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The impact of psychological characteristics on retirement savings in South Africa

By

Ms. Mmateboho Malinga

1655716

A research thesis submitted to the Faculty of Commerce, Law, and Management, University of Witwatersrand, in partial fulfilment of the requirements of the degree of Master of Management in Finance and Investment

Supervisor: Prof. Odongo Kodongo

ABSTRACT

This study investigates the relationship between psychological characteristics and cognitive biases with retirement savings behaviour in the context of South Africa. 201 responses were collected through random probability sampling technique from a wide range of industries in the country. A closed ended survey questionnaire was distributed through the University of Witwatersrand student database, which provided a diverse representation of the entire population of 15 million employed South Africans. The study utilized descriptive and inferential statistical analyses, including Pearson correlations and multiple regression analysis to explore associations and relationships between psychological traits, cognitive biases, and retirement savings behaviour. The survey instrument's reliability and validity were ensured using Cronbach's Alpha, confirming the accuracy and consistency of the collected data. The findings of this study highlight the notable positive relationships between psychological characteristics, cognitive biases, and retirement savings behaviour, revealing the underlying factors that influence individuals' financial planning decisions for their retirement. Additionally, demographic variables such as age, income, and education level were found to be influential factors that shape saving habits, emphasizing the multifaceted nature of retirement savings behaviour.

Keywords*:* Psychological Characteristics, Cognitive Bias, Retirement Savings Behaviour

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I give thanks to the almighty God, for His mercy, grace, favor and blessings throughout my studies and completion of my research project.

I would like to express my deepest and sincere gratitude to my supervisor Prof Odongo Kodongo, for believing in my research topic from day one. Giving me the opportunity to do pursue my research topic and providing invaluable guidance and provision throughout this research process. His enthusiasm, oversight, authenticity, thoroughness, and impetus have deeply encouraged me. It was a good privilege and honor to work and study under his guidance.

I would like to say thank you to my friends and work colleagues, for their constant support. I am extending my thanks to the Wits Business School students for their participation. I also thank all the staff of Research section and program manager Meisie Moya at WITS University, for their kindness.

M. Malinga

DEDICATION STATEMENT

I dedicate my thesis work to my family. A special emotion of appreciation to my loving, son (Nathan) and little sister (Lindi), whose words of encouragement, unwavering support, understanding and push for tenacity circle in my head has truly been a driving force behind its completion.

I also dedicate this thesis to my many friends, mentor, and colleagues who have supported me throughout the progression and duration of the research. Their belief in the pursuit and contribution of knowledge towards both academia and practice have been a persistent source of inspiration throughout this journey.

M. Malinga

ACRONYMS AND ABBREVITIONS

CB	Cognitive Bias
CPI	Consumer Price Index
EER	Expected Earnings Replacement
EMH	Efficient Market Hypothesis
GDP	Gross Domestic Product
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
PC	Psychological Characteristics
PFA	Pension Fund Act
RSB	Retirement Savings Behaviour
SARB	South African Reserve Bank
SPSS	Statistical Package for Social Scientists
USD	United States Dollar
WLD	World
ZAF	South Africa

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1. CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1. Introduction

Employed people get anxious about whether they would adequately fund their desired lifestyles during their retirement due to insufficient retirement saving rates, and soaring housing, healthcare, and food costs (Kimiyagahlam, Safari & Mansori, 2019). Many studies consistently raise concerns about the high occurrence of financial insolvency among individuals in retirement (Benartzi, 2010). Further, studies have found that insufficient individual retirement planning stems from financial literacy, risk approach, investment time horizons, confidence, and savings behaviour (Hanna, Waller, & Finke, 2011; Mitchell & Utkus, 2003; Tanaka, Camerer, & Nguyen, 2010; Van Rooij, Lusardi, & Alessie, 2011). However, no study has explored the correlation between retirement savings and the psychological characteristics of savers in South Africa. For that, there is a need for further research to be conducted to seal this knowledge gap.

Studies conducted globally indicated by the year 2050, 25% of the population in OECD countries and 17% of the global population will be over the age of 65 (He, Goodkind, & Kowal, 2016). Surprisingly, only 24.8% individuals worldwide are saving for their old age (Demirgüç-Kunt, Klapper, & Panos, 2016). These inadequate savings, combined with the aging population, pose significant challenges for pension systems, leading to a risk of many retirees having insufficient financial resources to support themselves during retirement (Farrar et al., 2019). As a result, this research aims at addressing the influence of psychological characteristics on retirement savings in South Africa. This gives rise to the questions on the problem statement and main purpose addressed in this study.

South Africa is faced with a poor savings challenge, as people do not save enough and as a result will not accumulate sufficient assets to retire comfortably (Benartzi, 2010). Saving behaviour of an individual can be supported by behavioural influences such as psychology and the effect of holding inadequate income (Willows & October,2021). Owing to the income disparity in South Africa (World Bank, 2020), certain individuals might be more affected by inadequate income, frequently along ethnic, informative and gender dimensions due to the inequitable dispersion of wealth (Asongu, Nnanna & Acha-Anyi, 2020).

We have seen government interventions in aiding South African households (following the 2021 budget speech, for example) to save for retirement by growing preservation before retirement and increasing flexibility through limited access to retirement savings through a "two-pot" process.[1] The government is of the notion that preservation of contributions should complement other efforts to promote retirement planning and to prevent old-age poverty, as well as reliance on the state. Thus, contemplation is also being undertaken to propose automated registration (and compulsory signing up) into the retirement systems since not all businesses offer a retirement benefit for their employees. Unless such employees self-register in a retirement annuity or endowment, they are left with no provisions for retirement.[2]

1.2. South African Retirement Savings Landscape

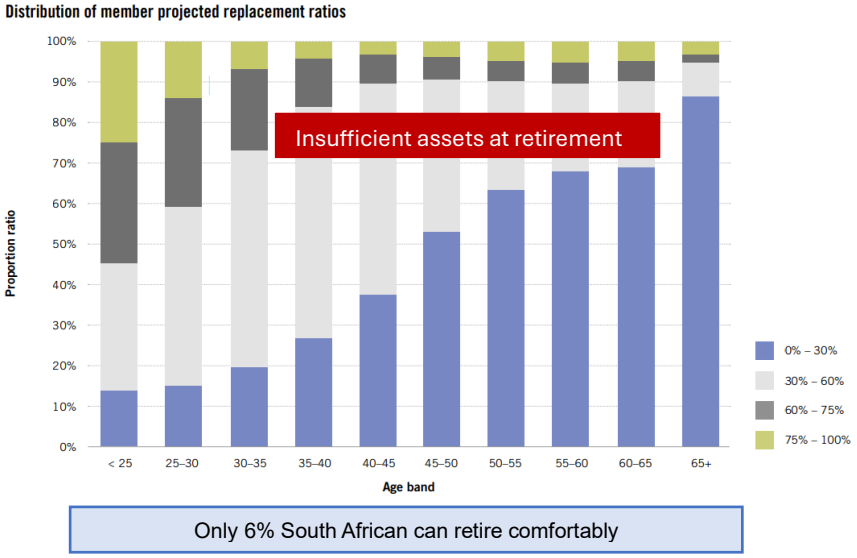
Retirement savings is the sum of income an individual sets aside over time for retirement. In South Africa, only about 6% of South Africans can retire comfortably and are independent from the state, family, and friends.[3] It is noted that to achieve a comfortable retirement savings (rule of thumb) investors need to save at least 17% of their monthly income for the next 40 years with no break in between. For that to happen, investors need a fund credit of 12 or 15 times of their pensionable salary at retirement as a key intervention to reach a 75% replacement ratio.[4]

Expected Earnings Replacement Ratio (ERR) by age

Figure 1 depicts statistical information based on the projected earnings replacement ratio (ERR) for members belonging to a retirement fund by age.

[1] https://www.gov.za/speeches/release-two-retirement-reform-discussion-papers-public-comment-14-dec-2021-0000
[2] https://www.gov.za/speeches/release-two-retirement-reform-discussion-papers-public-comment-14-dec-2021-0000
[3]https://connect.alexanderforbes.co.za/legacyarticle/140#:~:text=Alexforbes%E2%80%99%20Member%20Watch%20capture %20data%20on%20the%20key
[4]https://connect.alexanderforbes.co.za/legacyarticle/140#:~:text=Alexforbes%E2%80%99%20Member%20Watch%20capture %20data%20on%20the%20key

Figure 1: Expected Earnings Replacement Ratio (EER) by age



Source: Alexander Forbes Member Watch Survey[5]

Figure 1 shows members above 60 years and over present the worst probable effects. As it stands today, a total of 46% of pensioners over 60 years and above receiving old-age social grants from the government (Statusadmin, 2023). This appears to corroborate the statistics in Figure 1, which indicates that South Africans over 60 years cannot afford to retire comfortably and independently from the state. Only 3.3% of those members have above 75% replacement ratio; the rest of the members largely due to insufficient contributions and lack of preservation when changing jobs or on retrenchment fall below the 75% replacement ratio[6] These statistics show that South Africa has a poor savings culture, and there is a need for a robust intervention to address the poor retirement savings behaviour.

1.3. Behavioural Finance

Behavioural finance philosophies seek to examine the psychological effects and cognitive predispositions on individual behaviours and to elucidate why the efficient markets hypothesis (EMH) may not hold (Hon, Moslehpour and Woo, 2021). According

5 https://connect.alexanderforbes.co.za/legacyarticle/140#:~:text=Alexforbes%E2%80%99%20Member%20Watch%20capture %20data%20on%20the%20key

6 https://connect.alexanderforbes.co.za/legacyarticle/140#:~:text=Alexforbes%E2%80%99%20Member%20Watch%20capture %20data%20on%20the%20key

to Benartzi (2010:5), behavioural finance is a blend of finance and behavioural science. Cynics of EMH point out that psychological, cognitive, and emotional dynamics affect the decisions of investors, financial experts, and financial institutions (Hon et al., 2021). Thus, behavioural finance contends that asset prices are likely to vary from their basic worth, and these disparities are triggered by the presence of buyers/sellers whose judgment is informed by behavioural preferences (Hon et al., 2021; Barberis & Thaler, 2003).

That is, individual behaviour and cognitive biases may possibly drive irrationality which may influence financial decision-making (Benartzi, 2010:5). Information influences an investor's decision-making, which in turn, affects their sentiments and leads to cognitive biases. This phenomenon helps to explain how investors behave when the market deviates from the Efficient Market Hypothesis (Hon et al., 2021). Behavioural finance further suggests that individuals often engage in limited reasoning and struggle to effectively process information, as opposed to utilizing complete information for decision-making as believed in conventional/rational finance. The irrational decisions made by investors are primarily driven by their individual sentiments and attitudes.

1.3.1. Behavioural finance- Financial literacy and its role on retirement savings perception

As discussed, information flow may influence investors' financial decision making. Therefore, financial literacy interventions play a fundamental role in shaping investor biases and, as a result, may influence their investment decision to save towards retirement. According to Planting (2020), South African savings industry spends a lot of money creating a flow of information and educating investors on the significance of saving for retirement. However, the effects of this education remain weak as fewer than 10% of investors accumulate sufficient funds to retire comfortably. As an alternative of finger-wagging, it's time to transform the behaviour and thinking towards individual finances. To achieve this, it is important to understand the role of psychological characteristics on individual retirement savings and planning (Kimiyagahlam, Safari & Mansori, 2019).

Research shows that investors' understanding of retirement savings terms is restricted, due to lack of financial literacy which impacts on how they make decisions and what investment mistakes they make (Benartzi, 2010). Educating investors to comprehend the monetary influence of their benefits, regardless of age, gender, or

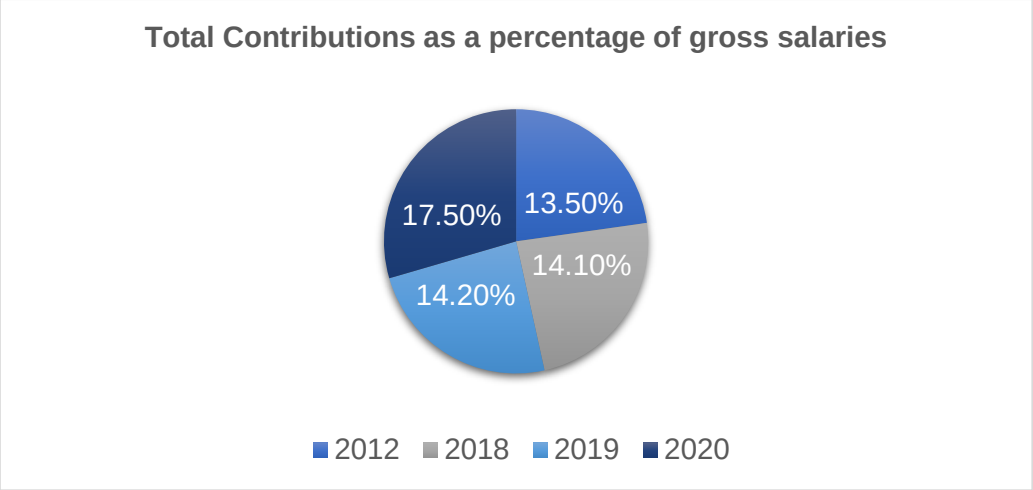
income, will aid them in making more informed financial decisions and encourage savings behaviours that assist in realising their savings goals.

Over the past years, we have seen a growing trend of driving investor education, fostering clear and simple communication, encouraging benefit counselling and specialised financial expert advice by financial institutions in the retirement fund industry.[7] Despite such initiatives by the retirement fund industry, still see the majority of people savings behaviour being poor as it has been recently reported that under twenty percent of South Africans over the age of 60 are obtaining private retirement income under R6 000 a month – approximately a quadrant of the country's standard income .[8]This, shows that income level for retirement is very low and insufficient to sustain the retiree and as a result increases the state burden and dependence on the government old age grant.

Figure 2 illustrates an average over-all contribution (as a percentage of earnings) in 2012, 2018, and 2019. The employer and employee contribution to retirement savings improved from 13.5% in 2012 to 14.2% [9] and a further 3.3% addition (17.5%) increase between 2019 and 2020 respectively[10] This may possibly be an outcome of members recognition of the value of saving for retirement through financial literacy interventions. Therefore, investment behaviour and financial literacy awareness can influence the outcome of their investments savings rate.

Figure 2: Total contributions as a percentage of gross salaries

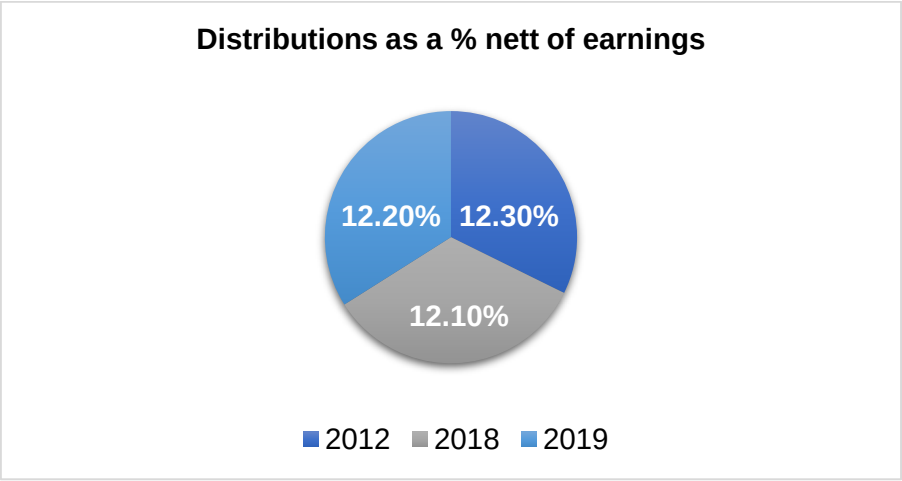
[7] https://www.10x.co.za/faq/for-business/starting-a-retirement-fund/contribution-rates-as-a-of-salarywage
[8] https://www.news24.com/Fin24/sa-pensioners-in-dire-financial-state-report-shows-20200306-2
[9] https://connect.alexanderforbes.co.za/legacy article/140#:~:text=Alexforbes%E2%80%99%20Member%20Watch%20capture%20data%20on%20the%20key
[10] https://www.fsca.co.za/Annual%20Reports/FSCA%20Annual%20Report%202021-2022.pdf



Source: Alexander Forbes Member Watch Survey

Figure 3 reveals the trends in the average distributions as a ratio of nett earnings after all management and fund expenses subtracted from full contributions in 2012, 2018, 2019. As a result, more expenses in running the funds may reduce the net retirement savings pool. Investors decisions in choosing the most appropriate investment should therefore consider the underlying expenses. What is important, is to have more going towards net retirement savings and fewer towards expenses.

Figure 3: Distributions as a % nett of earnings



Source: Alexander Forbes Member Watch Survey

1.4. Retirement savings behaviour: three-way interaction

Jacobs, Lawson, and Hershey (2005) outline a three-way interaction that influences retirement savings. This interaction involves risk tolerance, financial planning comprehension, and future time-perspective. Reyers (2018) further states that low

savings rates, volatile financial markets, and growing tension on government inability to provide sufficient social old age grants to individuals beyond retirement, all contribute to the move to inspire improved savings behaviour and appreciation of the drive to such behaviours.

Individuals who have a shorterm outlook on financial planning goals are often influenced by the connection between risk tolerance and saving for retirement. Therefore, having a low time perspective does not stem from a lack of understanding financial literacy; rather, it is due to the difficulty in envisioning the distant future. On the other hand, an investor with a high time perspective whether they are knowledgeable about financial planning or not, can greatly impact their risk tolerance when it comes to saving for retirements.

1.5. Behavioural psychology characteristics of retirement planning

Hershey and Mowen (2000) conducted a study on the influence on emotional traits, economic learning, and financial readiness on retirement planning. The focused on identifying the key traits that individuals exhibit when making decisions about their finances and savings. The researchers found that being financially prepared is strongly correlated with saving for retirement, which supports the idea that future-oriented perspective plays a significant role in both financial knowledge and retirement readiness. Additionally, Rolison, Hanoch, and Wood (2017) found that older individuals with shorterm time perspective are more likely to prioritise savings, while younger individuals with long-term time horizons, tend to prioritise financial learning.

