial literacy: A systematic review and bibliometric analysis. *International Journal of Consumer Studies*. https://doi.org/10.1111/ijcs.12605.
- Greenstone, M., Oyer, P., & Vissing-Jorgensen, A. (2004). Mandated disclosure, stock returns, and the 1964 Securities Acts Amendments. *Attanasio American Economic Review: Papers and Proceedings*.
- Guiso, L., & Japelli, T. (2005). Awareness and stock market participation. *Review of Finance*, *9*(4), 537–567.
- Guiso, L., Herrera, H., & Morelli, M. (2016). Cultural differences and institutional integration. Journal of International Economics, 99, S97–S113.

- Guiso, L., Sapienza, P., & Zingales, L. (2008). Trusting the stock market. *the Journal of Finance*, *63*(6), 2557-2600.
- Hanspal, T., Weber, A., & Wohlfart, J. (2021). Exposure to the COVID-19 stock market crash and its effect on household expectations. *The Review of Economics and Statistics*, 103(5), 994-1010. https://doi.org/10.1162/rest_a_01011.
- Hays, R., & Revicki, D. A. (2005). Reliability and validity (including responsiveness). In P. Fayers
 & R. Hays (Eds.), Assessing quality of life in clinical trials: Methods and practice (2nd ed., pp. 25–29). Oxford University Press. Housing market in Stockholm and London.
- Hox, J. J., & Boeije, H. R. (2005). Data collection, primary versus secondary.
- Hsiao, Y. J., & Tsai, W. C. (2018). Financial literacy and participation in the derivatives markets. Journal of Banking & Finance, 88, 15-29.

https://www.sciencedirect.com/science/article/pii/S0378426617302765.

- Hu, J. (2021). Impacts of zero-commission trading on stock market liquidity [Master's thesis, South Dakota State University].
- Huhmann, B. A., & McQuitty, S. (2009). A model of consumer financial numeracy. *International Journal of Bank Marketing*, 27(4), 270–293.
- Ifeanyi, O. J., & Iwiyisi, I. O. (2019). Linking the stock market performance indicators with economic growth in Nigeria. *The Business & Management Review*, *10*(2), 117-131.
- Jain, P. K., Mishra, S., O'Donoghue, S., & Zhao, L. (2020). *Trading volume shares and market quality: Pre-and post-zero commissions*. SSRN.
- Jiménez-Rodríguez, R. (2019). What happens to the relationship between EU allowances prices and stock market indices in Europe?. *Energy Economics*, 81, 13-24. https://doi.org/10.1016/j.eneco.2019.03.002.

Jones, C. M. (2002). A century of stock market liquidity and trading costs. SSRN. http://dx.doi.org/10.2139/ssrn.313681.

- Kahneman, D., & Tversky, A. (2013). Prospect theory: An analysis of decisions under risk. In Handbook of the Fundamentals Of Financial Decision Making: Part I (pp. 99-127). https://doi.org/10.1142/9789814417358_0006.
- Kaustia, M., Conlin, A., & Luotonen, N. (2023). What drives stock market participation? The role of institutional, traditional, and behavioral factors. *Journal of Banking & Finance*, 148, 106743. https://doi.org/10.1016/j.jbankfin.2022.106743.
- Kerimbek, G., Moldashbayeva, L., Jrauova, K., Satymbekova, K., & Imanbaeva, Z. (2019).
 History and prospects of development of the stock exchange. *NEWS of the national academy of sciences of the Republic of Kazakhstan*, 1(323), 60–65.
- Keting, S. (2011). Controversy of international carbon-motivated border tax adjustment and its impact on China's manufacturing industries. *Chinese Journal of Population Resources* and Environment, 9(4), 59–70.
- King, M. R., Osler, C. L., & Rime, D. (2011). Foreign exchange market structure, players and evolution.
- Kogan, L., Papanikolaou, D., & Stoffman, N. (2020). Left behind: Creative destruction, inequality, and the stock market. *Journal of Political Economy*, *128*(3), 855-906.
 https://doi.org/10.1086/704619.
- Kraemer, K. L., & Dedrick, J. (2002). Strategic use of the Internet and e-commerce: Cisco Systems. *The Journal of Strategic Information Systems*, *11*(1), 5–29.

