# An investment framework based on risk tolerance: a case of Vaal Triangle students


## A Evangelou

**orcid.org 0000-0003-1533-5236**


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Supervisor: Dr SJ Ferreira

Co-supervisor: Dr E Swanepoel

Co-Supervisor: Ms L Ferreira

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Student number: 24006068

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Antonios Evangelou

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**DECLARATION**

I declare that:

"**AN INVESTMENT FRAMEWORK BASED ON RISK TOLERANCE: A CASE OF VAAL TRIANGLE STUDENTS**"

is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references, and that this dissertation has not previously been submitted by me for a degree at any other university.

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A.EVANGELOU

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Vanderbijlpark

**ABSTRACT**

This study aimed at constructing an investment framework for students based on their risk tolerance level. The study reviewed current market investment products that could be suitable for students and this created the investment framework. Risk tolerance levels were also discussed and analyzed. Analysing students risk tolerance during the investor life cycle is imperative to students and financial planners alike, to facilitate the implementation of suitable investments and investment strategies. Students in universities do not have the required knowledge to make good investment decisions and this is why an investment framework was created to assist, guide and inform students of what stage of the individual investor life cycle that they are in and suggest suitable investment strategies.

The theoretical objectives provided an analysis of the risk tolerance, as well as the demographics of students. The theoretical framework was contextualised and assisted in achieving the empirical objectives of the study. Demographical and socio-economic factors affect the risk tolerance of students and how much risk they are willing to tolerate. It was found that gender and race have a positive relationship with risk tolerance and that females have a higher risk tolerance than males, which is contradictory to other studies. This was discovered by the use of one-way ANOVA to determine whether there is a relationship between risk tolerance and the variables that were used in the study.

The study implemented a quantitative approach, using secondary data analysis. The data used for the analysis is from a self-administered questionnaire in 2017 that was distributed to a sample of 396 students from two higher education institutions in the Vaal Triangle region. Two validated risk tolerance scales were used to analyse students risk tolerance levels. Statistical analysis was conducted, using SPSS software. The first empirical objective was to determine the risk tolerance levels of students in the Vaal Triangle region. The two results from the 13-item scale and the single-item scale for measuring risk tolerance indicated that the participants have a medium risk tolerance level. Since the 13-item risk tolerance scale and the SCF scale have similar results and the 13-item risk tolerance measures risk tolerance from multidimensional levels, the results from both the SCF as well as the 13-item risk tolerance scale results were used throughout the rest of the study, similar to previous studies.

To accurately determine student investors risk profiles and ensure that there was a successful implementation of investment strategies when making a decision, an analysis of risk tolerance

and investment decisions of student investors was done. There was only one significant difference between means found in the investment type group, and only with regards to risk tolerance, i.e., between participants that invest in clubs or groups, like stokvels, and participants who did not invest that would also not consider investing. No other important differences in levels of risk tolerance or subjective risk profiles were found, regardless of type of investment.

The third empirical objective was to determine the risk tolerance relationship of students based on gender and year of study. In regards to gender, it was concluded that there was a relationship with the Grable scale total and risk profile with gender. There was no particular relationship that was identified between the student's year of study and their risk tolerance level. These results were contrary to previous studies.

The fourth empirical objective was to determine the objective and subjective risk tolerance according to demographics. In terms of gender, both the objective risk tolerance scale and the subjective risk tolerance profile indicated a significant difference in risk tolerance. Hence, both scales reported similar results. There was no difference in the objective and subjective risk tolerance between the different racial groups. Both scales indicated a difference in risk tolerance within the groups. For the other demographics, year group, situation, monthly income, source of that income and the number of dependents, no statistical difference in the mean values were found between groups for both objective risk tolerance and the subjective risk tolerance profile.

It is also pivotal that individual investors know what stage of the investor life cycle they are in as this will assist in managing an effective investment portfolio and the correct asset allocation in the different phases of the life cycle. The framework was created whereby there are different steps that need to be looked at before taking the decision of what investment to invest in. The framework consisted of nine steps, these include the individual investor life cycle, investor objectives and constraints, risk tolerance levels, asset classes that could be invested in, demographics of individuals and how they affect risk tolerance, the risk appetite of the individual, subjective and objective risk tolerance, the different risk tolerance categories concluding with the best investment options for individuals in the different phases of the individual investor life cycle.

The conclusions and findings of this study contribute to research by provide students with a basic framework to implement investment strategies to follow to achieve their investment goals.

**Keywords:** risk tolerance, student investors, investment choices, investor lifecycle, investment, ANOVA, portfolio

## LIST OF ACRONYMS

**DHET** : Department of Higher Education and Training

**DOSPERT** : Domain-Specific Risk-Taking (scale)

**GLRT** : Grable and Lytton risk tolerance (scale)

**HEI** : Higher Education Institution

**SCF** : Survey of Consumer Finance

**SPSS** : Statistical Package for Social Sciences

**ETF** : Exchange-Traded Fund

**NWU** : North-West University

**ANOVA** : Analysis of variance (ANOVA)

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# CHAPTER 1: INTRODUCTION, PROBLEM STATEMENT AND OBJECTIVES OF THE STUDY

## 1.1 INTRODUCTION

Risk is defined as the insecurity that an investor has concerning any deviations from predicted income or outcome. Risk measures the uncertainty that an investor is prepared to take in order to realise a gain from an investment (Economic Times, 2017; Mirriam-Webster, 2016). Risk can be divided into two types; non-financial and financial risk. Non-financial risks are financial transactions that can negatively impact the operations or assets of a company. Financial risk is the likelihood of an event with a negative monetary implication.

The economic state of affairs in South Africa such as the economic growth, tax revenue, debt levels and the poor performance of state-owned enterprises has resulted in an increase in exposure to financial risk by South African investors over the past decade (2008-2018) (Reilly & Brown, 2012). Financial risk is mostly linked to investments, where investors face the risk of an unexpected decline in the value of their investments (Marx, Mpofu, De Beer, Mynhardt & Nortje, 2013). This has led to individuals being confronted with financial challenges. Some of these challenges include debt, increased cost of living and financial stress caused by the uncertainty of the economic- and financial environment (Lusardi, Mitchell & Curto, 2010:3; Van Deventer, 2013:1). There are factors in South Africa that lead to high economic strain, such as poverty, inequality and the unemployment rates, (Edigheji, 2010). These financial challenges can be felt by individuals who actively manage their finances through various investment opportunities. Individuals that are able to manage their finances through suitable investments will also be affected by these financial challenges. Active investing is the ongoing purchasing and selling of investments that should be done, to avoid financial challenges, in a proactive manner.

Individuals are usually considered risk-averse. Evidence of this concept is present in everyday life as individuals purchase various types of risk cover in the form of life insurance, disability cover, car insurance, as well as health insurance (Reilly & Brown, 2012). To prepare for everyday unforeseen circumstances, individuals should be thinking about the actual investment as opposed to just risk cover. Investor risk tolerance is defined by having both the willingness and an ability to take the risk. To be able to have the ability to take a risk can be determined by

the investor's time horizon, the size of the portfolio and his/her income relative to his/her investment goals (Grable, 1997).

Investment goals, also known as goal-based investing, is where investing is the main objective with the aim of attaining specific life goals. Investment goals are one of the key dependencies on the level of risk that an investor is able to take. Therefore, individuals should have a good understanding and be aware of the risk associated with the investment that they are willing and able to take. According to Hanna and Lindamood (2004:27), individuals are not fully aware and knowledgeable of their investment risk and it is important to note that in order for an investment to be able to benefit an individual, the individual needs to understand the nature of the underlying instrument.

If these goals are short term, but the time horizon is long, the ability to take risk is greater for the investor. Should the investor have a short time horizon with long term goals, the investor will have greater risk-taking ability. There are varieties of investment products that individuals could choose from, which include low to elevated risk investments, such as bonds and equities (Hoevenaars *et al.*, 2008:2942)**.** The individual should choose investment products that complement his/her investment goals and financial risk tolerance.

Studies have shown that students in secondary school have a reduced understanding of credit, such as personal loans, credit facilities as well as insurance (Bakken, 1967; Langrehr, 1979). In the studies conducted by Bakken (1967) and Langrehr (1979), it was established that male individuals scored considerably more when it came to borrowing money and using credit facilities when compared to female individuals (Bakken, 1967). This shows that male students take on average more risk than female students. Students who had basic knowledge and understanding of finances understood investment and loans better than those who did not have the business and financial education (Bakken, 1967; Connor, 1992; Hirra, 2010).

When developing an investment portfolio, the level of risk tolerance that an investor has is integral to make sure that the investor obtains the return expected according to his/her risk tolerance levels (Duncan, 2016). The risks experienced by the investors are determined by their risk tolerance levels. These include age, gender, income, job security and demographics. Hanna and Lindamood (2004) indicate that the share of financial assets and total wealth are crucial factors in determining the level of risk tolerance and note that it increases when an individual is close to retirement (Sung, 2017). Deaves *et al.* (2007) found that potential investors that have

a high propensity to plan, tend to be more risk tolerant. In addition, risk-taking is positively correlated with income but negatively correlated with age.

Individuals from the ages of 18 to 29 are in their accumulation phase of the investor lifecycle (Chen & Volpe, 1998:5). Van Deventer (2013:2) states that the generation of today is better positioned than the previous generations, as they are able to be the richest age group thus far as they have access to more investment opportunities. The youth in South Africa has the potential to increase, as well as accumulate higher future earnings, which makes the target market more lucrative for this generation than potential future investors (Bevan-Dye & Surujlal, 2011:49).

## 1.2 PROBLEM STATEMENT

Investment managers, as well as researchers in the last decade, have renewed their interest in better comprehending risk tolerance associated with investors. The reason that the interest is being renewed is due to the advances in investment management models, as investment managers need a minimum of four factors as inputs when developing financial plans. These include the goals, time horizon, financial stability and the level of risk tolerance of the investor (Garman & Forgue, 1997; Hallman & Rosenbloom, 1987; Trone *et al.,* 1996).

McLendon (2016:12) stated that there are a few students that have the financial reserves to engage in financing investment opportunities. McLendon (2016:12) found that students follow either their peers or their own instinct when it comes to investing their money. As such, it increases the likelihood that students could make a bad investment decision, which might lead to a negative investment experience (Kuhnen & Knutson, 2011). Individuals' perception of investments can be manipulated by individuals who have experienced financial losses, which can result in potential investors not investing and losing out on their potential earnings. There are 9 countries with less than two-thirds ($\pm$62%) of the youth actually investing their money; these countries are Singapore, Philippines, Indonesia, Hong Kong, Taiwan, Korea, India the United Arab Emirates and South Africa. (Charlett *et al., 1995;* Baker & Ricciardi, 2015).

Risk tolerance is one of the factors that is often overlooked when potential investors or organisations are interested in investing. Risk tolerance often enables a person or organisation to trade-off some level of investment returns for a better result over a period of time. It is important to identify these factors for each individual, as a well-drafted portfolio could benefit the individual in times of need (Kuhnen & Knutson, 2011). According to Mittra (1995), it is

important for a financial planner to study investors risk tolerance levels using a subjective measure, although their opinion may be subjective, as well as objective aspects of risk tolerance as this may help identify what risk tolerance the individual investor is able to take.

There are three main categories of risk tolerance (1) an aggressive investor that is prepared to use high-risk approaches in the pursuit for higher returns, although an aggressive investor must also be able to endure variations in the market, (2) whereas a moderate investor is one who believes in a balanced portfolio (3) conservative investor is willing to receive lower than usual profits for the safety of their capital (Wisdom Wealth Strategies, 2013).

Masenya (2017) conducted a study on student investment knowledge and risk tolerance. The purpose of the study was to discover whether students invest and in what type of products. The study found that only 11 per cent of the student sample invests. A large number of students also listed that (1) they do not know how to invest and (2) they do not know how to start investing. Students also identified that they do not have the financial means to invest as they get a limited amount of capital a month. Hence, the findings of this study provided an opportunity for additional research by creating an investment framework for students that have limited knowledge of investing and/or limited resources to invest based on the demographics and level of risk tolerance for students in the Vaal Triangle region.

The main objective of the study was to construct an investment framework for students, established on their risk tolerance level. The study reviewed the current market-related investment products that might be suitable for students. Also, risk tolerance levels of students were analysed. The final section of the study proposes investment solutions based on the investor lifecycle and the level and extent to which students are willing to take risk. The investment framework will serve as a benchmark framework for students, where they are able to choose the correct investment option according to their risk tolerance.

## 1.3 OBJECTIVES OF THE STUDY

The following objectives have been prepared in accordance to the study.

### 1.3.1 Primary objective

The primary objective was to construct an investment framework for students. This was based on their demographics and risk tolerance levels.

### 1.3.2 Theoretical objectives

The following theoretical objectives have been formulated to achieve the primary objective of the study:

- To contextualise the investor lifecycle and asset classes;
- To contextualise the components of risk tolerance;
- To explore current investment options for South African students; and
- To identify the demographic variables that influence risk tolerance.
- To construct a theoretical investment framework based on student demographics and their risk tolerance level.

### 1.3.3 Empirical objectives

The following empirical objectives have been identified to achieve the primary objectives:

- To determine risk tolerance levels pertaining to students in universities in the Vaal Triangle district;
- To determine how demographics affect the risk tolerance level of a student that study in the Vaal Triangle district;
- Determine the risk tolerance relationship based on gender and year of study;
- To determine how risk tolerance differ objectively (Grable Scale) and subjectively (SCF) based on demographics; and

## 1.4 RESEARCH DESIGN AND METHODOLOGY

A literature review, as well as an empirical analysis, has been included in the study. The data used in this study is secondary data collected in 2017 from a study by Masenya (2017). Masenya (2017) used a mixed methods design with a survey and interviews. The present study only utilised the raw quantitative data obtained from the surveys. The data were captured as part of the study by Masenya (2017) and was accepted by the Ethics Committee of North-West University and includes the ethics number of ECONIT-2017-022. Masenya's (2017) study aimed to find out whether students invest and in what type of products. That study found that only 11 per cent of the student sample invested. A large number of students also listed that they do not know how to invest and they do not know how to start investing. Masenya's (2017)

study allowed additional research opportunity as the present study proposed to investigate this opportunity for further research through focusing on the exploration of investment products established on the levels of risk tolerance and demographics of Vaal Triangle students and to create an investment framework based on their risk tolerance.

### 1.4.1 Literature review

The required literature was acquired from secondary data sources, which include textbooks, journals, online articles, business articles, internet sources, theses from relevant academic research and dissertations to achieve and construct the empirical analysis of the research.

### 1.4.2 Sample size and method

The data were collected by means of a non-probability convenience sample from the full-time undergraduate students that were registered in 2017 at the Vaal University of Technology in Vanderbijlpark as well as the North-West University, which is also based in Vanderbijlpark.

The sample size of 300 students that were enrolled full-time at two of South Africa's Higher Education Institutions was considered large enough sample. Previous studies of a similar nature had comparable sample sizes:

- Cross-cultural differences in risk tolerance: a comparison between Chinese and Americans (Xiao *et al.,* 2009) had a sample of 470 participants.
- An empirical investigation for determining the relationship between personal financial risk tolerance and demographic characteristic (Anbar *et al.,* 2010) had a sample of 450 students.
- Financial risk tolerance and additional factors that affect risk-taking in everyday money matters (Grable, 2000) had a sample of 600 participants.

### 1.4.3 Measuring instruments

Since this study made use of secondary data, it is necessary to discuss the manner in which the data were collected. This study made use of selected sections of the original data set.

The questionnaire consisted of demographic information, the survey of consumer finances, the risk tolerance scale that was developed by Grable and Lytton, the wealth domain of the

DOSPERT scale and subjective financial knowledge. The following risk tolerance measures were used in this study:

- *Survey of consumer finances (SCF)- (Subjective self-report measure)*

This scale is applied to collect data on assets, liabilities, financial attitudes as well as financial behaviours of individual groups. This scale was developed by the University of Chicago and was sponsored by the Board of the Federal Reserve and other governmental agencies (Grable *et al., 2001*). The use of the SCF financial risk-tolerance assessment has grown over the last couple of years because researchers, due to time constraints, needed a reliable method of assessment; the item has a long inclusion with the SCF so it must also be valid (Grable & Lytton, 2001).

- *Grable and Lytton risk tolerance scale (Objective risk tolerance scale)*

This is a questionnaire consisting of 13 items. The 13 items are an assessment that measures financial risk tolerance and were created by Grable and Lytton (2001) to measure the objective risk taking behaviour. The final version of the assessment gave a multidimensional scale, which was reliable and relatively easy to use. This risk tolerance scale also offered assistance for the construct validity of the tool (Grable & Lytton, 2001).

### 1.4.4 Data analysis

The relationships between risk tolerance and possible investment options are the main aims of the study. Since no complex statistical analysis was conducted on the primary dataset, this study aims to conduct statistical analysis for the investment framework. Statistical Package for Social Sciences (SPSS) was used to analyse the dataset using version 25.0 for Windows. The statistical methods used were as follows: descriptive analysis based on the demographics of participants to analyse if where they come from, or whether the stability of their environment has any impact on where they invest and how they look at investing. Correlation analysis and multinomial regression analysis were also used to identify the strength between risk tolerance and the demographics that were utilized in the study.

## 1.5 ETHICAL CONSIDERATION

North-West university provided ethical guidelines and principles that the study had to follow. The study was conducted in accordance with the ethical guidelines and principles as prescribed

by North-West University (NWU, 2016:15). The anonymity of the contributors was assured and the answers will remain confidential. The individuals who took part in the questionnaire were told to not leave any markers that could be used to identify them and not to include any details on the questionnaire. The data that were collected had clearance from both universities. The data were gathered under the ethics clearance number: NWU-00807-18-A4. Ethical clearance for the proposed study was sought from FEMS-REC.

## 1.6 CHAPTER OUTLINE

Below are the chapters that the study comprised of.

**Chapter 1: Introduction and background to the study**

The introduction and background to the study were provided in Chapter 1. Chapter 1 introduces the topic of the study, research objective, theoretical and the empirical objectives. The empirical and theoretical objectives of the study were listed and explained.

**Chapter 2: Investor lifecycle and investment decisions**

Chapter 2 introduces the individual investors' life cycle theory and the different phases that are in the lifecycle such as, the accumulation phase, consolidation phase including the spending and gifting phase. Investors objectives, including their constraints, are also discussed, together with the different classes that the individual could invest in, in the different phases of the life cycle.

**Chapter 3: Student investment and risk tolerance**

Chapter 3 provides the factors that influence risk tolerance, this includes age, sex, gender and marital status. The demographics were linked to the investor’s lifecycle to analyse which products would best fit the student and give him/her investment options within the South African context.

**Chapter 4: Research design and methodology**

Chapter 4 provides information on the research methodology and the techniques used in the data collection. The sample size, data collection process and the choice of the sample were also discussed in this chapter. The statistical techniques were also explained.

**Chapter 5: Results and findings**

Chapter 5 consisted of the analysis of the data that were used and compares results from previous studies as well as this study and analysed if any results are similar and provided findings of the data. This was done for understanding to create an investment framework that will work for students.

**Chapter 6: Conclusions and recommendations**

The study is concluded in Chapter 6 by providing recommendations as well as a conclusion for students to assist and guide them when investing in the future within the Vaal Triangle region.

# CHAPTER 2: INDIVIDUAL INVESTOR LIFE CYCLE THEORY

## 2.1 INTRODUCTION

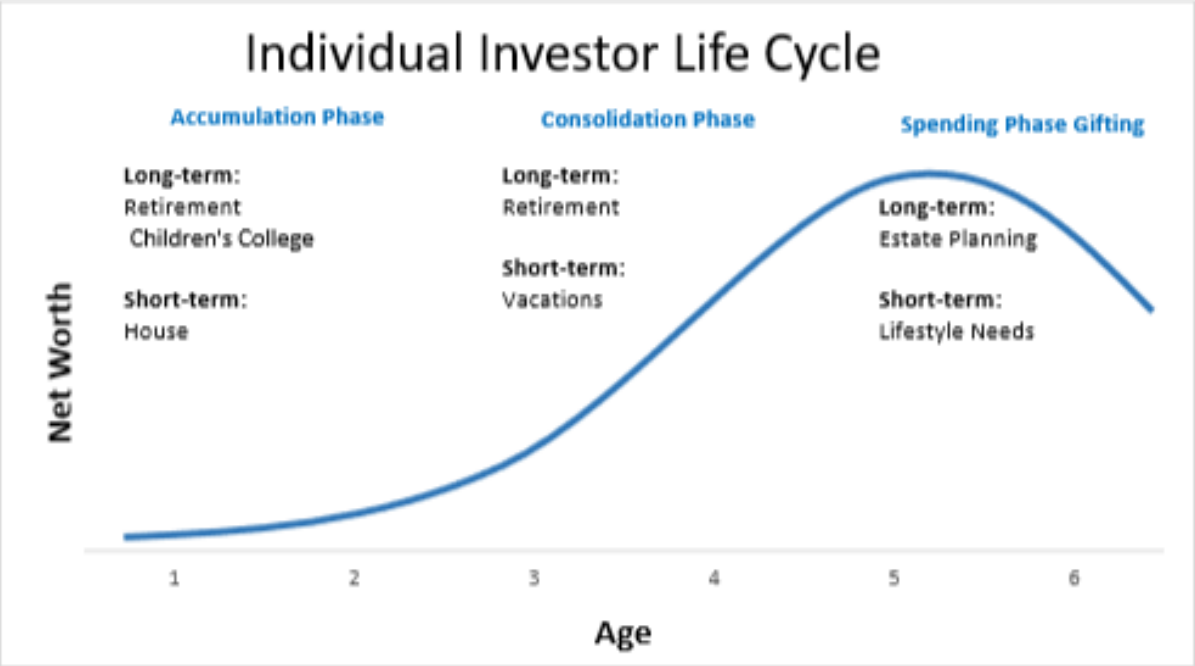
This chapter will focus on the investor life cycle and the types of asset classes that individuals invest in. The chapter furthermore focuses on investment decisions and how that is influenced by the investor life cycle theory. In order to construct an effective investment policy for the different needs and circumstances in an individual's life, it is crucial to determine individual investors' objectives and their constraints, which is called an investment portfolio (Coronation Fund Managers, 2017:105). It is also important to determine an investor's risk tolerance level before compiling an investment portfolio (Goodall, 2005:4). An overview is given on the vast range of investment opportunities in South Africa. The potential for student investors is also explored in the last section of Chapter 2. Therefore, this chapter forms the foundation of this study to establish an investment framework for student investors.

## 2.2 INDIVIDUAL INVESTOR LIFE CYCLE THEORY

Individual investor choices vary throughout the different phases of their life cycle since the investors will experience a change in their circumstances in each of the different phases. According to Bodie *et al.* (2010:698), the investor life cycle theory and what phase of the cycle the individual investor is in contributes as one of the main factors that influence the risk objectives of the investor. It is imperative, therefore, that the individual investor comprehends how essential it is to know where they are in the investor life cycle as it can help manage the effectiveness of the investment portfolio as it will help provide the best results (Goodall, 2005:3; Harry 2014:1). The individual investor life cycle has been defined as the several phases of owning an investment from the start of the transaction to the actual investment (Harty, 2014:1). In the different phases of the investor life cycle, each individual's needs are different. As the individual investor's life starts changing and net worth increases, the investment tactics are also altered to make sure that the goals and objectives that they have been met (Reilly & Brown, 2012:33). Within the investor life cycle, the assignment of assets shifts as the investor's circumstances change. According to Marx (2010:226), the investor life cycle theory is affected by demographics such as age and health of the investor as they become less tolerant of risk. This could be due to the recovery time from potential losses, as it is less than an individual investor that is younger.

The four phases of the investor life cycle are illustrated in Figure 2.1 (Reilly & Brown, 2012:33).

**Figure 2.1 Four phases of the investor life cycle**




Source: (Van den Bergh, 2018)

### 2.2.1 Accumulation phase

Individual investors that are in the accumulation phase find themselves in either their early or mid-working careers (Reilly & Brown, 2012:33). The investors in this phase of the life cycle are accumulating assets for long- and short-term goals. These include long term goals such as houses, vehicles, assets for their houses and saving for university as well as saving for their pension for when they retire and short-term goals which include paying off student debt and acquiring a home (Harty, 2014:1). Investors in this phase do not have a lot of capital but have a large amount of debt from the loans that they have, including vehicles and asset repayments these include house replayments and university loans. Therefore, individuals in this phase must manage their debt because their long-term debt is larger than their current net worth (Reilly & Brown, 2012:33). According to Harty (2014:1), it is important for individuals in the accumulation phase to start saving and investing their money.

As a result, individuals in this phase have a better chance to take on more risk to be able to make a return above average. This is because, in the accumulation phase, investors have a longer period to invest, which could lead to higher earnings in the future, compared to individuals in the consolidation or spending phase (Marx, 2009:266).

### 2.2.2 Consolidation phase

Marx (2009:267), as well as Reilly and Brown (2012:34) state that individual investors that are in this stage of the investor life cycle are at the halfway point of their careers and most of their expenses have been paid. This indicates that their expenses are less than their income. According to Reilly and Brown (2012:34), individuals that find themselves at this stage are able to use some of the extra funding they have from having less debt to be able to pay off their university loans and credit card debt, although this phase is extremely important for the investor to be able to put away a greater portion of earnings, as investors in the consolidation phase have a shorter time frame than an investor that is in the accumulation phase. This phase is important in retirement portfolio due to the time horizon until retirement being less than that of the accumulation phase (Marx, 2009:267). In this phase, to preserve capital is of utmost importance because the investors' willingness to take risk has decreased compared to when they were in the accumulation phase (Harty, 2014:1).

### 2.2.3 Spending and gifting phase

According to Marx (2009:267), the spending and gifting phase is the final stage of the investor life cycle theory and is looked at as a reward for the investor for being disciplined over the different phases. In this phase of the life cycle, the individual is usually retired and is receiving income from their retirement plan and their investments. Individual investors that are in the spending and gifting phase typically earn interest and/or dividends from low-risk investments. Their living expenses are usually covered in this phase.