1.6. South African Investment Landscape

The investment industry has progressed over the past decade and an array of different investment choices, formations, instruments, and contributors have changed. Asset managers, policies and financial consultants are having to familiarise their methodology, offering, expertise and information continuously, to keep up with the dynamic evolution of innovation and changing investor needs, regulations, and product offerings (Reuvers, 2021).

There has been a decline in fees as consumers continue to demand lesser charges, as they continue to observe the influence of these charges on their investment performance in the long term. Alternatively, individuals increasingly turn to passive

investment portfolios (index tracking) as they charge lower fees compared to actively managed portfolios. In the past five years, bonds and equities were equally negatively affected, complicating investors' portfolio diversification strategies. As a result, there has been an increase in alternative asset classes (hedge funds, private equity, derivatives) relative to traditional asset classes (equity, bonds, cash, property).

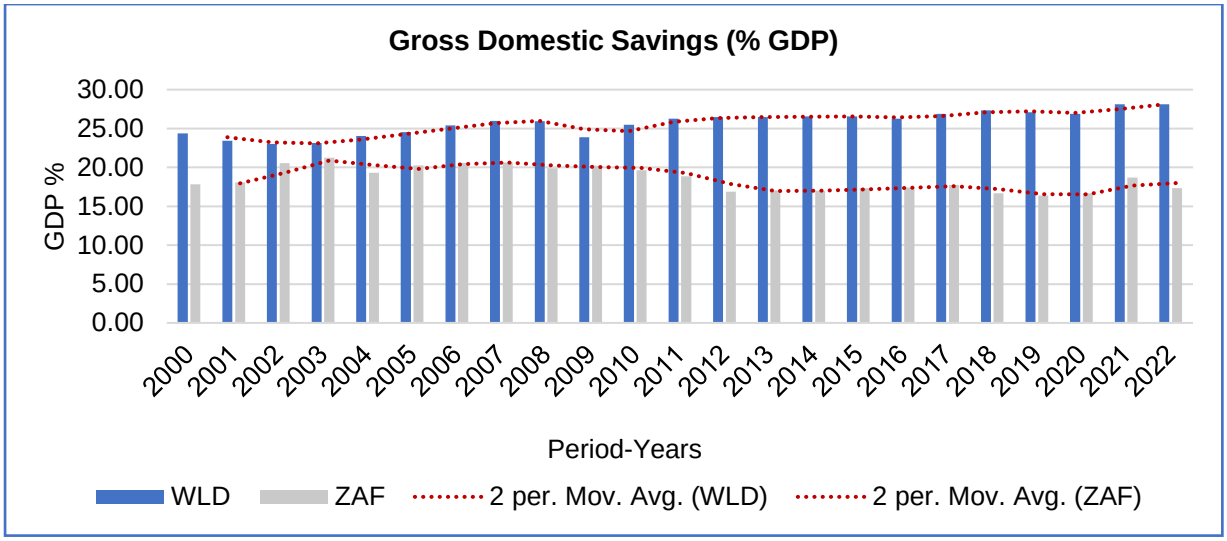
Traditional asset classes are threatened by recent developments in the macro economy. The industry has witnessed about 90% growth in income over nearly 20 years. However, in 2022, rapidly increasing interest rates worldwide saw both stock and bond (asset) prices plummet (Newsom, 2023). And global assets under management tumbled by USD 10 trillion (10%), to USD 98 trillion, near 2020 ranks[11]. As a result, the increased volatility in the markets of these traditional asset classes further channelled investors' interest towards alternative asset classes (Sharma & Kumar, 2019).

1.7. Behavioural Finance influence on critical investment: Retirement savings lens

The rate of savings for South African's is low relative to that of the rest of the world. Figure 4 shows that savings to GDP for South Africa was below 20% in 2022 compared to the Worlds savings to GDP at 24.4% respectively. Figure 4 shows the gross domestic savings (% of GDP) from 2000-2022, a comparison between South Africa (ZAF) and World (WLD).

Figure 4: Gross domestic savings (% of GDP)

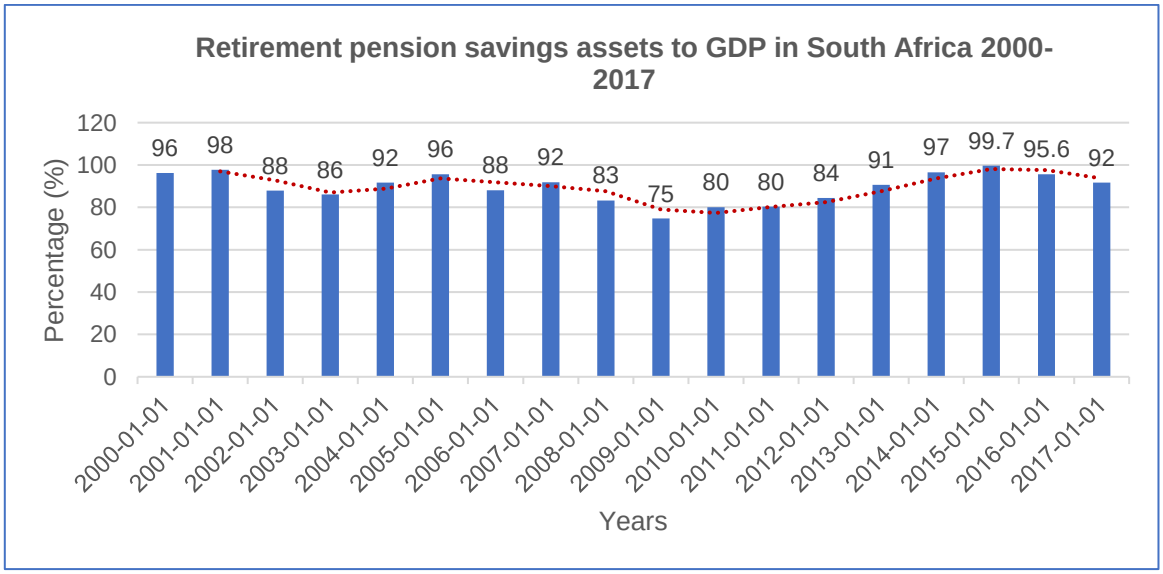
[11] BCG Global. (2023). *Chris McIntyre*. [online] Available at: https://www.bcg.com/about/people/experts/chris-mcintyre [Accessed 16 Aug. 2023].



Source: World bank (2023)

It is important to note that pension savings assets are the largest contributor of South Africa's Gross Domestic Product (GDP) (World Bank, 2022). According to Statista (2022), the aggregate assets of retirement pension savings in South Africa grew generally between 2002 and 2020 respectively, despite several variations. However, the country has experienced a significant decline amounting to 154.7 billion U.S. dollars as of 2020, compared to the year prior. Both figures reveal a fluctuating trend over the past years; however, the trend analysis compared to Figure 5 still shows a downward slope effect.

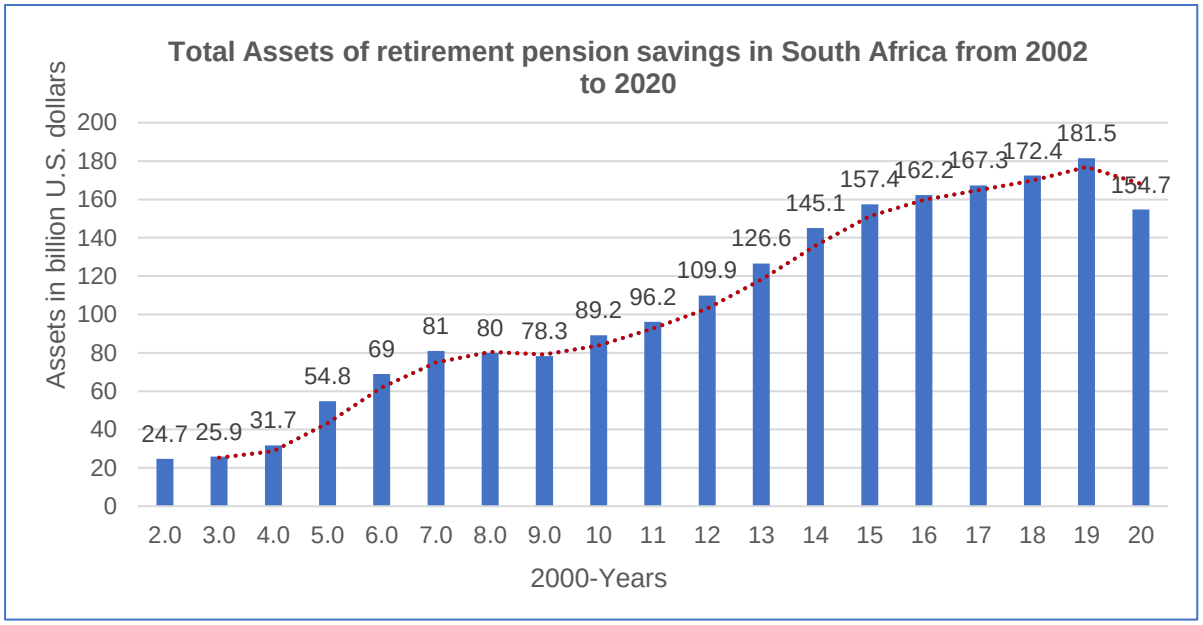
Figure 5: Retirement pension savings assets to GDP in South Africa 2000-2017



Source: Federal Reserve Economic Data

Figure 6 shows the total retirement savings assets trajectory from 2002 to 2020 respectively. It is worth noting that retirement savings play a considerable impact in many economies (World Bank, 2022; Willows & October, 2021) and influence fundamental support initiatives on government strategic programmes on social protections.

Figure 6: Retirement pension savings in South Africa 2002-2020 (in billion US$)



Source: Statista Research Department

1.8. Retirement savings versus financial market liquidity

Financial market volatility and uncertainty are a wake-up call for people with retirement savings that planning, and preparedness are important to ensure readiness for the next disruption[12] Macro-economic landscape (interest rates hikes, Russia & Ukraine war, Covid-19, etc.) introduce uncontrollable risks to the markets that adversely affect retirees' savings and ability of investment portfolios to meet their original objectives. In the constant mode that life expectancy is increasing, it is furthermore anticipated that markets continue to rise and fall over time. With people in or closer to retirement, time is one luxury they don't have and, thus, they face extreme risk from market plunges.

[12] https://www.facebook.com/BusinessTechSA.

Retiring through a bear market is further from ideal, specifically if an individual investment portfolio is heavily weighted on listed equities or other asset classes which are presently under pressure; the value at which assets trade is impacted by investors' expectations (which is driven by psychological behaviour) and market efficiency about the future earnings of those asset classes and future cash flows that they may generate. As a result, this may influence investors irrationality and market inefficiency stimulate psychological biases in decision making, as well as influence stock market price movements and performance returns (Sharma & Kumar, 2020). Retirement pension savings allocations to private equity assets class are covering 5%, lower than 10% limit.[13]

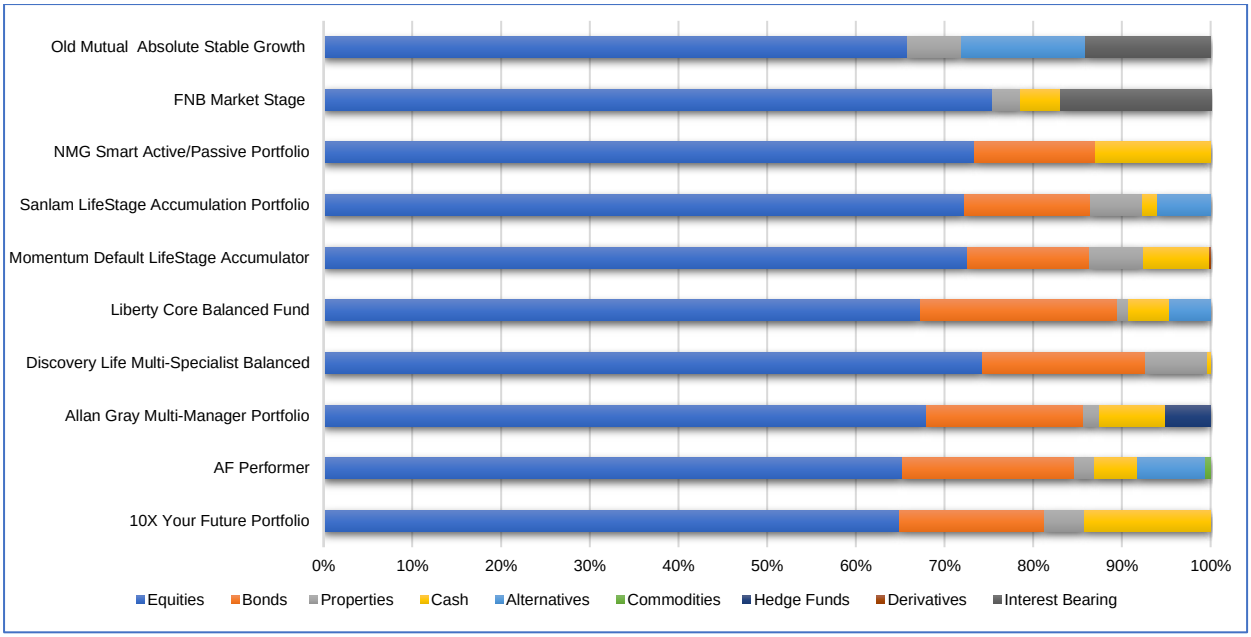
Regulation 28 distribution under the Pension Fund Act (PFA) restricts the scope of retirement fund savings investment in a specific asset or in exact asset classes. The primary purpose of Reg. 28 is to safeguard investors' retirement provision from the bearings of poorly diversified asset selections, thus limiting the maximum exposure to further risky asset classes (i.e., private equities, hedge funds), making sure that retirement savings are not unduly exposed to excessive risk-taking by asset managers [14] Both private equities and hedge funds are limited to 15% exposure.

Figure 7 shows the top 10 default investment portfolios chosen by trustees for their retirement investors, default investment choice considered appropriate to achieve CPI + 5% inflation beating performance target returns over a rolling period of 5 to 7 years. The composition of each portfolio asset classes is in line with regulation 28 under PFA.

Figure 7: Portfolio asset classes allocation comparison

[13] PENSION MARKETS IN FOCUS. (2020). Available at: https://www.oecd.org/daf/fin/private-pensions/Pension-Markets-in-Focus-2020.pdf.

[14] Moneyweb. (2023). *Regulation 28 of the Pension Funds Act: Your questions answered*. [online] Available at: https://www.moneyweb.co.za/financial-advisor-views/regulation-28-of-the-pension-funds-act-your-questions-answered/#:~:text=What%20is%20Regulation%2028%3F [Accessed 8 Oct. 2023].



Source: Compiled by researcher from fund factsheets of each of the default portfolios (trustee choice)

As prescribed by the South African Reserve Bank (SARB) asset class limit exposure is as follows: 75% equity, Listed Property 25%, Offshore Assets 45%, and Hedge funds 10% respectively. This limit plays a significant role in guaranteeing that retirees retirement savings provides them with adequate earnings post-retirement.

Behavioral finance is a discipline that has emerged out from the response to the restraints of EMH framework (Yildirim, 2017; Malkiel, Mullainathan and Strangle, 2005). Behavioural finance is considered a new discipline as it introduces a fundamentally different approach to understanding financial markets compared to traditional financial theories (Benartzi, 2010; Yildirim, 2017) as it integrates psychology and economics theory to explain investors irrational behaviour that contrasts with the classical financial theories like the EHM (Szyszka, 2007; Lo, 2005).Thus challenging the established theories (EMH) and focus on investors cognitive biases which influence investment decision making and market outcomes (Muradoglu and Harvey, 2012). Therefore, this discipline provides empirical evidence of market irregularities that cannot be explained through EMH; hence, it has now gained substantial recognition over the past decade thanks to behavioural economist like Daniel Kahneman and Richard Thaler. Behavioural finance draws from fields like psychology

(Kahneman, 2003; Kahneman and Tversky, 2013; Thaler,2016.) to bring a richer and more realistic understanding of investors' behaviour. This study aims to address the impact of psychological characteristics on retirement savings in South African. Therefore, this research attempts to solidify the economics of investors' behaviour through understanding the gap in the linkage between psychological characteristics and retirement savings in South Africa while considering the role of investor rationality and observations on their cognitive biases.

Because behavioural finance emphasizes how psychological traits and cognitive biases affect investors' financial behaviour, it has a substantial impact on retirement savings decisions. To assist people, overcome prejudices and make more well-informed, rational savings decisions, better retirement savings vehicles and policies can be designed thanks to investors' awareness of behavioural aspects. This will ultimately improve retirement financial security.

1.9. Problem Statement

The relationship between retirement savings and age has been examined by a number of academics (Adams & Rau, 2011; Clark, Knox-Hayes, & Strauss, 2009; Dalen, Henkens, & Hershey, 2010; Phua & McNally, 2008). Moreover, studies have also found that gender is a strong predictor of retirement financial planning (Fisher, 2010; Glass & Kilpatrick, 1998), with females generally saving less than males. Other studies highlight the role of EMH theory and behavioral finance (Hon et al., 2021; Barberis & Thaler, 2003; Fama,1970; Fama,1991; Fama & French 1996a, 1996b). However, very few studies have linked psychological characteristics to retirement savings (Tomar et al., 2021; Hershey et al., 2007).

South Africa has a poor culture when it comes to savings towards retirement as the data highlight that only 6% of South Africans can retire comfortably are independent from the state. Thus, an important one-sided question is, "Why are just a few individuals saving for retirement?" Following the behavioral finance literature (Kimiyagahlam, Safari & Mansori, 2019; Benartzi, 2010), this thesis argues that the answer to this question lies in individuals' cognitive biases essential in processing, interpreting, and rationalizing information relating to financial planning and saving behaviour.