- Leippold, M., Wang, Q., & Zhou, W. (2022). Machine learning in the Chinese stock market. *Journal of Financial Economics*, 145(2), 64-82. https://doi.org/10.1016/j.jfineco.2021.08.017.
- Levy, J. S. (2003). Applications of prospect theory to political science. Synthese, 135(2), 215-241.
- Li, F., Chow, T. M., Pickard, A., & Garg, Y. (2019). Transaction costs of factor-investing strategies. *Financial Analysts Journal*, 75(2), 62–78.
- Lim, K. P., & Brooks, R. (2011). The evolution of stock market efficiency over time: A survey of the empirical literature. *Journal of Economic Surveys*, *25*(1), 69–108.
- Liu, S., & Zhu, Z. (2009). Transaction costs and price volatility: new evidence from the Tokyo Stock Exchange. *Journal of Financial Services Research*, *36*, 65–83.
- Loertscher, S., & Niedermayer, A. (2008). *Fee setting intermediaries: on real estate agents, stock brokers, and auction houses* (Discussion paper, No. 1472).
- Long, J., Chen, Z., He, W., Wu, T., & Ren, J. (2020). An integrated framework of deep learning and knowledge graph for prediction of stock price trend: An application in Chinese stock exchange market. *Applied Soft Computing*, 91, 106205. https://doi.org/10.1016/j.asoc.2020.106205.
- Lund, S., Madgavkar, A., Manyika, J., & Smit, S. (2020). What's next for remote work: An analysis of 2,000 tasks, 800 jobs, and nine countries. *McKinsey Global Institute*, 1-13. http://thebusinessleadership.academy/wp-content/uploads/2021/01/MGI-Whats-next-forremote-work-v3.pdf.

Lussange, J., Lazarevich, I., Bourgeois-Gironde, S., Palminteri, S., & Gutkin, B. (2021).

Mazur, M., Dang, M., & Vega, M. (2021). COVID-19 and the march 2020 stock market crash.
Evidence from S&P1500. *Finance Research Letters*, *38*, 101690.
https://doi.org/10.1016/j.frl.2020.101690.

- McDonald, G., & Sandada, M. (2018). The determinants of stock market participation: Evidence from individual investors in Zimbabwe. *Acta Universitatis Danubius Economica*, *14*(4).
- Metghalchi, M., Hajilee, M., & Hayes, L. A. (2019). Return predictability and market efficiency:
 Evidence from the Bulgarian stock market. *Eastern European Economics*, *57*(3), 251-268. https://doi.org/10.1080/00128775.2018.1542601.

Meyrav, A. (2019). Zero commission stocks: A new era in online trading. Etoro.

- Michelacci, C., & Suarez, J. (2014). Business creation and the stock market.
- Nguyen, M. (n.d.). *The neural basis of herd behavior in experienced and novice stock traders across traditional and zero-commission trading*. Dartmouth College.
- Niu, G., Wang, Q., Li, H., & Zhou, Y. (2020). Number of brothers, risk sharing, and stock market participation. *Journal of Banking & Finance*, 113, 105757. https://doi.org/10.1016/j.jbankfin.2020.105757.
- Osipovich, A. (2020). Individual-investor boom reshapes US Stock market. *The WallStreet Journal*, *31*(August), 1-6. https://ofdollarsanddata.com/wp-content/uploads/2020/08/wsj feature nmaggiulli.pdf.
- Oxford Analytica. (2021). Rising US retail stock trading will draw modest reform. *Emerald Expert Briefings*, (oxan-db).
- Ozik, G., Sadka, R., & Shen, S. (2021). Flattening the illiquidity curve: Retail trading during the COVID-19 lockdown. *Journal of Financial and Quantitative Analysis*, *56*(7), 2356-2388. https://doi.org/10.1017/S0022109021000387.

- Paul, J. (2019). Marketing in emerging markets: A review, theoretical synthesis and Eldomiaty extension. *International Journal of Emerging Markets*, *15*(3), 446–468.
- Rezigalla, A. A. (2020). Observational study designs: Synopsis for selecting an appropriate study design. *Cureus*, 12(1), e6692. https://doi.org/10.7759/cureus.6692.
- Sebastiao, H. (2010). The informational impact of electronic trading systems on the FTSE 100 stock index and its futures contracts. *The European Journal of Finance*, *16*(7), 611–640. http://dx.doi.org/10.1080/13518470903345729.
- Shum, P., & Faig, M. (2006). What explains household stock holdings? *Journal of Banking & Finance*, 30(9), 2579–2597.
- Sivaramakrishnan, S., Srivastava, M., & Rastogi, A. (2017). Attitudinal factors, financial literacy, and stock market participation. *International Journal of Bank Marketing*, 35(5), 818–841. https://doi.org/10.1108/IJBM-01-2016-0012.
- Soltani, H., & Abbes, M. B. (2023). The Predictive Power of Financial Stress on the Financial Markets Dynamics: Hidden Markov Model. Journal of Economics and Finance, 47(1), 94-115.
- Spiroska, E., & Broman, D. (2020). Entrepreneur or Fool: A comparative study of the housing market in Stockholm and London.
- Steib, B. (2021). 'The Robinhood Effect'-Digital technology in global financial markets and its effects on investor decision making.
- Stringham, E. P., & Curott, N. A. (2015). On the origins of stock markets. *The Oxford handbook* of Austrian economics, 324.