When individual investors are in this phase, it means that they have received their benefits from their investment portfolios and have invested correctly according to their time frame. According to Harty (2014:1), the gifting phase is the same as the spending phase because investors in this stage of the investor life cycle know that the revenue and assets that they have accumulated are enough to pay for their expenses. These individual investors, in this stage, can also be added to trusts as a way of reducing estate taxes, this is known as estate planning (Reilly & Brown, 2012:34).

It is imperative for an individual investor to know where they are in the investor life cycle as it is the main factor to help with the investment goals and assists with the effectiveness of managing the investment portfolio (Bodie *et al.*, 2010:697). The main purpose of the investors' individual life cycle theory is that it refers to different phases of ownership when investing from the beginning of the purchase to the end where the individual investment is sold (Bodie *et al.*, 2010:698). When doing the asset allocation, it is not determined by the investors' age but rather by the circumstances the individual finds themselves in as each individual is considered as distinct in their own way as they have different situations and challenges. This is the most important characteristic that financial institutions and fund managers should take into account when doing asset allocation and investment allocation (Harty, 2014:1).

Individual investors, along with their financial planners, have to analyse the investors risk tolerance and appetite in relation to which part of the individual life cycle they fall part of. Only after this has been established then the investors' goods and objectives will contribute to the correct structure and asset allocation of the investors' investment portfolio (source). Investors also usually have investment constraints that limit specific assets from being added into the investment portfolio that will be discussed in the following section (Marx, 2010:268).

## 2.3 INVESTOR OBJECTIVES AND CONSTRAINTS

Every individual investor has an investment portfolio that is catered to him/her, because of their different situations and circumstances, despite many having similar attitudes towards risk (Bodie *et al.*, 2010:698). Investment objectives are specific and measurable performance outcomes and constraints are limitations on the ability to make use of investments. In order for financial planners to build an investment policy, the individual investor's objectives and constraints ought to be determined first. In the following section, the individual investors' objectives and constraints that need to be considered when creating an investment portfolio are discussed.

### 2.3.1 Investment objectives

Almost every individual investor has investment objectives that are stated in accordance with their risk and return (Reilly & Brown, 2012:39). The factors that are linked with the individual investors risk objectives include their ability, as well as willingness to take on risk. When the individual investor is able to accept the different types of risk, this is known as risk tolerance. However, when the investor is unwilling and cannot take the risk, this is known as risk aversion

(Alexander *et al.,* 1989:9). There are three specific steps that are undertaken to determine an investor's risk objectives; these include:

- **Specify a measure of risk**: this is the most important challenge for financial planners when creating an investment portfolio, because risk can be measured in absolute or relative terms. In absolute terms, the amount of risk will contain a certain level of variance or standard deviation of total return (Marx, 2009:265).
- **Investor willingness**: the willingness of an individual investor to take on risk is unlike institutional investors because an individual investor's willingness is determined by the psychological or behavioural aspects, this being either expenditure needs, long term responsibilities, wealth goals, financial strength or responsibilities. These factors could determine whether an investor is prepared to take risk (Bodie *et al.,* 2010:11).
- **Investor ability**: the investor's capability to take on risk depends on the financial and practical aspects that limit the amount of risk taken by the investor. An investor's short-term timeframe will adversely influence his/her ability to take risk, which is similar to an investor's responsibilities and expenditure being less than what they have invested in their portfolio. This shows that they are clearly more capable (Wilson, 2010:1).

#### 2.3.1.1 Capital preservation

When an individual investor chooses to decrease their risk of losses in real terms, it is known as capital preservation (Reilly and Brown, 2012:42). The main purpose of capital preservation is to maintain individual investors' investment purchasing power. To b achieve this objective, the inflation rate, as well as the return should be equal to each other (Marx, 2009:267). This objective is appropriate for strongly risk-averse investors or for funds needed over a short period of time, for instance, education or household expenses (Reilly & Brown, 2012:42). Investors who have a longer period of time should only look to spend their returns on investments and should use that money to invest and spend and to consider reasonable growth in income or assets. These types of investments with lower risk are bonds and fixed money market instruments (Marx, 2009:267).

#### 2.3.1.2 Capital appreciation

Capital appreciation is described as the increase in the value of an investment over a given period to be able to fulfil a need in the future. The investment growth is through capital gains (Kennan, 2010:1). The objective is to achieve returns higher than inflation. This type of

investment has a larger risk and is for investors that are willing to take on more risk to meet their goal and objectives, for instance, investors who have a longer time frame (Marx, 2009:267). Capital appreciation does not include dividends, which are payments made by the company to shareholders, as this is not a long-term investment. Capital preservation is an objective that requires more risk because instead of keeping capital, capital appreciation looks to grow the capital (Marx, 2009:267).

#### 2.3.1.3 Total return maximization

Capital appreciation and total return are very similar in the sense that the investors aim is to increase their portfolio in real terms over time in order to satisfy their needs in the future. The growth of capital appreciation takes place from capital gains, whereas with total return, the objective is to increase the capital base by capital appreciation and re-investment of the appreciation (Reilly & Brown, 2012:42).

#### 2.3.1.4 Current income preservation

Income preservation is seen as the goal that an individual investor wants to achieve and to be able to achieve it, they need to establish a portfolio that focuses on creating income instead of capital gains. This means that the investor needs to invest in high coupon bonds in the fixed income market because the investor is seeking to receive an income from the investments, rather than a long-term plan (Marx, 2009:267). This goal is suitable for investors who are retired and depend on receiving income from their investments to cover their daily costs and other requirements (Reilly & Brown, 2012:42).

### 2.3.2 Investment constraints

Individual investors need to consider their investment constraints when they are generating an investment policy in line with their investment objectives. Investment constraints limit the investor to what or how much they can invest, which limits their abilities in specific investment types (Wilson, 2010:1). Investment constraints have five main factors that comprise of liquidity needs, time frame of the investment, tax consideration, legal and regulatory factors and preferences, which are discussed below.

#### 2.3.2.1 Liquidity needs

Marx (2009:268) defined liquidity as the ability to change an asset to cash at its existing market value. Liquidity restrictions thus consider the individual investor's need for money or liquidity at the immediate market price (Bodie *et al.,* 2010:698). This is an investment constriction that most investors are subjected to and it varies from each individual investor, depending on personal circumstances such as age, employment status and tax status. (Wilson, 2010:1). The amount of liquidity an investor has depends on the amount that they can invest which therefore leads to return an investor can achieve (Bodie *et al.*, 2010:704)..

#### 2.3.2.2 Time horizon of investor

The time horizon constraint is the time taken between making an investment and requiring the cash. There is a link between an investor's time horizon, liquidity needs and the capability to handle risk. An investor with a long-time horizon will usually need less liquidity and can accept greater portfolio risk (CFA, 2019). These individual investors therefore do not need much liquidity as the funds are not required in the short term but instead for potential future needs. However, investors that have a shorter time horizon have a smaller capability to accept risk because of the complexity of regaining capital from losses in the short term. These individual investors also need more liquidity and less risky ventures because resources are required to meet their goals for the short-term (Reilly & Brown, 2012:43). An individual investor's horizon could include the ability to make a university education investment or the retirement date for an employed person. This is why the time horizon of an individual needs to be considered when an individual investor has to make a decision between assets or various maturities (Bodie *et al.,* 2010:704).

#### 2.3.2.3 Tax concerns

Tax concerns are crucial to making investment decisions when creating an investment policy. Cautious deliberation needs to be given to the tax position of the individual investor (Marx, 2009:268). Individual investors need to be apprehensive with the rate of return after taxes and their investment goals and the objective should be to maximise the return after taxes and not the gross returns (Wilson, 2010:1). Investors that fall into higher tax brackets need to be motivated to invest in investments that are tax deferred to be able to decrease the impact of taxes that have to be paid from investment returns (Mayo, 2000:885).

Taxes tend to make investment planning more complex as these include taxes on personal income that relate to capital gains tax, tax on interest bearing income, dividend taxes and estate duty implications. When an asset has been sold for a higher price than its cost or base, then capital gains tax is taxable, although unrealised capital gains are not taxable. Financial planners are expected to have the financial knowledge of the market that the investor is in and the investor needs to know what their tax implications are. Financial investors need to have the best interest of the investors in mind to maximise their earnings (Marx, 2009:268).

#### 2.3.2.4 Legal and regulatory factors

Individual investors are not usually affected by regulations; however, professionals and institutional investors need to be mindful of the regulations. The legal and regulatory elements can also restrict individual investor's investment choices. According to Financial Security (2010:1), legal and regulatory factors consist of limitations on the distribution of specific assets, the right of access to certain funds and the prohibition of specific investments.

The financial market is regulated by numerous laws (Reilly & Brown, 2012:43). The legal and regulatory factors are more applicable to the institutional investors than the individual investors, because they are influenced by several laws and regulations (Wilson, 2010:1). Any legal or regulatory limitations that are deemed appropriate should be contained by the IPS. Pension funds are also subject to restrictions on their portfolios in some countries. Individuals that have access to information of listed companies, by virtue of directorship and that information was not made public, are restricted from trading before the release of the financial results (Analystprep, 2019:1).

In South Africa, the investors have a small amount of regulatory controls that oversee investments but have more regulations of the exchange control that are related to foreign investment. Although, the portfolios of institutional investors are comprised by rules that are even more strict to ensure that the capital will be well-maintained (Marx, 2009:268). An investment decision of a fiduciary is also controlled by laws and regulations. They have to follow the judicious investor rule: the professional investors that make investment decisions in harmony with other people's wishes and manages their money, has a fiduciary responsibility to limit investments to certain assets that would have been accepted by a sensible investor (Bodie *et al.,* 2010:704).

#### 2.3.2.5 Unique needs and constraints

Every individual investor has preferences and needs that are unique to them and financial managers have to consider this when constructing an investment portfolio. Social worries and personal preferences may make some individual investors eliminate specific investments from their portfolio, such as the investors not wanting to invest in SIN TAX companies because of social and environmental concerns (Reilly & Brown, 2012:46). The other personal preferences might be because of family needs and it also depends on what phase of the life cycle the investor is in.

Investment objectives, as well as the constraints of an individual investor, are important to specify as it helps to create an investment policy that has been well planned. Individual investors as well as financial planners must identify if the investor can tolerate the amount of risk in relation to the levels of return that they desire in order to select the best asset allocation for their investment portfolio (Reilly & Brown, 2012:46).

## 2.4 TRADITIONAL ASSET CLASSES IN SOUTH AFRICA

When an individual investor has better knowledge of their investment objectives as well as their constraints and time horizon, it assists their financial planners to create asset allocation for the individual investor's portfolio. Asset allocation involves making decisions about the individual investor's cash and how it could be distributed throughout different asset classes and the amount each asset class could hold. This indicates that a mix of asset classes are chosen that mirror the individual investors' investment objectives and time horizon which are key parts in the amount of risk that an investor can take (Vanguard 2013:14).

When creating an investment portfolio, the most important question for an investor and the financial planner is deciding on which asset class needs to be in the investment portfolio as there are five different asset classes; capital, bonds, equities, assets and exotics (Discovery, 2012:4). Exotic items form part of the non-traditional asset class and are comprised of collectables, for example, art, cars, jewellery, gold, diamonds and stamps. Every asset class, consequently, comprises of various elements that make them suitable for different investment objectives (Coronation Fund Managers, 2013:98). When financial managers formulate judgments about what should be in the portfolio asset mix, it is vital to take into consideration the liquidity, volatility, risk versus return and advantages of asset classes versus its

disadvantages. The elements of traditional as well as non-traditional asset classes will be examined in the following section (Vanguard, 2013:19).

### 2.4.1 Cash investment

Cash remains one of the most secure classes but provides the lowest return over time (Coronation fund managers, 2013:98). The investments with cash are on-call deposits in banks, cash management trusts and similar short-term interest-bearing investments. As the most secure form of investment being cash, it is thus considered as a standard to which other investments are compared. This implies that when cash rates decrease, other investments come to be more desirable and tend to rise in price (Sanlam, 2019:1). The most liquid fund that is exempt of risk is the money market fund and is provided to individual investors; this means that the return that is gained on the cash-based investment outperforms other investments over the short term. Cash-based investments offer liquidity, which makes it simpler to extract the capital (Vanguard, 2013:19).

Asset managers purchase a combination of money market securities, which are issued by several companies, banks and government bonds, containing numerous maturities that go up to 12 months (Liberty, 2009:3). These securities may be held within their money market unit trusts and multi-asset unit trusts for their diversification benefits (Prudential Investment Managers, 2016:1). The money market fund is the best investment if the investor wants to store money.

Cash is appropriate for emergency funds for unforeseen expenses that may arise. Most money market funds are suggested for risk-averse individuals wanting a short-term investment with protection from equity and bond market volatility (Coronation fund managers, 2013:98). Cash-based investments are expected to provide an inferior rate of return and have the smallest volatility of the main asset classes (Vanguard, 2013:19). The advantages and disadvantages of cash are discussed in Table 2.1.

**Table 2.1: Advantages and disadvantages of cash investments**

| ADVANTAGES | DISADVANTAGES |
|---|---|
| Cash is the majority liquid as well as risk-free investment offered to individuals (Liberty, 2009:3)<br>Money market unit trusts are seen as more flexible than your traditional term deposits that banks offer, this is because there is a waiting period to withdraw your cash (Prudential Investment Managers, 2016). | In the past, cash has been the lowest-retuning asset class for a calendar year, apart from 2015 (Sanlam, 2019:2)<br>Exposure to single counterparty risk being the bank, this is risky as the counterparty could default (Sanlam, 2019:2) |
| In the short-term, cash may outperform asset classes (Liberty, 2009:4). | Cash fixed deposit rates are low, this is because the inflation rate is usually higher than that of the rate of return (Prudential Investment Managers, 2016). |
| Does not have any drawdowns as there is no possibility for capital losses (Sanlam, 2019:1). | Tax disadvantages, individuals are only offered R23800 interest exemption for the interest received, anything over this amount will be taxed (Liberty, 2009:4). |
| Correlation benefits, but only when utilised within a portfolio and not as a standalone investment (Sanlam, 2019:1). | Cash-based investments have no hedge against the inflation rate (Liberty, 2009:3). |
| Cash-based investments are also known to be safer during a recession to invest (Coronation Fund Managers, 2017:124). | |

### 2.4.2 Equities

Stocks and shares are also known as equities because they signify a part of ownership in a company that the individual investor can invest in. Publicly owned companies that are listed on the stock exchange are invested in by unit trust managers, as the share price is published (Prudential Investment Managers, 2019). According to Coronation Fund Managers (2016:129), the South African collective scheme industry is dominated by equity-based investments. When individual investors in South Africa invest in equities it means that they are part owners in companies that are listed on the stock market as well as part-owners in unlisted companies (Bodie *et al.*, 2008:4).

Investors who want a medium- to long-term investment that matures after a period of five years or longer can invest in equities. When an investor invests in equities, they need high probable returns as there are no guarantees that it will yield high rates of return. There is no assurance of a fixed income stream of cash as it forms a component of the company's ownership, even though equities offer the option for capital growth and can also offer an income stream through dividend payments (Monevator, 2012:1).

Investors that want to profit from their holdings in equity need to have a longer-term investment horizon of more than seven years. As equity holdings are a longer-term investment, goal and equities should be sold at retirement, the investor then should be able to go with the cyclical process of the equity (Prudential Investment Managers, 2019).

Equities are known to hold the most risk out of the asset class, this is because share prices are susceptible to large amounts of volatility in the stock market on a day-to-day basis. This means that investors will experience large gains or losses because of volatility; as the volatility is high, the asset has more risk (Mayo, 1988:228). Equities express higher risk and returns than capital, bonds or tangible assets. In the past, the rate of return of equity-based investments did better than any other asset classes in the long-term (Bodie *et al.*, 2008:4). The advantages and disadvantages of equities are discussed in Table 2.2.

**Table 2.2: Advantages and disadvantages of equities**

| ADVANTAGES | DISADVANTAGES |
|---|---|
| If investors want to produce higher returns in the longer term, historically equities are the better investment (Prudential Investment Managers, 2019). | Dividends is not fixed or controllable (Finance Management, 2019:1). |
| As your investment grows, dividends can also be paid out from the company (Monevator, 2012:1). | Equites show greater risk as well as prove to have higher volatility. (Monevator, 2012:1). |
| Equities are capable to surpass inflation (Liberty, 2009:3). | There could be large fluctuation in the market price giving either high returns or low returns (Liberty, 2009:4). |
| The leading investment in an individual's portfolio is equities (Monevator, 2012:1) | When a listed company change ownership, this can result in losing investor confidence and may result in loss, fear and greed (Monevator, 2012:1). |
| Equities are known to have the best rates of return over medium to long term period (Liberty, 2009:3) | |

### 2.4.3 Bonds

Bonds are a long-established asset class in South Africa and are traded on the bond exchange. Bonds are a form of long-term debt in which the issuing corporation promises to pay the principal sum at a specified maturity date. Bonds are used to increase finances in the long term for government, semi-government organisations and commercial organisations. The bond price as well as the interest rate is decided on a specific date and this is when the bond achieves maturity and can be redeemed (Marx, 2010:207). Bonds pay a fixed interest payment to the bondholders, usually every six months, until the bonds mature (The Savings Institute 2014:1).

Although bonds are traded before they mature on a specified date at the rate that occurs on the stock market at that time do not have to be held till the maturity date, but can be redeemed then (Marx, 2010:207). There is however volatility in the bond market, because of the inverse correlation between the cost of a security and interest rates. In the event that interest rate decreases, the profit of the security increases (Mayo, 1988:212; Liberty, 2009:1).

Bonds are viewed as interest-bearing ventures even though they include a more drawn out time frame than money. Securities that are held by investors in their investment portfolio are authorised to receive an annual instalment that is fixed at the buy date that is generated from the interest (Mayo, 1988:177). Investors are exposed to a greater deal of risk, even though the interest rate may seem to be more secure because if inflation or the interest rates increase over the short-term while progressing to the time to maturity, investors will lose their capital (Mayo, 1988:177). Over a period of time, bonds are viewed as low- to medium-risk ventures and, therefore, have a medium rate of return over time (The Savings Institute 2014:1).

Bonds and other fixed-income securities play a critical role in an investor's portfolio. Owning bonds helps to diversify a portfolio, as the bond market does not rise or fall alongside the stock market (The Savings Institute 2014:1). If an individual investor has a short, medium- or long-term horizon, bonds will be considered appropriate to invest in. The advantages and disadvantages of bonds are discussed in Table 2.3 below.

**Table 2.3: Advantages and disadvantages of bonds**

| ADVANTAGES | DISADVANTAGES |
|---|---|
| Bonds offer safety of principal and periodic interest income, which is the result of the expressed interest rate or coupon rate and the principal or assumed worth (Liberty, 2009:3). | Increasing interest rates, market volatility and credit risk are all disadvantages of bonds (Liberty, 2009:3). |
| Bonds give a higher rate of return than money (Liberty, 2009:3). | Bond prices increase when interest rates decrease, and prices decrease when interest rates increase (Moneyator, 2012:1). |

| ADVANTAGES | DISADVANTAGES |
|---|---|
| Bond prices sometimes benefit from safe-haven buying, which occurs when investors move funds from volatile markets (Liberty, 2009:3). Bonds are seen as risk-averse investments as they are less volatile than equites (Liberty, 2009:3). | Bonds are more prone to changes in interest rates as well as inflation (Monevator, 2012:1). |
| Bonds offer a fixed stream revenue (Monevator, 2012:1). | There is a small chance that bond prices may be volatile to certain government statements in the economy (Liberty, 2009:3) |
| Treasury bonds are seen as a risk-free investment (Monevator, 2012:1). | In some cases, the issuer of the bond does not have the capital to settle the bond (Investment Management Association, 2014:1). |

### 2.4.4 Property (Real estate)

Hirt and Block (1986:500) state property bought with the intent of earning revenue through rental income or resale, instead of a primary residence is a great form of investment. Real estate investors usually acquire homes, apartment buildings and commercial buildings to lease out to tenants. Investors can participate as an individual, real estate investment trusts or limited partnerships (Monevator, 2012:1). The most traditional asset classes, such as property and real estate, provide payment in the form of rates of return, which increases the worth of buildings. Experience can be gained by investors that invest in commercial property by exchange-traded funds and real estate investment trusts (Monevator, 2012:1).

Investing capital in real estate leaves an individual with limited liquidity relative to cash or any other investments. Investing in real estate is also capital intensive and depends mostly on cash flow. An individual who needs protection from the volatility of the stock markets should invest in estates as a solution. According to the Savings Institute (2014:1), real estate investment is a medium to high risk class but has medium to high risk returns. Due to the property market

being negatively influenced by increasing interest rates, a depleted correlation on interest-bearing investments, even capital-based investments, is to be expected. Property is, therefore, a medium to long term investment, normally below five years but not shorter than three years (Financial Security, 2010:3).

Property comprises of tangible as well as registered property. Registered property exists when the said property is itemised in an investor's name. Return is acquired by means of rental revenue and when growth occurs in the property's said value. Tangible property exists when loan stocks of the property as well as the property unit trusts (PUTs) are held within an investment product (Liberty, 2009:2).

In comparison, real estate markets in the majority of nations are not as effective and structured as markets for other liquid investment instruments such as stocks, bonds and collectable assets. Individual properties are uniquely distinctive to themselves and thus cannot be directly similar, which poses a great challenge to an investor seeking to assess and compare costs and investment prospects (Coronation Fund Managers, 2017:132). Information asymmetries are common in real estate markets. Transactional risk is therefore increased, although it does provide some opportunity to obtain properties at lower prices (Financial Security, 2010:3).

A greater risk is associated with property than with real money or securities, however, less than equities. Subsequently, property can generate significantly more yields than money or bonds, in spite of the fact that returns are less than equities. Property ventures produce better yields than money or fixed interest over the medium- to long-term (Financial Security, 2010:3). Property ventures are thusly accepted to be the best and offer the best yield speculation by numerous investors. The increase of the property price is also seen as a hedge against inflation (Mayo, 2000:832). Table 2.4 discusses the advantages and disadvantages of property.

**Table 2.4: Advantages and disadvantages of property (real estate)**

| ADVANTAGES | DISADVANTAGES |
|---|---|
| Investment property produces stable revenue earnings to the investors (Loan Market, 2019:1). | The initial rate of acquiring an investment property is often exceedingly high (Loan Market, 2019:1). |
| Property value nearly always appreciates in time, depending on the geographic location (Liberty, 2009:3). | After you acquire the property, you will not have the opportunity to rent it out immediately as you will have to look for occupants to rent it to (Monevator, 2012:1). |
| Tax that is related with the fees paid on the investment property, such as property upkeep, council rates, fees charged by a managing agent can be declared by the end of the financial year (Monevator, 2012:1). | Historically, property has lagged behind equites (Loan Market, 2019:2). |
| The midpoint amongst bonds and equities have been the risk and return of assets such as property (Liberty, 2009:3). | Property bundles can occur in notable losses in funds (Monevator, 2012:1). |
| You are able to use the existing investment property in order to get an additional loan to be able to purchase another property (Loan Market, 2019:1). | Property investments need commitment and time from the investor over a long period of time (Liberty, 2009:3). |
| Physical asset investments such as property guarantee more assurance when providing profits (Liberty, 2009:3). | |
| Tangible property is considered to be more commonly used as investments than collectables (Monevator, 2012:1) | |

## 2.5 COLLECTABLE ASSET CLASSES IN SOUTH AFRICA

Traditional asset classes are considered to be liquid and are traded on the stock market, whereas collectable asset classes have poor liquidity. These assets include art, jewellery, gold, diamonds, antiques and stamps (Afropolitan, 2019:2). These assets have high transaction costs compared to the usual costs of bonds and equities. Financial institutions will therefore not be likely to hold these asset classes. The reason for high transaction costs is because there is not much of a national market for these types of asset classes, as they depend on how much it costs to an individual since their market price is not very high. Collectables are usually sold at auctions and there is a great degree of doubt concerning the price as they are usually viewed as hobbies to certain individuals, rather than a short- or long-term investment (Afropolitan, 2019:2).

Even though collectables rise in value, they tend to grow gradually over a lengthy period of time and this can act as a hedge against inflation. Investors are occasionally persuaded to add them to their portfolios for the reason of hedging them against inflation as they also offer an essential intangible value that most other types of investments do not have, such a special fulfilment (Afropolitan, 2019:2). Marsh (2016:5) stated that these are called treasure assets and there is an increasing prejudice, which is only collectables that are successful are more likely to have an upward trend in market price. Marsh (2016:5) stated that there is difficulty in determining the returns from investing in collectables, as each item sold yearly is different and non-identical and some items are seldom sold. The actual return on keeping and storing collectables might be even less than what the market places them at because they do not consider the storage costs, insurance cost, commission on sales and the risk of locating a buyer. The issue of storage and insurance is highly underrated because one who invests in real estate realises that insurance and maintenance also reduce potential returns (Marsh, 2016:5).

One of the purposes of purchasing collectable assets is to allow investors who participate in such collections to derive gratification from such assets. However, this gratification that individual investors obtain from such assets is difficult to quantify, which makes it impossible to determine, with reference to accurate rates of returns on these collectable assets (Campbell *et al.*, 2008:5). According to Mayo (2000:818), the economic value of such assets is determined by their scarcity rather than their demand. There are various other aspects such as the status and superiority of the painter, the calibre and quality of the art itself and the exogenous or external factors, which aid in determining the value of the said collectable asset (Mayo,

2000:818). The factors, when considering the rarity of the work itself, include the medium and themes used and the external factors include the state of the collectable, previous collectors as well as the museums or displays (Mayo, 2000:819).

### 2.5.1 Collectable assets

A collectable is an object that has more value than its original selling price because of different reasons, such as the rarity of the item or popular demand. Different types of collectables include antiques, art, coins, stamps and diamonds.