Investor behaviour greatly influences activity in the stock markets. The stock market's performance, as a primary source of equity capital for businesses, is frequently regarded as a reflection of a country's economic strength and development (Rasheed et al., 2018). With rapidly growing interest from investors, it has become clear that there is a pressing need to better define the financial market efficiency of this new investment paradigm, especially concerning performance returns. Thus, the study aims at investigating the influence of psychological characteristics on retirement savings in South Africa to better understand the phenomenon of psychological characteristics and retirement saving correlation to each other. It also aims at exploring the effect of investors' cognitive biases on their attitude towards savings for retirement. Because psychological traits and cognitive biases both contribute to explanation of why people depart from sensible retirement saving behaviour. Thus, a deeper knowledge of these phenomena can aid in the development of human behaviour-based financial education programs, legislations, and retirement products.

1.10. Objectives of the Study

- To investigate the influence of psychological characteristics on retirement savings in South Africa
- To examine the effect of investors' cognitive biases on their attitude towards savings for retirement.

1.11. Research Questions

- What are the psychological characteristics that impact retirement savings in South Africa?
- How do investors' cognitive biases affect their attitude towards savings?

1.12. Significance of the Study

The study of the impact of psychological characteristics on retirement savings in South Africa is vital as it facilitates the understanding of the fundamental impetuses, behaviour, attitude, predispositions, and decision-making methods that influence investors and market participants. This comprehension can inform interventions and strategies to foster better retirement planning, financial planning, addressing issues like procrastinations, risk aversion, and cognitive biases that may possibly impact retirement saving.

1.13. Organization of the study

Chapter 1: This chapter discussed the introduction and the theoretical background of the study. It also focused on the research primary purpose, the problem statement, research questions and the significance of conducting this study.

Chapter 2: This chapter focuses on literature reviews, looking at studies that have been conducted from both present and past with the aim of addressing the underlining research questions outlined above. This chapter gives a framework and review of literature in support of the research objectives, key concepts, and theories.

Chapter 3: Chapter 3 is focuses on research methodology that outlines various methods used to prepare research design, methods, and sampling techniques. It further discusses data gathering and ways of analysis.

Chapter 4: This chapter focuses on the analysis and presentation of findings. This part of the research will discuss the data analysis results, interpretation and findings about the research.

Chapter 5: This chapter discusses the conclusion and recommendations. The conclusion and recommendations are derived from the findings that emanate from Chapter 4 The findings are anchored within the objectives of the study, which result in producing the conclusion and recommendations of the study.

1.14. Summary of the chapter

In this chapter, the study provides an introduction and background context into the study of the impact of psychological characteristics on retirement saving in South. This study begins by discussing the South African retirement savings landscape and the emergent of behavioural finance steaming from the theory of efficient market hypothesis. The study reviews the South African investment landscape relating to gross domestic savings as a percentage of GDP, and how investors preference has changed over the past decade. Finally, this study discusses the potential research problem statement, primary objectives and the significant of the study. Overall, this chapter provides a foundation for understanding the impact of psychological characteristics on retirement saving in South Africa.

2. CHAPTER 2: THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. Theoretical framework and hypothesis development

2.1.1. Behavioural Finance Theory

Behavioral finance is a discipline that has emerged from the field of EMH. Traditional finance theory, which includes the expected utility theory and the efficient market hypothesis, has proven inadequate in explaining investor's behaviourand their preferences and associations with investments in certain sistuations. As a result, further exploration in the field of economics has been motgivated to seek additional explanations for the changes in investor interests when circumstances changes. This has led to more research in the economic field to identify additional influences on changes in investor interests under different conditions (Yusuf, 2015). The definition of behavioural finance assumes two significant characteristics such as individual investors and whole market. Thus, behavioural finance in a comprehensive viewpoint is separated between macro behavioural finance and micro behavioural finance (Pompian, 2006; Bikas et al., 2013).

Macro behavioural finance reveals and depicts abnormalities of efficient market hypothesis that may possibly be clarified by patterns of individual behaviour. Micro behavioural finance, on the other hand, examines behaviour and irregularities of individual investors and it distinguish them from rational individual (Bikas et al., 2013). For the purpose of this study we looked into the inquiry of behavioural finance ralated to individuals impact on the market. Goldberg & Von Nitzsch (1999) defined behavioural finance as financial market theory positioned towards behaviour; discipline which is directed to evidence that individuals behave rationally only within specific constraints. Thaler (1999) asserted that behavioural finance is a combination of classical economics and financial principles within researches exploring psychology and decision making.

Behavioural finance combine psychology and sociology in its theory. Mulvey and Shetty (2004), debated that investors lacked making rational economic decisions constantly; predominantly in situation of unpredictability as they can deviate from rational behaviour. Such a behaviour can result to irrationality in decision-making,hence, the development leading to the addition of the investigation to the

impact of sentiments and psychological characteristics in financial decision making. Mitchell and Utkus (2004), regarding behavioural philosophies, smaintained that effective retirement saving plannning is largely dependent on decisions concerning investor's psychological attributes towards saving. Psychological characteristics to be referred to in this study are,perspective on savings behaviour, attitude towards saving and risk tolerance. Therefore, based on the above theory it is evident that the study can be able to determine the investors willingnesstowards retirement savings by observing the above psychological characteristics.

2.1.2. Prospect Theory

Kahneman and Tversky (1979) challenged the expected utility theory, which assumes that investors decide between risky assets by considering the utility values associated with the prospects and of happening and if the utility contingent on their current wealth. However, prospect theory reveals that investors choose among substitutes that incorporate prospects and gains in terms of expected utility. The utility of returns depends on the potential value of gains and losses relative to previous outcomes, and investors use various diverse approaches when making decisions. Investors are risk-averse, preferring investments with low uncertainty over those with high uncertainty[15].Soufian et al. (2014) explained how the efficient market hypothesis can explain investors behavioural preferences and cognitive biases. They found that investors decision-making processes are not always fully logical, as suggested by the optimal capital distribution theory, which believes that economic theories can drive the entire economy.

Caginalp and DeSantis (2011) paradoxically argue that the efficiency of the stock market is determined by quality of investments, investors, and traders. They suggest that behavioural finance, rather than traditional economics, should be used to understand the irrational behaviour of investors and the unpredictable rise and fall of the market (Nair & Antony, 2015). Even though investors have access to relevant information about securities and market value, they often make uninformed decisions. These decisions are influenced by potential outcomes and emotions. Additionally,

[15] Wikipedia Contributors (2019). *Risk aversion*. [online] Wikipedia. Available at: https://en.wikipedia.org/wiki/Risk_aversion.

investors' perception, financial literacy, and the influence of family, friends and rivals can also impact their decision-making. Thus, investors cognitive biases can influence their attitude towards savings behaviour which tends to impact financial behaviour. Cognitive biases (confidence, optimistic/pessimistic and rational expectation) and financial literacy are used to observe investors behavior towards savings. Therefore, based on the above theory it is evident that we can be able to determine the investors capacity towards retirement savings by observing their biases, information and financial literacy comprehension and knowledge which can distinguish individual investors from each other (Tomar etal., 2021).

2.2. The Literature Review

2.2.1. Efficient market hypothesis

Efficient Markets Hypothesis (EMH) implies that capital markets reflect all presented information, making it impossible to always attain higher-than-average performance returns (Timmermann & Granger, 2004; Malkiel,1992). If returns were predictable many investors would use them to generate limitless returns. The investors' market behavior should produce returns that conform to the EMH, otherwise there would exist a money-machine generating limitless wealth, which cannot occur in a stable economy (Timmermann & Granger, 2004). Therefore, EMH fails to account for investors' behavioral prejudices, information irregularity, and market anomalies that can lead to mispricing and inefficiencies (Gupta, 2016; Fender, 2015). These aspects challenge the hypothesis of perfect market efficiency, highlighting restraints in explaining asset prices and market behavior.

On the other hand, behavioral finance explores how the psychological characteristics and cognitive biases influence investors' decisions, leading to market anomalies and unorthodoxies from the forecasts of traditional finance models like the Efficient Market Hypothesis (EMH).[16] It is important to note that behavioral finance is on a positive description of investors' behavior particularly under risk and uncertainty, rather than on the normative analysis of behavior which is more typical of the conventional approach (Stracca, 2004).One of the key objectives of behavioural finance is to

[16] Behavioral Finance and Asset Prices. (2023). *Contributions to Finance and Accounting*. doi: https://doi.org/10.1007/978-3-031-24486-5.

understand systematic market extrapolations of investors' psychological characteristics and cognitive biases. These psychological characteristics, cognitive biases provide a more comprehensive context to justify asset prices and market behaviour (Gwilym, 2010). For example, Benartzi and Thaler (1995) show how loss aversion can explain the equity premium puzzle. The integration of psychology and finance, behavioural finance directs the restrictions of purely rational models, recognising that market participants may divert from optimum decision-making appropriate to emotional and cognitive influences. Therefore, investors' psychology captures a wide range of information about asset prices, volume and market behaviour that can lead to definite new predictions (Barberis, 2018).

2.2.2. The impact of psychological characteristics on retirement savings

Gerhard, Gladstone, and Hoffmann (2018) state that psychological characteristics influence an individual's propensity to save in a unique way based on life-cycle stage, gender, financial literacy level or income – aspects which themselves also impact savings. According to Mowen (2000) and Asebedo et al., (2018), comprehensive personality traits form the basis for limited psychological characteristics that work together to shape behaviour. As a result, researchers have found correlations linking a variation of psychological characteristics and saving behaviour (Gerhard, Gladstone, & Hoffmann, Mowen, 2000; Asebedo et al, 2018). However, these traits can either impact savings directly or indirectly. It is also noted that attitude also play a central role towards saving behaviour as sentimental positions (feelings) are linked with saving behaviour. Scholars found that optimistic reactions impact individual's capability to produce earnings, flourish at on their jobs, exercise determination and -self-discipline, and boost feelings of self-confidence (Bandura, 1997; Lyubomirsky, King, &Diener 2005; Asebedo et al., 2018). Hence, these two traits are noted to be the essential psychological characteristics that supports saving behaviour.

Saving is reflected as a rational behaviour assumed by individuals to prepare for retirement, yet South Africans are economically unprepared for this major life transition (fewer than 6% can retire comfortably). The amalgamation of emotional perceptions in savings behaviour studies has develop progressively through the emerge of behavioural finance and observation that individuals do not continuously make reasonable financial decisions (Asebedo et al., 2018). From an economics perception, irrationality is demarcated as demonstrating unpredictable partialities over a period;

nevertheless, finance alone is restricted in its capacity to elucidate the development of partialities or what might cause them to vary for some individuals and not others (Asebedo et al., 2018). Therefore, in various conducts, a psychological model is perfect to outline and recognise this absurdity, and the fundamental psychological characteristics impact that may justify this savings behaviour. We acknowledge that the psychology of saving in South Africa is multifaceted, as a variety of psychological characteristics affect saving outcomes.

2.2.3. Time perspective outlook on retirement savings

The importance of setting money aside today for future purposes is an intricate process determined by a broad scope of aspects. Conventionally, economic experts have hypothesised savings as what remains as disposable income after expenditure (Lunt & Livingstone, 1991). The rise in interest and inflation rates could hamper individuals' disposable income, which as a result impact on savings. Therefore, if current income is lower than average normal life cycle income, individuals will reduce their savings, and borrow to finance spending. According to Deaton (1991) and Carroll (1997), they forecast an eminent correlation between expenditure and income regardless of projected future income, and thus, contemplate that an individual adopts saving more when subjected to more uncertainty ("precautionary saving"). It is important to note that the key drivers of savings behaviour as discussed above impact individuals' financial decision making which may influence retirement savings. Therefore, these variables play a significant role in ensuring adequate retirement savings. An individual capacity to save and the motivation to save- are hypothesised as a function of two sets on influences of saving money (Katona, 1975). Thus, this is an imperative characteristic – merely because someone who chooses to save, does not imply that he or she can, and vice-versa. Distinguishing between the willingness and the capacity to save implies that psychological characteristics prompt retirement savings outcomes.

2.2.3.1. Attitude towards retirement saving.

Attitude is the discernment, viewpoint, or outlook concerning a person, plan, thing, or state. Ajzen (1991) proposes that an individual with a positive outlook of a distinctive behaviour has a higher inclination to develop such behaviour. Several researchers recognise a positive correlation between one's view toward retirement saving (Zeka, Rootman and Kruger (2020). On the other hand, several studies highlight the fact that

people regularly behave differently based on their attitudes, particularly when it comes to future-oriented behaviours like savings money (Rabinovich, Morton, and Postmes,2010). These differences might be produced by a mix of environmental, cognitive, and psychological variables (Goda, Levy, Manchester, Sojourner, and Tasoff, 2019). Although experiencing an optimistic outlook, preferences change, and people make choices in conflict with their attitude at realisation. Guven (2012) observed facts to prop this fundamental correlation: optimistic people are more likely to save, feel confident about preservation, have a preference on future time outlook, ensure control and discipline over expenditure, be free from debt, take extra time beforehand to make a decision, and be confident about future prices and personal prolonged existence. On the other hand, negative sentiments undermine saving behaviour (Neukam & Hershey 2003; Asebedo et al., 2018). According to Neukam and Hershey (2003), they found that saving practices for those with sturdy financial goals were reliant upon their level of financial anxiety—with higher levels of anxiety hindering optimistic saving habits; emotions may assist their saving attempts.

2.2.4. The effect of investors' cognitive biases on retirement saving behaviour

Traditional finance concepts, such as the representation of the portfolio and the efficient market hypothesis (EMH), seek to understand and explains why financial markets are efficient. On the other hands, behavioural finance aims to make sense of the logic behind the evidence of market inefficiency and irregularities. Asad et al. (2018) provides and explanation of behavioural finance and the reasons why markets are inefficient. They argue that volatility, which is triggered by individuals' irrational behaviour, is an inherent characteristic of every investment asset. Shiller (2013) was one of the few who provided early indications of tech and housing bubbles, suggesting that markets and their participants are not necessarily rational. Proving the notion that psychology can affect our decision making more than financial theories and therefore, psychological biases can influence investors behaviour (Sharma and Firoz, 2022). Overcoming such biases can increase financial and retirement savings success or failure.

Oprean and Tanasescu (2014) discovered that behavioural errors such as fear, doubt, confidence, and sadness, significantly affect investment decision-making related to rational savings behaviour. These errors can lead investors to behave in distinctive

ways in various situations, highlighting the importance of integrating psychology theories with finance to understand their impact on retirement saving success (Zahera & Bansal, 2018).

2.2.4.1. Confidence and retirement saving behaviour

Confidence is a state of cognizance in which and individual believes in his/her talents. On the other hand, overconfidence refers to when an individual overestimates their abilities or is excessively optimistic about the potential consequence of their actions. They believe that the knowledge they possess is sufficient for making sound investment decisions (Meier, 2014; Daniel and Titman, 1995; Ricciardi & Simon, 2000; Zahera & Bansal, 2018). Bakar and Yi (2016) and Tuyon and Ahmad (2016), argue that overconfidence can influence trading behaviour and impact asset growth, thereby affecting decision-making (Ben-David et al., 2007). It is importance to note that there is a correlation between overconfidence and decision-making (Bakar & Yi, 2016). Past investment performance increases confidence (Gervais and Odean, 2015). Therefore, when equity markets yield high, investors become more confident in a particular investment portfolio. Parveen and Siddiqui (2018) and Shah et al. (2018) describe a negative between overconfidence and investment decision-making, as it contributes to market volatility and triggers market interventions (Jlassi et al., 2014). Boussaidi (2013) found a unidirectional cause and effect relationship trading volume and yield unpredictability, indicating the occurrences of overconfidence in the market. Khalid et al. (2018) established that overconfidence has a positive impact investment performance. Hayat and Anwar (2016) suggest that financially literate investors are particularly prone to overconfidence and tend to and make well-informed decisions regarding their retirement savings.

2.2.4.2. Optimism and pessimism and retirement saving behaviour

All behavioural errors, such as confidence, fear, and depression, are contrary to rational behaviour. In the stock market irregularities occurs, and a minority of investors earn unusual profits due to their irrational behaviour, innate disposition, and tendency to follow the crowd to feel secure in the market (Oprean & Tanasescu, 2014; Fung, 2011; Kaustia & Perttula, 2012). News about the performance of a portfolio or asset class performance can influence investors' behaviour, making them either confident or doubtful. This behaviour the determines the immediate exchange and volatility in the stock market. Expectancy biases tends to overemphasize positive results, which

shapes investors' outlook (Astebro et al., 2007), Consequently, investors may overstate certain facts. On the other hand, the French stock market reflects a behavioural inclination in investment decision-making, where doubt prevails over confidence because it takes time for optimism to be reinforced. However, even a minor shock is enough to trigger markets and create pessimism. This indicates that investors' reactions and attitudes influence decision- making (Dhaoui & Khraief, 2014).

There exists a weak correlation between optimism and investor decision-making (Bashir et al.,2019), as investor attitude informs decision-making. A positive (negative) attitude leads to optimistic (pessimistic) decision-making (Kaplanski et al., 2015), which results in high expectations for investment returns (Aspara, 2013). Optimism bias is significantly correlated with a higher risk tolerance and principle of seeking high returns (Menon et al., 2009; Dimmock & Kouwenberg, 2010). Finally, the exploration also reveals a correlation between confidence and investment decision-making (Astebro et al., 2007; Barber & Odean, 2008; Krizan & Windschitl, 2007; Puri & Robinson, 2007).

2.2.4.3. Rational expectation and retirement saving behaviour

The rational expectation hypothesis, first introduced by Muth (1961) and further developed by Lucas and Prescott (1971), suggest that investors use available information to guide their decision-making and aimed to avoid systematic errors in their forecasting models. However, Daniel, Klos, and Rottke (2023) argue that individual investors' expectations are often inaccurate. Instead, they propose that aggregated prediction from multiple investors can provide more rational expectations in the market. Recent studies do not support this methodology and highlight the limitations in making rational decision (Branch, 2004; Sargent, 1993).