- Takyi, P. O., & Bentum-Ennin, I. (2021). The impact of COVID-19 on stock market performance in Africa: A Bayesian structural time series approach. *Journal of Economics* and Business, 115, Article 105968.
- Tewksbury, D., & Scheufele, D. A. (2019). News framing theory and research. In Media effects (pp. 51-68). Routledge.
- Theofanidis, D., & Fountouki, A. (2018). Limitations and Delimitations in the Research Process. Perioperative Nursing, 7(3), 155–163. https://doiorg.links.franklin.edu/10.5281/zenodo.2552022
- Thomas, A., & Spataro, L. (2018). Financial literacy, human capital and stock market participation in Europe. *Journal of Family and Economic Issues*, *39*(4), 532-550.
- Venkataraman, S. (2019). The distinctive domain of entrepreneurship research. In Seminal ideas for the next twenty-five years of advances (Vol. 21, pp. 5-20). Emerald Publishing Limited.
- Wakker, P. P. (2010). Prospect theory: For risk and ambiguity. Cambridge university press.
- Xue, F., Li, X., Zhang, T., & Hu, N. (2021). Stock market reactions to the COVID-19 pandemic: The moderating role of corporate big data strategies based on Word2Vec. *Pacific-Basin Finance Journal*, 68, 101608. https://doi.org/10.1016/j.pacfin.2021.101608.
- Yan, X., Yu, G., & Ji, P. (2019). ERP investment and implementation between China and US: difference and enlightenment. *Information Technology and Management*, 20, 175–185.
- Yao, Y., Tian, L., & Cao, G. (2022). The Information Spillover among the Carbon Market, Energy Market, and Stock Market: A Case Study of China's Pilot Carbon Markets. *Sustainability*, 14(8), 4479. https://doi.org/10.3390/su14084479.

Yenkey, C. B. (2018). Fraud and market participation: Social relations as a moderator of organizational misconduct. *Administrative Science Quarterly*, 63(1), 43-84. https://doi.org/10.1177/0001839217694359.

- Yong, B. X., Abdul Rahim, M. R., & Abdullah, A. S. (2017). A stock market trading system using deep neural network. In *Asian simulation conference* (pp. 356–364). Springer, Singapore.
- Yu, Z., Xiao, Y., & Li, Y. (2020). The Response of the Labor Force Participation Rate to an Epidemic: Evidence from a Cross-Country Analysis. *Emerging Markets Finance and Trade*, 56(10), 2390–2407. https://doi.org/10.1080/1540496x.2020.1787149.
- Zhang, K. H. (2001). How does foreign direct investment affect economic growth in China?. *Economics of Transition*, *9*(3), 679–693.
- Zheng, W., Li, B., Huang, Z., & Chen, L. (2021). Why Was There More Household Stock Market Participation During the COVID-19 Pandemic?. *Finance Research Letters*, 102481. https://doi.org/10.1016/j.frl.2021.102481.
- Zhou, J., Li, W., Yan, Z., & Lyu, H. (2021). Controlling shareholder share pledging and stock price crash risk: Evidence from China. *International Review of Financial Analysis*, 77, Article 101839.
- Zhou, L., Qin, K., Torres, C. F., Le, D. V., & Gervais, A. (2021). High-frequency trading on decentralized on-chain exchanges. In 2021 IEEE Symposium on Security and Privacy (SP) (pp. 428-445). IEEE. https://doi.org/10.1109/SP40001.2021.00027.
- Zou, J., & Deng, X. (2019). Financial literacy, housing value and household financial market participation: Evidence from urban China. *China Economic Review*, 55, 52-66. https://doi.org/10.1016/j.chieco.2019.03.008.