#### 2.5.1.1 Antiques

According to Campbell (2008:64), an investor should consider the long-term benefits of collecting modern first editions of books, which are books that have only been printed in the beginning and not re-printed, have an astonishing return. Dealers that obtain antiques at estate auctions or auctions to reinstate the antiques, make significant returns. The value of the antiques is determined by several factors such as the rarity, uniqueness and artists. At auctions, the prices are determined by the auction houses and collectors receive a considerable rate of return. According to Reilly and Brown (2012:76), the typical investor that has limited antiques for household decoration, finds such revenues incomprehensible and any amount of profit that individuals anticipate to receive from selling their antiques can be taken away by the excessive transaction costs and excessive illiquidity of antiques.

#### 2.5.1.2 Art

Investors that utilise art as an investment need to have significant information and adequate cash to purchase the arts of famous individuals and to have the ability to pay elevated transactional rates (Campbell, 2008:64). According to Reilly and Brown (2012:76), art can be a rewarding investment for investors.

According to Campbell (2008:64), specific paintings prices have risen considerably and as an outcome, provided considerable returns to the investors. Small investors that do not have the significant knowledge of paintings find it challenging to receive returns that reward them for the doubt, excessive illiquidity and elevated transaction costs.

#### 2.5.1.3 Coins and stamps

Purchasing coins as an investment is because coin values are cyclical, built on the supply and demand. Rates from coins are not in long-term demand rise along with a coins' perceived intrinsic value (Marudhar Arts, 2015:1). Investors buy coins with the expectation that the value of their purchase will increase in the long term (Marudhar Arts, 2015:1). It is believed that the market for stamps and coins is more liquid than that of arts and antiques. An investor can get a high rating for the coin or stamp through a dealer, and if the rating for the coin or stamp is high then they can be sold quickly at a higher price (Mayo, 1988:566).

#### 2.5.1.4 Diamonds

According to Reilly and Brown (2012:77) and Baunat (2018:1), the value of diamonds is more likely to increase than any other collectable asset. This is because diamonds usually increase in demand but decrease in supply. Diamonds are also a safe investment as they offer protection against credit risk, currency fluctuations and inflation. Diamonds are also highly liquid, tax-friendly and are the only collectable assets than can offer this unique combination.

### 2.5.2 Advantages and disadvantages of investing in collectable assets

#### 2.5.2.1 Advantages of investing in collectables

- Some collectables increase in value for a long period of time (Alexander & Sharp, 1989:636).
- Collectables can act as a hedge against inflation (Mayo, 2000:817).
- Collectables offer an important intangible benefit that most other types of investment do not (Mayo, 2000:817).
- Collectable assets can create significant profit when price inflation and the flow of services are taken into consideration (Mayo, 2000:817).
- When the markets are economical, collectable assets will be valued and the investors that enjoy these assets will find it easier to sell (Alexander & Sharp, 1989:636).

#### 2.5.2.2 Disadvantages of investing in collectables

- Collectables require attention and storage to secure and maintain them (Alexander & Sharp, 1989:636).

- They require liquidity; it may take some time to get rid of the collectables and you may have to sell at a less than the desired price if the cash is needed promptly (Mayo, 2000:817).
- Collectables involve high opportunity cost as they require large outlays of capital (Alexander & Sharp, 1989:636).).
- Investors are subjected to bid-ask spread risk (Alexander & Sharpe, 1989:636).

Table 2.5 provides investment vehicles for individuals that are in the different phases of the investor life cycle and provides them with a guideline of what they should invest in.

**Table 2.5: Investment decisions and the investor life cycle**

| PHASE | ASSET CLASS |
|---|---|
| **Accumulation phase** | Stocks, bonds, cash, antiques, equities and collectables |
| **Consolidation phase** | Bonds, property, cash, stocks |
| **Spending and gifting phase** | Stocks, bonds, cash. |

**Source: Author (2019)**

## 2.6 INVESTMENT OPPORTUNITIES IN SOUTH AFRICA

Revenue maximisation has been the main aim in financial markets (Power, 2018:1). Optial fiscal return on shareholders' investment is usually needed in order to maximize revenue not giving the investor many investment opportunities that are diversified for the individual investors' needs, within the South African economy. Nevertheless, there is an upward trend towards investment strategies that consider social and environmental influence together with financial return – usually influenced by the increase of critical discussions on social media around topics that are associated with gender equality and access to education (Power, 2018:1).

The movement towards more sustainable investing finds itself very attractive to Generation Z A study that was recently done by Swell Invest (2018:19) found that 76 per cent of Generation Z believe businesses can have a large positive social impact and 36 per cent think improving society should be a business's main objective. This movement is known as responsible investing, which considers how companies rate environmental, social and governance issues (Fin24, 2019:1). There is a focus on buying into companies that have sustainable policies and deliver a positive impact on the environment and their communities and that have a structure, which is fair to its stakeholders. Much of this investing helps companies focus on measure of risk. Companies that are more cognisant of the impact that they have on society and the environment are more sustainable, better managed and will eventually deliver higher returns to the shareholders (Power, 2018:1).

Generating financial returns from investments can be complex, impact investments have provided increasing returns, necessitating the private sector to make a profit. Impact investing is an approach where investors goals and objectives are to create an environmental impact to generate financial returns (Viviers, 2019:1). Impact investors are progressively investing in social enterprises that are offering products and services that help the environment and society. More than two-thirds of existing impact investments have been invested within developing markets. Some of these investments include small loans, inexpensive housing, renewable energy and sustainably grown crops. Given this focus, South Africa offers great potential for ventures in impact investments (The South African, 2019:1).

South Africa has a strong financial system and is also seeking innovative ways to mobilise capital for small businesses, address unemployment and strengthen the key sectors in the economy (source). There is an increasing call in contemporary market economies for ethical, social and inclusive capitalism. Asset owners and asset managers are also becoming more receptive to the notion that they can affect social and environmental change through the financing they extend (McCallum, 2019:1).

## 2.7 THE POTENTIAL FOR STUDENT INVESTORS

A study by Masenya (2017) has found that students between the ages of 18 and 24 are in the accumulation phase of investing. Individuals in this stage of the lifecycle are gathering assets, planning for retirement and are satisfying their needs and long-term goals by purchasing or saving for houses, cars, furniture and children's college (Harty, 2014:1). Individuals in this

stage usually have large debts from car loans, house deposits and university debt that they are still paying off and have a small net worth. Harty (2014:1) states that it is essential for investors in this stage to begin to invest and save their money on a regular basis. In addition, Reilly and Brown (2012:33) state that individuals in this phase are willing to take on more risk for higher returns, due to individual investors in this phase having a longer time horizon and greater future earning ability.

Furthermore, students invest because they are motivated to secure their future financial wellbeing. The study found that they invest in money market accounts, shares, bonds, funds and investment groups such as stokvels (Masenya, 2017:154). According to Masenya's (2017:153) study, students are high-risk investors as they mostly invest in shares and derivatives. This is in line with the accumulation phase of investing as students can take on a high amount of risk when investing as their time period to recover from any potential future losses is longer. According to some experts, university students have an advantage over other types of investors. This is because they have time to invest. Experts state that the small amount of money that students have if invested correctly, can reap huge profits in the future.

According to a study conducted by Van den Berg (2019:183), knowing the position in the investors life cycle is an important element in managing an effective investment portfolio, which is that of risk tolerance and should be taken into consideration as it is a commanding factor in planning and managing the effectiveness of the individual investors investment portfolio. This again shows that students have a higher risk tolerance as they have a longer time period to recover from their losses (Van den Berg, 2018:183).

The barrier that student investor has is that they have a lack of investment knowledge, which might hinder the way and amount of time they take to recover from their financial losses (Masenya, 2017:153). With this in mind, the potential for student investors in the financial market is vast and they could possibly invest in sustainable investments as that is currently the largest investment for millennials, due to returns being made while it is environmentally conservative (The South African; 2019). Investments such as stocks, bonds, mutual funds, real estate and commodities are other options of investing, depending on the financial situation of the student investor.

## 2.8 SYNOPSIS

Chapter 2 discussed the individual investors' life cycle. This is important because the main factor influencing a decision made by an investor depends on which phase in the investor life cycle they are. Investors can be categorised into four sections, which consist of the accumulation, consolidation, spending as well as the gifting phase. Individual investors investment portfolios differ as they depend on which phase they are in and on the different circumstances that they find themselves in.

Traditional and collectable asset classes in South Africa were also analysed. The traditional asset classes can be categorised into cash, bonds, equities and property, whereas non-traditional and collectables can be classified into arts, antiques, gold, diamonds and stamps. An individual should understand their investment objectives and constraints if they want to invest successfully, the individual's volatility, liquidity, risk, as well as their return have to be understood and these investment plans need to be revised regularly to be rebalanced when required, as this will help with the investment opportunities that are discussed and especially the potential for student investors and what is currently available to help students invest to help grow their portfolio.

In the following chapter, the individual's investor risk tolerance is discussed.

# CHAPTER 3: INVESTOR RISK TOLERANCE

## 3.1 INTRODUCTION

The most important element that the financial industry uses is risk tolerance. It is an important factor that has to be considered when a financial adviser is planning the investment strategy of the individual investor (Rutgers, 2014:1). Risk is formed from doubt and lack of ability to predict the market prices accurately, although, risk can be managed if it is a result of uncertainty (Crouhy *et al.,* 2014:1). Daily, an individual will face risk, but in general investment terms, the uncertainty of potential loss of future returns can be defined as risk (Van den Berg, 2004:238). An individual's understanding of risk and return are linked, to some degree, with the experiences the individual has encountered in his/her lifetime (Crouhy *et al.,* 2014:1). The experiences the individual has encountered in his/her life will have an impact on the factors that influence the investor's investment choices, like the time horizon, income, the available capital, liquidity requirements, the investor's investment knowledge, his/her emotional resilience and the attitude the investor has towards the volatility of certain investments (Fredman, 1996:25; Hanna & Chen, 1997:17).

Risk is defined as inadequateness to be able to control an outcome (Brun, 1994). Individuals usually think they have control over something more than they truly do; this is defined as the illusion of control. It is when an individual is of the view that he/she has more control over something such as winning the lottery if they pick the numbers themselves (Langer, 1975). The deception of control has been linked to unrealistic optimism, which is general optimism about the outcome of a certain event and occurs for both genders no matter the level of education or age (Weinstein, 1987). Risk is learned by the social and cultural concepts of the world (Boholm, 1998). The achievement of financial success can be explained, at least in part, by a combination of someone's personality characteristics and socioeconomic background (Grable, 2000). due to limited knowledge and lack of proper procedural rational, decision-makers make "satisfying" decisions as opposed to "optimal ones", and decisions can be opportunistic rather than either rational or logical. Though decision-makers try to make decisions on a rational basis, their decision-making process is limited by their cognitive abilities, such as habits, values, reflexes, knowledge, etc., as well as by external environmental factors (Simon, 1987).

The risk that each investor is ready to take and is willing to accept will vary according to his/her goals and objectives as well as the stage the individual is in, in the life cycle (Old mutual, 2015:7). The main objectives of many financial institutions are to be able to find the causes of risk for individual investors and to manage and to be able to control the risk. To do this, risk has to be quantified. If the risk of the portfolio can be measured, then the primary risk elements of financial assets can be identified. By doing this, the portfolio can be structured and diversified in such a way that the financial advisor can spread the assets across different investments, which will help decrease the possible loss by spreading the risk of the portfolio (Rachev *et al.,* 2011:5).

Financial institutions and planners for investment companies need to be aware of the risk tolerance of individual investors and need to determine their ability as well as their willingness to take on risk as an essential factor in the investment preparation method (Larkin *et al.,* 2013:1). Risk tolerance is an important factor when determining the individual investors' asset portfolio composition; it is a complex process to analyse because it is a multidimensional attitude that is an ambiguous concept and can be influenced by various factors (Grable & Joo, 1997:73).

Various elements affect the willingness and capability of an individual to be able to take on risk and this determines his/her risk tolerance level. The risk tolerance level of the individual affects the level of return of his/her investments. Individual investors that have a higher risk tolerance threshold are more likely to benefit from higher probable gains in the long term but also have the risk of higher possible losses (Finke & Huston, 2003:233). In an efficient market (where market prices reflect all available and relevant information), an individual investor that favours less risk compared to the investors who want to take on more risk will lose out on the returns. The individual investors' reward for being able to take on more risk is the higher returns they will obtain (Finke & Huston, 2003:233).

This chapter aims to achieve the theoretical objectives by providing a conceptual review and determining how financial risk tolerance can be measured and how it links to demographic factors. To be able to describe the relationships, various aspects have been highlighted. Risk perception and the connection between risk and return is explained. The previous studies on risk tolerance and the factors that influence them have been reviewed. The second section of the theoretical framework is included in this chapter.

## 3.2 RISK PERCEPTION

Risk perception is a vital factor that impacts the investment choices of individual investors such as experiencing loss, the unpredictability of gains, diversification of portfolios and the knowledge about financial assets are some factors that can affect risk perception (Sindhu *et al*., 2014:8). Risk perception of each individual differs, which makes the analysis of risk perception even more challenging. Every investment decision of an investor is influenced by the risk perception they have (Bajtelsmit & Rastelli, 2008; Xiao, 2008). The social and cultural construct is a perception of risk that goes further than just the individual and reflects values, symbols, history as well as ideology (Weinstein, 1989).

Psychological as well as emotional factors can influence investment choices and if individual investors could understand the factors more, this would lead to better investment choices (Lennart *et al.*, 2004). According to Adams (2004:23), everyone must be willing to take a risk, as this is used as the starting point of any theory in risk. Adams (2004:23) concludes this statement by stating that this is not the case on the literature of risk.

Many years of research have been dedicated to psychological work to understand the perceived risk of individual investors (Slovic & Peters, 2006:322). There are currently two theories that currently lead the world of risk perception, namely the cultural theory as well as the psychometric paradigm. The psychometric paradigm is within the disciplines of psychology and decision sciences and the cultural theory comes from sociologists and anthropologists. According to Slovic (1966:10), "risk does not exist out there", independent of our thoughts and cultures, waiting to be calculated. A theoretical framework is infused in the psychometric diagram and assumes risk to be subjectively described by individual investors who can be impacted by a wide range of social, cultural and institutional-encompassing elements.

## 3.3 RISK PERCEPTION AND EFFECT

Risk is seen and acted on in two different ways in the world today, namely in an instinctive manner as well as reason, logic and deliberation to analyse risk to make investment decisions (Slovic & Peters, 2006:322). According to Trudeau (2009:15), the instinctive feeling is the main way in which an individual analyses risk and this is illustrated smartly by the Doonsberry (cartoon) creator, it is where two characters that are deciding if it is safe or not to greet each other in the street by systematically tabulating the risks involved. This indicated to us that most

risk that we are dealt with on a daily basis are analysed instantaneously and automatically, this is defined as the experiential mode of thinking (Slovic & Peters, 2006:323).

## 3.4 PERCEIVED RISK AND BENEFIT JUDGEMENTS

It has been found that more hazardous activities are positively correlated and have more benefits than activities that have a low risk. However, they are adversely linked to individuals' minds and judgments. According to Alhakami and Slovic (2000) the link to strength of positive or negative affect was the relationship between perceived risk and benefit. This indicated that individuals judge risk on what they think and feel about it (Alhakami *et al.,* 2000:5). Every individual investor has their own tolerance of and attitude toward risk, so an investment that is measured as "high risk" by one individual would differ from another individual's definition of "high risk". Therefore, investment managers have an essential task when they assign an investor to the appropriate investment portfolio, as it needs to suit the investor. If an investment manager is aware of the client's risk tolerance level, they can assign them a relevant portfolio (Hanna *et al.;* 2004:27). Therefore, in recent years, understanding, as well as financial risk tolerance measurement, have been of curiosity to researchers as well as investment managers alike.

## 3.5 RISK TOLERANCE

In the financial industry, there is one important element which is risk tolerance, which is an essential factor that needs careful consideration when a financial manager develops an investment portfolio (Rutgers, 2014:1). Investors' attitude towards risk in the financial sector is known as risk tolerance (Sahin & Yilmaz, 2009:2). According to Grable (2000:1), the amount to which an investor is prepared to accept the possibility of an outcome, which is uncertain in an economic decision, is known as risk tolerance. It is useful in summarising an investors perception between risk and return when measuring risk (Grable, 2000). According to Resnik (2008:2), risk tolerance is defined by the amount of risk an individual has to take to get a favourable outcome. Every investor will differ with his/her tolerance toward risk and this will vary on the objectives and constraints that the investor has. Factors include the revenue the individual will gain, available capital, information about the investments and time frame that the individual has (Fredman, 1996:25; Hanna & Chen, 1997:17)

Risk tolerance is considered as an imperative factor that impacts a variety of personal financial decisions of an investor (Snelbecker *et al.*, 1990). It has received far less attention due to there

being a general lack of knowledge about the factors of risk aversion that influence investing (Harlow *et al.*, 1990). Risk tolerance is an attitude that consists of many distinct components (Callan & Johnson, 1999:3). An investor's risk tolerance changes over time, this can be because of changes in environment, wealth, age, demographics, marital status or occupation. When demographic, as well as economic factors, alter for the investor, his/her risk-reward spectrum will also alter accordingly (Bertaut, 1998:263; Grable *et al.*, 2006). Individual investors short- and long-term goals are usually affected by risk tolerance. The way individuals invest their resources for specific goals, such as retirement savings, are also influenced by their risk tolerance level (Grable, 2016:19). According to Hanna and Chen (1997:17), individual investors mostly focus on their short-term goals instead of their long-term goals. Every individuals' risk tolerance level for investments is different and is challenged by the prospect of unforeseen losses. This is why it is of utmost importance that individual investors, financial companies and planners recognise that there are gaps amongst perceived risk and actual risk.

Previous studies of risk tolerance have been conducted and are tabulated in Table 3.1 with each of the findings.

**Table 3.1: Studies conducted on risk tolerance**

| AUTHORS | OBJECTIVE | FINDINGS |
|---|---|---|
| **Hallahan *et al.* (2003)** | The objective was to study the link between demographic factors and subjective financial risk tolerance. | There is evidence that risk tolerance displays evidence of a relationship that is concave with income throughout every age group, irrespective of their gender although dependants, as well as the marital status of the individuals, have discovered that it does not have a relationship with risk tolerance |
| **Yao *et al.* (2004)** | Over time the levels of financial risk tolerance need to be investigated. | Risk tolerance levels are affected by the volatility in the stock market. Investors need to be financially educated to |

| AUTHORS | OBJECTIVE | FINDINGS |
|---|---|---|
| | | stabilise price volatility in the stock market. |
| **Yao *et al.* (2005)** | Race and ethnicity and the link to risk tolerance need to be investigated. | After considering controlling factors, it was found that Africans and Hispanics have more risk tolerance than White individuals but are less likely to exercise it. |
| **Hanna and Lindamood (2007)** | Using the Survey of consumer finance (SCF), models from 1992 until 2007 need to be analysed. | Differences in individual risk tolerance could not have caused stock market increases in 2007 or caused an effect on the real estate bubble in 2008 although risk tolerance levels of households seemed to be higher in 1998 than in 2004 and 2007. It concluded that when measuring risk aversion, the SCF risk tolerance measurements are not stable. |
| **Grable *et al*. (2009)** | The risk-taking propensity of working adults at different stages of their lifetime | Individuals that have been working for many years have shown to be more likely to miscalculate the amount of risk tolerance that they want to take, this is compared to individuals that have not been working for a long period of time. However, middle-aged adults that work are also more likely to underestimate their risk tolerance; these results were found to be insignificant. |

| AUTHORS | OBJECTIVE | FINDINGS |
|---|---|---|
| **Strydom *et al.* (2009)** | Studying the risk tolerance of individuals in the South African context. | It was found that risk tolerance was significantly associated with gender, race and religion although income was not significant or related to risk tolerance, this might be due to the lack of data. |
| **Van den Bergh (2018)** | An analysis of risk tolerance during the life cycle of the investor | Risk tolerance is an imperative factor in analysing investor risk strategies. It was found that the demographic factors have a significant effect on South African individual investors risk tolerance. |
| **Dickason-Koekemoer (2018)** | The subjective risk tolerance of South African Investors | African investors have a greater likelihood to take on more risk when making investment choices; young investors tend to be more risk-tolerant; individuals that are married or divorced are more likely to be risk-averse. |

Source: Van den Bergh (2018)

A distinction should also be made between risk tolerance and risk appetite. Table 3.2 elaborates on the various definitions of risk tolerance.

**Table 3.2: Risk tolerance definitions**

| DEFINITION | SOURCE |
|---|---|
| The attitude an investor has towards risk is defined as risk tolerance. | (Sahin & Yilmaz, 2009:2). |

| | |
|---|---|
| The willingness that an individual has to take part in behaviours that the outcomes are uncertain and has an identifiable negative outcome. | Irwin (1993) |
| The greatest degree of uncertainty or volatility is known to be risk tolerance when discussing investment returns that an investor can accept when a financial decision is made. | Grable (2000:625) |
| The readiness to take financial risk is defined as financial risk tolerance. | (Hanna *et al*; 2004;27) |
| Risk willingness is reciprocal for risk aversion, it shows the willingness to take financial risk whereas risk aversion is the unwillingness to take risk. | (Finke & Huston, 2003:234) |

Source: Author compilation

Financial risk tolerance describes an investor's mind-set about risk and is described as the amount of doubt or investment return volatility that an investor wants to agree to when choosing his/her financial investment (Faff, 2008:2). Irwin (1993) stated that risk tolerance is when investor that is willing to partake in behaviours in which the results remain doubtful with the possibility of an identifiable negative result. An important factor about risk tolerance is that it can determine the correct amount of assets that are meant to be in the investor's portfolio, which are best suited for the individual in terms of his/her risk and return and his/her needs (Droms, 1987). Schaefer (1978) further states that risk tolerance is the maximum amount of risk that an investor can and is willing to take.

Financial risk tolerance is the attitude that an investor has and is described as the amount of return that an investor can and is willing to take when making a choice about his/her investments (Grable & Lytton, 1999b; Grable, 2000:25; Faff, 2008:2). The opposite of risk tolerance is risk aversion because risk aversion is defined as the choice to maintain a certain amount of consumption over an uncertain amount of consumption even if the possibility of the higher return exceeds that of a guaranteed return (Finke & Huston, 2003:234).

Determining the financial risk tolerance and discovering the elements that affect financial risk perception has been going on for many years as it is interesting to investors and researchers (Adem, 2010). Many variables once grouped and discussed can interpret an individual's risk tolerance level. These variables are age, sex, marital status, occupation, wealth, etcetera. The financial risk tolerance of individuals is presumed to be the main element of choice behaviour in a situation that the individual is facing when investing (Grabble & Lytton, 2001:43; Bailey & Kinerson, 2005:26). Nevertheless, risk tolerance is found to be one of the principles of investing that is the most understood and is also a complex psychological concept. Every individual has their own amount of risk tolerance level that they can and is willing to take and their attitude towards risk is also different. An investment that is considered to be high risk by one investor can be considered low risk by a different investor (Adem, 2010).

There are two types of risk tolerance and these are subjective as well as objective risk tolerance (Hanna *et al.,* 1997:17). Objective risk tolerance is built on Malkiel's notion of the objective financial situation of a household, which includes the goals of the household and the time horizon of these goals and subjective risk tolerance is grounded on the economic theory of risk aversion. Malkiel (1996:401) states that the amount of risk is dependent on the investor's financial state and includes all different types of income but excludes any income from investments. A subjective measure of both emotional and financial capability of an individual investor to bear losses is frequently used (Hanna *et al.,* 2001:53)

Financial risk tolerance has been documented and assessed, but in practice, it is difficult to assess, this is because the nature of risk-taking is subjective (Adem, 2010). Various ways can be used by researchers as well as investment managers that can measure investor risk tolerance. These are by evaluating actual behaviour, enquiring about their investment decisions and asking a mixture of investment and subjective or hypothetical queries (Roszkowski *et al.,* 1993; Wang & Hanna, 1997; Hallahan *et al.*, 2004). There is one method that is mostly used which is an experimental questionnaire where questions about hypothetical situations and/or investment options are queried (Grable and Lytton, 1997).

Snelbecker *et al.,* (1990) state that researchers, as well as financial investors, usually accept that it is important to make an effort to determine the level of risk tolerance of an investor. An important factor on risk tolerance it is a complex ideology, and can be affected by various aspects. The risk tolerance level of the investor is the investment manager's primary responsibility before planning and creating investment strategies (Hallman & Rosenbloom,

1987; Trone *et al*., 1996; Garman & Forgue, 1997). Investment managers have a common agreement, such as demographics can be utilized to sufficiently categorise individuals into categories for risk tolerance. Previous studies done by Grable and Lytton (1997) and Carducci & Wong (1998) discovered that the factors that have an impact on risk tolerance can be extended beyond the testing factors that are mostly psychological (Grable & Lytton 1997; Carducci & Wong, 1998). These studies have concluded that risk tolerance, as well as age, are correlated but there have been inconsistent findings of the relationship with gender, age, marital status, occupation, self-employment, income, race and education and risk tolerance. The section below examines the demographic factors and the outcome they have on the risk tolerance of investors.

Over the years, there have been multiple definitions of risk, but in conclusion, it is viewed as the possibility of an individual experiencing the effect of danger (Short, 1984:711). Raynor & Cantor (1987) concluded that risk is the likelihood of an adverse incident and the scale of its consequences (Rayner & Cantor, 1987). Risk concepts have a similar common element, which is how they define reality and possibility. With a discussion around the scepticism of the possibility of something happening, Rosa (2003:56) defines risk as "a situation or an event where the outcome is uncertain". Doubt and risk are closely related and in various theories about behaviour, psychological uncertainty is believed to be an important intermediary of human responses with outcomes that are unknown in situations and is a psychological construct, which means that if the knowledge of the individual was complete, this would mean that the individual would have no uncertainty (Windschitl & Wells, 1996).

## 3.6 DEMOGRAPHIC FACTORS INFLUENCING INVESTOR RISK

The literature suggests that it is imperative to take into consideration the following factors when analysing risk; biological makeup of an individual, demographics, socioeconomic profile, type of personality as well as his/her psychological constructs (Cesarani *et al*., 2008). A vital factor that influences an individual's investment choices is risk tolerance (Snelbecker *et al.*, 1990:378). Therefore, for investors, it is imperative that their financial planners, as well as researchers, understand what factors affect risk tolerance (Grable, 2016:25).