Investors are required to make well-informed predictions based on past trends and insights to understand market behaviour. Colasante et al. (2017) conducted an experiment that examined whether cumulative predictions, as opposed to individual predictions, results in more unbiased expectations. However, there are varying opinions among scholars regarding this phenomenon. This study investigates the role of past expectations and past understanding in predicting future stock prices. Consequently, investors use symmetry values as a reference point to form expectations as new information becomes available in the market. On the contrary, Hassan and Mertens (2017) hold a contradictory view, suggesting that there is less

tendency for investors to make simultaneous errors due to presence of different household in the economy, which might not always act rationally.

2.2.4.4. Information, financial literacy and retirement saving behaviour

As financial and investment products continue to develop to keep up with the dynamic changes of the retirement industry, we see a rise in complex financial instruments growing, thus, resulting in individuals' constant development in understanding these comprehensive financial/investment products to make well-informed decisions. Clearly, financial literacy and educational level plays a crucial role in understanding and comprehension of retirement saving. Therefore, further investigating the correlation relating to psychological characteristics and financial literacy can serve as a promising and stimulating topic to explore (Tomar etal.,2021; Murphy, 2013). The financial literacy behaviour is stimulated by a future time- orientation behaviour. Therefore, financial education programmes constructed to improve retirement saving behaviour should be fine-tuned in line with the individual's outlook prospects of their retirement.

Howlett, Kees, & Kemp (2008) discovered the impact of imminent positioning and financial information on customers' involvement in 401 knowledge related such that customers with higher future alignment and elementary financial awareness remained more expected to partake in the retirement saving plan vehicle as compared with someone with high awareness and low future positioning. Therefore, in the absence of information, future positioning and goal clarity failed to have any rationality on the involvement percentage in 401(k) strategies (Tomar etal.,2021). Financial literacy coupled with information and retirement planning seminars, workshops and financial planning present the most promising results in encouraging retirement savings behaviour. Financial literacy influences financial decision-making (Rooij etal.,2011).

The integration of financial literacy programmes can help empower individuals to make well-informed retirement saving plans. Information and financial literacy can have a strong impact on investment perceptions. Such perceptions are driven mainly by individual risk appetite which is influenced by their level of financial knowledge (Diacon, 2004). An investor with high financial proficiency tends to invest in riskier investment selections compared to laypeople with low financial proficiency. As a result,

financial literacy has an optimistic stimulus on participation in the stock market (Tomar et.al., 2021; Roioij et.al., 2011).

2.3. Summary of the chapter

In this chapter, the study provides a theoretical framework and literature review of the study. Focusing on both past and present research studies for conceptualisation of various theories about the research topic. The study begins by discussing behavioural finance theory as an emergent discipline that branched out from efficient market hypothesis theory. We then review prospect theory which challenges the expected utility theory. Finally, this study discusses the psychological characteristics, investors cognitive biases, financial literacy and the role play in influencing retirement saving behaviour from various philosophers. Overall, this chapter provides identification of concept in relation to the research topic, classifies what has been transcribed by various scholars, determines the degree to which the research theme exposes any understandable inclinations or designs. This allows researchers to gain knowledge of the prevailing study and discussions pertinent to research topic.

3. CHAPTER 3: RESEARCH METHODOLOGY

3.1. General Description and Justification for the Proposed Research Paradigm

Research methodology is defined as the path followed by a researcher in conducting research, which indicated the way the research problems and objectives are formulated, and results presented based on collected data (Sileyew 2019; Creswell & Poth, 2016; Creswell, 2011). Research methodology use both primary and secondary data because the research topic support both the psychological and empirical studies to understand investors behaviour and market movements (Sharma & Kumar, 2020). The positivism paradigm informs this research study. Alharahsheh and Pius (2020) assert that positivists believe that the only reliable way to gain knowledge is through observing and measuring the natural world. They contend that natural rules and theories can be developed using this knowledge. Knowledge, according to positivists, is objective and independent of the researcher (Soo, Lars, and Anthony, 2020). Consequently, they place a strong emphasis on the collection and interpretation of data using quantitative approaches and statistical analysis, enabling the testing of the proposed hypothesis (Mohajan, 2020), because they believe that statistical methods can be used to quantify and measure relationships between phenomena. The approach makes use of sizable, representative samples, which improves the finding's generalisability. This is crucial for establishing more general conclusions about how psychological characteristics, and cognitive biases influence retirement savings behaviour in various demographics. As previously stated, it is a potent tool for producing actionable insights that can guide policy, enhance financial literacy, and ultimately improve individual retirement outcomes because it offers objectivity, empirical measurements, and hypothesis testing (Park, Konge, and Artino, 2020).

3.2. Population and Sampling

3.2.1. Context of the study and unit of analysis

The South African retirement industry has excess assets under management of R4.6tn (pension/provident funds) savings for all participating members, and it is considered the highest to GDP ratio compared to the rest of the world[17]. The study has 15 million

[17] Statista. (n.d.). *Assets of pension funds in South Africa 2019*. [online] Available at: https://www.statista.com/statistics/421641/pension-funds-assets-south-africa/.

employed population in South African and only 10-17 million individuals have a retirement savings product. Such product can be offered by employers and other individuals can take up on their own because of their behaviour and attitude towards savings. There are about 90% of South African's who do not save towards retirement[18] or savings are not sufficient as they will be required to work post-retirement.

Therefore, the target group for this study is individuals with retirement savings products and those with no retirement savings products. As it stands, we have 15 million employed (population size) participants across 2500 employers in South Africa[19] and out of that 15 million it is important to note that not all have retirement savings, as not all employers participating in the economy have such insurance products in their business. The target population is determined using a selection criterion to select individuals of the general population who can at best, share experiences and thoughts under the most convenient conditions (Asiamah et al., 2017).

3.3. Sampling methods

This study uses a simple random approach. In this type of sampling method, each population participant has an exactly equal chance of being selected and most straight forward of all probability sampling methods (Thomas, 2020). This approach helps in ensuring high internal validity: randomisation is the best method to reduce the impact of potential confounding variables as stated by Thomas (2020).

3.3.1. Sample size

Clow and James (2013), define the sample size as the number of units in a subgroup (sample) of the targeted population selected to participate in the study. Following Clow and James (2015), this study uses the formula below to calculate the sample size.

[18] Content, P. (n.d.). *WATCH | 90% of South Africans don't save enough for retirement | #RealityCheck*. [online] News24. Available at: https://www.news24.com/news24/partnercontent/watch-realitycheck-90-of-south-africans-dont-save-enough-for-retirement-20230630.
[19] https://connect.alexanderforbes.co.za/legacy article/140#:~:text=Alexforbes%E2%80%99%20Member%20Watch%20capture%20data%20on%20the%20key

$$\text{Unlimited population: } n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2}$$

$$\text{Finite population: } n' = \frac{n}{1+\frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2 N}}$$

Where:

z = z score

ε = margin of error

N = population size

p̂ = population proportion

Because the population is essentially infinite (15 million individuals), the finite sample adjustment is not necessary. Thus, assuming a population proportion of 0.5, and infinite population size (15 million), with consideration that **z** for a 95% confidence level is 1.96, the sample size is calculated as follows:

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2}$$

$$n = \frac{1.96^2 \times 0.5(1-0.5)}{0.05^2} = 384.16$$

Therefore, for the occurrence above, a sample size of a minimum of 385 participants is essential. However, due to time constraint the study was able to achieve a total of 201 participants response.

3.4. Data Collection

According to Trinidad et al., (2023), data collection is the procedure for collection of respondents' views about the subjects of interest to the study. The methods include emailing survey questions to respondents to be self-administered (Tomar et al., 2021). Under this approach, respondents access the survey via their emails either as an attachment or embedded directly to the email, via an online link. For the current study, the questionnaire consists of closed-ended questions embedded over respondents' emails. Closed-ended questions are well-defined as question types that probe respondents to indicate from a distinctive set of pre-well-defined answers, such as "yes/no" or including conventional multiple-choice questions (Wang, Hong & Hsu, 2006). This method assists in gathering primary quantitative data from respondents.

This method is time and economical considering the large number of respondents to be considered.

3.4.1. Primary data collection

Primary data was collected by a form of questionnaires which formed the foundation of the information collected for this research study. Kumar (2011) defines a questionnaire as a list of questions, the ripostes to which are recorded by participants, after reading the questions and translating what is mandatory. Research questionnaires employed the use of scaling/ranking questions as they present a probability for respondents to rank the proposed answers to the items on the scale given a range of values (for example from 1 to 5).

3.4.2 Measurement Scale

Since the purpose of this study is to establish the impact of psychological characteristics on retirement savings behaviour, psychological characteristics and cognitive bias were used as independent variables while retirement savings behaviour was considered the dependent variable. The variables were structured on a Five-item scale by Glover & Ryan (2018); Hershey et al. (2010); Friedberg (2023); Jacobs-Lawson & Hershey (2005) to capture psychological characteristics and cognitive bias and retirement savings behaviour. Respondents were required to answer all substantive questions on a five-point Likert-like scale (1= strongly disagree to 5 strongly agree).

Based on Tomar, Baker, and Kumar (2021), psychological characteristics in the context of retirement savings encompass retirement goal clarity and future time perspective. As such, to accurately capture the construct of psychological characteristics, the researcher needs to ask questions on retirement goal clarity and future time perspective to assess the clarity and specificity of an individual retirement savings goals which is crucial for retirement planning.

On the other hand, cognitive biases measure market efficiency and inefficiency on respondents' cognitive biases in investment decision making, investor confidence, optimism/pessimism, rational expectations, and information/financial literacy. Hence Sweta, Baker, Satish, and Arvid (2021), Hershey, Jacobs-Lawson, and Austin (2013) classify cognitive biases in the context of retirement savings into financial literacy, risk

tolerance, and self-control issues. According to Lusardi and Mitchell (2014); Nanziri and Olckers (2019), the utmost common method to measure financial literacy is to ask three to five questions testing respondents' numeracy, interest rates, inflation, and risk diversification. Financial literacy hypothetically influences retirement financial behaviour involving planning, saving, and investment management (Hauff et al., 2020). Similarly, Sweta et al., (2021) proposes that an individual cognitive bias related to retirement savings behaviour can be understood by asking questions related to such individual willingness to take investment and savings risks, as well as those that reflect an individual's ability to delay their instant gratification for the sake of long-term financial benefits.

Finally, retirement savings behaviour measures an individual savings behaviour as influenced by psychological characteristics and cognitive biases. An individual retirement savings behaviour can be measured by his/her commitment to save. Hence Sweta et al., (2021), Hauff et al., (2020), and Tomar et al., (2021) argue that an individual's commitment to save reflects his/her ability to engage in positive retirement savings behaviour.

3.5. Data Analysis

3.5.1 Data preparation procedure

Data analysis is prepared and cleaned through Microsoft Office Excel and analysed and interpreted using Statistical Package for Social Scientist (SPSS) software. The process starts by importing the data from the Google Form platform into Excel. After that, the data is clean-up to remove unusable information and to eliminate errors that could affect the analysis. Import data through SPSS to allow for statistical estimation and forecasting analysis and descriptive statistics analysis are used along with inferential statistics.

3.5.2 Measurement

Since the purpose of this study is to establish the impact of psychological characteristics on retirement savings behaviour, psychological characteristics and cognitive bias were used as independent variables while retirement savings behaviour was considered the dependent variable. The variables were structured on a Five-item scale by Glover & Ryan (2018); Hershey et al. (2010); Friedberg (2023); Jacobs-

Lawson & Hershey (2005) to capture psychological characteristics and cognitive bias and retirement savings behaviour. Respondent are required to answer all substantive questions on a five-point Likert-like scale (1= strongly disagree to 5 strongly agree).

3.6. Validity and Reliability

Validity is the degree to which a research study measures what it argues to measure exclusively of being shaped by unrelated components or predisposition. In contrast, reliability is the degree to which the research outcomes are constant and perpetual over time and across different tests, procedures, and evaluators. For us to achieve high-quality and trustworthy research finding it is essential for us to employ both validity and reliability measures. Hence, finding equilibrium demands substantial proficiency, expertise, and attention to detail. Initially the objective is to yield research outcomes that are valid and reliable but additionally impactful and instrumental to the contribution of the body of literature in both practice and academia. Accomplishing this level of distinction involves an immersed comprehension of the distinctions and difficulties of research methodology and a dedication to excellence and rigor in all viewpoints required in this research process (SooleenAbbas, 2023).

The study employs Cronbach's Alpha as a unit of analysis for reliability testing. Frost (2022) defines Cronbach's alpha as a coefficient measure of the internal reliability, or trustworthiness, of a set of survey objects. Cronbach's alpha measures the level of understanding on a consistent 0 to 1 scale. Greater values signal higher accord connecting items (Frost, 2022). Below is the formula to be employed.

$$\alpha = \frac{N\bar{c}}{\bar{v} + (N-1)\bar{c}}$$

Where:

N = number of items

$\bar{\mathbf{c}}$ = average inter-item mean covariance.

$\bar{\mathbf{v}}$ = average mean item variance

The study use validity to express the accuracy of the research method measures. To ensure that the method measures what it claims to measure, and the findings strictly relate to real-life assessments (Scribbr, 2019). There are four main types of validity namely, construct, face-to-face, content and criterion. However, for the purpose of this

study, the researcher will focus is mainly on both construct and content validity measures. Scribbr (2019) defines construct as a measure of concept that is intended to be measured and content to be a measure that tests full representation of what the research aims to measure. To achieve both content and construct validity, the extant literature was consulted to determine the constructs (psychological characteristics, cognitive bias, and retirement savings behaviour) and their respective items.

3.7. Data analysis procedure

The research study adopted a quantitative technique. Statistical analysis of the data collected from primary sources was employed to examine trends, patterns, and correlations between dependent and independent variables.

3.7.1 Descriptive statistics

Descriptive statistics is commonly employed to synopsise and depict statistical information concisely and implicitly[20]. It aids scholars and experts to depict the central tendency (i.e., mean, median, mode). Measures of dispersion (minimum, maximum, standard deviation) are used to review and arrange data descriptions of a statistical set (Bhandari, 2020), and shape the distribution of a dataset. It also involves graphical representation of data to aid visualisation and understanding. The study employed the pre-estimation test which includes skewness and kurtosis to assess how the data assumes the normal distribution as well as the flatness of the tails of the distribution. The descriptive statistics further included the test of associations between the study variables using the Pearson correlation test.

The Pearson correlation coefficient (r) is the most conventional technique of determining a linear correlation (Turney, 2022). It is a number between –1 and 1 that measures the strength and direction of the correlation amongst two variables. The below table explains the Pearson Correlation Coefficient by Turney (2023). It assisted researchers on testing the correlation between dependent and independent variables.

Table 1: Pearson Correlation Coefficient

[20] Simplilearn.com. (2021). Exploring Descriptive Statistics: Everything You Need to Know! | Simplilearn. [online] Available at: https://www.simplilearn.com/what-is-descriptive-statistics-article#:~:text=Descriptive%20statistics%20helps%20researchers%20and.

Pearson Correlation Coefficient (r)	Correlation type	Clarification
Variable between 0 and 1	Positive correlation	As one variable changes, the other variable changes in the similar direction.
Variable of 0	No correlation	No correlation between the variables.
Variable between 0 and 1	Negative correlation	As one variable changes, the other variable changes, moving inversely.

It is important to note that the correlation coefficient, r, is directly correlated to the coefficient of R^2 in a palpable way. [21] Therefore, the symbol of r varies on the symbol of the projected slope coefficient b_1:

- If b_1 is negative, therefore, r takes a negative symbol.
- If b_1 is positive, therefore, r takes a positive symbol.

For this reason, the projected slope and the correlation coefficient r constantly distribute the similar symbol. [22]

3.7.2 Multiple regression analysis

Multiple regression analysis is used to analyse the correlation between a single dependent variable and several independent variables[23]. The aim is to use independent variables whose values are identified to calculate the value of the single dependent value. To each predictor value is evaluated, the weights indicating their comparative contribution to the overall projection. A multiple regression approach is used to examine: (a) the extent to which nine demographic indicators were predictive of individuals' retirement savings practices, and (b) whether unexplained savings from the initial regression model could be hierarchically predicted using the six psychological scales and perceptions of one's savings relative to peers. Inferential statistics analysis assisted the researcher to select whether information proves or

[21] PennState: Statistics Online Courses. (n.d.). *1.6 - (Pearson) Correlation Coefficient, \(r\) | STAT 501*. [online] Available at: https://online.stat.psu.edu/stat501/lesson/1/1.6.

[22] PennState: Statistics Online Courses. (n.d.). *1.6 - (Pearson) Correlation Coefficient, \(r\) | STAT 501*. [online] Available at: https://online.stat.psu.edu/stat501/lesson/1/1.6.

[23] www.sciencedirect.com. (n.d.). Multiple Regression Analysis - an overview | ScienceDirect Topics. [online] Available at: https://www.sciencedirect.com/topics/social-sciences/multiple-regression-analysis#:~:text=Multiple%20regression%20is%20a%20statistical.

contradicts assumptions and whether it is comprehensible to a larger population (Bhandari, 2020). Independent variables are psychological characteristics (PC) and cognitive biases (CB). Dependent variables on the other hand, comprise retirement saving behaviour (RSB). The regression analysis explained above takes the following form:

$$Y = c + b_1 X_1 + b_2 X_2 + \cdots + b_n X_n$$

Where:

Y = dependent variable

$\boldsymbol{X_1,\ldots,X_n}$ = number of independent variables

C = constant

This regression analysis guarantees maximum estimate of the dependent variable from the set of independent variables[24]. This analysis is usually completed by the ordinary least squares (OLS) estimation.