The characteristics that are the most widely investigated are demographics when it comes to risk tolerance. The main reason that it is investigated is due to the fact that a decision between many investment managers as well as researchers is that in order to be able to differentiate the

levels of risk tolerance between individuals, demographics can be used and it can also help classify them into different groups. Every investor's level of risk tolerance is different and is dependent on the demographic factors which are his/her age, gender, marital status, race, level of education, employment status and income, which are discussed in the section that follows.

Table 3.3 presents the conclusions from the literature about the impact that particular individual characteristics have on risk tolerance.

**Table 3.3: Assumed relationships between risk tolerance and demographics**

| CHARACTERISTIC | LOW-RISK TOLERANCE | HIGH-RISK TOLERANCE |
|---|---|---|
| Gender | Female | Male |
| Age | Older | Younger |
| Marital status | Married | Single |
| Occupation | Workers and labourers | Professionals |
| Self-employment | Non-Self employed | Self-employed |
| Income | Low | High |
| Race | Non-Whites | Whites |
| Education | Less | More |

Source: Grable (1999)

### 3.6.1 Gender and risk tolerance

It was thought that a classification factor that was important for risk tolerance was gender, this is because it was found that men tend to be seen as 'thrill-seekers', more than what women are (Roszkowski *et al.*, 1993). A general agreement between investment managers is that the gender of an individual is a differentiating and classifying factor because there is a strong belief that men need to take on more risks than what women do (Slovic, 2000:169). Other researchers

have also verified this hypothesis (Higbee & Lafferty, 1972). According to Blume *et al.,* (1978), a national study that was conducted at the New York Stock Exchange indicated that male individuals who invest in equities were more risk aggressive than their female counterparts, who had similar characteristics. These results were confirmed by Coat and McDermott (1979) who studied the properties of gender, group structure as well as general risk-taking behaviours that used an experimental method on over 200 university students.

Sung and Hanna (1996b), as well as Xiao and Noring (1994), had both acquired data for regression type analysis using the survey of consumer finance. The researchers conclude that female individuals were not as eager as male individuals to take on financial risk. Bernasek (1996) analysed results from a survey of the literature and determined that male individuals invest their pensions more aggressively than what female individuals do and in general, males are more risk-tolerant than females. Lytton and Grable (1997) took a sample of 592 random taxpayers that analysed gender differences in financial attitudes and came to the conclusion that females displayed less assurance in their financial situations and had lower risk-taking propensity than what males did.

Bajtelsmit and Bernasek (1996:5) are of the view that other details should be focused on where females' economic and social factors, which include their income, occupation and investment knowledge, should be taken into account.

A study that was conducted in America using a mail questionnaire that was sent to 851 active consumers, which came from five brokerage firms, found gender-based conflicting results. The study concluded that gender is an important element when deciding an investor's yearning for dividend yield and price stability (Baker & Haslem, 1974:22). Schooled and Warden (1996) used data from the 1989 SCF and came to the conclusion that gender did not seem to affect stockholding, where Fitzsimmons and Wakita (1993) concluded that there was no difference between genders. The majority stated that gender and risk tolerance studies concluded that males were higher risk-takers than their female counterparts (Grable & Lytton, 1999). Grable (1997) concluded that risk tolerance might be sub-dimensional and not multi-dimensional. The unique role that women have as child guardians and moms as well as having elevated enzyme monoamine oxidase, women becoming more sensation seeking as well as averse to ambiguous situations (Bajtelsmit & Bernasek, 1996).

### 3.6.2 Age and risk tolerance

The most frequent demographic factor that was investigated was age, as it is the factor that is mostly believed to be linked with financial risk tolerance (Grable *et al.,* 2009:4). As individuals get older, it is believed that they would rather not take more financial risk. This view is because of the belief that as investors become older, they tend to have less time to recover from potential losses experienced from high-risk investments than an individual who is younger and has more time to recover (Grable & Lytton, 1997:64). Wallach and Kogan (1961) are the first researchers to have studied the link between age and risk tolerance. Their experiment used dilemmas of choice that showed that individuals that were older had a lower risk tolerance than individuals who were younger. In 1996, the dilemma test that was created by Wallach and Kogan (1961) was used to investigate cautiousness in the context of 24 life situations using the factors age, sex and education and concluded that older individuals are warier when making a decision compared to the younger individuals.

This input is used by investment managers and measures how much time is remaining until a client needs their financial assets to meet their goals and objectives. Bakshi and Chen (1994) deliberated on the life cycle risk aversion hypothesis and assumed that the older an investor gets the more risk-averse they become and they believed that by measuring the proportion of the household's assets that are held in the form of risky assets, then risk aversion could be measured. Moring and Suarez (1983) came to the conclusion that the older the individual got, the more risk-averse they became, by investigating the effect of age on holding risky assets. They used a survey that was conducted in 1970 in Canada that used consumer finance data, the risky assets that were the sum of stocks, bonds, mutual funds as well as real estate.

Researchers in risk tolerance continuously study age relationships by utilising the life-cycle effects and survey methods. Brown (2004) used economic theoretical modelling with macroeconomic data that used treasury bill rates, stock, and bond market variances and identified that portfolio structure leaned towards being age dependant. Dahlback (1991) did a cross-sectional data analysis that used a survey from 443 single Swedish residents that were between the ages of 22 and 64 and used a bivariate correlation analysis to establish whether or not older individuals were more risk-averse than younger individuals concluded that it was the case. Recent studies have put scepticism on the validity of claims that age is effective in differentiating risk tolerance levels of investors. Using a mixture of econometric modelling and data from a survey that was conducted in 1983, Haliassos and Bertaut (1995) suggest that

education, as well as race, account for risk tolerance more than age because individuals depart from expected utility maximisation.

A survey from Sung and Hanna (1996) analysed the answers from the risk tolerance question in consumer finance and discovered that age and risk tolerance had no relationship, risk tolerance had a negative relationship with age, which leads to research that concerns the link between risk tolerance and age as not completely convincing. Reilly and Brown (2011) used the ordinary least squares regression model by using data that was obtained from over 17 000 individuals and the results showed that relative risk aversion decreased as one increases in age till the age of 65, after this age risk aversion begins to increase. Okun, Stock and Ceurvorst (1980) found that most of the research that was done in the past was plagued with the researchers drawing the data from the two extremes of the adult range. It relied mostly on single criterion variables and not reporting on data even though the validity and reliability of the measures were done. The conclusion in the literature is that individuals that are younger are more likely to be more risk-tolerant than older individuals. According to Nandagopal and Kannadasan (2010), individuals that are young could recover losses that have occurred from investments and younger individuals are able to accumulate their wealth and protect it in the long run. Many financial investment managers assume that the marriage status of an individual is an important aspect that significantly impacts the risk and returns preferences and the satisfaction of the individual's finances (Lazzarone, 1996)

### 3.6.3 Marital status and risk tolerance

Individuals that are single have also been associated with increasing levels of risk tolerance (Baker & Haslem 1974). The over-all consensus between researchers is that individuals who are single are believed to take on more risk than married individuals. This is because individuals who are single have fewer worries than married individuals, particularly with relation to dependants and they also have less social risk when taking on risky investments (Roszkowski *et al.,* 1993:225; Sung & Hanna, 1996:15; Grable, 2000:38; Grable & Lytton, 2001:44; Grable & Joo, 2004:74; Yao *et al*., 2004:259; Yao & Hanna, 2005:85; Grable & Roszkowski, 2007:797).

Financial investment managers assume that individuals who are single do not have as much to lose as individuals that are married, who often have responsibilities for themselves as well as their dependents. Financial investment managers assume also that individuals who are married

are vulnerable to social risk, which can be described as the potential loss of confidence in the eyes of associates and friends if an investment choice takes the indicates an increase in loss (Roszkowski *et al*., 1993).

In addition, Grable (2000:627) discovered that individuals that are married have a higher risk tolerance level than individuals that are single. Additionally, researchers such as Strydom *et al.* (2009:19) and Dickason (2017) have not found a link or relationship between the risk tolerance of an individual and his/her marital.

Sung and Hanna (1996a) found that males that are single are more probable in taking a financial risk than individuals and females that are wedded. Lee and Hanna (1991) also found that there was a positive association with married couples, stock ownership, and wealth levels. At a given level of wealth, households that are single-headed tended to have more stock ownership than households that had married couples. Researchers advised that individuals who are married have higher propensities for taking risks, even though other researchers have been unsuccessful in finding any significant connection or link using statistical methods that there is a relationship between risk tolerance and the marital status of an individual (Haliassos & Bertaut, 1995).

### 3.6.4 Occupation and self-employment vs risk tolerance

In this research, occupation is defined as an individual's principal job or their business as making a means of earning a salary. Financial investment managers have come to the conclusion that an occupation that is ranked higher in status can be utilized as a sorting factor related to higher levels of investor risk tolerance (Roszkowski *et al*., 1993). Meyer *et al.* (1961) used a questionnaire for risk tolerance, one that is similar to the choice dilemmas questionnaire in research that utilised 31 managers and 31 entrepreneurs; they concluded that entrepreneurs showed greater risk tolerance for intermediate level risk than comparable entrepreneurial individuals.

Grey and Gordon (1978) discovered that individuals that are risk-takers when measured in a multidimensional manner, were more likely to move up in positions more quickly than individuals that scored a lower risk rating. Individuals that are self-employed were defined as being such if their income came directly from the business that they own, either through their profession or the trade that they do instead of salaries and wages from someone that they work for. Investment managers have assumed that individuals that are self-employed automatically have higher risk tolerance taking levels and will naturally select investments that are riskier

and accept increased investment volatility when compared to individuals that work for someone (Maccrimmon & Wehrung, 1990).

Barnewall (1988) stated that individuals who take less risky chances usually select occupations that have relatively small economic and political risks. Masters (1989) discovered that non-professionals usually were more conservative when it came to investment decisions than professionals and retired individuals. With a relevant analysis the research of occupational risk tolerance, there seems to be a relationship indicating that specific professions and employment classifications can be said to appeal to individuals that have a risk tolerance that is high, however, there are also professions that attract individuals that have a lower risk tolerance level. According to Masters (1989), occupations that are seen as non-professional are usually linked with individuals that have lower risk tolerance. Financial investment managers have also concluded that occupations with a ranking status that is high can be utilized as a classification factor associated with greater risk tolerance levels (Roszkowski *et al*., 1993).

### 3.6.5 Income and risk tolerance

Important factors that determine an individual's investment risk tolerance are income and wealth. This is because it is assumed that an individual's risk tolerance level rises as his/her income rises, this is because individuals that have money or are wealthy are able to easily recover from a financial loss from a risky investment (Grable & Lytton, 1999:65). MacCrimmon and Wehrung (1986) state that individuals that earn a higher salary usually take on more risk than lower-income individuals. Researchers have come to the conclusion that income levels that are increasing are linked with access to more immediate resources (O'Neil, 1996). This leads to the conclusion that higher levels of income are linked to higher levels of risk tolerance.

Cohn (1975) conducted a survey from a 100-item questionnaire to elicit responses from 972 individuals that were selected randomly for their goals, asset holdings, and market beliefs. The researcher concluded that the higher the wealth and income of an individual the higher the risk tolerance level. A study conducted by Shaw (1996) used the regression analysis technique to analyse data and concluded that growth in wages was positively linked with risk-taking tolerance. Hawley and Fujii (1993) discovered that the relationship between income and risk tolerance was negative. This indicates that the higher the income for the individual the less risk

they are willing to take and the lower the level of income, the higher the risk they are willing to take. There have also been studies that were inconclusive.

Samuelson (1969) used a Bernoulli type utility model that analysed the link between wealth, risk tolerance and income and concluded that a higher salary did not necessarily indicate higher risk tolerance levels. Grable and Friend (1975) stated that, while wealth and income were increasing, risk tolerance tended to stay the same. This result was based on a random sample using regression analysis. Based on the analysis thereof, Pålsson (1996:771) discovered that any variations in the amount of income did not cause any systematic changes in risk tolerance. According to Grable (1997:160), the results recommend that when developing a hypothesis using the income that an individual investor receives as a differentiation factor in determining the risk tolerance levels of the individual, needs be done carefully. These results have pros and cons, which propose that caution needs to be used when a hypothesis is being developed that concerns income as a distinguishing factor in determining the levels of risk tolerance. Nonetheless, using previous findings, it is still suitable to set a hypothesis that suggests that the income of an individual should be positively linked with investor risk tolerance (Grable, 1997:165).

### 3.6.6 Race and risk tolerance

Not many studies have been conducted pertaining to link between risk and race. The first researcher that explored risk-taking differences between black and white adults was Lefcourt (1965:765). The risk-taking experiment by Lefcourt (1965:765), consisted of 30 African and 30 white participants, the results of which presented that the African participants take fewer risks, makes fewer bet shifts and opts to choose fewer low probability bets than the white demographic does. Observational measures such as asset ownership and the proportion of overall wealth allocation to risky investment assets such as stocks or small business are used by most studies.

The 1983 and 1986 consumer finance surveys were used by Haliassos and Bertaut (1995:1115) to carry out profit and loss assessments of probability and multistage samples. The results established that there was a greater probability of white respondents taking investment risks. The 1989 consumer finance surveys were used by Zhong and Xiao (1995:6) to initiate a Tobit analysis, which concluded that white individuals were more likely to possess stocks and bonds than non-white individuals. They subsequently concluded that the majority of non-white

individuals may be less likely motivated to invest in precarious investments. This is characterised with long periods to balance out the volatility that is associated with stocks and bonds. Thus, non-white individuals are more inclined to participate in investment decisions that benefit them in the present rather than in the future.

Leigh (1986) discovered that non-white individuals, in comparison to white individuals, were more risk-tolerant. Using a combination of econometric models, as well as correlation techniques, Leigh (1986) concluded that there was a higher probability of non-white participants taking on more risk than white participants. In general, there is an acceptance by researchers and investment managers that there is a relationship between race and risk tolerance. Subjective or objective measures of financial risk tolerance have been utilised by a number of studies. Sung and Hanna (1996:11), using the 1992 SCF, studied factors relating to SCF financial risk tolerance variable, coded as inclined to take a risk or reluctant to take any risk. They concluded that white individuals have higher financial risk tolerance than any other race.

According to Coleman (2003), in comparison to otherwise similar white individuals, blacks and Mexicans are likely to be less motivated to participate in high financial risks and thus more likely motivated to take no financial risk of any kind. Nonetheless, when net worth is added to the model, the results show a significant difference. Cultural influences, as well as barriers to access financial markets, can be representations of race and ethnicity. Haliassos and Bertaut (1995:1116) deliberated the possibility that culture influences an individual participants' investment choice. One of the implications that arise from this is that the black, as well as the white demographic, may have a variation in choices available, in addition to cultural belief systems, which are used to determine these choices (Nobles, 1978:679).

Considering budgeting amongst other factors, the white demographics risk tolerance level is considered to be greater than that of the non-white demographic. Accordingly, Zhong and Xiao (1995) believe that this could be because of different cultural values, preferences, and tastes. Other reasons regarding non-white demographics are that they may not have been able to have the opportunity or the exposure to financial institutions and non-traditional investment opportunities. Furthermore, numerous non-white cultures incline to be concerned with the past or present, instead of focusing on the future. It is accepted by researchers that if other factors are controlled, white individuals are seen to have a risk tolerance that is higher than that of non-white participants.

### 3.6.7 Education and risk tolerance

Another factor that encourages individuals to participate in financial risk is their level of education. There is an assumption that a correlation exists between higher education levels and an increased level of risk tolerance. As education has a great impact on the level of understanding of risk, which is an integral component of financial investment. Thus, higher education promotes and increases participation in financial risk (Grable & Lytton, 1999:65).

Leimberg (1993) stated that "the best investment, bar none, is education". Investor risk tolerance might be different because of the knowledge of what has happened in the past, which might help them know what might happen in the future. In a study conducted by Leimberg(1993), indicated that the mean showed that the higher the education level is, the higher the chance is of being grouped into either the high or average risk-tolerance category. Subsequently, respondents who had lower education levels exhibited little or no risk tolerance.

Education is distinguished as the level or standard to which an individual completes formal education (Masters, 1989:151). It has been discovered by a number of researchers that a greater level of education is related to a greater risk tolerance level. Baker and Haslem (1974) used data from a survey that consisted of 851 random participants who were distributed to five brokerage firms. They established that investors that did not have an education favoured price stability rather than those that had some college training. A study conducted by Haliassos and Bertaut (1995) determined that in overcoming stockholding obstacles, education was a vital factor. Haliassos and Bertaut (1995) also discovered that individuals with no college qualification had a lower likeliness to hold stocks when comparing to individuals that had a college degree.

Masters (1989:152) imparted that the level of education, in general, is not always an influencing factor on investment decisions but rather that investors who have a higher level of education had more of an inclination to invest in higher-risk investments. A study conducted by McInish (1982:127) dealt with a regression analysis where risk tolerance and demographic variables were integrated. It was found that the level of education had a positive relationship with risk tolerance, but there were no significant regressions in any of the education coefficients (McInish, 1982:128). It was determined by Hallahan *et al*. (2003:499) that the level of education that an individual investor has is not a factor that is significant enough to affect an individual's attitude towards risk.

Concluding education and risk tolerance, it is suggested by the literature that education and investor risk tolerance have a positive relationship that is reasonable. Nevertheless, these findings are not definite and additional research is needed.

## 3.7 SUMMARY OF RISK TOLERANCE AND DEMOGRAPHICS

There is continuous credence between researchers and investment managers alike that (a) individuals that are single have a higher risk tolerance than individuals that are married; (b) individuals that are younger are more risk-tolerant than individuals that are older; (c) females risk tolerance is less than that of a male; (d) non-whites are less risk-tolerant than white individuals; (e) individuals that have a higher income have a greater risk tolerance level than those that are lower-income earners; and (f) the level of education is also associated with higher risk tolerance levels.

## 3.8 RISK APPETITE

According to Lucarelli and Brighetti (2010:2), financial risk tolerance can be explained as a risk attitude and risk capacity combined. The amount of risk tolerance individual investors can take is known as the investors' risk appetite, which is the amount of risk an investor wants to take and risk capacity, which is the capable and affordable total risk that an individual investor can take. According to Weber *et al.* (2002:222), there is fundamental diversity between the two components of risk tolerance, where risk attitude is associated with the personality and psychological characteristics of an individual, risk capacity is a financial characteristic of the individual (Lucarelli & Brighetti, 2010:2). Botha *et al.* (2012:541) describe risk capacity as the ability to be able to take the risk and has the financial capacity to withstand the market loss. The total exposed amount that an organisation hopes to carry out is known as risk appetite, based on risk and return trade-offs for one or more desired outcomes (Rims, 2012).

Risk appetite can be expressed quantitatively or qualitatively as the amount that an individual or an organisation progresses towards in the pursuit of rewards. This is referred to as the individual’s or organisation’s goals and objectives.

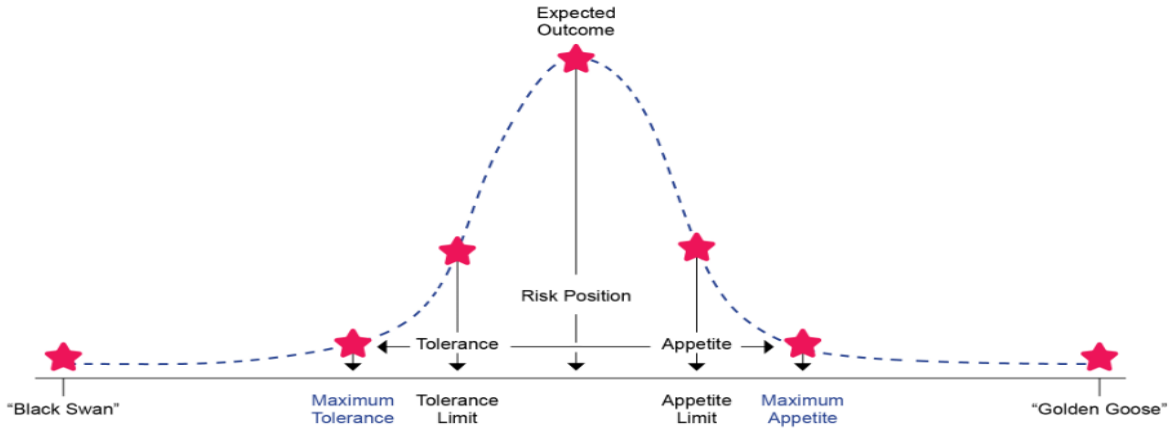



Figure 3.1: Risk appetite and tolerance of an individual (Adapted from Rims, 2012

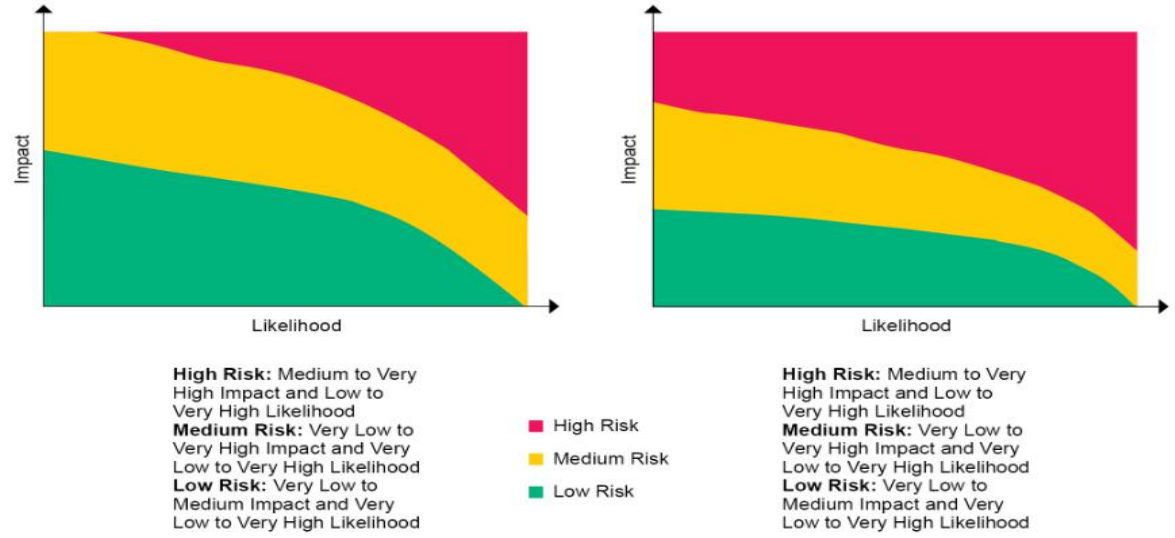



Figure 3.2 & Figure 3.3: High risk vs low-risk appetite (Adapted from Rims, 2012)

Risk attitude is a choice and managed approaches can be utilized to select suitable risk attitudes in order to improve both the decision-making process as well as decision outcome.

## 3.9 SUBJECTIVE AND OBJECTIVE RISK TOLERANCE

It is claimed by Anbar and Eker (2010:505) that an investor's subjective financial risk tolerance will alter over a period of time; hence, they will not have the same risk tolerance throughout as the demographic as well as the economic factors change, therefore, risk tolerance will change. As this happens, it is imperative for investment managers to update the risk tolerance level of the client accordingly. Riley and Chow (1992:32) state that the use of objective measures is because the allocation of assets is often more diverse from what an investor or financier would

specify as their subjective allocation. Once Riley and Chow (1992:32) had indicated that this directed the objective measure being more superior than the subjective approach, requesting the investors to have a theoretical response to situations. Halek and Eisenhauer (2001:3), who objectively measure financial risk tolerance, note that questionnaires can distort individual responses in terms of their gains or losses.

When measuring financial risk tolerance, questionnaires are popular instruments that can be used to do so. The use of questionnaires is recommended as it permits a greater number of contributors in the research to be covered, which eliminates biased responses. This measuring tool can contain matters that include a wider range of financial and investment choices, which are imperative in ascertaining an individual's risk level and may not be accomplished with objective methods (Grable & Lytton, 1999a:166).

Yang (2004:21) specifies that using objective measures of risk tolerance in assessing asset allocations for individuals may not be sufficiently accurate since it might not be a true reflection of an individual's risk appetite. Individuals may be compelled into investments that they might not pursue, for example, a company's policy requiring employees to invest a portion of their pension into the company's shares. Grable and Lytton (1999a:165) state that objective risk tolerance measures could tend to be descriptive and not predictive and this would not indicate or explain actual investor behaviour, whereas, subjective financial risk tolerance could.

The objective financial risk tolerance within a household might be different from their subjective risk tolerance since objective risk tolerance is measured with the amount of risky financial assets, relative to either total assets or net worth. Even though this might be a small amount of risky assets, the household might believe that they are highly risk tolerant or vice versa (Chang *et al.,* 2004). Objective or subjective measures of risk tolerance would partially do the job in measuring tolerance levels, as it assists in gathering data needed to complete the analyses and once the analyses have been completed, the classification of investor's is required to determine their portfolio implications and recorded tolerance scores.

## 3.10 RISK TOLERANCE WITHIN THE INVESTOR LIFE CYCLE

Harty (2014:1) states that the different stages investors go through in their lifetime, from the initial purchase to the disposal of the investment, is defined as the investor life cycle. Bodie *et al.* (2010:698) indicate that the most crucial factor that influences an investor's objective is the stage the investor is currently in. Investors should understand the importance of the stages of

their life cycle and where they are in the individual phase of the life-cycle because it is an essential component for the efficient management of an investment portfolio.

The needs of each investor in the investor life cycle are diverse. Investment strategies alter over time as there are changes in the investor's net worth and risk tolerance levels. They need to ensure that the choices regarding the management of their investment portfolio can achieve the goals and objectives that they set out (Reilly & Brown 2012:33). Age and wealth play a pertinent role in the investor lifecycle, as the investors' conditions and resources change over a period of time (Goodall, 2005:3; Harty, 2014:1). There are four different phases that an investor can be grouped into, these four phases are the accumulation phase, consolidation phase as well as the spending and gifting phase as displayed in Figure 3.4:

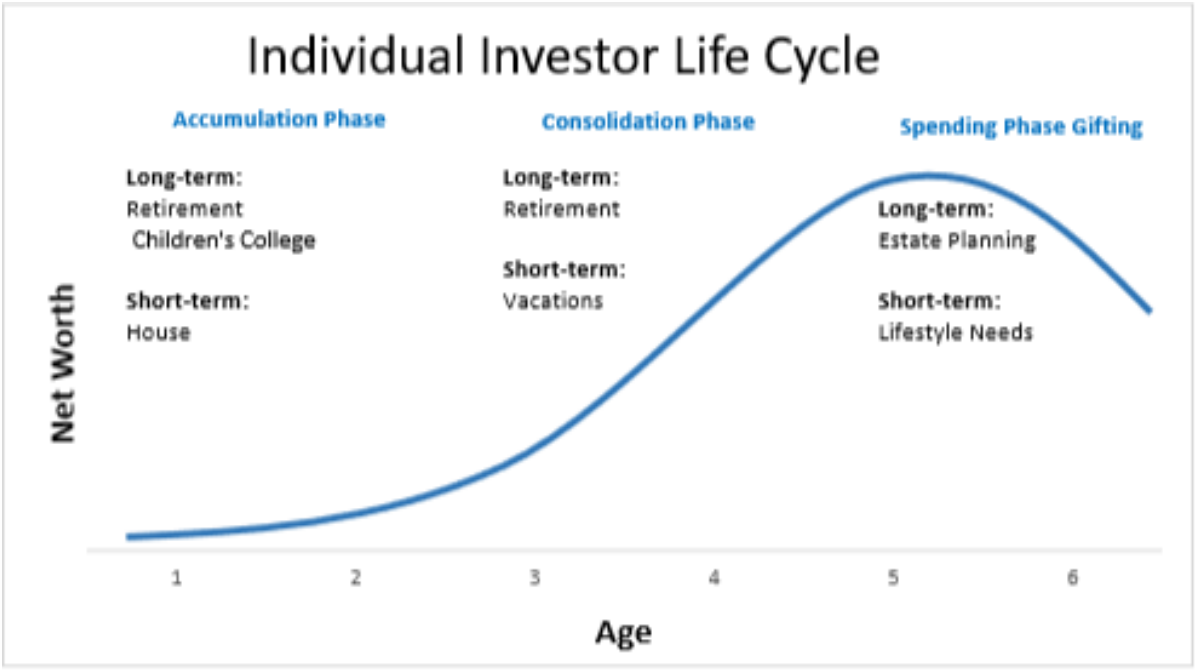



Figure 3.4: Individual investor lifecycle (Reilly & Brown, 2012:33)

### 3.10.1 Accumulation phase

The accumulation phase of the investor life cycle is in the early to middle years. In this phase, individuals are accumulating assets (fixed assets such as houses), retirement planning and satisfying their instant needs and long term goals, such as cars, furniture and saving for their children's education (Harty, 2014:1). In this stage, individuals have substantial debt from car loans, house down payments and university debt, which they are still paying off and a small net worth. Harty (2014:1) further indicates that it is imperative for investors in this stage to

commence with investing and saving their money on a more regular basis. Reilly and Brown (2012:33) specify that in this phase, individuals are willing to take on additional risk for higher returns because they have a greater future earning ability and a longer time horizon.

### 3.10.2 Consolidation phase

Kodajji (2007) indicates that the mid-life cycle of the investor, the investor has accumulated assets to cover his needs, which would include housing, education for the children and marriage expenses and is currently exploring increasing his/her wealth. According to Harty (2014:1), larger portions can be saved by investors in the consolidation phase, than what they would be able to in the accumulation phase, to provide for their future retirement. This stage has still a fairly long time horizon of 20 to 30 years, but the investors are willing to take fewer risky opportunities than they would in the accumulation phase (Reilly and Brown, 2012:34). In this phase, saving and capital preservation is the most pertinent fact, as the individual investor is less eager to tolerate a high degree of risk (Harty, 2014:1).

### 3.10.3 Spending and gifting phase

The rewarding stage for the investor is the spending and gifting stage if he/she was disciplined over the investment years (Harty, 2014:1). This is the stage that usually occurs at retirement where the investor would be receiving a retirement annuity and income from his/her investment portfolio (Marx, 2009:267). In this phase, there is a large degree of emphasis on capital protection, which indicates that individuals are prepared to make investments that are low-risk in order to receive interest on dividends. According to Harty (2014:1), individuals that are in this phase of the investor life cycle have achieved the advantage of adequate asset allocation and an efficient investment portfolio over their lifespan of being an investor. The gifting spending phase is very similar, this is because investors believe that they have enough revenue to cover their costs and are able to give financial support to individuals that need it (Reily & Brown, 2012:34).

The principal characteristic of an individual investor's life cycle is that as the investor goes through three different phases. The portfolios asset allocation needs to be adjusted to be able to meet the goals and objectives that the individual wants to achieve (Bodie *et al.*, 2010:698). For an individual investor, it is important that they have the knowledge and know what phase of the individual investor life cycle they are in. This is important because it is seen as the main factor that influences the investment goals and objectives of individuals (Bodie *et al.*,

2010:697). In the different phases, every investor is seen as unique in each phase of the lifecycle according to their personal circumstances. This is an important factor to consider by financial planners as well as fund managers at financial organisations. According to Harty (2014:1), asset allocation decisions ought to be based on the individual investor's goals and objectives and not their age. Financial planners and fund managers should determine the investor's risk and return preference in relation to what phase of the individual investor life cycle they are in. However, there are investment constraints that could limit the inclusion of specific assets in the investment portfolio even though the individual investment objectives are given in order to construct the portfolio with the necessary asset allocation (Marx, 2010:268).

## 3.11 FINANCIAL RISK TOLERANCE, PORTFOLIO FORMATION, AND RISK TOLERANCE CATEGORIES

The level of financial risk is important to note as this will show how an individual would like their investment portfolios to be constructed (Corter & Chen, 2000:369).

An individual that has a high-risk appetite would invest in investments that are riskier, such as purchasing shares and in start-up companies, whilst those with a lower risk tolerance would prefer investments with lower risk such as stable shares and highly graded bonds (Corter & Chen, 2000:369). As shown in Figure 3.5 and 3.6 the amount that an investor is likely to receive from an investment will be determined by the amount of risk they are willing to consume (C2VTrader, 2015:1). Thus, meaning that investors who are willing to consume high risk will be rewarded with high returns and those who yield a lower risk will receive a lower return. Figure 3.6 shows the financial risk tolerance of an individual, as well as the types of assets that an individual would likely add to their portfolio while illustrating the correlation between risk and return (C2VTrader, 2015:1).

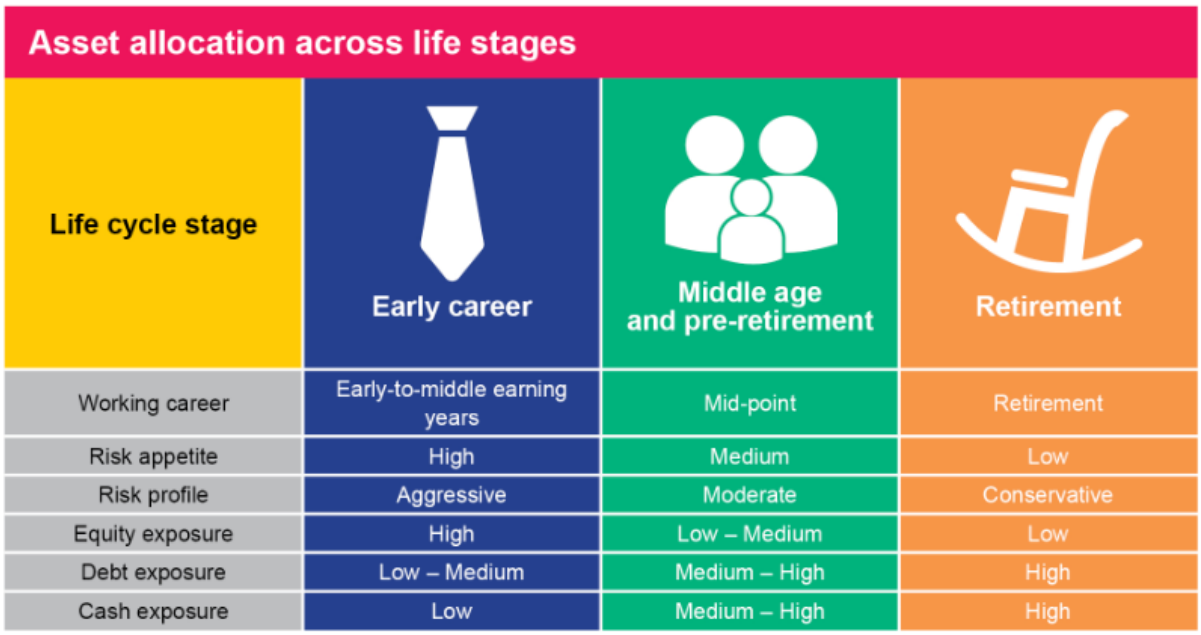



Figure 3.5: Asset allocation across life stages (C2VTrader, 2015:1)

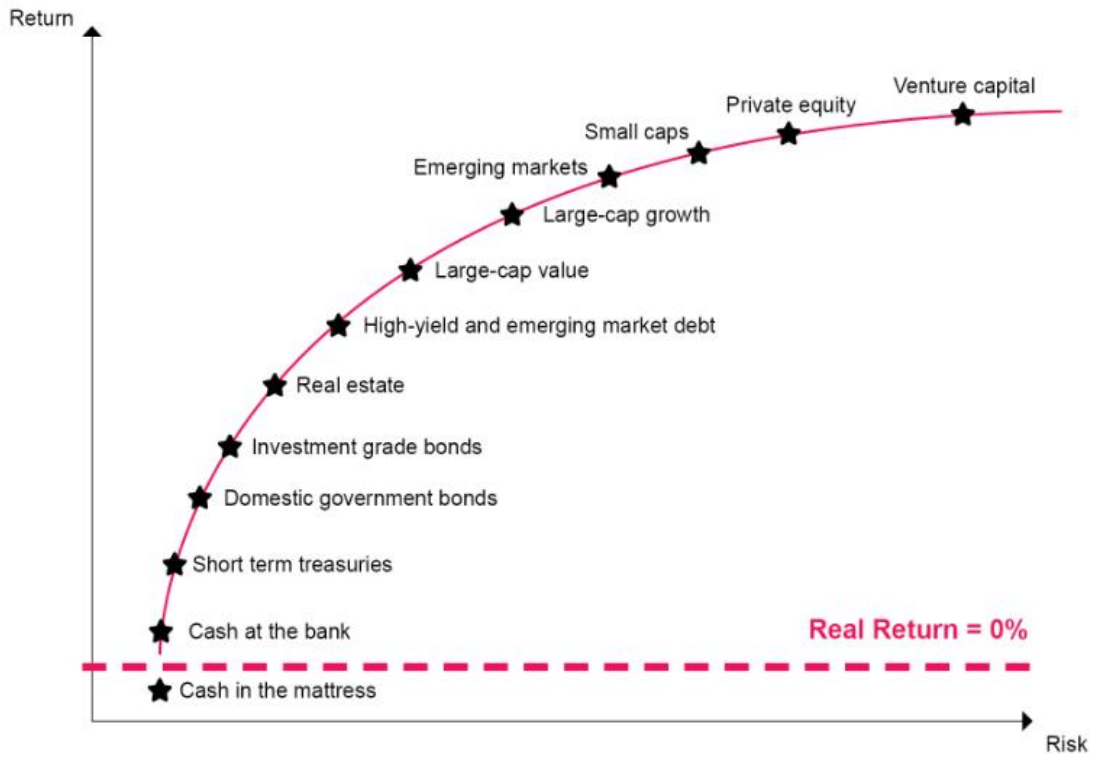



Figure 3.5: Asset allocation across life stages (Hinz *et al.*, 1997)

### 3.11.1 Conservative investor

An investor who does not want to see less money in their monthly statements is defined as a conservative investor. Conservative investors are risk-conscious and will most likely avoid high-risk classes due to the stage in their career and their age. They are likely to be older, leaning towards retirement or in retirement, therefore, they would invest their funds in high-quality bonds and fixed income streams (Lytton & Grable, 1997:7). Investors that are conservative do not show the need to consume any risk, they fall into the lower risk to no risk tolerance bracket (Larkin *et al.*, 2013:82). These investors do not need their portfolios to make an income for several years, as they are risk-averse individuals (Grable, 1997:81). It becomes challenging for conservative investors when inflation is high or if there is a negative correlation in fixed income securities; the reason for this is that conservative investors primarily hold their money in short-term assets, fixed income streams, cash and high-quality bonds (Hinz *et al.*, 1997:91). This is shown in Figure 3.6. Knowing that capital is safe is what low-risk investors prefer, they would rather keep money safe in a bank account and not in investing in shares.

### 3.11.2 Moderately conservative investors

Whilst a moderately conservative investor is more willing to bear slightly more risk and is looking for a little more return than that of a conservative investor, they are similar as they are both averse to a large short-term downside fluctuation (Tools for Money, 2004:1). If a moderately conservative investor's life expectancy is more than 10 years, he/she would need protection from market fluctuations and would need to be informed all the time and have exposure to investments that will increase in value in the later years (Campbell *et al.*, 2003:59). Real estate, fixed income securities, tangible commodities and several types of stocks. according to Afza Nazir (2007:13), are what these investors should invest in. These types of investors would prefer to leave their money in the bank and limit their risk, but realise that long term investments might be better. Moderately conservative investors can be persuaded to take on a limited amount of risk with their investments (Campbell *et al.*, 2003:60).

### 3.11.3 Moderate investors

Moderate investors require good returns and are aware that they need to take risks in order to get those returns. The generated income is usually several years away, therefore, most investors will fall into this category, essentially for investing for daily expenses and retirement purposes (Olivares *et al.*, 2008:11). Moderate investors are generally middle-aged and are looking to set long-term goals, such as children's tuition. They have managed portfolios and the asset classes consist of a balanced mix of all major viable asset classes

### 3.11.4 Moderately aggressive

Moderately aggressive investors usually invest in bonds and other risk-free assets that are managed and kept to ensure the portfolio is fully diversified. A moderately aggressive investor takes more downside risk than the market; when the markets are moving upwards, he/she is expected to be compensated accordingly. These investors fully utilise risky asset classes whilst typically avoiding fixed income positions (Olivares *et al.*, 2008). Individuals with sufficient knowledge about the market, postgraduate qualifications in finance, high-income earners and males dominate this category (Afza & Nazir, 2007:13). These investors are able to make up their minds easily and quickly, as they are usually experienced in a wide range of investment products (Cambell *et al.*, 2003:61). These investors are able to accept the occasional poor portfolio performance and may suffer from regret at a later stage (Cambell *et al.*, 2003:61).

### 3.11.5 Aggressive investors

Aggressive investors are looking to outperform the market, which entails them being exposed to more risk. These investors believe that protecting principle is not as important as maximising long-term results. Aggressive investors tolerate large amounts of losses and can endure extensive volatility, which is the reason they are willing to accept substantial risk as they value maximising returns. To an aggressive investor, liquidity is not a general concern (Olivares *et al.*, 2008:11). Aggressive investors are able to make up their minds relatively fast, as they have been managing their investments with tangible investment views and have large amounts of investment experience (Campbell *et al.*, 2003:61). Aggressive investors want to accumulate substantial wealth and generate enough income from other sources to maintain their living expenses, giving them the opportunity to recover any losses. Fixed-income assets are generally avoided altogether, as aggressive investors hold their growth in sector mutual funds and shares with bonds (Olivares *et al.*, 2008:11). In Figure 3.7, a summary of different investments to make, after the above has been mentioned.

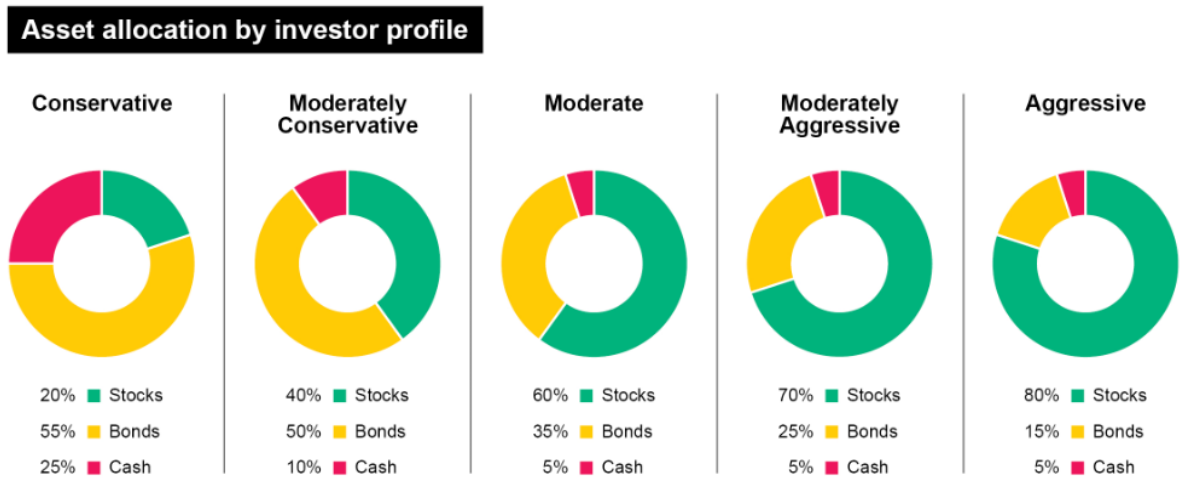



Figure 3.7: Asset allocation according to the investor profile (Edge, 2019)

### 3.12 SYNOPSIS

Chapter 3 introduced the theory of risk perception and risk tolerance. Risk is something that investors need to consider before they start investing as an appropriate balance between risk and return needs to be achieved. There are different types of investments and each investment carries a different type of risk as they each have different returns. This is why it is important

for individuals to understand the relationship between risk and return as they are required to estimate and evaluate the expected risk-return trade-off.

Individual investment portfolios are strongly affected by the level of risk tolerance and that is why it is of utmost importance that individual investors risk tolerance should be considered carefully before any investments are selected. Individual investors can be broken down into five categories, namely, aggressive, moderately aggressive, moderate, moderately conservative and conservative. As an individual investor risk profile can change over their lifetime, it should be reviewed by the investor and their financial planner. For an individual to understand their risk tolerance fully, they need to understand the subjective and objective of risk tolerance as this could help them in their investor life cycle and put them into the relevant risk category that they need to be in.

The following chapter discusses the research design and methodology concerning this study.

# CHAPTER 4: STUDY DESIGN AND METHODOLOGY

## 4.1 INTRODUCTION

The objective of understanding a phenomenon through gathering, analysing and interpreting data is known as research (Leedy & Ormrod, 2001). According to Williams (2007:65), research is a methodical process because the researcher must describe the objective, manage the data and correspond the findings and/or results, which occur within an established framework and in line with general guidelines; therefore, at least one question about a phenomenon initiates research.

A basic secondary data analysis and a questionnaire were followed in the study from a study that was conducted by Masenya in 2017. Section 4.3 discusses and focusses on the source of the primary data while Section 4.4 provides more information on the data collection method, sampling procedures, strategies, methods used in the data collection, data preparation and the pilot testing that was used to compile and arrange the raw data. Sections 4.5 and 4.6 briefly discuss the probability and non-probability sampling techniques that are available in research. Section 4.7 provides a discussion on the sampling size and how quantitative and qualitative sampling can be implemented while a description of the sample used in the research was compiled. Section 4.8 is the research approach classification with a brief discussion on the different research approaches that are available and which research approach was used within the study. The layout of the questionnaire was explained with the demographic information in Section A, savings and investment in Section B, investment and instruments in Section C and the risk tolerance scales in Section D.

In Section 4.11, the focus is on the secondary data analysis process and application by using the primary data that were collected in 2017. There are a few advantages and disadvantages to the application of secondary data analysis, which is also briefly discussed.

The main objective of the study is to analyse the investment framework of students by using their levels of risk tolerance as well as their demographics. The empirical objectives that follow were created in line with the primary objective.

- Determine risk tolerance levels pertaining to university students in the Vaal Triangle region;
- Determine the influence of demographics on risk tolerance levels pertaining to university students in the Vaal Triangle region; and
- Determine whether the risk tolerance levels differ subjectively or objectively for students in the Vaal Triangle region.

To achieve the primary as well as the empirical objectives of the study, research design and methodological approach need to be planned. Chapter 4 concentrates on describing the research design and methodology applied in the study.

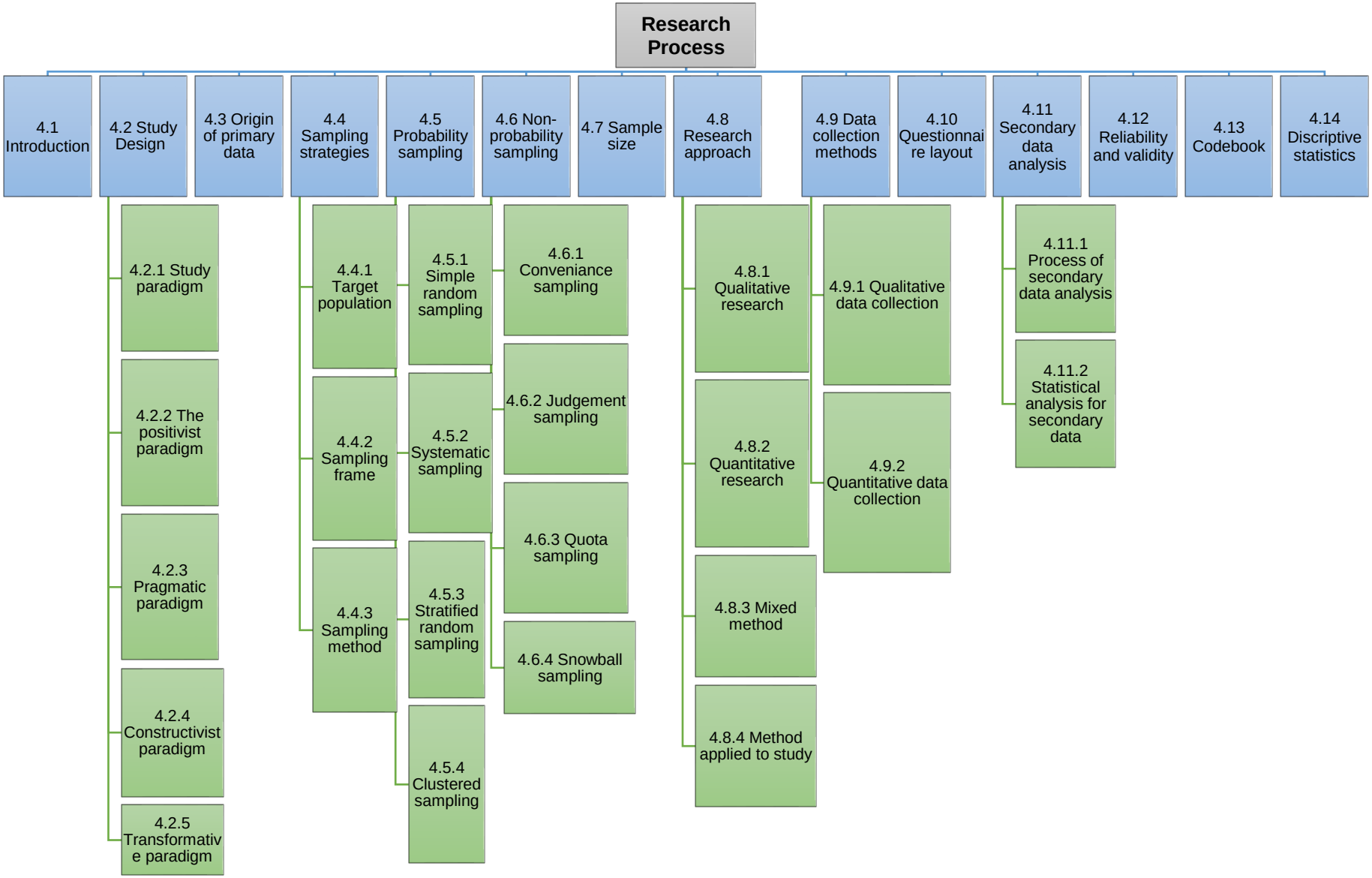



Figure 4.1: Research Process

## 4.2 STUDY DESIGN

Research design is defined as the procedures of research that can start at a decision for broad assumptions until the details of the data collection and analysis methods. The main objective of the study design is to decide which study design needs to be utilised to study a topic. This decision is based on the worldview assumptions the researcher brings to the study, the specific methods as well as the analysis and interpretation (Creswell, 2009). Fouche *et al.* (2011) state that methodological decisions and interpretations are based on study designs. According to Kothari (2004:32), the research design involves the advanced preparation of methods that need to be applied for the collection of necessary data with the methods that need to be applied in a study's analysis, which need to be linked with the objectives of the research being conducted and the availability of resources.

To have an effective development of the research process in a study, the research design is a necessity. The research design also ensures that the research has effective and reliable results in a way that errors and instabilities can be recognised (Kothari, 2004:32).

### 4.2.1 Study paradigm

Research paradigms are also known as worldviews and are general orientations on how individuals perceive the world as well as the reason for the research (Tracy, 2013). These areas are shaped by an individual's area of beliefs, as well as the mentors that an individual has in their lives. The types of beliefs that an individual has will influence whether they use quantitative, qualitative or mixed research methods (De Vos *et al.*, 2011a:513).

There are generally four research paradigms, these include the positivist paradigm, constructivist paradigm, participatory and the pragmatists paradigm (Creswell, 2009:140). Paradigms essentially do not answer questions that are important but they can guide us to where the answers could be. This also depends on where the researcher looks to find the answer (Rubin & Babbie, 2001:32). The way in which reality and knowledge are defined, what assumptions are upheld when doing research and which strategies are used to collect and analyse the data, are the ways in which paradigms differ (Feilzer, 2010; Creswell & Plano Clark, 2011; Tracy, 2013). The four types of paradigms are discussed below.