3.7.2.1 Model Modification

This study implements the approach tailed by Andrianaivo and Kpodar (2011) and Lundqvist and Erlandsson (2014) to observe the correlation between psychological characteristics, cognitive biases and retirement saving behaviour by using the following bivariate econometric model, therefore, the research model specification taking the above equation into considering is as follows.

$$RSB = C + \beta_1 PC + \beta_2 CB + \beta_3 AG + \beta_4 EL + \beta_5 INC + M_t + e_t$$

Where:

RSB = Retirement Saving Behaviour

C = Constant,

PC = Psychological Characteristics,

CB = Cognitive Biases,

AG = AGE,

[24] www.sciencedirect.com. (n.d.). *Multiple Regression Analysis - an overview | ScienceDirect Topics*. [online] Available at: https://www.sciencedirect.com/topics/social-sciences/multiple-regression-analysis#:~:text=Multiple%20regression%20is%20a%20statistical.

EL = Education Level,

INC = Income Level,

$\mathbf{M_t}$ = Represents the natural logarithms of retirement savings behaviour

$\mathbf{e_t}$ = Denotes the random error term.

3.8 Ethical Considerations

3.8.1 Purpose of study and deception

This study focuses on primary data and examines how behavioural finance impacts retirement savings in South Africa. However, there are concerns regarding ethical use of participants data. Nonetheless, most of the secondary information used in this study is publicly available through, publications, websites and statistical reports conducted by other researchers. It is important to note that discussions on various topics may arise during the research on behavioural finance and retirement savings. For outlining ethical considerations, the version provided by Bryman and Bell (2007) is used as a foundation.

3.8.2 Ensuring confidentiality and anonymity

Bryman and Bell (2007) define confidentiality as the protection of information collected from participants during a research study. Privacy, on the other hands, refers to safeguarding of participants personal information from individuals and organisations (Bryman and Bell, 2007:69). In this study, the gathered data for this study does not include any confidential information and is completely anonymous. The questionnaires did not ask for the respondent's name, surname, identification, or address.

3.8.3 Ensuring no-harm and wrongdoing

Bryman and Bell (2007) argued that management scholars are most likely to engage in misconduct than to harm participants. Their research highlights the tendency to treat participants as mere data source and prioritising the outcome over the importance of the individuals themselves (Bryman & Bell, 2007:68). In this study, data is gathered using a survey questionnaire, employing a quantitative approach Therefore, it is challenging to avoid treating respondents solely as data. However, it is important to note that the results of this study are not linked to any specific individuals, but rather, they focus on interpretations and correlations derived from statistical analysis of the collected data.

3.9 Summary of the chapter

In this chapter, the study outlines various methods used to prepare research data, design, methods, and sample techniques. This study further discusses primary data collection and ways of analysis. Research employed quantitative technique with the use of statistical analysis of the data collected by employing descriptive statistics, multiple regression analysis, model modifications and Pearson correlation coefficient. This study then outlined the studies ethical consideration procedures. Overall, this chapter provides statistical analysis framework into the roadmap followed, confirming that the study is conducted in a methodical, accurate, and quantitative approach. Understanding that a well-defined research methodology, it is vital in obtaining precise and reliable outcomes, attracts meaningful deductions, and contribute to the body of knowledge in both academia and practice.

4 CHAPTER 4: PRESENTATION AND INTERPRETATION OF RESULTS

4.1 Introduction

This chapter aims to embark on a comprehensive exploration of the impact of psychological characteristics on retirement savings in South Africa. As such, the chapter adopts the descriptive statistics as a primary lens for describing the participants demographics as well as the characteristics of the study variables. Thereafter, to ensure robustness in the findings and results of the study, the study attempts to explain the reliability of the questions contained in the questionnaire by leveraging on Cronbach's Alpha to determine if indeed the questions measure the constructs as expected. Further, the study relies on the Pearson correlation test to establish the associations between the construct of psychological characteristics, cognitive bias, age, education, and income levels with retirement saving behaviour. Lastly, the chapter establishes the underlying relationships between psychological characteristics, cognitive bias and retirement savings behaviour using multiple regression analysis while controlling for demographic variables (age, education level, and income level) thus contributing significantly to the literature related to the impact of psychological characteristics on retirement savings behaviour, especially in the context of South Africa. Based on the discussed, the subsequent section presents the process of data cleaning, editing, and coding of the responses.

4.2 Data cleaning, editing, and coding

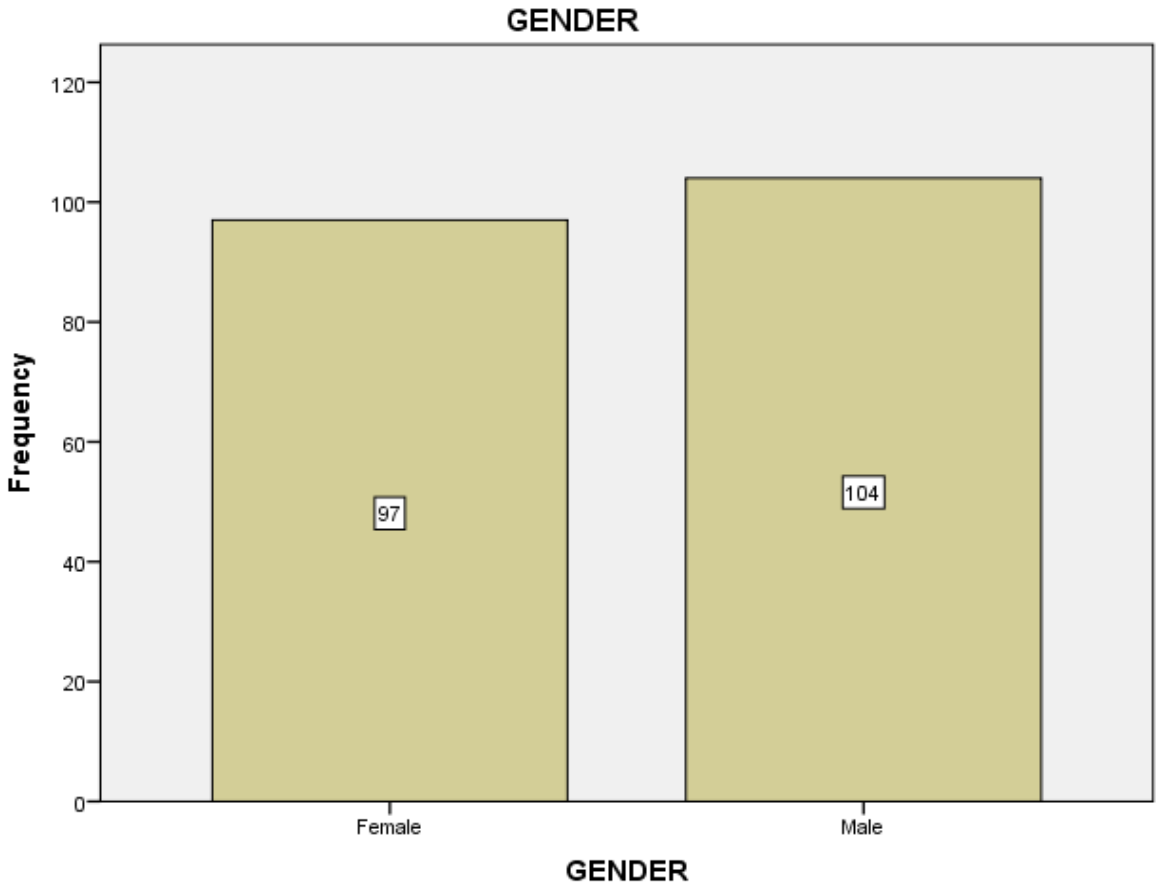
Initially, this study proposed to utilize a sample of 385 study participants to determine the impact of psychological characteristics on retirement savings in South Africa. The survey questionnaire was distributed through the University of Witwatersrand student database. The decision to consider the University of the Witwatersrand student database is because it hosts different demographics, including gender, age, race, education level, and employment status, which are representative of the South African population, thus giving the researcher convenient access to a subset of South African population. Post distribution of the survey questionnaire, the response rate was high within the first week of distribution, however, it significantly dropped thereafter. To improve the response rate, the reminder or follow-up email was sent to the students to ensure they continue to fill the questionnaire. Regardless of the efforts made to ensure the targeted sample of 385 is achieved, only 201 responses were collected,

which signifies a 52.21% response rate. The 201 responses were successfully answered, hence were all retained for analysis. The survey questionnaire adopted three types of five-point Likert scales with the following denominations and their respective coding: Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, and Strongly Agree = 5; Very low = 1, Low = 2, Moderate = 3, High = 4, and Very High = 5; Strongly Not Confident = 1, Not Confident = 2, Neutral = 3, Confident = 4, and Strongly Confident = 5. Based on the 201 responses collected, the subsequent section delves into the descriptive statistics related to the demographics of the study participants.

4.3 Demographic variables

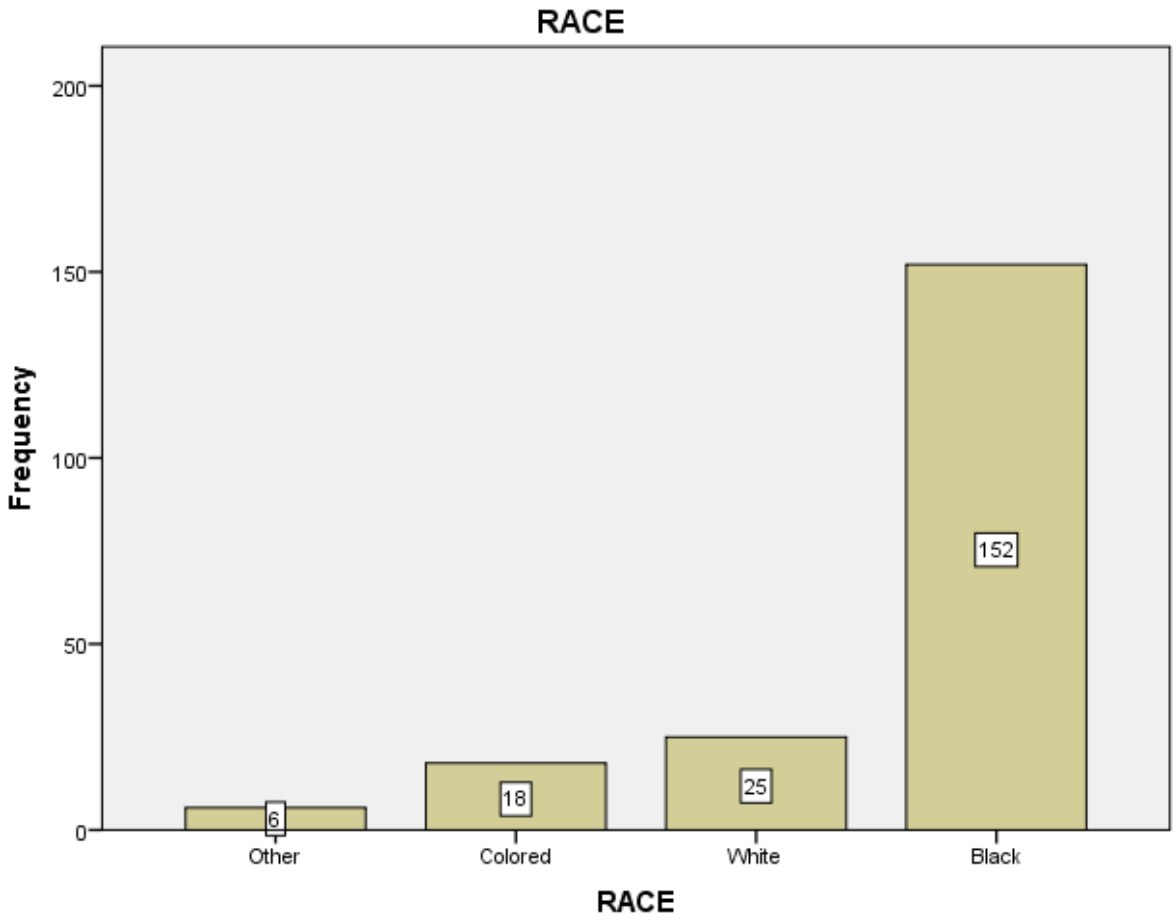
Figure 8 presents the gender distribution of the 201 respondents who participated in the study. From Figure 8, it can be observed that 48.26% (97) of the study participants were females, while 51.74% (104) were males. Thus, males were more represented in this study than their respective female counterparts. Although marginal differences can be observed between gender distribution in this study, the literature suggests that males are more likely to save towards their retirement than their female counterparts (Hershey, Jacobs-Lawson, McArdle, & Hamagami, 2008; Blanco, Aquila, Gongora, Weidmer, & Duru, 2015).

Figure 1: Gender distribution



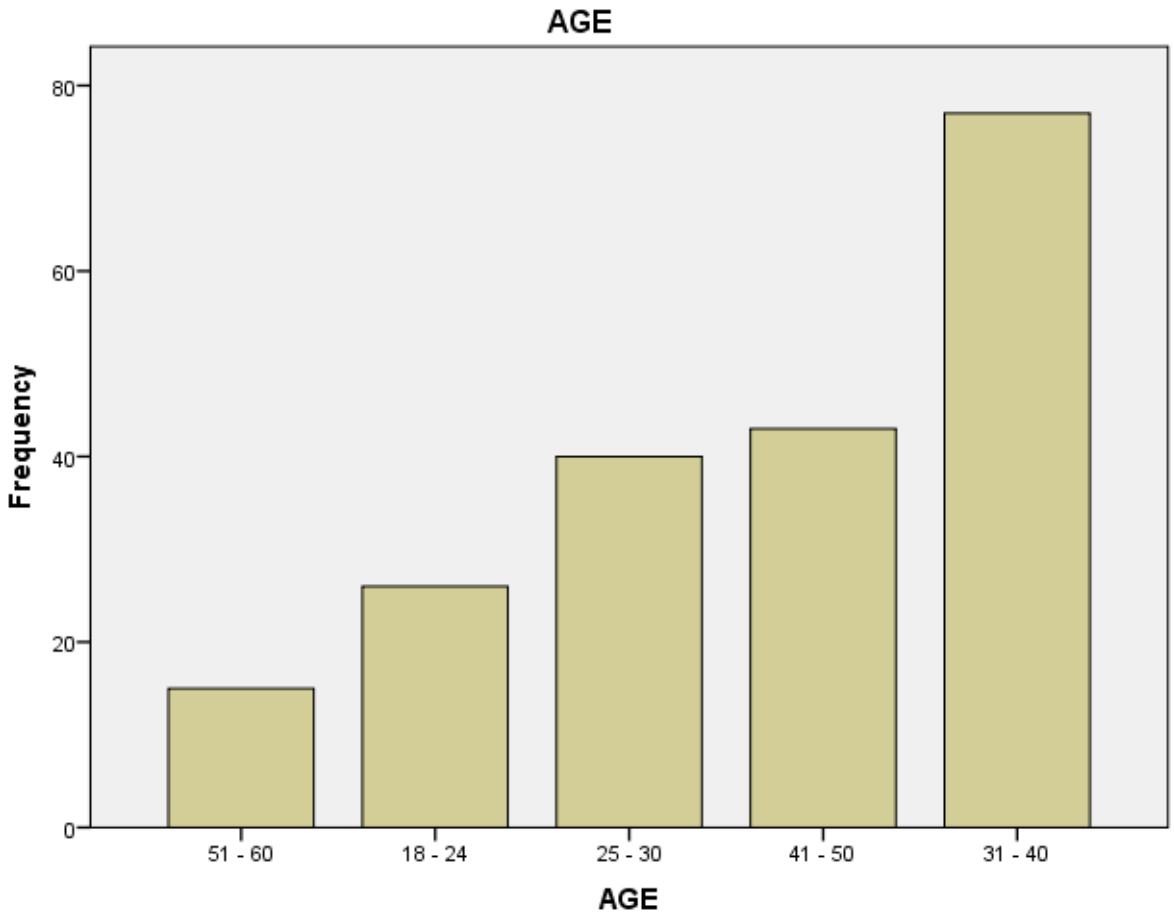
Likewise, based on Figure 9, majority of the study participants belonged to the community of black people, 75.62% (152), while 12.44% (25) were white. Also, 8.96% (18) constituted the coloureds while other racial groups were marginally represented at 2.99% (6). In the South African context, prior studies theorize that the degree of inequality between the racial groups remains high due to the legacy of the system of apartheid, which precluded the black South Africans from participating in economic activities (Johnstone, 2022; Levy, Hirsch, Naidoo, & Nxele, 2021). This practice prohibited majority of the black population in South Africa to attain the required education or literacy to understand and participate in retirement planning (Johnstone, 2022; Levy et al., 2021). Therefore, the overrepresentation of the black South Africans in this study somehow reflects the South African demographics, whereby black people constitute majority of the populations in South Africa. However, the historical systemic barriers to economic advancement and income generation may impact the retirement planning strategies for each racial groups, especially blacks.

Figure 2: Race distribution



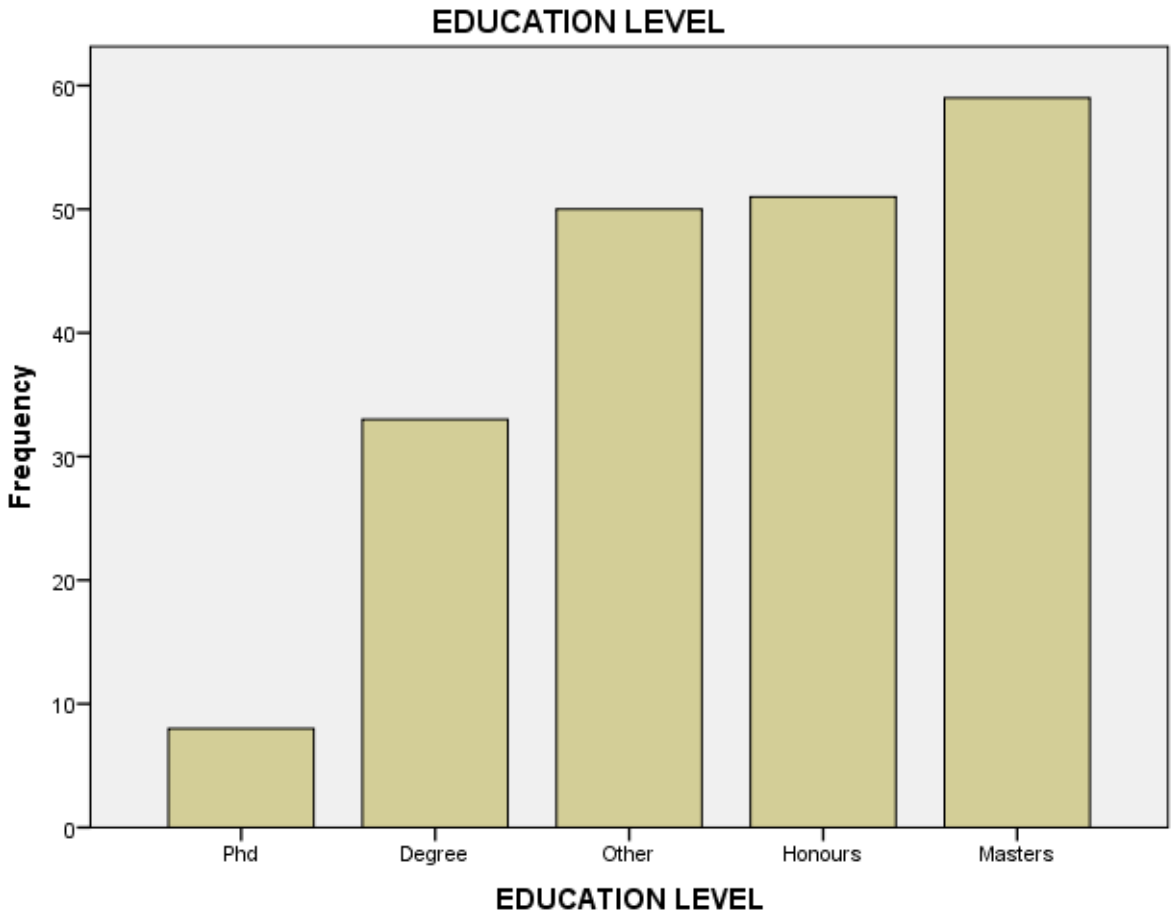
On the grounds of age distribution, most of the study participants (38.31% = 77) belonged to the age bracket of 31 – 40 years, while those in the age bracket of 41 – 50 years constituted 21.39% (43) of the total study participants. Similarly, 19.90% (40) of the study participants were in the age group of 25 – 30 years, 7.46% (15) were in the age category of 51 - 60 years, while the remaining 12.94% (26) were in the age cohort of 18 - 24 years. Based on the views of Onyango (2014); Finke and Huston (2014), age plays a crucial role towards individual savings behavior for retirement. According to Jorgensen, Foster, Jensen, and Vierra (2017), people within the lower age brackets tend to satisfy their short-term gratifications over long term financial goals. Hence, only those approaching their retirement are likely to save for post-retirement.

Figure 3: Age distribution



Regarding the distribution of education level, most of the study participants were in possession of postgraduate qualifications. For instance, as presented in Figure 11, 29.35% (59) of the study participants were in possession of a master's degree, 25.37% (51) had honours degree, and 3.98% (8) obtained a PhD. Finally, those with undergraduate degrees and other qualifications were distributed at 16.42% (33) and 24.88% (50) respectively. The most interesting aspect of the education distribution rests on the intersection between racial groups and the education level. As previously indicated, access to higher education for the black populace in South Africa has historically been limited (Gallo, 2020). However, based on the intersection between race and education levels, several implications about inclusive access to higher education in South Africa can tentatively be deduced.

Figure 4: Distribution of education level



Most interestingly, the employment distribution as depicted in Figure 12 portrays that 92.54% (186) of the study participants are employed, while only 7.46% (15) were unemployed. These findings present an interesting view for the study as the aim is to determine the impact of psychological characteristics on retirement savings. Hence having a larger number of employed respondents is instrumental in establishing the above-mentioned relationship. Also, the interrelationship between race and employment status presents one of the interesting discoveries in this study. Previously, the historical injustices in South Africa included discrimination which segregated the blacks, resulting in lack of employment opportunities for the black South Africans (Parashar, 2014; Gallo, 2020). However, the underlying employment status distribution hypothetically illustrates significant strides towards equitable employment in South Africa.

Figure 5: Employment distribution

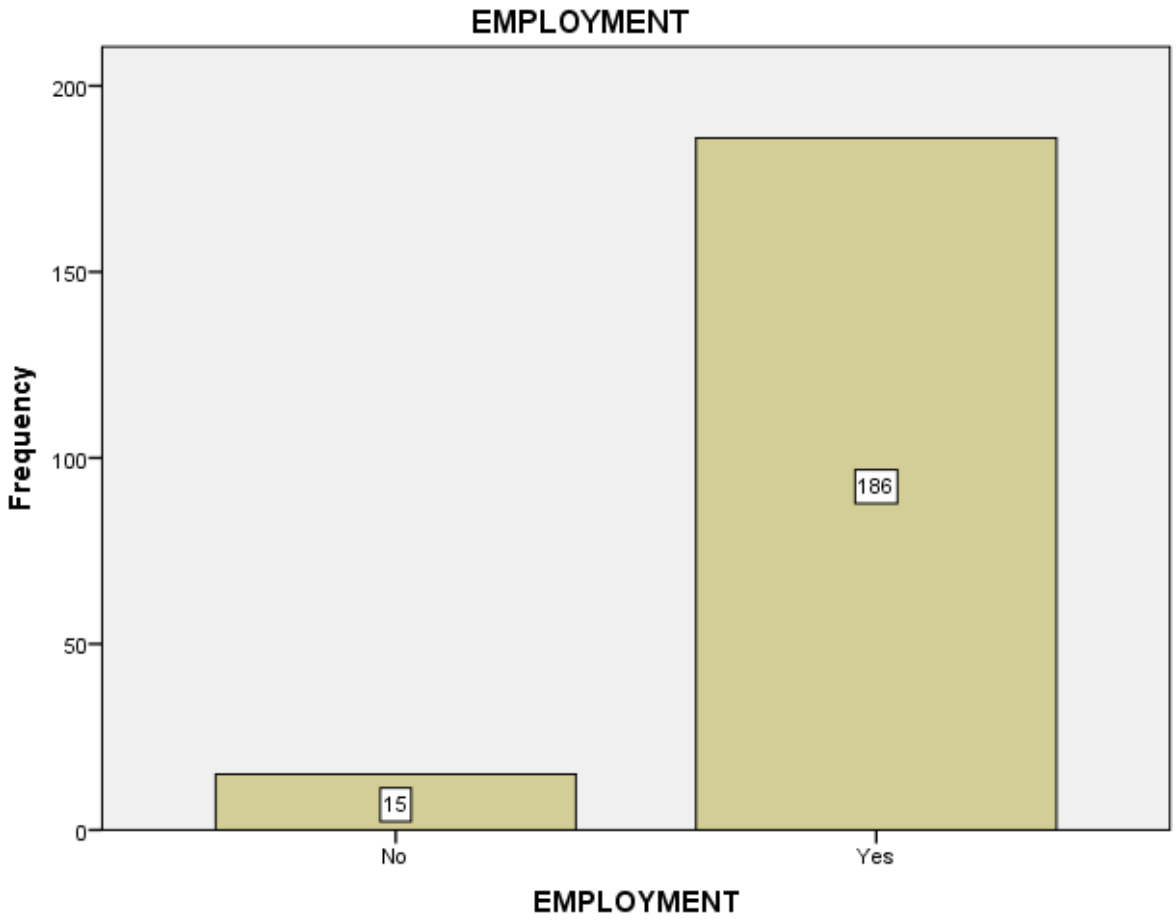
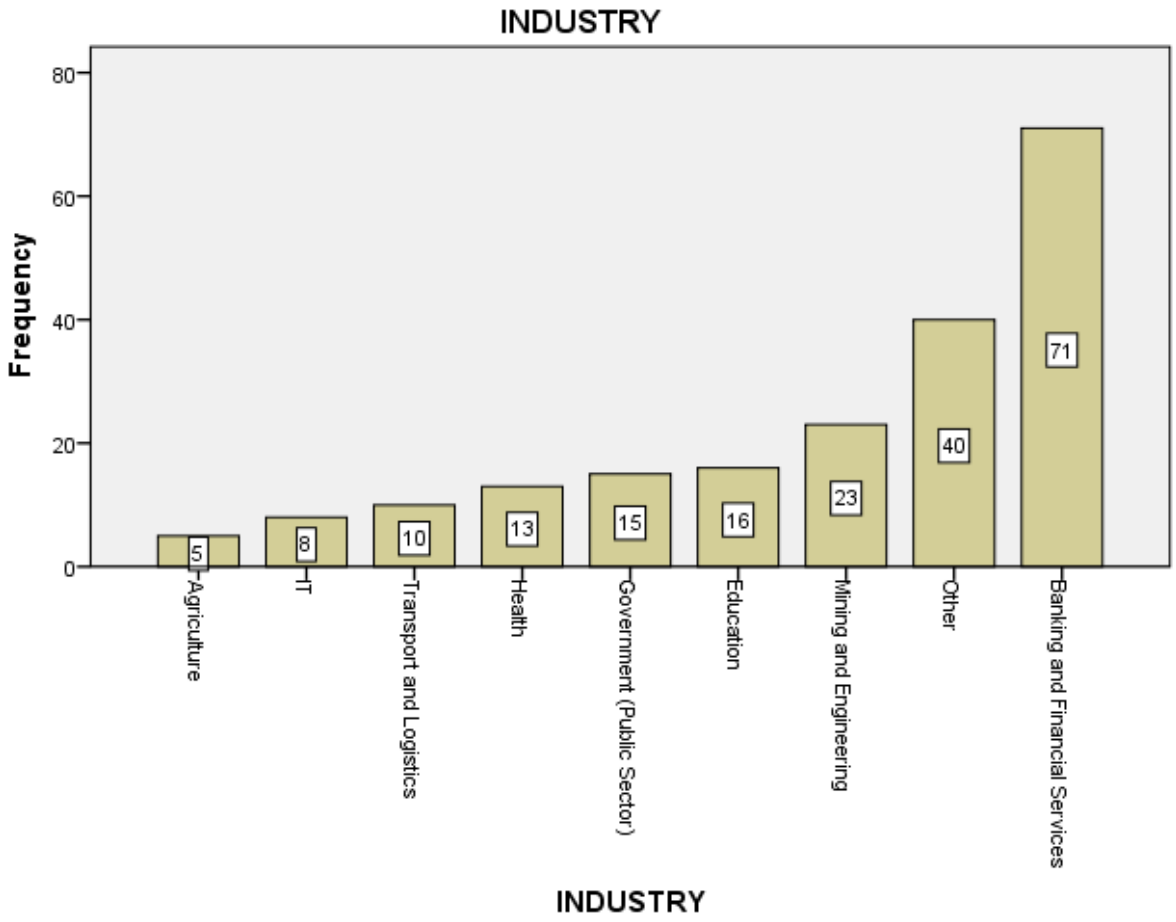


Figure 13 illustrates the employment sector distribution of the study participants. Based on Figure 13, most of the study participants (31.32% = 71) were employed in the banking and financial services sector, followed by 19.90% (40) who are employed in the other sectors not specified by the study. Also, 11.44% (23), 7.96% (16), 7.46% (15), 6.47% (13), 4.98% (10), 3.98% (8) and 2.49% (5) were employed in the mining and engineering, education, government (public sector), health, transport and logistics, IT, and agricultural sectors respectively. Given the interplay between race and employment sector in South Africa, these findings and results further augments the idea of striving towards achieving employment equity in South Africa. Previously, the South African labor market constituted blacks, predominantly designated for semi-skilled occupations, and the whites, who reserved the white-collar jobs amongst themselves (Parashar, 2014). Figure 13 indicates that currently/post-apartheid, the blacks fare better in most of the industries to occupy white-collar positions.

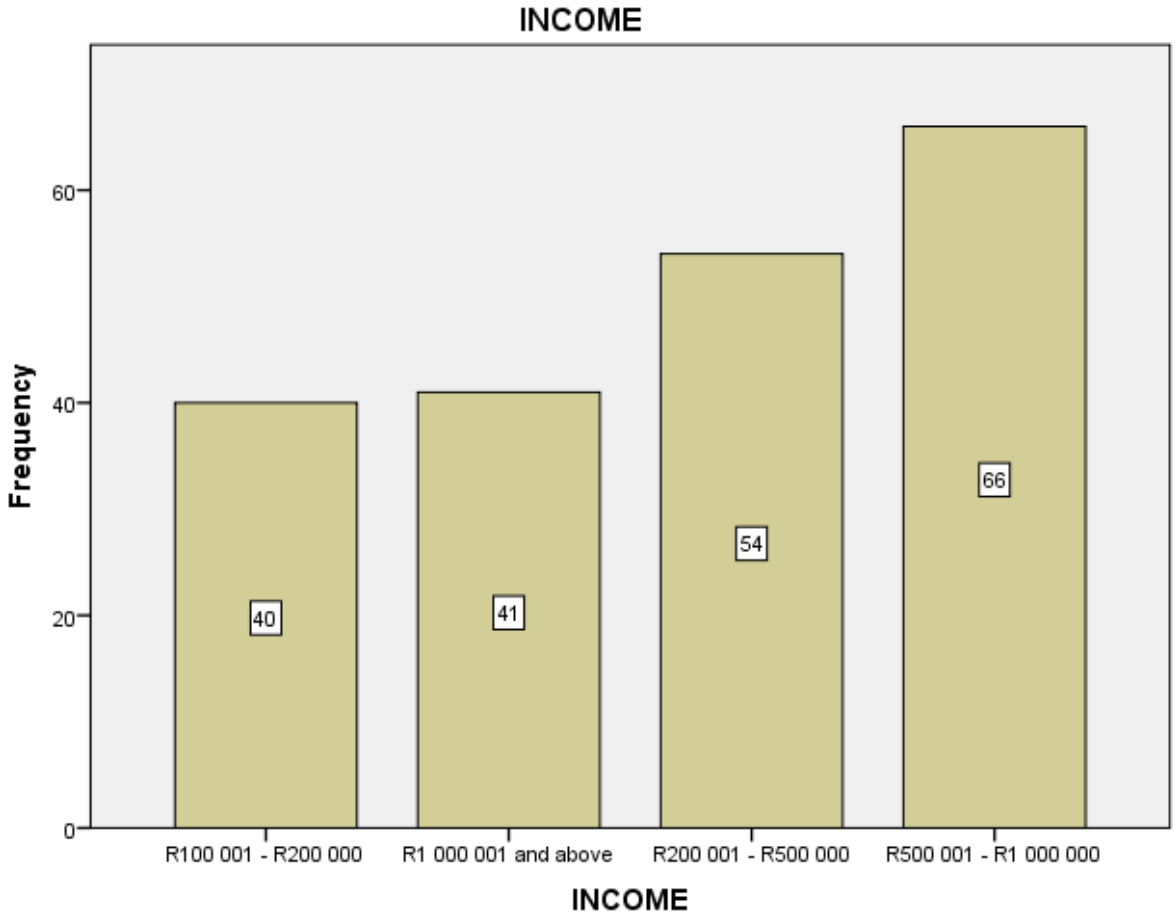
Figure 6: Employment sector distribution



Based on the income distribution as projected by Figure 14, it can be observed that 32.84% (66) were in the annual income bracket of R500 001 – R1 000 000. It is also evident that those in the annual salary band of R100 001 – R200 000 and R1 000 001 and above were almost equally represented at 19.90% (40) and 20.4% (41) respectively. Finally, those within the income bracket of R200 001 – R500 000 were the less represented at 26.87% (54). In South Africa, there exists unparalleled levels of income distribution. According to Chatterjee, Czajka, and Gethin (2022), the top 10% of the in South Africa own 86% of wealth, while 0.1% of the top 10% own one-third of the 85% wealth. This inequality is embedded in income and all forms of assets at the top end, which includes housing, pension funds, and financial assets. Unfortunately, the wide income inequality gap has not reduced since the end of apartheid in South Africa, leaving the black South Africans disproportionately represented among the lower income brackets (Nattrass and Seekings, 2010). Since

majority of the study participants are black South Africans, the income distribution with the majority falling within the range of R200 000 – R1 000 000 and above presents a diverse socioeconomic landscape within the sample population. As such, the income distribution in Figure 14 reflects efforts to address historical injustices by promoting economic inclusion. This is evidenced by the presence of those earning income exemplified in the top income bracket (R500 000 – R1 000 000 and above), thus indicating progress in achieving upward mobility and economic empowerment within the black communities.