### 4.2.2 The positivist paradigm

Denscombe (2008:12) states that a traditional form of research is the positivist paradigm and is used mostly for quantitative research rather than qualitative research as the assumptions hold more truth for quantitative research than for qualitative research. Therefore, the issues that are studied by positivists show why the causes that influence outcomes need to be identified and assessed; for example, the ones that are found in experiments. Careful observation and measurement of reality helps develop positivists knowledge and helps develop numeric measures of observations. One of the main objectives of a post-positivist is studying the behaviour of individuals (Creswell, 2009).

The beliefs that positivist researchers have is known as the positivist paradigm (De Vos *et al.,* 2011c). Positivists consider certain methods and procedures of the natural sciences to be suitable for phenomena in social sciences. This indicates that the investigation and clarification of human experiences are being researched by using methods that have been scientifically tested (Ryan, 2006:8). The positivist paradigm emphasises that actual experiences can be noted empirically and can be described with rational analysis. Positivist research methodology, therefore, stresses micro-level research in an environment that eradicates the intricacy of the outside world. Certain policies are prescribed according to the conclusions that are collected by using a scientific method (Kaboub, 2008:10).

It is believed by positivists that knowledge is gained from the result of facts that have been recognised through examination and observational social phenomena (Krauss, 2005). The positivist paradigm requires researchers to start their research with theory, then collect data that either supports or rejects it and, subsequently, make the essential changes before any other tests can be done (Creswell, 2014:7). The positivist paradigm can be concluded by indicating that the research concentrates on variables to reveal the reason for a relationship and the causes and effects of that relationship by using social phenomena and scientifically proven methods (Creswell, 2012:8).

### 4.2.3 Pragmatic paradigm

The pragmatic paradigm derives from actions, consequences as well as current circumstances (Creswell, 2014:10). Great emphasis is placed on practicality rather than the abstract with regards to pragmatism and it functions on the assumption that the value of any theory can only

be measured by how well it delivers in real practical needs and how well it works in practice (Denscombe, 2008:23).

Pragmatic researchers focus on the 'what' as well as the 'how' of a specific problem and are not committed to one precise philosophy (Creswell, 2003:18). Researchers that use mixed methodology would use a pragmatic paradigm as it provides a framework (Tashakkori & Teddlie, 2003:54). The research problem is placed in the centre of the pragmatic paradigm and by using the pragmatic paradigm it allows the researchers to utilise all methods to understand the problem (Creswell, 2003:15).

As the research problem is in the centre, data collection and the analysis methods are chosen as the most likely to provide the insight to the questions with no loyalty to any other paradigm (Patel, 2015:1).

### 4.2.4 Constructivist paradigm

Constructivist, also known as the interpretivist paradigm, researchers have the approach of intending to understand "the world of human experience" (Cohen & Manion, 1994, pg36), this proposes that "the reality is socially constructed" (Mertens, 2005:12). Wilson (1970) formulated the interpretive paradigm. A variety of theories as well as approaches are included in this paradigm to qualitative research. With this paradigm, it is not believed that rules and interpretations are clear for all participants. It is presumed that interpretations are made and traded in explanatory procedures and that research has to start with examining the concepts created and applied in these processes (Blumer, 1969:2) The constructivist researcher most frequently relies upon the participants views of the study and recognises the impact on the researcher of their own experiences and background (Creswell, 2003:8). Constructivists cannot start with a theory (as with positivists), they would rather produce or create a theory of patterns or meanings during the course of the research process (Cresswell, 2003:9). Constructivists usually depend on qualitative data collection methods and analysis or a mixture of both qualitative and quantitative methods (Strydom, 2011c:496).

### 4.2.5 Transformative paradigm

The transformative paradigm came about in the late 80s and early 90s due to the fact that there was a dissatisfaction with the dominant research paradigms that existed. It came to the realisation that most sociology and phycological theories, which underly the main paradigms,

were formed from the perspective of white, able-bodied males and were based only on male subjects (Mertens, 2005). Quantitative as well as qualitative data collection methods and analysis can be used with the transformative paradigm in a similar way than that of the constructivist paradigm, although the mixed methods approach gives the researcher using the transformative paradigm structure to develop a "more complete portrait" of our social world through different types of lenses (Somekh & Lewin, 2005:23). This allows for a greater understanding of more diversity of the views and values of individuals.

## 4.3 THE ORIGIN OF THE PRIMARY DATA

Primary data are new data obtained by a researcher for the first time. These data are factual as they are gathered through various methods such as questionnaires, interviews, focus groups, observations and scheduling. The data can be shown through diagrams, charts as well as tables (Techies, 2019). New data are continuously collected and added to primary data and are added to the library that already exists of the social knowledge and, in some cases, the data are open to other researchers in order for the general research community to reuse them. In these cases, the data are then called secondary data analysis and can be used to re-examine data.

The main purpose of collecting primary data is for it to be used for research output pertaining to the financial well-being of the individual, the demographics, risk tolerance levels, behavioural finance, subjective well-being, measures of personality as well as the short-term and long-term decisions when investing. A questionnaire relating to the purpose of the concepts was created and forwarded to respected South African universities in the Vaal Triangle area, including North-West University and the Vaal University of Technology, for the students to complete. The students were selected from a random sample across all faculties.

## 4.4 SAMPLING STRATEGIES

Sampling strategies are defined as the population from which a sample is taken. Sampling can be used in many terms, such as the frame of the sample, the population of the sample, eligibility criteria, criteria that is inclusive and exclusive, design of the sample, the sampling bias as well as the sampling error and power analysis (Landreneau, 2009:09). The ones that are relevant to this study have been discussed below. There are also various kinds of sampling, which include convenience, accidental, snowball, quota sample, purposive sampling, simple random sampling and cluster sampling that are discussed in section 4.5 and 4.6 (Landreneau, 2009:10).

### 4.4.1 Target population

The target population discusses the group of individuals or objects in which researchers show an interest in generalising the results (Lavrakas, 2008:1). Hair *et al.* (2000:328) state that elements that have been identified are known as a population and the researcher is interested in it in regards to what extrapolations can be done even though the population will not reflect characteristics that are true (Lavrakas, 2008:1). According to Quinlan (2012:206), before beginning the target population selection, the population parameters need to be identified. In regards to the primary data for this study, the target population is students registered in traditional as well as university of technology South Africa that fall within the Vaal Triangle district. The students in the universities were students that mostly study BCom degrees, as the questionnaire that was handed to the university of technology did not have many students in the classes compared to the amount of students at the traditional university.

### 4.4.2 Sampling frame

A sampling frame is a full list of all individuals or subjects you want to research on. The discrepancy between a population and a sampling frame is that the sampling frame is precise whereas the population in general (Statistics how to, 2017). A sampling frame consists of a composition of all appropriate sampling units or a database for finding a depiction of the factors of the target population (Malhotra, 2004: 316). It is more accurate when the information is extracted from the population (Strydom, 2011b:224). The sampling frame is students at a traditional university as well as a university of technology within the Vaal Triangle region. The choice of the students was founded upon the non-probability, purposive sampling, which is defined in the section that follows.

### 4.4.3 Sampling method

The sampling method is defined by a method in which sample units are chosen. The research required non-probability purposive convenience sampling to be used (Parasuraman *et al*., 1991:456; Naumann & Giel, 1995:201). There are two main categories of sampling as stated by Berndt and Petzer (2011), namely probability and non-probability sampling. Probability sampling is constructed upon principles of unpredictability and probability theories, whereas non-probability methods are not. The requirements of the probability sample satisfy the conditions for the use of theory of probability in order to accurately generalise the population; whereas, with non-probability sampling, this is not the case (Strydom, 2016:102).

## 4.5 PROBABILITY SAMPLING

Probability sampling entails drawing a sample from a population, grounded on the principle of chance and/or randomisation (Kirk, 1999:367). This type of sampling method is more complicated, time-consuming and more expensive than non-probability sampling. However, because units from the population are selected at random and the probability of each unit of inclusion can be calculated along with reliable estimations for parameters, probability sampling is more applicable (Strydom, 2011b:228). Four sampling methods comprise probability sampling, namely simple and systematic random sampling, stratified and cluster sampling (Quinlan, 2011:209; Strydom, 2011b:228).

### 4.5.1 Simple random sampling

Simple random sampling is attained if each component in the population, that is not in the sample already, has a similar chance of being taken up into the sample on the next draw as it did on the previous draw (Quinlan, 2011:210). The actual drawing of the sample involves the generation of a predetermined number – the sample size – of random numbers. The population elements correspond to these numbers from the sample. According to Marlow (2005:139), the simplest sampling method is simple random sampling and each individual that is involved in the research should be given a numerical value. The most important factor of this method is that the numerical values should be decided at random (Maree, 2016:89).

### 4.5.2 Systematic sampling

Simple random sampling and systematic sampling correspond if the elements are given numerical values in a random manner (Barreiro and Albandoz, 2001:10). Quinlan (2011:210) states that systematic sampling is drawn by systematically moving through the sample frame and selecting every $k^{th}$ element. To initiate the randomness in this process, the starting point is selected at random. It is useful to use this method in conditions where the size of the population is not identified and the elements of the population arrive at a particular location over time (Maree, 2016:195).

### 4.5.3 Stratified random sampling

Stratified sampling is defined by Quinlan (2011:210) as a particular population that displays a significant amount of heterogeneity when elements in a population show significant amounts of differences when a particular element is being studied. Non-overlapping groups are called a strata and independent sampling is conducted in each stratum. According to Flick (2011:72), natural subgroups can be used to form strata. The problem of non-homogenous populations can be addressed in a way that it represents the population more precisely by using simple random sampling (Grinnell & Unrau, 2005:160).

### 4.5.4 Clustered sampling

Quinlan (2011:211) states that when a population is split into various types of groups based on their characteristics, it is defined as cluster sampling using a probability sampling method. It is commonly discussed as multistage or area sampling (Monette *et al.,* 2005:137). This type of sampling method is used when no list has been specifically set for participants that are available, although, there is a geographical map available (Strydom, 2011b:230). Cluster sampling is at least a two-stage procedure, instead of selecting randomly from the clusters that are available in the study (Quinlan, 2011:212).

## 4.6 NON-PROBABILITY SAMPLING

According to Zikmund *et al.* (2013:392), the sampling method that selects samples that are based on the sample's convenience or the researcher's judgement is known as non-probability sampling. The elements that compose this sample are selected by non-random methods, therefore, this sample is more likely to produce probability samples than representative samples (Creswell and Plano Clark, 2011:174). Although this is true, researchers use these types of samples because qualitative as well as quantitative researchers can use it. The four different types of non-probability sampling methods are discussed below (Quinlan, 2011:213; Strydom, 2011b:231).

### 4.6.1 Convenience sampling

This technique is the least demanding of the four methods. It involves the collection of the most available topics and is the least expensive in terms of the time used as well as the effort and cash. This type of research depends on the convenience of the researcher. Although in

convenience sampling, the probability is high that the two selected groups, will have "low-set" and "high-set" groups (Marshall, 1996:523). Mujis (2004) states that it will be contradictory in other ways for not permitting us to think of them as similar. Classes mostly chosen by convenience sampling are conductive to self-selection, administrative decisions, time of the class, number of the years of exposure and many other polluting factors. Another problem with convenience sampling is the existence of outliers. Outliers are cases which would make our findings subject to apprehension (Farrokhi, 2012:24)

### 4.6.2 Judgement sampling

An additional non-probability sampling method, known as judgemental sampling but also defined as purposive sampling, is a type of sampling method that is completely grounded on the judgement of the researcher (Monette *et al.,* 2005:148). The sample comprises of units that have the characteristic and illustrative features of most of the population and is also the most beneficial to the research (Grinell & Unrau, 2008:153). Monette (2005) states that each individual that has been selected for the study should participate and make a contribution.

### 4.6.3 Quota sampling

Quota sampling is where individuals are not selected at random; instead, a number of requirements and characteristics have to be met by the individuals in order to use this sampling method (TNS, 2011:11). This type of sampling is preferable to other forms of non-probability sampling because it forces members of multiple subpopulations to be included (EMS, 2011). The reason behind quota sampling is that if the sample is effectively represented by the characteristics of the population, it has a greater correlation with the study variable and to be represented correctly (TNS, 2011:11). Quinlan (2011:214) states that the sampling method uses different quota criteria and produces a sample. Market researchers mostly use this sampling method because it can be used to get a sample as close as possible to a duplicate population and can also classify diverse subcategories that can closely resemble the characteristics of the original population (Royse, 2004:198).

### 4.6.4 Snowball sampling

Snowball sampling is a convenience sampling method that is utilised when it is challenging to gain access to subjects with the targeted characteristics. As such, this method uses the existing subjects to recruit new research subjects and continues until data saturation (Sadler, 2010:11).

This sampling method takes time but allows the researcher to communicate better with the samples as they are all linked to previous subjects that recruited them (Sadler, 2010:12). The inclusion criteria of the study have to be met by the participants (Quinlan, 2011:214). When there is not any knowledge of the sampling frame, this type of sampling method is used and only participants that are suitable to the study can access the data (Alson & Bowles, 2003:90).

A purposive non-probability sampling frame was used as the sampling method to collect the primary data. Where a sample has collected elements that have characteristics that represent the population and can serve as the purpose of the study, it is known as purposive sampling (Monette *et al.,* 2005:148).

## 4.7 SAMPLING SIZE

The sample size is drawn from the target population where the sample size must be illustrative so the researcher is able to make conclusions from the statistics of the sample (Maleske, 1995). It is essential to note that if the sample size is small it will lack the precision to give answers that are being investigated and that are reliable to the researcher. However, if the sample size is too big then time and resources could be wasted, usually at a minimal gain (Chuan, 2006:72)

When defining the sample size that needs to be taken from the population, Salant and Dillman (1994) state that there are four factors that need to be considered:

- How much can be tolerated from the sampling error;
- What is the size of the population;
- In regards to the characteristics of interest, how varied is the population and
- the smallest subgroup within the sample for which estimation is needed?

Quantitative sampling is used, in order to draw an illustrative sample from the population so that the findings of studying the sample can then be generalised back to the population (Marshall, 1996). The larger the sampling size, the smaller the random sampling error. An appropriate sampling size for a qualitative study is one that effectively answers the research question (Marshall 1996:523).

Quantitative sampling is usually larger than qualitative as quantitative sampling and should represent the distribution of similar characteristics from where they were drawn (Marlow & Boone, 2005).

### 4.7.1 Sample

A convenience non-probability sample of 396 university students taken between July and September 2017 was used for this study. The students are between the ages of 18-31 that study BCom, BA, BSC, BTech, Diploma and are both male and female students. The questionnaires took no longer than 20 minutes and they were conducted under the relevant supervision of the lecturer for the participants' classes. To distribute the questionnaire, the relevant lecturers from the representing HEIs were contacted to gain permission for the distribution of the questionnaire in the class sessions that were available. The questionnaires were delivered to the relevant HEIs after gaining permission and were distributed in the session. The questionnaires were completed in a time period where the class was not disrupted.

## 4.8 RESEARCH APPROACH

There are three main categories of research approach when doing research methodology, these three categories are qualitative approach, quantitative approach as well as the mixed method approach (Kothari, 2004:33; Conrad & Serlin, 2011:147). The quantitative as well as the qualitative approaches should not be seen as completely different or contrasts, but rather as different ends of a continuum (Newman & Benz, 1998). In the middle of the continuum is the mixed methods research approach, because it has elements of both the quantitative and the qualitative approaches. The most common difference between qualitative and quantitative research is the use of words (qualitative) instead of numbers (quantitative) or applying close-ended questions (quantitative hypotheses), instead of open-ended questions (qualitative interview questions) (Creswell, 2009:25).

### 4.8.1 Qualitative research

Research that provides results that have not been done through a statistical analysis or any other means of quantification is known as qualitative research. Qualitative research can refer to the lives of individuals', what they have experienced, personal behaviours including emotions, as well as how they are socially and their organisational functioning (Strauss & Corbin, 1990). The role of qualitative methods in looking for and giving a reason is widely recognised within

a range of different epistemological approaches (Giddens, 1984; Layder, 1993; Lofland, 1995; Miles and Huberman, 1994). There is still a discussion whether causes of social phenomena can be truly found, as there has been research that argues that the cause and effect of social analysis can be speculative. They are in effect not measuring qualitative data but instead measuring a non-mathematical method of explanation, conducted for the purpose of discovering concepts and relationships in raw data and then arranging this into a theoretical explanatory scheme (Bilken & Bogdan, 1997). There are two main types of qualitative research, which are participant observation and in-depth interviewing. Participant observation data are gathered in a natural environment, which engages natural behaviour, whereas in-depth interviewing is an open-ended questionnaire that is used to get as many details as possible (Bilken & Bogdan, 1997).

Therefore, qualitative research can be categorised into various categories, which depend on the methodology used within the study (Quinlan, 2011; Creswell, 2013b). For the purpose of gaining a better understanding, study designs can be defined as exploratory research for the context of this study (Leedy & Ormrod, 2005). By conducting interviews to get non-numeric data, a small, non-representative sample of participants was used (Kumar, 2005; Leedy & Ormrod, 2005)

### 4.8.2 Qualitative research approaches

#### 4.8.2.1 Phenomenology

Phenomenological research is investigations into the structure of the world of humans, where there is experience in everyday situations and relations (Maree, 2016:77). Studies that focus on the meaning of certain experiences that have been lived and what they hold for participants are known as phenomenological studies and are used to determine what a specific experience means to an individual that has had the experience and the individual is able to give a comprehensive description of the experience (Moustakas, 1994:13). This type of research describes a meaning to many individuals of their experiences that they have lived, of a phenomenon or a concept. Phenomenology concentrates on describing what the participants have in common when experiencing a phenomenon such as grief, because grief is a universally experienced feeling. The main purpose of this type of research is to decrease individuals' encounters with a phenomenon to an explanation of the "very nature of the thing" (Van Manen, 1997:177). A phenomenon that is identified and data is collected is done by qualitative

researchers, this data are collected from the individuals that have had experiences with a specific phenomenon and are able to give a description of the experience for all individuals. The description that is given is made up of what the individual has experienced as well as how he/she has experienced it (Moutsakas, 1994). This type of qualitative approach is mostly used in the social and health sciences, but also in educational research (Maree, 2016:78).

#### 4.8.2.2 Narrative

In social sciences, narrative research is defined as a form of research where linguistic data is the centre to the work. The narrative researcher collects stories that describe individuals' lives and analyses and tells the story in a way of a narrative speech of the experience. The interpretation that occurs does not make narrative into fiction. The essence of one telling a story is an exercise in "sense-making" and is integral to the identity creation process (Mariano, 2000).

The narrative is not just the listening of events, but an attempt to link them both in the time and the meaning. The outcome of this is the adoption of a "personal myth" that seeks internal coherence but may or may not adapt to standards of external validity (Mariano, 2000). According to Jovchelovitch & Lofland (2000), the narrative is present in every age, in every place and in every society and can be written or in a visual text.

#### 4.8.2.3 Grounded theory

Grounded theory was developed as an approach that can substitute the positivist tradition. There have been many different types of grounded theory that have been documented. Even though there are multiple versions of the grounded theory, the one developed by Strauss and Corbin (1990) is most referenced. The aim of the grounded theory is to move past the explanation and to generate or discover theory (Strauss & Corbin, 1990). Strauss and Corbin (1998) state that this theory has been created through participants that have undergone the procedure or the phenomenon. The grounded theory has been derived from the study that the phenomenon represents. The grounded theory is discovered, created and provisionally validated across systematic data collection and is also analysed when it is related to that specific phenomenon, thus, data collection, analysis and theory stand in a mutual relationship with one other (Strauss & Corbin, 1990:23).

Grounded theory seeks to create a theory that is grounded by data that has been systematically gathered and analysed; this is the most common difference between grounded theory and other research methods. This method reverses traditional quantitative approaches by grounding theory in accounts and everyday life observations (Berg, 2007:15).

#### 4.8.2.4 Case study

Case-study research is an empirical inquiry that examines a current phenomenon in its real-life perspective when the limits between phenomenon and context are not visibly clear and in which various sources of proof are used (Yin, 1984:23). Case-study research excels at bringing us to an understanding of a complicated issue or object and can broaden experience or add strength to what is already understood through previous research (Soy, 1997). This type of method uses numerous data collection methods and techniques for analysis. It gives researchers opportunities to triangulate data to be able to strengthen the findings in the research as well as their conclusions; throughout the interpretation as well as the analysis procedure, the researcher continues to be open to new prospects and insights. The approach used in analysis reassures researchers to go further than the initial impressions to enhance the likelihood of findings that are reliable and accurate (Maree, 2016:107). Case-study researchers need to spend time communicating with individuals taking part in the research. The report would involve lessons discovered or patterns found that are related to theories (Quinlan, 2011: 184).

### 4.8.3 Quantitative research approach

In quantitative research, an empirical process is used, which implies that the theory is the starting point for formulating a hypothesis that will be examined in research. The conclusion of this process says something about the theory that was analysed (Creswell, 2008). Quantitative research can be used to investigate scientific domains and make use of an inductive approach as well, while in qualitative research, existing theory can be used more deductively as a background to see whether it applies to other settings or contexts (Brewer & Albert, 1990). Quantitative research is, therefore, a way to test objective theories by studying the relationship between variables. Instruments can be used to measure these variables for numbered data to be analysed by the use of statistical procedures (Creswell, 2008). Similar to qualitative researchers, the ones who participate in this form of inquiry have theories about

testing theories in-depth, building in protections against bias, controlling for alternative explanations and being able to generalise and replicate the findings (Creswell, 2009).

According to De Vos *et al.* (2011b), quantitative researchers collect numerical data and use tools such as questionnaires; statistical procedures are then used to analyse this numerical data. The results that are found with quantitative studies provide answers to questions in regard to the what, who, when, where and the how of the issue (Grimes & Schulz, 2002). The main differences between the two types of studies (qualitative and quantitative) will lie with the research type, data collection method, forms of the data, analytical objectives and size of the study's sample (Creswell *et al.*, 2003a; Mack *et al.*, 2005:2). Mixed methods have been popular because the researchers discovered that there is a need to have both types of elements combined (Kumar, 2005; Bergman, 2008; Monette *et al.*, 2013).

**Table 4.1: Different quantitative research approaches**

| QUANTITATIVE RESEARCH APPROACHES | MAIN CHARACTERISTICS | SOURCE |
|---|---|---|
| **Descriptive** | • The variable or the phenomenon is investigated in its present state of existence.<br>• The main objective is to find a link between the variables.<br>• This means that the classification of elements that fall part of a specific phenomenon or variable is built on an observational basis or the study of the link between two or more variables.<br>• The collection of data is usually observational and with the data that is collected, the hypothesis is developed. | Hopkins (2000:1); Maree and Pietersen (2007:152) |
| **Correlational** | • Find and describe using statistical analysis the relationship between two or more variables | Maree (2016:207) |

| QUANTITATIVE RESEARCH APPROACHES | MAIN CHARACTERISTICS | SOURCE |
|---|---|---|
| | • Descriptive research design can be compared to it.<br>• It does not examine cause and effect but the method for data collection is observational because it will identify trends and patterns.<br>• This approach is non-experimental because variables can only be examined and grouped when they are in their natural occurrence and there were no manipulations applied. | |
| **Casual comparative** | • Two or more variables that are independent and have occurred are compared by the researcher.<br>• The way in which the dependant variable influences the independent variable is examined.<br>• Describes the cause and effect connections between the variables. | Creswell (2014:12) |
| **Experimental** | • Examines the particular treatment in the study and then evaluates the result of the treatment. | Creswell (2014:12) |

### 4.8.4 Mixed methods

The mixed-method approach merges or associates quantitative as well as qualitative forms. The mixed-methods approach involves the use of quantitative as well as qualitative approaches to a study and contains philosophical assumptions. The mixed-method approach collects and analyses both kinds of data, but also uses both approaches together to have strong results and the research is subsequently better as it doesn't just have the qualitative or quantitative research

(Creswell & Plano Clark, 2007). The reason for the increase in the use of this type of method is argued by Greene (2008) by stating that mixed-method studies have the probability to be able to capitalise on the strengths of quantitative and qualitative study designs.

Azorín and Cameron (2010) state that mixed-method research can be put into two categories, namely fixed and emergent. Studies that have both quantitative and qualitative phases are known as fixed method studies because these are pre-determined procedures that are planned and also applied accordingly (Creswell *et al.*, 2011). A study that delivers findings that are inadequate usually includes a second phase, which is known as an emergent mixed-method study (Morse & Niehaus, 2009).

#### 4.8.4.1 Different mixed method approaches

There are four main types of mixed-method approaches, namely exploratory, explanatory, trianggulation and embedded (Maree and Creswell, 2016:210). The main characteristics of the mixed-method approaches are discussed in Table 4.2.