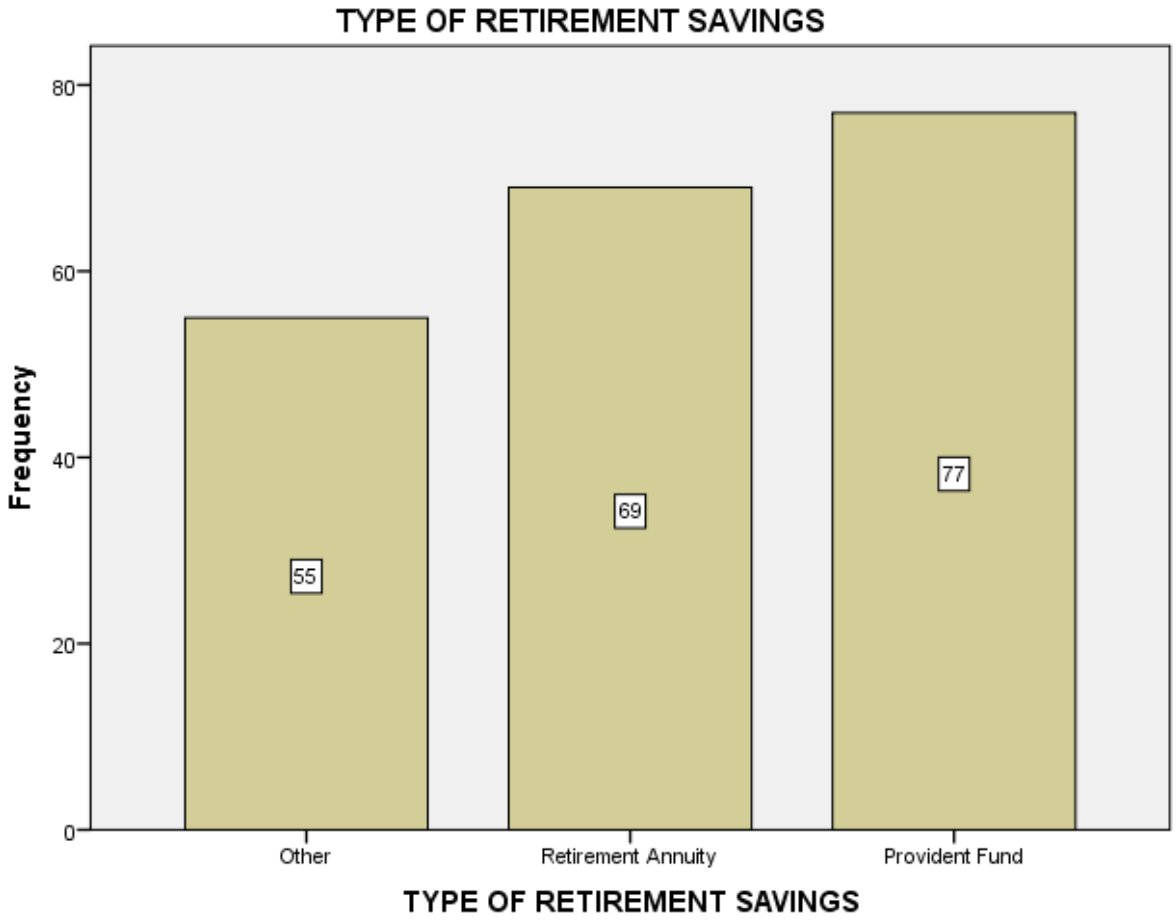
Figure 7: Income distribution



Finally, on the type of retirement plan, most of the study participants (38.31% = 77) contributed to provident fund, (34.33% = 69) saved through retirement annuity, while 27.36% (55%) leveraged on other retirement saving vehicles to provide financial security upon their retirement. Within the South African context, the literature suggests that the black South Africans are the least likely to have the retirement savings due to

societal and cultural norms of increased spending and extreme financial dependency relationships (Willows, 2019). However, the results and findings in Figure 15 challenges these assertions. As observed, majority of the study participants have a retirement savings in a form of retirement annuity and provident fund, while minority are in possession of other forms of retirement savings.

Figure 8: Type of retirement saving plan



4.4 The Reliability Test

The survey questionnaire for this study followed the OECD framework guide that facilitates the collection of data on financial literacy at national levels (OECD INFE, 2011). The guide served as a guiding principle on how to set the research questions. The survey questionnaire also followed the guiding questions that financial advisors ask an individual during their financial planning process. The advisor would want to gather as much information about the individual primary investment goals and risk

tolerance as asking the right questions can help the advisor understand their clients need (Jarrell, 2023). Financial guidance is concerning a lot more than making investment choices. It's about holistic financial and retirement planning. Therefore, it is important to prepare to learn everything about clients' psychological traits, cognitive biases, and retirement behaviors which all facts are gathered through understanding of their primary investment goals and risk tolerance. This helps them discover the right solutions which are in-line with their values which can make a significant impact on their quality-of-life pre- and post-retirement (Jarrell, 2023; Tamplin, 2024). Therefore, asking PC, CB and RSB questions developed using the above-mentioned sources assisted in this study to determine not only the importance of savings for retirement, but also if they should consider making plans to start saving (Wohlner,2023).

The reliability test for this study was conducted using Cronbach's Alpha to test whether the items or questions entailed in the questionnaire converge at some point, thus indicating internal consistency. The construct of Psychological Characteristics (PC), Cognitive Bias (CB), and Retirement Savings Behavior (RSB) were measured by ten, nine, and five items respectively. This implies that the overall scale contained twenty-four items/questions. Based on the findings in Table 2, Cronbach's Alpha for the construct of Psychological Characteristic (PC), Cognitive Bias (CB), and Retirement Savings Behaviour (RSB) are given as 0.893, 0.765, and 0.916 respectively.

Table 2: Reliability test

Variable	**Cronbach's Alpha**	**N**
PC	0.893	10
CB	0.765	9
RSB	0.916	5
OVERALL	**0.936**	**24**
Cronbach's Alpha: Measure of internal consistency • Psychological Characteristics (PC) • Cognitive Bias (CB) • Retirement Savings Behavior (RSB)		

Based on Table 2, the Alpha coefficients for all the variables (PC, CB, and RSB) are above the 0.7 benchmark, indicating satisfactory reliability for the questions of the

study. Similarly, the overall Cronbach's Alpha of 0.936 indicates that in overall, the items of the scale indeed converge at a specific point for each variable contained in the study, hence there is internal consistency in the items that measure the underlying constructs of the study.

4.5 Descriptive statistics for the variables of the study

Before analyzing the descriptive statistics, it is crucial to test for normality of the data as some of the descriptive statistics, such as a mean, can be influenced by the skewness of the data. Therefore, based on the findings in Table 3, the skewness and kurtosis of the variables Psychological Characteristics (PC), Cognitive Bias (CB), and Retirement Savings Behavior (RSB) falls within the recommended range of -2 and +2, as put forth by Mudau (2021), hence signifies a bell-shaped distribution. This observation is further augmented by the Shapiro-Wilk test as reported in Table 3, which indicates the W-statistic closer to 1 and the associated p-values below the 0.05 significance level for all the study variables, thereby suggesting that the data departure from the normal distribution is not extreme. Thus, the descriptive statistic for the current dataset is likely to paint a reliable picture of the characteristics of the data for the underlying constructs.

Based on findings and results presented in Table 3, the mean of 3.59 for PC suggests that on average, the study participants agree that they are cautious about their spending, spend money on short term gratifications, consider saving for retirement, understand the importance of saving for their retirement, willing to forgo some of their needs to save for retirement, have the goal to retire comfortably having accumulated 75% of their salary or more after retirement, have serious thought about changing their current behavior towards saving for retirement, willing to set aside excess funds immediately for retirement savings than spending on short term gratifications, that their attitudes influence their financial behavior, especially in relation to saving for post-retirement, and that they always feel in control of their financial decisions and savings strategies. Likewise, the mean of 3.68 for CB indicates that on average, the study participants are confident in their understanding for several retirement savings options, agree that they are familiar with the concept of compound interest and its impact on saving behavior, find it challenging to prioritize savings for retirement over short term needs, have diversified their retirement savings into different asset classes, that the

external information or benchmarks influence their perception of what constitutes “enough” for retirement, that the financial losses impact their willingness to invest in some retirement saving vehicle, are confident in making the right decisions regarding their retirement savings, have you estimated the amount of money you will need for a comfortable retirement, and that they are expecting stability in their investments over time, with modest profits given normal market conditions.

However, the mean statistic of 3.19 for RSB reflects that the study participants consider their current level of commitment to saving for retirement to be moderate, and are just neutral on whether their emergency fund is separate from their retirement savings, whether they have taken steps to ensure the alignment between their retirement savings and their lifestyles and future plans, whether they are comfortable with the level of risk in their retirement savings, and whether they have sought advice or information on retirement savings from the financial advisor.

Regarding the extremity of the dataset, the maximum statistic of 5 across all the variables, PC, CB, and RSB, portray that some of the study participants strongly agree on the items of all the variables. On the other hand, the minimum statistic of 1 for PC, CB, and RSB suggests that on the lower bound, some of the study participants strongly disagreed on the grounds of PC, CB, and RSB as presented in Table 3.

Table 3: Descriptive statistics of the variables of the study

	Min Statistic	Max Statistic	Mean Statistic	Std. Dev. Statistic	Skewness Statistic	Kurtosis Statistic	Shapiro-Wilk test	
							W	Sig.
PC	1	5	3.59	.88	-1.361	1.312	.853	.000
CB	1	5	3.68	.73	-.738	.734	.957	.000
RSB	1	5	3.19	1.08	-.424	-.597	.957	.000
Valid N (listwise)								

Skewness: Measure of symmetry in the data.

Kurtosis: Measure of whether the data exhibit heavy/light tails relative to normal distribution.

Shapiro-Wilk test: Tests if the data is normally distributed.

- Psychological Characteristics (PC)
- Cognitive Bias (CB)
- Retirement Savings Behavior (RSB)

4.6 Associations between demographical variables (age, education level, and income), PC, CB, and RSB

Based on the reviewed literature, age, education level, income, psychological characteristics, and cognitive bias are known to significantly impact the individual retirement savings behavior (Bizimana & Ogbe, 2023; Blažienė, 2023). As such, Table 4 presents the associations between these variables within the South African context. As such, only the significant associations at both 99% and 95% significant levels are discussed. Relying on the findings and results in Table 4, it is evident that all the demographical variables, age, education, and income levels have a significant positive association with retirement savings behaviour. This is evidenced by a positive correlation coefficient of 0.468, 0.443, and 0.429 with the corresponding p-value of 0.000 for all the pairwise associations with RSB. The positive correlation implies that as people age, obtain higher education levels, and experience an increase in income over time, they tend to save more for their retirement.

Regarding the positive relationship between age and retirement savings behaviour, Safari, Njoka, Mugisho, and Munkwa (2021) theorize that according to lifecycle hypothesis, individuals seek to maintain a stable consumption throughout their lifetime. Therefore, as individuals age and approach their retirement, they are likely to exhibit behaviours that lead to increased savings to maintain their consumption post-retirement. Similarly, relying on behavioural economics as people age, they become risk averse, hence prioritize saving for retirement relative to pursuing other financial goals.

On the grounds of education level, Morgan and Long (2020) believes that the positive association between income level and retirement savings behaviour stem from the fact that as people advance their studies, they are also at the advantage of obtaining financial education as well as awareness of the importance of retirement planning. Thus, they are likely to understand financial planning concepts, investment options as

well as the benefits of retirement savings which ultimately necessitates behaviours aimed at saving for consumption after retirement. Similarly, Lorenzo, Granados and Rico (2021) assert that as individuals acquire advanced qualifications, they experience increased prospects for career advancement and consequently higher earning potential. Therefore, individuals with high income means that they have excess financial resources that they can save for retirement by contributing to retirement savings account on monthly basis (Choukhmane, Colmenares, O'Dea, Rothbaum, and Schmidt, 2022).

The positive association between income level and retirement savings behaviour posits that the higher the level of income, the higher the prospects of indulging in retirement savings behaviours, hence, supports many of the studies that the level of income serves as an antecedent to retirement savings behaviour. According to Nyaboke (2016); Ngare and Githui (2014), as individuals experiences an increase in income, their disposable income increases, hence have excess funds which they can commit towards saving for retirement and emergency funds. Likewise, those with lower income levels tend to save less or not save at all due to lower disposable income that limits their ability to dedicate a specific amount to retirement (Nyaboke, 2016; Ngare & Githui, 2014). For instance, Fabian, Charles, Robina, and Marus (2022) asserted that, in Uganda, individual salaries are highly subjected to deductions, some of which relates to loans and mortgages which often are non-performing, leading to lower disposable income and retirement savings behaviours. Further, Fabian et al., (2022) argue that those with lower income are disadvantaged due to high inflationary pressures which negatively affects their purchasing power, leaving no room to engage in retirement savings behaviour.

Further, and based on the findings in Table 4, there exist a significant positive correlation coefficient of 0.693 between the construct of psychological characteristics and retirement savings behaviour. Likewise, the implication is that certain psychological traits such as being cautious about spending, spending money on short term gratifications, considering saving for retirement, understanding the importance of saving for their retirement, willingness to forgo some of the needs to save for retirement, having the goal to retire comfortably having accumulated 75% of their salary or more after retirement, having serious thought about changing current

behavior towards saving for retirement, willingness to set aside excess funds immediately for retirement savings than spending on short term gratifications, having attitudes that influence financial behavior especially in relation to saving for post-retirement, and always feeling in control of financial decisions and savings strategies are associated with higher likelihood of engaging in positive retirement savings behaviours.

Lastly, the significant pairwise association of 0.735 between cognitive bias and retirement savings behaviour bears a connotation that people exhibiting specific cognitive biases such as confidence in understanding several retirement savings options, familiarity with the concept of compound interest and its impact on saving behavior, finding it challenging to prioritize savings for retirement over short term needs, having diversified retirement savings into different asset classes, the perception that external information or benchmarks influence their perception of what constitutes “enough” for retirement, financial losses impacting their willingness to invest in some retirement saving vehicle, confidence in making the right decisions regarding their retirement savings, estimating the amount of money needed for a comfortable retirement, and expecting stability in their investments over time with modest profits given normal market conditions are likely to make decisions that align with positive retirement savings behaviours.

Table 4: Associations between demographical variables (age, education level, and income), PC, CB, and RSB

		AGE	EDUCATION LEVEL	INCOME	PC	CB	RSB
AGE	Pearson Correlation	1	.457**	.558**	.519**	.454**	.468**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
EDUCATION LEVEL	Pearson Correlation	.457**	1	.577**	-.490**	-.361**	-.443**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
INCOME	Pearson Correlation	.558**	.577**	1	.436**	.384**	.429**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
PC	Pearson Correlation	.519**	-.490**	.436**	1	.774**	.693**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
CB	Pearson Correlation	.454**	-.361**	.384**	.774**	1	.735**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
RSB	Pearson Correlation	.468**	.443**	.429**	.693**	.735**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

- Psychological Characteristics (PC)
- Cognitive Bias (CB)
- Retirement Savings Behavior (RSB)

4.7 Empirical findings

The model in Table 5 presents the regression output that examines the relationship between the construct of psychological characteristic (PC), cognitive Bias (CB) with Retirement Savings Behaviour (RSB), with controls including demographic variables such as age, education level, and income level. Based on the findings and results, the overall explanatory power of the model is captured through the coefficient of determination, R-Squared, given by the value of 0.601. The R-Squared of 0.601 for the underlying model indicates that approximately 60.1% of the variance in RSB is accounted for by age, education level, income level, psychological characteristic, and cognitive bias, hence the remaining 39.9% of the variance in RSB is explained by other

factors not specified in the model as captured by the error term. Like the associations discussed in Table 5, the most significant relationships at the 95% significance level is discussed in the subsequent section. In doing so, the section recalls the research questions, and present the findings related to the research questions.

Research Question 1: *What is the impact of psychological characteristics on retirement savings behaviour in South Africa?*

Regarding objective and research question 1, the retirement savings behaviour was regressed against the psychological characteristics to determine the relationship between retirement goal clarity and future time perspective with an individual commitment to save for retirement. Based on the output in Table 5, the coefficient for the construct of psychological characteristics is 0.26, with the associated p-value (0.007) below the 0.05 significance level. These findings imply a significant positive impact of retirement goal clarity and future time perspective on the individual's willingness to save for retirement, such that a unit favourable change in the retirement goal clarity and future time perspective of South Africans would elicit the moderate positive improvement ($r = 0.287$) in their retirement savings behaviour. These findings are consistent with those documented by Bandura (1997); Lyubomirsky, King, and Diener (2005); and Asebedo et al., (2018) who established that individuals who are optimistic exhibit reactions that impact their capability to identify and harness financial opportunities, advance at work, exercise determination and self-control, and boost feelings of self-efficacy, hence contribute to proactive approach to financial planning for post-retirement. In general, it is perceived that individuals who have a strong connection with their future selves exhibit behaviours that encourage cautious spending, saving, and overall cash management which all contribute to the better financial preparedness post-retirement.

Research Question 2: *What is the influence of investors' cognitive biases towards retirement savings behaviour in South Africa?*

Likewise, the retirement savings behaviour was regressed against cognitive bias to determine the predictive power of financial literacy and risk tolerance on the individual's commitment to save for post-retirement. Conforming to the output in Table 5, there exists a correlation coefficient of 0.719 with the associated p-value of 0.000 between an individual's financial literacy and risk tolerance with his/her commitment

to save for retirement. The idea is that a favourable change in financial literacy and risk tolerance leads to a significant positive change ($r = 0.719$) in an individual commitment to save for retirement. Hence, financial literacy and risk tolerance play a crucial role in influencing an individual's commitment to save for retirement. These findings and results mirror those obtained in Zahera and Bansal (2018); Oprean and Tanasescu (2014) who also theorized that cognitive bias could have formidable influence on retirement savings behaviour. For instance, regarding overconfident bias, overconfident individuals are likely to engage in financial planning and investment practices as their confidence leads to proactive approach in managing retirement savings. Similarly, regarding confirmatory bias, individuals may seek clarity and information pertinent to their strongly held beliefs about specific retirement savings, which ultimately reinforces their desire to save for post-retirement. Further, on the grounds of familiarity bias, individuals may invest in familiar asset classes, which contributes significantly to their sense of comfort and confidence in their investment choices. Lastly, based on diversification bias, individuals can spread their investments across various asset classes, thereby minimizing risk exposure in their retirement portfolio, hence, sensitize their behaviours towards saving for retirement.