**Table 4.2: Mixed method approaches**

| MIXED METHODS APPROACH | MAIN CHARACTERISTICS | SOURCE |
|---|---|---|
| **Triangulation** | • This is the most familiar mixed-method design.<br>• Quantitative as well as qualitative methods are applied by the researcher for the same amount of time and have the same weight to be able to get the best understanding of the phenomenon that is being investigated.<br>• Quantitative and qualitative data are separated during collection and analysis.<br>• It is more efficient and less time-consuming. | Morse (1991:122); Maree & Creswell (2007:62) |

| MIXED METHODS APPROACH | MAIN CHARACTERISTICS | SOURCE |
|---|---|---|
| | • To simultaneously collect and analyse both data sets, a lot of skill is needed. | |
| **Explanatory (sequential design)** | • This design begins with the application of a quantitative phase that builds up to the consecutive execution of a qualitative phase.<br>• The researcher is assisted by the qualitative phase by the analysis and the explanation from the discoveries of the primary quantitative phase.<br>• It is valuable to use this method when researchers need to form a group that is based on the results from a quantitative analysis. | Morse (1991:120); Creswell (2007:76) |
| **Exploratory** | • In contrast the explanatory sequential design, begins with the application of a qualitative phase to be able to explore a specific phenomenon.<br>• To test the extent of a phenomenon, a quantitative phase is applied to generalise the results of the original qualitative phase.<br>• Explaining, compiling and reporting is easy.<br>• This method is time-consuming before being able to be applied in practice. | Creswell *et al.* (2003:209). Fouche (2011:441). |

| MIXED METHODS APPROACH | MAIN CHARACTERISTICS | SOURCE |
|---|---|---|
| **Embedded design** | • The embedded design happens when both quantitative and qualitative data are gathered (and analysed) within a quantitative and/or qualitative traditional study.<br>• The design that is embedded can happen in two ways, namely the qualitative phase is added to the quantitative study (e.g. experiment) or a quantitative phase can be added to a qualitative study (e.g. case study). | Creswell and Plano Clark (2007:67); Creswell (2014:16). |

Source: Authors compilation

### 4.8.5 Research method applied to the study

A quantitative research method approach was used in the study where a positivist paradigm was utilised, as the theory behind the data were supported through research previously done at the North-West University, Vaal Triangle Campus in South Africa. Provision needs to be made when using the quantitative research approach because systematic and objective collection of information from a representative sample by means of a hard copy questionnaire can be made (Creswell & Plano Clark, 2011:31). An essential research method is the quantitative research approach as it investigates the phenomenon or variable in its current state of existence (Williams, 2007:66). The positivist paradigm main objective is to be able to predict results, test theories and to determine the association between variables or the relationship of cause and effect (Creswell, 2014:6; Patel, 2015:1).

## 4.9 DATA COLLECTION METHODS

As stated by Checkland & Holwell (1998), data is an illustration of facts, concepts or instructions in a manner that is formal and that is appropriate for communication, interpretation or processing by individuals or by automatic means. Data are facts that are gathered from

observations or recordings about occurrences, objects or individuals (Clare & Loucopoulos, 1987:2). Data are seen as the raw material of organisational life and comprises of disconnected numbers, words, symbols and syllables that are related to process and events of business (Martin & Powell 1992:10).

### 4.9.1 Qualitative data collection methods

Collecting qualitative data entails gaining permission, executing a good qualitative sampling strategy, creating a means for recording data, saving the data and forestalling any ethical concerns that can happen (Creswell, 2012:331; Quinlan *et al.*, 2015:16). Various researchers (Ritchie & Lewis, 2003; Mack *et al.*, 2005; Cooper & Schindler, 2014) have stated that the data collection methods in qualitative studies that are mainly applied are observations and interviews.

#### 4.9.1.1 Qualitative observations

The process of obtaining observations and field notes concerning the behavioural patterns and activities of people, as well as events and objects as they develop are known as qualitative observations (Angrosino, 2007; Creswell, 2013a). It was also discussed by Creswell and Plano Clark (2011:1029) that reflective notes concerning themes, emerging codes and concerns that arise during the observation are chronicled by the observer. Normally, an observer is involved, to a certain degree, in what they are observing (Creswell, 2012:375). Daymon and Holloway (2010:262) believe that observations are subdivided into four different categories, which are mentioned and briefly discussed in Table 4.3.

**Table 4.3: Different types of observations**

| TYPE OF OBSERVATION | DESCRIPTION |
|---|---|
| **Complete participant** | The researcher is included and participates completely among the individuals, subject to the observation. |
| **Participant as observer** | The researcher partakes in the task to obtain data from a subjective point of view. Nonetheless, when the researcher is incorporated within the |

| TYPE OF OBSERVATION | DESCRIPTION |
|---|---|
| | task itself, this type of observation can create a disturbance in gathering and recording data in a suitable way. |
| **Observer as participant** | The researcher is precluded from participating in the group being observed. Field notes are taken by the researcher. The data is collected without the researcher's influence on the activity being studied or direct contact with individual participants. |
| **Complete observer** | The individuals being studied neither see nor notice the observing researcher. |

Source: Author's compilation.

Researchers usually gather data that determines the intensity, frequency and duration at which these behaviours are observed; it is referred to as structured observation (Bentley *et al.*, 1994:5). These structured observations comprise of an observation list, which is utilised in conjunction with a fixed number of points (Bentley *et al.*, 1994:5). The observation list is then applied according to a number of pre-determined situations or individuals (Blandford, 2013). Unstructured observations, in contrast, have an unorganised nature and are normally applied when researchers wish to obtain an understanding of behaviours in both a socio-cultural and physical context (Creswell, 2012). Researchers have the option to either implement a structured observation or an unstructured one on the basis of the study's nature (Mulhall, 2003:306).

Like any other method of collecting data, the method of observing may present some challenges. Carson *et al.* (2001) discuss that these challenges may involve determining the type of observation role that the researcher is going to undertake through the duration of the study accurately quoting recordings and remembering to take field notes. Creswell (2012:376), however, believes that the ability to change a role during an observation lies with a good qualitative observer. Simply put, a researcher may begin by observing in a non-participant role and subsequently progress into a participant role and vice versa.

#### 4.9.1.2 Interviews

The aim of a qualitative interview is to see a scenario or situation from the participant's perspective, which can be an important source of information if they are interviewed appropriately. The main objective of qualitative interviews is to achieve rich illustrative data that will help the researcher to understand the participant's structure of knowledge and social reality (Maree *et al*. 2016). The researcher obtains information during the interviews through a direct exchange with individuals or a group of individuals of that observation or study (Greeff, 2011:342). Qualitative interviews are defined by Sewell (2001) as an effort to understand the world from the participant's point of view in order to comprehend the meaning of the experiences that individuals have. Qualitative interviews can be subdivided into two groups, namely focus groups and individual interviews (Kaplowitz & Hoehn, 2001; Creswell & Plano Clark, 2011:305).

Unstructured interviews usually take a conversation style where the participant's views, attitudes, beliefs and ideas are explored by the researcher. These types of interviews are often done over a certain period (Maree, 2016). In order to establish what an individual's opinions, perceptions, forecasts and facts are, this type of interview is used (de Vos, *et al*. 2002). As social interactions, interviews allow meaning to be necessarily negotiated between several selves (Collins, 1998:3, 5). As all unstructured interviews are performed with the lack of any prior information, experience or opinions on the research matter, it requires a format and it must also follow a process. Experts in the field, as well as the selected participants, should review the questions considering its preparation (de Vos, *et al*. 2002). Mason (Collins 1998:1) considers it to be beneficial to discuss data generation than data that are collected. Enough flexibility needs to be maintained in order to produce stories of individuals while collecting data that has enough consistency to make a comparison between and among subjects available, as this is one of the main challenges in unstructured interviews (May, cited in Morse, 1991:192).

Semi-structured interviews, also known as focus groups, are used by researchers in interviews to obtain detailed explanations of the beliefs and perceptions of a participant or accounts of a certain topic (De Vos *et al*. 2002). This type of interview process has certain open questions and are followed by questions that can clarify the story (Maree, 2016). In this interview process, the participant is considered the expert and should be granted maximum opportunity to share his/her story (Smith *et al*., 1995:9-26). Questions in this process are mostly open-ended and

the researcher should formulate questions, which he thinks are appropriate and relatable to each interested issue (Smith *et al*., 1995:14,16). The researcher should have a set of pre-established questions that can be used as an instrument when engaging with participants (Holstein & Gubrium, 1995:76). As quoted by Krueger (Kingry *et al.*, 1990:124), a focus group can be defined as obtaining views on a defined area of interest in a liberal and unthreatening environment using a carefully planned discussion. As a research technique, focus groups can be used to collect data through group communication on a topic decided by the researcher (Morgan 1997: 6). To understand how people, think or feel about a particular issue, product or service, interviews such as these are done in groups (de Vos *et al.* 2002). Preceding the development of more quantitative measures, focus group interviews can be used to validate and construct (Kingry *et al.*, 1990:125). Semi-structured interviews allow the researcher to investigate the different views in a particular area that is of interest (Nyamathi & Shuler, 1990:1282).

In structured interviews, the questions are comprehensive and prepared beforehand, similar to survey research. The person interviewing controls the tempo of the interview and by doing this the questions are consistent and straightforward. The participants taking part get identical set of questions that are asked in the same sequence and order by the same interviewer (Maree, 2016). There is very little room for variation in the participant's response, apart from an infrequent open-ended question being asked.

### 4.9.2 Quantitative data collection methods

Numerical measurements are used by quantitative data collection methods to focus on the empirical objectives of the study (Zikmund & Babin, 2013:134). It was stated by Delport and Roestenburg (2011:171) that structured observations, structured interviews, questionnaires, scales, indexes and checklists form part of numerical measurement methods. Marais (2013:56) states that observations and surveys are two primary methods of data collection used in quantitative studies.

#### 4.9.2.1 Quantitative observation

A structured observation, according to Zikmund and Babin (2013), is a method of collecting data where there is no communication or questioning between individuals being observed. Researchers would rather record the information they have obtained from their observations, which surround unfolding events or use to their advantage internet activity records or record

information scanners (Zikmund & Babin, 2013:236). To collect data, quantitative studies make use of structured observations (Delport & Roestenburg, 2011:182). Structured observations are known as systematic data collection methods, allowing numerical data from observations to be created by researchers (Cohen *et al.*, 2013). Malhotra (2010:237) believes that there is much criticism surrounding observation methods, due to obtained data being biased. This is a result of gathered data which is obtained by researchers without them being aware of the individual's attitude, purpose or preferences (Marais, 2013:56). Eventually, the collected data resulting from the observation method are deemed subjective (Delport & Roestenburg, 2011:182). Thus, instead of the observation method being utilised independently, it should rather be applied to support surveys (Malhotra, 2010:237).

#### 4.9.2.2 Checklists

A survey that uses a series of items is known as a checklist. The respondent must describe which is most suitable to them in the situation they are in. When the type of checklist forces an individual to decide between two aspects that would normally contradict each other, it is known as the forced-choice checklist (de Vos, 2002).

#### 4.9.2.3 Indexes and scales

Both ordinal and interval measures of a variable are produced by indexes and scales. They are both composite measures of a variable, which is established on more than one item of data (Babbie, 2001:150). A focal difference is shown in the way they are individually formed according to their attributes. Scales are normally compared to indexes as non-paralleled, as scales regard the intensity which unique items imitate the variable being determined and presented with more knowledge than index sources (Hudson,1981a: 133; Babbie, 2001: 150). Neumann (2000:182) suggests that a scale is quantified by a researcher according to a variable's durability, rigidity or effectiveness.

#### 4.9.2.4 Questionnaires

The new dictionary of social work (1995:51) defines questionnaires as a "set of questions on a form which is completed by the respondent in respect of a research project". The questions can be open or closed. Questionnaires can be used in a variety of ways, but must not be confused with research interviews, for which research interviews schedules are required (Snyman 1984: 83-88). The design of a questionnaire is extremely important as it is the instrument with which

data is generated. Questionnaires that are different, require different kinds of surveys (Snyman 1984: 83-88); the design of a good questionnaire is when the researcher keeps in mind the following:

- The questionnaire's features
- The sequence of questioning
- Phrasing or language
- Categories of response.

The questionnaire that was used to gather initial study data was brief and the questions were clear to ensure that they were succinct and simple to adhere to (Quinal *et al.*, 2015:273). Steps were taken to guarantee that the question phrasing in the questionnaire was suitable and that language use was kept simple in order to accommodate individuals whose first language is not English (Pallant, 2007:10). This questionnaire can also be completed within 20 minutes, which means that the questionnaire was designed to be less time consuming for the students.

#### 4.9.2.4.1 Questionnaire format

The type of questionnaire will influence what format it will be, where it will be done, as well as who will participate in the questionnaire. A covering letter should supplement all questionnaires. The covering letter should be indicative of how the respondent's participation in the investigation began. The name, address and telephone number of the researcher, or of a contact person, must appear on the covering letter so that the researcher can be contacted (de Vos, 2002:176). A brief explanation of the study's objective must also be provided to facilitate and encourage respondents in order to encourage respondents to cooperate with the analysis (Baker, 1988:172). Babbie and Rubin (2008) believe the importance of the questionnaire's format is as crucial as the nature and wording of the questions.

According to De Vos (2002), open questions are questions in which the respondent is given the opportunity to write in the space provided with the question. Normally, more open questions can be analysed in questionnaires used in pilot studies and later given as closed questions. As stated by McDaniel and Gates (2010:201), the use of structured questions is useful in self-administered questionnaires. While in unstructured questionnaires, questions are open-ended and allow the participant's answer to be provided in the open space contained in the questionnaire (Malhotra, 2010:333). According to de Vos (2002), closed questions offer

the respondent the chance to select more than one option provided to them. The closed questionnaire is beneficial when a considerable amount of knowledge and information concerning a subject are present and the response options are comparatively recognised. Other benefits to closed questions are the respondent's better understanding of the meaning of the question and the comparison between one another (Schuerman, 1983:151).

#### 4.9.2.4.2 Pilot testing of the data collection methods:

The pilot study's purpose is to enhance the investigation's effectiveness and success, room for the data collection method's criticism as well as comments by the respondents must be given. The pilot study needs to be done in the same environment and manner that the main investigation will be done (De Vos *et al,* 2002). Babbie (2001:250) expressed that no matter how much care is taken to design the data collection method, the certainty always exists in that there may be possible error and that the best way to protect one against such error is by pretesting the instrument.

#### 4.9.2.4.3 Pre-testing interview questions

Pre-testing interview questions assist in ensuring that questions are comprehended in a way that it was intended (Shukla, 2008:91; Silver *et al.,* 2013:149); thereby, identifying, correcting and eliminating any potential obstacles that might occur (Churchill & Iacobucci, 2010). Correspondence or telephonic contact do not hold as much value as personal interviews with experts. Interviews should be conducted with a background of that broad perspective (de Vos *et al*, 2002). According to Parasuraman (1991:397), participants who are being used to pre-test should possess similar characteristics to those who the study is intended for.

#### 4.9.3.4.4 Pilot testing questionnaires

Rubin (1983:275-276) places emphasis on the wording of the questionnaire as it can significantly influence the respondent's reactions. It can be effectively indicated by the pilot study whether a specific question or the total questionnaire is worded correctly. Churchill (1995) suggests that pilot tests assist in estimating the questionnaires performance under actual circumstances and situations. Data are obtained during a pilot test, from a small group of participants who share similar characteristics to be used in the actual study (Quinlan, 2011). Malhotra (210:346) states that sample sizes differ from 15-30 participants in terms of pilot testing.

A sample of 13 postgraduate students was used to pilot the self-administered questionnaire. During the questionnaire's completion, these individuals were asked to notify the researcher of any difficulties experienced. The postgraduate students stated that some questions were difficult to interpret, this was amended.

## 4.10 QUESTIONNAIRE LAYOUT AND CONTENT

The questionnaire includes the following sections:

### Section A: Demographic information

The main objective of this section was to locate the demographics of the individuals. The characteristics that were included were age, sex, nationality, as well as race. The participants also had to fill in the field of study that they are enrolled in, as well as their academic year.

### Section B: Savings and investment

This section aimed to find out if the participants are able to save or invest with the money that they are currently earning as a salary or their monthly allowance.

### Section C: Investment instruments

This section follows from Section B. If the participant had selected that they invest, they were asked what instruments they invest in and what per centage of their monthly income is used for this purpose.

### Section D: Grable and Lytton's risk tolerance scale

The risk tolerance scale of Grable and Lytton (1999) was used to test the student population's risk tolerance and was contained in the questionnaire. 13 items that include multiple-choice questions were provided for in this scale. Ratings were assigned to each multiple-choice question. Unfortunately, the scale did not contain the same number of multiple-choice rated options. Three important factors, investment risk, risk comfort and experiences as well as speculative risk were covered by the 13-item financial risk tolerance scale (Grable & Lytton 1999:177).

### Questionnaire administration

In order to obtain the data needed from the participants, the self-administered questionnaire was used. The following points were briefly explained and contained in the cover letter, which was affixed to the questionnaire:

- the study's purpose;
- the ethical clearance of the study;
- the data's voluntary participation and the confidentiality;
- the researcher's' consent to use the data; and
- the questionnaire's completion instructions.

## 4.11 SECONDARY DATA ANALYSIS

Secondary data analysis was applied in this study. Data that were collected and analysed previously are known as secondary data; it is also data that a researcher had no direct control over or had any involvement in (Walliman, 2006:52). This type of analysis is valuable because it provides an opportunity for the data that has not been analysed fully to be used and to bring a different perception to the data that exists already and to be able to execute the research questions that the researcher collected with the primary data (Ritchie & Lewis, 2003:61). When researchers begin their research, they should first determine if the source and quality of the primary data are reliable (Salkind, 2000:190). Quantitative and qualitative studies can be used with secondary data analysis. Content analysis is performed with qualitative studies on the material that already exists. A sampling technique is used to be able to do this, by using this technique, it extracts the main themes from all the existing data that regards a specific research phenomenon (Strydom & Delport, 2011:384).

An existing data set can also be used in quantitative studies to reanalyse the data with different statistical measures to answer the questions that are most relevant to the research (Strydom & Delport, 2011:384). Both these ways are considered to be a part of the secondary data analysis. Table 4.4 discusses the secondary data application used in the study. The data that was used for this secondary data analysis was obtained in 2017 for an MCom in Risk Management by Mesenya and is, therefore, considered appropriate for use as most of the students stated that they do not know how to invest and they do not know how to start investing. Therefore, there was a gap in the research to construct an investment framework based on the student's risk tolerance levels.

### 4.11.1 Process of secondary data analysis

There are six steps to be applied when a researcher utilises secondary data analysis during their study, according to Grinell and Johnston (2014:520). These six steps include formulating the research problem, formulating the research questions, conducting a pilot study, reprocessing the data, analysing and interpreting the data and writing a report on the findings.

**Step 1: Formulating the problem**

When using secondary data analysis, existing data sets should not be used as they already exist, even though it is convenient and inexpensive (Strydom & Delport, 2011:384). It is important for the researcher to plan the problem before analysing the data (Patton, 2002:293). When the data set is determined, the researchers' problem should be completed as the researcher will enhance the process as they move along (Strydom & Delport, 2011:384).

**Step 2: Formulating the research questions**

The research questions should be the goals and objectives of the study relating to the hypotheses; once the research problem has been formulated, the questions should be devised. The final step in formulating the research questions will be for the researcher to clarify the nature and scope of the study and implement the pilot study.

**Step 3: Conduct a pilot study**

The researcher should have discussions with experts to see if the subject that was envisioned will contribute to the field of study. It is essential that the researcher understands what the existing theory around the study is, as well as what the existing data around the study is and whether or not it would benefit to answer the research questions and problems.

**Step 4: Reprocessing the data**

Once the above-mentioned steps have been completed, the current dataset should be analysed. This is important as it should be valid and reliable for the use of the study. The reprocessing of data occurs when the researcher identifies the variables that need to be investigated from the current dataset. All data is not necessary when the reprocessing of data transpires in the secondary study, therefore, for the data to fit in the secondary analysis it should be reduced.

**Step 5: Interpreting and analysing the data**

The researcher must ensure that the data responds to the articulated research questions once the reprocessing of data is complete. Identifying relationships to new hypotheses occurs when the secondary data is compared to that of other studies and the original.

**Step 6: Write a report**

The results of the secondary data analysis should be reported to be able to substantiate and verify the study and the field of research.

**Table 4.4: Application of secondary data analysis steps**

| PROCESS OF SDA | APPLICATION OF SECONDARY DATA ANALYSIS |
|---|---|
| Step 1: **Formulate the problem** | Investor risk tolerance affects the way that investors invest. Demographics, religion, age and sex all play a part in this. There are not enough studies that contribute information to investors from different demographics, age, sex and religion know where to invest and which portfolio would be the best to invest in. |
| Step 2: **Formulate the research questions** | **Research question based on primary objective:** An investment framework for students, based on their demographics and risk tolerance, is the primary objective of this study |
| | **Research questions based on theoretical objectives:**<br>• Contextualise the investor lifecycle and asset classes;<br>• Explore current investment options for South African students;<br>• Contextualise risk tolerance and its components;<br>• Identify the demographic variables that influence risk tolerance; |
| | **Research questions based on empirical objectives:**<br>• Determining risk tolerance levels pertaining to university students in the Vaal Triangle region;<br>• Determine the influence of demographics on risk tolerance levels pertaining to university students in the Vaal Triangle region; and<br>• Determine whether the risk tolerance levels differ subjectively or objectively |

| PROCESS OF SDA | APPLICATION OF SECONDARY DATA ANALYSIS |
|---|---|
| | for students in the Vaal Triangle region.<br>• Construct a theoretical investment framework based on student demographics and their risk tolerance level. |
| Step 3:<br>**Conduct a pilot study** | The researcher familiarised himself with the literature that was previously written surrounding risk tolerance and risk profiling. An analysis on investor wellbeing was done, which consisted of the following aspects: age, sex and demographics. A gap in the literature was identified by the researcher as there was no literature, to the knowledge of the researcher, on what different investment demographics such as age, sex, religion and risk tolerance level could invest in. Two existing data sets were considered and the most suitable one was utilised for the research problem of the study. The one used by Masenya (2017). |
| Step 4:<br>**Reprocess the data** | The data was then analysed by the researcher with help from a statistician. The data set was considered to be effective and reliable. The data was examined thoroughly and was lowered in order to fit the secondary data analysis. This meant that all the data from the initial questionnaire was not used (Addendum 4.1 was applicable for this study). The only information that was regarded as valid for the study was the information concerning the investors' demographics, financial well-being and risk tolerance. |
| Step 5:<br>**Analyse and interpret the data** | The statistician, researcher and the risk specialist came to the conclusion that the reused data set answered the formulated research questions. The findings are examined and understood in the correct manner using a statistical analysis that is deliberated on in Section 4.4.4. Furthermore, the results of the secondary data analysis are compared to other studies that are similar to this study. |
| Step 6:<br>**Write a report** | The findings and results are reported on in Chapter 5. |

Source: Author's compilation.

### 4.11.2 Statistical analysis for secondary data analysis

The science of collecting, exploring and presenting large amounts of data is known as statistical analysis in order to find fundamental patterns and trends. Statistical analysis is utilised in everyday scenarios – in governments, research as well as industry – to become more scientific about choices that need to be made (Smith, 2019:1). IBM statistical package for the social sciences ™ (SPSS) Version 25 (IBM SPSS, 2018) was applied to analyse the data of this study. The following section shows the statistical methods that were applied during this study.

## 4.12 RELIABILITY AND VALIDITY

In research, reliability means consistency: if the data has been run five times, you should be getting the same results every time. Whereas, validity in research is defined as a measurement that is supposed to tests that it is valid and reliable (Stephanie, 2016). Reliability is the measure of stability or consistent test score, this can also be thought of as the ability for a test or research findings to be repeatable (Stephanie, 2016). To assess the reliability of the research that has been accepted, the measurements of high quality and reliability and validity were looked at (Cant *et al.,* 2005:234).

It is imperative that dependable and valid measuring instruments are applied to make sure that the results from the survey are trustworthy (Cant *et al.,* 2005: 234). Inefficient findings regarding a certain trend are led by reliability and validity not being tested (Struwig & Stead, 2010:130).

## 4.13 CODEBOOK

Codebooks are used by researchers to serve as a guide to coding responses and as a definition of the documentation. Data files generally have one line per observation, such as a record and each column usually contains a single variable, although one variable may span over several columns (Lavrakas, 2008:10). The most basic codebook illustrates the layout of the data in the data file and explains what the codes in the data set mean and helps record the values linked with the answer options (Lavrakas, 2008:12).