> **Research Question 3:** *What is the impact of demographic variables on retirement savings behaviour?*

Of the demographic variables, age, education level, and income level are known to have a significant positive effect on retirement savings behaviour. As such, age, education level, and income level were chosen for this study do ascertain their impact on retirement savings behaviour. Based on the findings in Table 5, only age and income level have a significant positive relationship with retirement savings behaviour given by the coefficients of 0.256 and 0.362 and the corresponding p-values of 0.031 and 0.34 respectively for age and income. The observation that income level is positively related to retirement savings behaviour echo the findings of Fabian et al., (2022) who are of the opinion that educated individuals are likely to earn better monthly income/salaries relative to those with lower qualifications, hence, have an incentive to save for retirement due to having excess funds. Similarly, the findings related to age and retirement savings behaviour supports those in Safari et al., (2021) and Tuan-Hock, et al., (2011), who also established that elder people have accumulated

knowledge in investments and retirement planning over their years, hence are likely to engage in behaviours that support consumption post-retirement.

Lastly, the captivating aspect of the findings in Table 5 dwells in the influence of education level as control variable in shaping retirement savings behaviour. Interestingly, based on Table 5, education level also proves to be significant in explaining the retirement savings behaviour. The positive signage of education level as the control variable presents an interesting discovery as it implies that as people acquire advanced education, they are likely to engage in retirement savings behaviours. These findings reiterate those put forth by Kimiyagahlam et al., (2019), who proclaimed that higher education level imparts financial knowledge, hence individuals are likely to make informed decisions regarding their retirement savings (Shariff & Ishak, 2021). Similarly, education level is positively correlated with income (Ozer & Perc, 2020), as also observed in Table 4. This suggests that as individuals acquire advanced education, they can fill higher positions characterized by high salaries. Hence individuals are likely to commit the excess funds towards retirement savings.

Table 1: Regression output

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.775[a]	.601	.591	.6919362	1.884
a. Predictors: (Constant), Cognitive Bias (CB), Psychological Characteristics (PC), Education Level, Age, Income					
b. Dependent Variable: Retirement Savings Behavior (RSB)					

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.123	.386		-.318	.751
	AGE	.256	.058	.058	.974	.031
	EDUCATION LEVEL	.090	.051	-.103	-1.751	.081
	INCOME	.362	.064	.059	.969	.034
	PC	.260	.096	.212	2.721	.007
	CB	.719	.107	.485	6.729	.000

Durbin Watson (DW): Tests if autocorrelation exists in the residuals of the regression model. It occurs when the residuals of the regression model are correlated.

Standardized vs Unstandardized Coefficients: Standardized coefficients are expressed in standard deviations, while unstandardized coefficients are expressed in raw units.

- Psychological Characteristics (PC)
- Cognitive Bias (CB)
- Retirement Savings Behavior (RSB)

4.8 Summary of the chapter

In this chapter, the study provides a mass of information to answer the research questions, test the hypothesis, observe the suggested themes, and explore the assumptions. This study begins by discussing the process of data cleaning, editing, and coding. Categorisation of data by demographic variables, followed by testing reliability of our data which followed the OECD and financial advisor framework guides. The reliability test for this study uses the Cronbach's Alpha. This study then uses Descriptive statistics analysis for the variables of the study (PC, CB, RSB) and associations with the demographic variables. Finally, the study discusses the empirical findings suggest that both psychological characteristics, cognitive biases and demographic variables have a significant positive impact on retirement saving behaviour. Overall, this chapter provides data interpretation, results, empirical findings, and implications.

5 CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This concluding chapter aims to summarize the key findings of the study titled “The impact of psychological characteristics on retirement savings in South Africa and draw insightful conclusions from the analysis. By thoroughly investigating different psychological factors and their impact on retirement savings behavior, this research has provided valuable insights into the crucial aspects that influence individuals’ financial readiness for retirement in South Africa. Building on the empirical evidence and theoretical framework discussed in the previous chapters, this chapter intends to distill overarching conclusions and offer actionable recommendations for policy makers, financial institutions, employees, and individuals. The goal is to improve retirement savings outcomes and promote financial well-being among South Africans. The chapter further provides a detailed overview of the empirical study, encompassing the research design, data collection methods, and analytical techniques used to determine the impact of psychological characteristics on retirement savings behavior. Additionally, the chapter provides highlights of the key findings and results obtained in chapter 4, revealing the embedded relationship between psychological characteristics and retirement savings behavior.

5.2 Summary of the empirical study

The aim of the study was to investigate the relationship between psychological characteristics and retirement savings in South Africa. The objective was to gain an in-depth understanding of how psychological factors and cognitive biases influence individual’s decisions to save for their retirement. To achieve the objective, the study targeted individuals in South Africa with or without retirement savings products, thereby recognizing the significance of diverse perspectives within the population. The study employed a simple random sampling technique to select a sample of 385 participants among the 15 million employed South Africans across 2500 employers. However, due to time constraints, only 201 responses were collected and analyzed. Nevertheless, this sample size serves as a solid foundation for analyzing and exploring the stated research objectives and questions.

The data was collected through a closed-ended survey questionnaire distributed through the University of Witwatersrand student database. The idea was that the University of Witwatersrand student database consists of student dynamics which can be a valid representation of the South African population. Hence the questionnaire was designed to include student demographics and measure several constructs such as psychological characteristics, cognitive bias, and retirement savings behavior using a five-point Likert scale. In terms of data analysis, the study leveraged on descriptive and inferential statistics. Descriptive statistics summarized and illustrated the distribution of study variables. Meanwhile, inferential statistics included multiple regression analysis and Pearson correlations to establish the stated relationships. Moreover, Cronbach's Alpha was used to validate the survey questionnaire used in the study. Finally, all the processes were anchored on ethical consideration of anonymity and confidentiality, no potential harm for study participants. Therefore, the study was conducted in the most responsible manner to ensure the validity and reliability of the findings.

5.3 Summary of the key findings

On the demographics of the study, the findings and results revealed a positive relationship between age and education level, suggesting that older individuals possess higher education levels (Safari et al., 2021; Tuan-Hock et al., 2011). Most specifically, the relationship suggests that older individuals demonstrate higher educational achievements relative to their younger counterparts. Therefore, these findings underscore the importance of considering age when examining educational level. Similarly, there is a positive relationship between income level and educational level, suggesting that individuals with higher educational achievements enjoy higher income (Fabian et al., 2022). This is because education plays a crucial role in determining income levels, with those pursuing higher education typically earn more. Thus, the positive relationship highlights the importance of education in shaping individuals' economic circumstance and socioeconomic status.

On the constructs of the study, there is a positive relationship between psychological characteristics and retirement savings behavior. This discovery suggests that individuals portraying certain psychological characteristics such as optimism, positive attitudes, financial literacy, future time perspective, and positive emotions are likely to

demonstrate proactive engagement in retirement savings behavior (Bandura, 1997; Asebedo et al., 2018). Based on these findings, it can be inferred that individuals portraying positive attitudes towards retirement savings behavior demonstrates rational expectations, and those exhibited higher levels of financial literacy were more inclined to engaging in retirement savings strategies (Lyubomirsky, King, and Diener, 2005). In general, the positive relationship between psychological characteristics and retirement savings behavior emphasizes the critical role of psychological factors in shaping individuals' decision and behaviors regarding financial and retirement planning (Bandura, 1997; Asebedo et al., 2018).

Likewise, the study revealed a positive relationship between cognitive bias and retirement savings behavior. The implication is that individuals displaying higher levels of cognitive bias are likely to demonstrate more favorable retirement savings behavior (Zahera & Bansal, 2018). Specifically, the results indicate that individuals who display cognitive biases such as overconfidence, familiarity bias, confirmatory bias, and diversification bias tendencies are more likely to engage in proactive retirement savings behaviors (Nafziger, 2017; Oprean & Tanasescu, 2014). These findings further illustrate that cognitive biases play a crucial role in shaping individual's financial decisions, especially in the context of financial and investment planning.

Lastly, demographic variables such as age, income level, and education level were used as control variables in determining the impact of psychological characteristics on retirement savings behavior. All the demographic variables had a positive relationship with retirement savings behavior. Firstly, age emerged as a significant predictor of retirement savings behavior, indicating that individuals tend to portray favorable retirement savings behavior as they age with time (Safari et al., 2021). Therefore, we can infer that as individuals progress through different life stages, they become cautious about their spending, leading to proactive savings habits (Tuan-Hock et al., 2011). Also, education level has a positives association with retirement savings behavior, indicating that individuals with higher education demonstrate high engagement in retirement savings activities (Kimiyagahlam et al., 2019; Ghafoori, Ip, & Kobatek, 2021). Lastly, it was determined in chapter 4 that income level is a significant determinant of favorable retirement savings behavior. In essence, this relationship highlights the role of income level in shaping individuals' ability to save for retirement (Nyaboke, 2016). This is because higher income earners may have high

disposable income available for saving and investing, enabling them to create larger retirement nests over time (Ngare & Githui, 2014).

5.4 Managerial and policy implications

Based on the key findings and results obtained in chapter 4, this section provides both managerial and policy implications that can help majority of South Africans to engage in practices that promote retirement saving. The managerial implication specifically addresses the employed South Africans, while the policy implications cater even the unemployed South Africans.

5.4.1 Managerial implications

There is a need to implement financial education and literacy programs that target employees of all ages and educational backgrounds within the workplace context. This can be done with the primary objective of addressing cognitive biases as well as behavioral tendencies that hinder effective retirement planning and savings behavior. The programs can be designed in a manner that provides tailored educational materials that consider the unique needs and preferences of different demographic groups. Employers can play a crucial role in this effort by offering different retirement savings plans, and counselling to employees regardless of their income levels. As such, to increase employee participation in these programs, employers should provide incentives to employees or employer matches, not only on high earning employees. Additionally, including financial wellness programs that offer resources for retirement planning and savings strategies in employee benefit packages can be highly beneficial.

5.4.2 Policy implications

The South African government should implement policies that promotes retirement savings behavior. Increase awareness in the benefits they offer on retirement contributions in the form of tax deductions or credits. These financial incentives are likely to sensitize employees to save more for retirement. Also, the government can enforce the automatically enrollment and escalation features in retirement savings plans such that employees are automatically enrolled in retirement savings plans, until such an employee opts out, and that the rates paid into retirement contributions increase over time.

The South African government should further tailor targeted outreach programs, especially to underserved populations. These can be accessible and culturally relevant programs specifically designed in multiple South African languages to increase outreach within communities. For effective rollover of these projects, the South African government should collaborate with community organizations, schools, and employers to facilitate understanding and engagement with retirement savings concepts. One effective way to address this is through public awareness campaigns. The South African government should create educational initiatives that aim to inform citizens about the significance of retirement savings and financial planning. These campaigns can highlight the advantages of setting savings goals and regularly reviewing retirement plans to ensure they are sufficient.

Also, regulatory interventions have a vital role to play. The South African government should introduce regulations that mandate employers to provide retirement savings plans or automatically enroll employees in these plans unless the same employees decide to decline. These can be done regardless of employee income bracket. Thus, this measure can enhance the availability of retirement savings options and motivate more individuals to actively save for their future.

5.5 Suggestions for future research

The aim of this study was to determine the impact of psychological characteristic on retirement savings in South Africa. In doing so, the study only considered psychological characteristics and cognitive bias as the independent variables, controlled for demographic variables such as age, education level and income level. However, several factors such as debt level or financial obligation may impact retirement savings behavior regardless of age, income, and education level. As such, omitting these variables may result in underestimating or overestimating the relationship between psychological characteristics and retirement savings behavior. Therefore, future studies should incorporate a comprehensive variables and respective controls to adequately capture the complexity of factors influencing retirement savings behavior. It may also involve using mixed research to identify additional variables or advanced statistical techniques to account for unobserved heterogeneity.

5.6 Summary of the chapter

In this chapter, the study presents the assumptions drawn from chapter 4 empirical results and findings to make recommendations for further research. The study begins by discussing the summary of the results and discuss the key findings. The study then discusses both managerial and policy implications that can encourage retirement savings behaviour and address poor savings culture that South Africa is currently facings. Finally, this study discusses further research propositions. Overall, this chapter provides conclusion and recommendations.

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Appendix 1: Data Collection instrument

LETTER OF INTRODUCTION

Miss M. Malinga (1655716)
Cell: 063 673 5918

Dear Participant,

You are invited to participate in an academic research study. In partial fulfillment of a Master of Management in Finance and Investment programme at the University of Witwatersrand Business School, Parktown, Johannesburg. I am required to undertake a research project. The purpose of this research study is to investigate **"The impact of psychological characteristics on retirement savings in South Africa"** under the supervision of Prof Odongo Kodongo.

As part of the research study project, I would like to invite you to take part in answering a survey questionnaire. This questionnaire will require 10-15 minutes of your time.

You cannot be identified in person based on the answers you give. Your participation in this study is very important to me. You may, however, choose not to participate and you may also stop participating at any time without any negative consequences. The interview is completely anonymous and confidential as you are not asked for your name or any form of identification.

I kindly request your indulgence with answering the questionnaire.

Thank you. Yours Sincerely

QUESTIONNAIRE

SECTION 1: QUALIFYING CRITERIA (QC)

1.1 Are you currently employed in South Africa

- Yes
- No

1.2 In which industry are you employed.

- Banking and Financial Services
- Mining and Engineering
- Government (Public Sector)
- IT
- Agriculture
- Education
- Health
- Transportation and Logistics
- Other (specify) .....

1.3 What is your current level of income

- R3500- R100 000 annually
- R101 001- R200 000 annually
- R201 001- R500 000 annually
- R500 001 – R1000 000 annually
- R1000 001 and above
- Other

1.4 Do you have a retirement saving vehicle?

- Yes
- No

1.5 If your answer to Question 1.4. is Yes, what is your retirement saving vehicle

- Retirement Annuity
- Pension Fund
- Provident Fun
- Other……

1.6 If your answer to Question 1.4 is No, why do you not have a retirement savings vehicle

- I'm not aware of any retirement savings vehicles.
- I do not trust retirement savings vehicles.
- I do not have enough money to save.
- I have investments that can take care of me in retirement.
- Other (specify) ……

SECTION 2: DEMOGRAPHICS (D)

2. 1 **Gender**

- Male
- Female
- Prefer not to say
- Other……..

2.2 Racial Group

- Black
- Colored
- Indian
- White
- Other

2.3 How old are you (in years)

- 18 – 24
- 25 - 30
- 31 – 40
- 41 – 50
- 51 – 60
- 61 - 70

2.4 What is your current level of education

- University Degree completed
- Attended university but did not complete
- Technical education post-secondary (completed)
- Attended technical education but did not complete.
- Secondary education completed
- Did not complete secondary education
- Primary education completed
- Did not complete primary education
- None.

2.5 Level of income group classification

- Lower (less than R5 000 per month)
- Lower-Middle (more than R5000- but less than R20000 per month)
- Upper Middle (more than 20 000 but less than R30000 per month)
- High Income (R30 000 per month and above)
- Not disclosed

SECTION C: PSYCHOLOGICAL CHARATERISTICS (PC)

As honestly as possible, indicate your best option on the scale of 1-5. Where 1 means very strongly disagree and 5 means very strongly agree.

3.1 I am cautious with my spending

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

3.2 I often spend my money on short-term gratifications (e.g., …….).

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

3.3 I plan to start saving for my retirement.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

3.4 I understand the importance of saving for retirement.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

3.5 I am willing to forego some of my needs in order to save for my retirement (e.g., give up buying clothes, entertainment etc.)

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

3.6 My goal is to retire comfortably by ensuring I have 75% of my salary or more after retirement.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

3.7 I have very serious thoughts of starting to change my behavior towards saving

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

3.8 If I have enough funds to set aside more savings towards my retirement, I will do it immediately rather than spending on short term gratifications.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

3.9 Does your attitude influence your financial behaviour, especially in relation to saving for the future?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

3.10 Do you feel in control of your financial decisions and savings strategies?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

SECTION D: COGNITIVE BIAS (CB)

4.1 How confident are you in your understanding of retirement saving options?

1. Strongly not confident
2. Not confident
3. Neutral
4. Confident
5. Strongly Confident

4.2 I am familiar with the concept of compound interest and its impact on retirement savings.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

4.3 Have you diversified your retirement savings across different asset classes?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

4.4 I find it difficult to prioritise saving for retirement over immediate financial needs or desires

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

4.5 Do financial losses impact your willingness to invest in certain retirement vehicles

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

4.6 I am confident in my ability to make the right decisions regarding my retirement savings

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

4.7 My perception of what constitutes "enough" for retirement is influenced by performance of a fund or investment portfolio

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

4.8 I have estimated the amount of money that you will need for a comfortable retirement

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

4.9 Assuming normal market conditions, what would you expect from your investment over time

1. To generally keep pace with the stock market
2. To slightly trail the stock market, but make a good profit
3. To trail the stock market, but make a moderate profit
4. To have some stability, but make modest profits
5. To have a high degree of stability, but make small profits

SECTION D: RETIREMENT SAVING BEHAVIOUR (RSB)

5.1 How would you describe your current level of commitment to saving for retirement

1. Very low
2. Low
3. Moderate
4. High

5. Very High

5.2 I have an emergency fund separate from my retirement savings

6. Strongly disagree
7. Disagree
8. Neutral
9. Agree
10. Strongly agree

5.3 I have taken steps to ensure my retirement savings aligns with my lifestyle and future plans

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

5.4 I am comfortable with the level of risk in my retirement savings portfolio.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

5.5 Have you sort advice or information on retirement savings from a financial professional?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Appendix 2: Ethical Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

OFFICE OF THE DEPUTY REGISTRAR

11 December 2023

Mmateboho Malinga
Student Number (1655716)
Master of Management in Finance and Investment
Wits Business School

TO WHOM IT MAY CONCERN

"The impact of psychological characteristics on retirement savings in South Africa."

This letter serves to confirm that the above project has received permission to be conducted on University premises, and/or involving staff and/or students of the University as research participants. In undertaking this research, you agree to abide by all University regulations for conducting research on campus and to respect participants' rights to withdraw from participation at any time.

If you are conducting research on certain student cohorts, year groups or courses within specific Schools and within the teaching term, permission must be sought from Heads of School or individual academics.

Ethical clearance has been obtained. (Protocol number: WBS/FI1655716/525)

Research Expiration: (Research submission date)

Nicoleen Potgieter
University Deputy Registrar

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