**Table 4.5: Codebook for questionnaire**

| QUESTION | CODE | VARIABLE | VALUE ASSIGNED TO RESPONSES |
|---|---|---|---|
| Question 1 | A1 | Age | N/A |

| QUESTION | CODE | VARIABLE | VALUE ASSIGNED TO RESPONSES |
|---|---|---|---|
| Question 2 | A2 | Gender | Male = 1; Female = 2 |
| Question 3 | A3 | Race | African = 1; White = 2; Coloured = 3; Asian/Indian = 4 |
| Question 4 | A4 | Marital status | Never married = 1; Married = 2; Divorced = 3 |
| Question 5 | A5 | Nationality | South African = 1; Other = 2 |
| Question 6 | A6 | Home province in SA | N/A |
| Question 7 | A7 | Home language | Sesotho = 1; IsiZulu = 2; Sepedi = 3; Tshivenda = 4; IsiNdebele = 5; IsiXhosa = 6; SiSwati = 7; English = 8; Afrikaans = 9; Tswana = 10; Tsonga = 11; Other = 12 |
| Question 8 | A8 | Degree | BA = 1; BCom = 2; BEd = 3; BSc = 4; BTech = 5; Diploma = 6; Other =7 |
| Question 9 | A9 | Year of study | 1st = 1; 2nd =2; 3rd/4th = 3; Hons = 4; MCom = 5; PhD = 6 |
| Question 10 | A10 | Current situation | Full-time student = 1; Part-time student = 2; Full-time student and part-time worker = 3; Part-time participants and full-time worker = 4 |
| Question 11 | A11 | Monthly income/allowance | R500 or less = 1; R501-R1000 = 2; R1001-R1500 = 3; R1501-R2000 = 4; R2001-R2500 = 5; R501-R3000 = 6; More than R3000 = 7 |
| Question 12 | A12 | Source of income/allowance | Allowance = 1; Bursary/Scholarship = 2; Salary (Part-time or Full-time job) = 3; Savings = 4 |
| Question 13 | A13 | Dependents | Yes = 1; No = 2 |
| Question 14 | A14 | Number of dependents | N/A |
| Section B: Saving and Investment | | | |
| Question | **Code** | **Variable** | **Value assigned to responses** |
| Question 1 | B1 | Saving | Yes = 1; No = 2 |
| Question 2 | B2 | Type of savings | Flexible = 1; Fixed-term = 2; Tax-free/call account = 3; Call deposit = 4; Other = 5 |
| Question 3 | B3 | Investing | Yes = 1; No = 2 |
| Question 4 | B4 | Reasons for not investing | Don't know where to start = 1; Lack of investment knowledge = 2; Too much effort = 3; Lack of time = 4; Investing is intimidating = 5; Other = 6 |
| Question 5 | B5 | Consider investing | Yes = 1; No = 2 |
| Question 6 | B6 | Percentage income would invest | 0%-5% = 1; 5%-10% = 2; 10%-25% = 3; 25%-50% = 4; 50% or more = 5 |
| Section C: Investments | | | |
| Question | **Code** | **Variable** | **Value assigned to responses** |

| QUESTION | CODE | VARIABLE | VALUE ASSIGNED TO RESPONSES |
|---|---|---|---|
| Question 1 | C1 | Type of investments | Money market account = 1; Government bonds = 2; Pension/Retirement annuity = 3; Stock/shares = 4; Derivatives (FOREX/ETFs) = 5; Investment club/group (e.g. *stokvel*) = 6; Other = 7 |
| Question 2 | C2 | Percentage income invested | 0%-5% = 1; 5%-10% = 2; 10%-25% = 3; 25%-50% = 4; 50% or more = 5 |
| Question 3 | C3 | Period invested | Less than 6 months = 1; 6 months = 2; 1 year = 3; more than one year = 4; 2-5 years = 5; 5 years or more |
| Section D: Investment risk perception | | | |
| Question | **Code** | **Item** | **Value assigned to responses** |
| Question 1 | D1 | 3, 7, 18, 11 and 24 | Extremely unlikely = 1; Moderately unlikely = 2; Somewhat unlikely = 3; Not sure = 4; Somewhat likely = 5; Moderately likely = 6; Extremely likely = 7 |
| Section E: 13-item Risk tolerance measure | | | |
| Question | **Code** | **Item** | **Value assigned to responses** |
| | | | Take substantial risk = 1; Take above average risk = 2; Take average risk = 3; Not willing to take risk = 4 |
| Question 1 | E1 | 1 | a = 1; b = 2; c = 3; d = 4 |
| Question 2 | E2 | 2 | a = 1; b = 2; c = 3; d = 4 |
| Question 3 | E3 | 3 | a = 1; b = 2; c = 3; d = 4 |
| Question 4 | E4 | 4 | a = 1; b = 2; c = 3; d = 4 |
| Question 5 | E5 | 5 | a = 1; b = 2; c = 3 |
| Question 6 | E6 | 6 | a = 1; b = 2; c = 3 |
| Question 7 | E7 | 7 | a = 1; b = 2; c = 3; d = 4 |
| Question 8 | E8 | 8 | a = 1; b = 2; c = 3; d = 4 |
| Question 9 | E9 | 9 | a = 1; b = 3 |
| Question 10 | E10 | 10 | a = 1; b = 3 |
| Question 11 | E11 | 11 | a = 1; b = 2; c = 3; d = 4 |
| Question 12 | E12 | 12 | a = 1; b = 2; c = 3 |
| Question 13 | E13 | 13 | a = 1; b = 2; c = 3; d = 4 |
| Section F1: Single-item risk tolerance measure | | | |
| Question | **Code** | **Variable** | **Value assigned to responses** |
| Question 1 | F | SCF | Take substantial risk = 1; Take above average risk = 2; Take average risk = 3; Not willing to take risk = 4 |
| Section F2: Subjective investment knowledge | | | |
| Question | **Code** | **Variable** | **Value assigned to responses** |
| | | | |
| Question 1 | G | 1, 2, 3, 4, 5, 6, 7, 8 and 9 | Extremely unlikely = 1; Moderately unlikely = 2; Somewhat unlikely = 3; Somewhat likely = 4; Moderately likely = 5; Extremely likely = 6 |

## 4.14 DESCRIPTIVE STATISTICS

Descriptive statistics, according to Quinlan *et al.* (2015:359), describe data such as age, gender, race, income, ratios, averages or standard deviation. Descriptive statistics' primary objective is to explain the data that was collected and can be classified into three categories:

- measure of central tendency;
- measures of dispersion; and
- measure of shape.

**Table 4.6: Categories of descriptive statistics**

| MEASURES | TECHNIQUES OF THE MEASURES |
|---|---|
| Measures of central tendency | **Mean:** Is the average value of all the observations, vulnerable outliers that are unique to a data set (Neuman, 2014:399). |
| | **Median:** Is the value that falls in the centre of the data set (Neuman, 2014:399). |
| | **Mode:** Is the value that appears the most in a data set (Neuman, 2014:399). |
| Measures of dispersion | **Range:** Is the value that is the difference between the maximum and the minimum values from the data set (Hair *et al*., 2013:272). |
| | **Variance:** The variance is reflected by the calculation of the mean square deviation of the total values from the mean (Chandra & Sharma, 2013:36). |
| | **Standard deviation:** Is a measure of how spread out the data set is and reflects variability (Chandra & Sharma, 2013:36). |
| Measures of shape | **Skewness:** Skewness is used to define the extent to which a distribution of a data set varies from a distribution of a normal data set (Struwig & Stead, 2010:159). |

| MEASURES | TECHNIQUES OF THE MEASURES |
|---|---|
| | **Kurtosis:** Kurtosis is a measure of the peak or flatness of the probability distribution of a real-valued random variable (Hair *et al*., 2013:272). |

Source: Author's compilation.

Descriptive statistics is interlinked with the frequency distributions and is generally applied to summarise the capturing of the data (Masenya, 2018:30). Ordinal and nominal scales allow for certain descriptive statistics to be performed. The nominal scales used in this study i.e. gender and race are descriptive statistics that include the frequency and mode of variables where the mode represented the most frequently occurring age, gender and race. (Quinlan *et al.*, 2015:107). Whereas the descriptive statistics or the ordinal scale (i.e. sources of information, SCF and risk tolerance) considered frequency, mode, median and range (Stevens, 1946:677).

Analysis of variance (ANOVA) is a collection of statistical models and their relationships with statistical procedures (McDaniel & Gates, 2007:502). ANOVA tests whether the mean scores of the groups are different from each other (Maree *et al*., 2011:229). Two important values are serviced using ANOVA, namely the F-value and the p-value, which are used to classify significant variations in statistical analysis (Remler & Van Ryzin, 2011:307). There are two kinds of ANOVA that can be classified; one-way ANOVA is where only one component is involved and two-way ANOVA where more than one component can be identified (Malhotra, 2010:531). A one-way ANOVA was carried out for this study to determine whether there were any statistically significant changes between the participants' risk tolerance levels, different demographic profiles and their financial literacy.

## 4.15 CORRELATION

Correlation is among the most used forms of data analysis, as reference is made to the statistical process used to establish whether two variables are related (Leedy & Ormond, 2010:273). Its main purpose is to determine the strength of the linear relationships amongst two quantitative variables, as well as measuring direction (Pallant, 2007:126). Furthermore, multiple measures of correlation can be applied, which include Spearman rank order (rho) and Pearson's product-moment correlation coefficient (*r*) (Struwig & Stead, 2101:140). There are also three types of correlational research, namely positive, negative and no correlation.

A positive correlation is when two variables are linking with the way they correlate, meaning if one variable decreases the other variable will decrease and subsequently if one variable increases the other variable will also increase (Bhat, 2019:1). A negative correlation is the contrast to positive correlation and it is when two variables are negatively correlated, this means that when one variable decreases the other variable will increase (Bhat, 2019:1).

A correlation coefficient of zero is when there is no linear relationship between the two continuous variables and indicates that it does not exist (Mukaka, 2012:1)

## 4.16 SYNOPSIS

Chapter 4 covered different types of research design and methodology, as well as which research design and methodology was applied. The chapter commenced with an introduction of the different paradigms and study designs that can be applied in various studies. Furthermore, the different research paradigms such as the positivist, post-positivism and pragmatism were discussed briefly. The different research approaches were also clarified, being the quantitative, qualitative and mixed-method research designs. The study used a quantitative research method approach, whereby a positivist paradigm is applied, as the theory behind the data was supported through research previously done at the North-West University campus and made used a secondary data analysis method.

The procedures for sampling and the strategies on the origin of the primary data were presented and discussed in detail, as well as the pilot testing of the questionnaire, data collection methods, the questionnaire administration and the preparation of the data. The purposive sampling method was used for the research by North-West University in the Vaal Triangle in order to obtain the final data for the research. The advantages and disadvantages were also presented pertaining to the secondary data analysis process, which assisted the researcher to analyse the self-administered questionnaire. The study focused on demographics, satisfaction with life, risk tolerance and physical activity. The results and findings within the study will be discussed in Chapter 5.

# CHAPTER 5: ANALYSIS AND INTERPRETATION OF EMPIRICAL FINDINGS

## 5.1 INTRODUCTION

Analysis and interpretation of the empirical findings are provided in this chapter. The demographic information of the participants is discussed first. A discussion of the various descriptive and inferential statistics applied in the study then follows. The aim was to achieve certain empirical objectives about a sample of university students in the Vaal Triangle region. The objectives were to:

- Determine risk tolerance levels pertaining to students in universities in the Vaal Triangle district;
- Determine how a change in demographics affects the risk tolerance level of a student that resides in the Vaal Triangle district;
- Determine the risk tolerance relationship of students based on gender and year of study;
- Determine the objective and subjective level of risk tolerance based on demographics; and
- Construct a theoretical investment framework based on students' demographics and their risk tolerance levels.

## 5.2 DATA GATHERING PROCESS

This study's data were derived from that of a previous study done by Masenya (2017). The primary data was collected through the distribution of 400 questionnaires to two selected higher education institutions. A total of 396 questionnaires were returned. The questionnaire consisted of 51 items, divided into seven sections: Section A – Demographic information; Section B – Ability to save and invest; Section C – Investment habits; Section D – Perception of financial risk; Section E - Grable and Lytton 13-item risk tolerance scale; Section F – One-item survey of consumer finance scale (SCF); and Section G - Financial knowledge. For this study, only the demographics section, risk tolerance section and the ability to save and invest were used.

## 5.3 DEMOGRAPHICS AND PARTICIPATION IN INVESTMENT ANALYSIS

The demographic characteristics of the sample are reported in this section. Characteristics of demographics such as socioeconomic demographics were applied to classify and to assist the

researcher to understand the results of the participants better. The information is represented in Table 5.1, after which descriptions of each demographic are discussed. The sample comprised of 396 participants from both a university of technology as well as a traditional university. As previously mentioned, the demographic information of the participants was gathered in Section A in the questionnaire.

### 5.3.1 SAMPLE DESCRIPTION

**Table 5.1: Demographics, investments and risk tolerance of participants**
*Characteristics of the participants (n=396)*

| Item | Category | Frequency | Percentage |
|---|---|---|---|
| Age | 20 years and younger | 117 | 29.6 |
| | 21-25 years | 256 | 34.8 |
| | 26-30 years | 17 | 4.3 |
| | Older than 30 years | 6 | 1.3 |
| Gender | Male | 169 | 42.8 |
| | Female | 226 | 57.2 |
| Race | African | 327 | 82.6 |
| | White | 54 | 13.6 |
| | Coloured | 12 | 3.0 |
| | Indian | 3 | 0.8 |
| Marital status | Single | 382 | 96.7 |
| | Married | 12 | 3.0 |
| | Divorced | 1 | 0.3 |
| Nationality | South African | 386 | 97.5 |
| | Other nationality | 10 | 2.5 |
| Home language | Sesotho | 127 | 32.3 |
| | isiZulu | 59 | 15.0 |
| | Sepedi | 21 | 5.3 |
| | Tshivenda | 23 | 5.9 |
| | isiNdebele | 4 | 1.0 |
| | isiXhosa | 23 | 5.9 |
| | SiSwati | 12 | 3.1 |
| | English | 33 | 8.4 |
| | Afrikaans | 42 | 10.7 |
| | Setswana | 28 | 7.1 |
| | isiTsonga | 18 | 4.6 |
| | Other | 3 | 0.8 |
| Qualification | BA degree | 66 | 16.7 |
| | BComm degree | 127 | 32.1 |
| | BEd degree | 62 | 15.7 |
| | BSc degree | 28 | 7.1 |
| | BTech degree | 10 | 2.5 |

| | | | |
|---|---|---|---|
| | Diploma | 99 | 25.0 |
| | Other | 4 | 1.0 |
| Year of study | First year | 84 | 21.4 |
| | Second year | 54 | 13.8 |
| | Third/Fourth year | 218 | 55.6 |
| | Honours degree | 29 | 7.4 |
| | Master's degree | 3 | 0.8 |
| | Doctoral degree | 4 | 1.0 |
| Study situation | Full-time student | 360 | 90.9 |
| | Part-time student | 1 | 0.3 |
| | Full-time student, working part-time | 30 | 7.6 |
| | Part-time student, working full-time | 5 | 1.3 |
| Monthly income | R 500 or less | 119 | 30.1 |
| | R 501 - R 1 000 | 99 | 25.0 |
| | R 1 001 - R 1 500 | 51 | 12.9 |
| | R 1 501 - R 2 000 | 51 | 12.9 |
| | R 2 001 - R 2 500 | 32 | 81.0 |
| | R 2 501 - R 3 000 | 16 | 4.0 |
| | More than R 3 000 | 28 | 7.1 |
| Source of income | Allowance | 229 | 58.0 |
| | Bursary/Scholarship | 115 | 29.1 |
| | Salary (Full- or part-time job) | 36 | 9.1 |
| | Savings | 12 | 3.0 |
| | Other | 3 | 0.8 |
| Number of dependents | No dependents | 317 | 81.3 |
| | 1-2 dependents | 55 | 14.1 |
| | 3-4 dependents | 15 | 3.8 |
| | 5 or more dependents | 3 | 0.8 |
| Investment type | Money market account | 15 | 3.8 |
| | Government bonds | 2 | 0.5 |
| | Derivatives (FOREX, ETFs) | 14 | 3.5 |
| | Investment club/group (Stokvel) | 5 | 1.3 |
| | Other types of investment | 5 | 1.3 |
| | Multiple types of investment | 9 | 2.3 |
| | Does not invest, would consider | 330 | 83.5 |
| | Does not invest, would not consider | 15 | 3.8 |
| Risk comfort and experience | Low-risk tolerance | 40 | 10.1 |
| | Medium risk tolerance | 327 | 82.6 |
| | High-risk tolerance | 29 | 7.3 |
| Speculative risk | Low-risk tolerance | 36 | 9.1 |
| | Medium risk tolerance | 219 | 55.3 |

| | | | |
|---|---|---|---|
| | High-risk tolerance | 141 | 35.6 |
| Investment risk | Low-risk tolerance | 34 | 8.6 |
| | Medium risk tolerance | 293 | 74.0 |
| | High-risk tolerance | 69 | 17.4 |
| Total risk tolerance (Grable) | Low-risk tolerance | 5 | 1.3 |
| | Medium risk tolerance | 355 | 89.6 |
| | High-risk tolerance | 36 | 9.1 |
| Risk profile | No risk | 73 | 18.4 |
| | Average risk | 169 | 42.7 |
| | Above-average risk | 111 | 2.8 |
| | Substantial risk | 43 | 10.9 |
| Reasons for not investing | Don't know where to begin | 105 | 31.5 |
| | Lack of investment knowledge | 121 | 36.3 |
| | Too much effort | 13 | 3.9 |
| | Lack of time | 22 | 6.6 |
| | Investing is intimidating | 18 | 5.4 |
| | Other | 54 | 16.2 |

Source: Author

#### 5.3.1.1 Age distribution of participants

Table 5.1 indicates the different ages of the participants that participated in the quantitative study. The majority of the participants that took the questionnaire were between the ages of 21 and 25 years old making up 34.8 per cent of the sample. 29.6 per cent of the sample were below the age of 21 and individuals 26 years and older made up 5.6 per cent of the sample.

#### 5.3.1.2 Gender of participants

The majority of the participants were females, which represented 57.2 per cent of the sample, with 42.8 per cent of the sample represented by males.

#### 5.3.1.3 Race of participants

As displayed in Table 5.1, 82.6 per cent of the population was African participants, White participants were 13.6 per cent of the sample and Indian and Coloured participants were 0.8 per cent and 3 per cent respectively.

#### 5.3.1.4 Marital status of participants

The demographics section of the questionnaire included questions on the marital status of the participants. Table 5.1 reveals that the majority of the participants were single (96.7 per cent), 3 per cent were married and 0.3 per cent were divorced. This result was expected as the selected sample represented university students.

#### 5.3.1.5 Nationality of participants

Table 5.1 shows that the majority of the students (97.5 per cent) are South Africans and only 2.5 per cent were from a foreign country.

#### 5.3.1.6 Home language of participants

The most common language spoken by students at the two universities is Sesotho, which represents 32.3 per cent of the participants, as indicated in Table 5.1. Thereafter, the second most spoken language was represented by IsiZulu with 15 per cent and isiNdebele with 1 per cent, followed by other languages that were not identified with 0.8 per cent.

#### 5.3.1.7 Degree participants are enrolled in

Table 5.1 shows the degree in which the participants were enrolled while participating in this study. This chart shows that the BComm degree had the most participants that were enrolled and represented 32.1 per cent of the sample, followed by 25 per cent of the participants that were enrolled for a diploma and 16.7 per cent for a BA degree.

#### 5.3.1.8 Year of study for participants

The third empirical objective was to determine the risk tolerance relationship of students based on year of study. Table 5.1 shows what academic year of study the participants were in during participation in this study. The majority (55.6 per cent) of the participants were in the final years of their undergraduate degree. This was followed by participants that were in their first year of study (21.4 per cent) and their second year of study (13.8 per cent). It also shows that just over 9 per cent were postgraduates.

#### 5.3.1.9 Monthly income and source of income for participants

In the last sections of the questionnaire, the focus was on the source of the income and how many dependants the participants had. As shown in Table 5.1, the majority of the participants (30.1 per cent) earn R500 or less per month. The participants that earn between R501 and R1000 made up 25 per cent of the sample and participants who earn between R1001 and R1500 and R1501 to R2000, each made up 12.9 per cent of the sample. Table 5.1 shows that the majority of the participants' income is received through an allowance (58 %) whereas 29.1 per cent receive an income through a bursary and/or a scholarship and only 9.1 per cent receive income from a full-time/part-time work.

#### 5.3.1.10 Number of dependents of participants

Table 5.1 indicates that the majority of the participants do not have dependents (81.3 per cent), whereas 18.7 per cent stated that they do have dependents. As indicated in Table 5.1, the number of dependents that the participants have are mostly limited to one to two (14.1%) and the other 4.6 per cent indicated that they had three or more dependants.

### 5.3.2 PARTICIPANT INVESTMENT HABITS

#### 5.3.2.1 Participants that invest and investment type

As shown in Table 5.1, only 12.7 per cent of the participants from the study's sample invest. This means that from the 396 participants that took part in the questionnaire, only 50 indicated that they are involved in investing activities and 86.9 per cent of the participants stated that they do not invest. Therefore, out of the 12.7 per cent of the participants that do invest, 30 per cent invest in money market accounts and 28 per cent said they invest in derivatives (FOREX, ETFs). This indicates that participants have two extremes; either low-risk investments, such as money markets or high-risk investments, such as derivatives. Additionally, 10 per cent of the participants invest in stokvels.

#### 5.3.2.2 Participants that are willing to invest

Table 5.1 shows that 83.5 per cent of the participants that do not invest, would want to invest in the future. Participants stated that the reason behind them not investing was due to them not knowing how or where to begin investing (31.5 per cent), as they do not have investment

knowledge (36.3 per cent) and do not understand the markets or that the markets are intimidating (5.4 per cent).

### 5.3.3 RISK TOLERANCE LEVEL OF STUDENT INVESTORS

Two measures were used, namely the 13-item risk tolerance scale by Grable and Lytton (1999) and the SCF single-item measure. To measure the risk tolerance from a multiple dimension, Grable and Lytton's (1999) 13-item risk tolerance scale were included. The multidimensional scale has 13 items that comprise of questions that are multiple-choice and range from 1 to 47. The scale was split equally into three groups to determine low, medium and high-risk tolerance. Ratings are assigned to the multiple-choice questions, although not all the scales have the same number of options for the multiple-choice or ratings allocated to them (Grable & Lytton, 1999:177). To measure the participants' risk tolerance and subjective approach, the SCF single-item measure was included by utilising a single-question self-report. The SCF risk tolerance item measures the individual's risk tolerance level through a single-question measure.

#### 5.3.3.1 Risk comfort and experience (Grable and Lytton)

The risk comfort and experience of the participants was also measured. Table 5.1 shows that most of the students have a medium risk tolerance level (82.6 per cent) followed by low and high-risk tolerance at 10.1 per cent and 7.3 per cent respectively.

#### 5.3.3.2 Speculative risk (Grable and Lytton)

In Table 5.1 it is shown that most participants have a medium risk tolerance when taking speculative risk into consideration (55.3 per cent). Furthermore, 35.6 per cent of the participants have a high-risk tolerance and 9.1 per cent have low-risk tolerance.

#### 5.3.3.3 Investment risk (Grable and Lytton)

In Table 5.1 it can be seen than most of the students have a medium investment risk tolerance level (74.0 per cent) followed by high-risk tolerance (17.4 per cent) and low-risk tolerance (8.6 per cent)

#### 5.3.3.4 Total risk tolerance (Grable and Lytton)

The total risk of the participants, which was measured using Grable and Lytton's 13-item risk tolerance scale, indicates that the majority of the participants had a medium risk tolerance with

89.6 per cent followed by high-risk tolerance with 9.1 per cent and low risk tolerance with 1.3 per cent.

#### 5.3.3.5 Risk profile (SCF risk tolerance)

It can be seen in Table 5.1 that 42.7 per cent of the participants indicated that they would be willing to take average investment risk as they would like to earn average returns. Thereafter, 2.8 per cent of the participants indicated that they would take above-average risk and expect to make average returns. This indicates that most of the participants are willing to take medium risks when they invest.

The two results from the 13-item scale and the single-item scale for measuring risk tolerance indicated that the majority of the participants have a medium risk tolerance level. Since the 13-item risk tolerance scale and the SCF scale have similar results and the 13-item risk tolerance measures risk tolerance from multidimensional levels, the results from both scales will be used throughout the rest of the study, similar to previous studies such as Ferreira (2019) and Ramudzuli (2016). This study states that participants have a medium risk tolerance level.

**Table 5.2: Descriptive statistics and reliability coefficients for risk tolerance, its factors and risk profile** (scales adapted to 1-20 for easy comparison)

| | Mean | Std. Deviation | Reliability |
|---|---|---|---|
| GL-RTS | 11.36 | 2.02 | 0.64 |
| GL-RTS – Risk comfort and experience | 10.31 | 2.12 | 0.34 |
| GL-RTS – Speculative risk | 13.07 | 3.84 | 0.22 |
| GL-RTS – Investment risk | 11.43 | 2.66 | 0.52 |
| Risk profile (SCF) | 13.43 | 4.48 | |

As seen in Table 5.2, the risk tolerance scale (GL-RTS) recorded a mean of 11.36 and a standard deviation of 2.02. With regard to the subsections of risk tolerance, speculative risk recorded the highest mean of 13.07 compared to risk comfort and experience of 10.31 and investment risk tolerance of 11.43. However, the highest standard deviation was also speculative risk (3.84). This was followed by investment risk (2.66) and then risk comfort and experience (2.12). From Table 5.2, it is seen that risk tolerance and its subsections show

positive values for skewness, which indicates a positive right-skewed symmetry of distribution. Risk profile recorded a mean of 13.43 and a standard deviation of 4.48, which is relatively higher than that of the risk tolerance scale.

Reliability measures the extent to which an instrument yields the same results over multiple trials. If the reliability is between 0.6 and 0.7 or higher, the instrument is considered reliable. It can be seen that risk tolerance reliability is 0.64, which is considered reliable. Speculative risk (0.22), investment risk (0.52) as well as risk comfort and experience were not considered reliable.

## 5.4 CORRELATION ANALYSIS

Correlation analysis is a statistical procedure that measures the strength and direction (positive or negative) of the relationship between two variables (Pallant, 2007:101). Pearson correlation coefficient was calculated to measure the relationship between individual investors' subjective risk tolerance that was measured by means of the SCF, actual risk tolerance that was measured using the GL-RTS. A positive correlation specifies that when one variable increases, the other variable should increase. However, when there is a negative correlation, this indicates that when one variable increases, the other variable tends to decrease (Privitera, 2012:473). The main difference between the Pearson and Spearman correlation analysis is that the Spearman correlation can also be used when the assumptions of the Pearson correlation are markedly violated (Leard Statistics, 2019:1. The analysis evaluated whether the risk tolerance levels were influenced by whether a person was male or female or his/her year of study. The results concluded that gender could have some influence on three of the factors, which are risk comfort and experience, speculative risk and investment risk and year of study only influenced investment risk. Table 5.3 shows the two demographics and the Grable and Lytton (1999) 13-item risk tolerance scale.

**Table 5.3: Students gender and year of study influence on Grable and Lytton (1999) 13-item risk tolerance scale and SCF**

| | | Gender | Year of study |
|---|---|---|---|
| 1. | Grable risk tolerance | -0.12* | 0.04 |
| 2. | Risk comfort and experience | -0.04 | 0.01 |

| | | | |
|---|---|---|---|
| 3. | Speculative risk | -0.03 | 0.13* |
| 4. | Investment risk | -0.18** | -0.03 |
| 5. | Risk profile SCF | -0.12* | -0.05 |

Significance level is at *p<0.05 and **p<0.01

### 5.4.1 Risk tolerance factors and SCF

Table 5.3 provides the relationship for gender and year of study with the different factors of the Grable and Lytton 13-item risk tolerance scale and the SCF to see if the factors are actually related to the gender or the year of study to the person. Gender displayed no relationship with risk comfort and experience (-0.04) and speculative risk (-0.03). Although there was a relationship with Grable total and risk profile (SCF) with gender at a significance level of 0.05 and it was also significant with investment risk at 0.01. No particular relationship was identified between the student's year of study and his/her level of risk tolerance.

**Table 5.4: Students gender and year of study correlation comparison with SCF and Grable and Lytton (1999) 13-item risk tolerance scale**

| | | Male | Female | First and second year | Third/fourth year | Post-graduate |
|---|---|---|---|---|---|---|
| 1. | Risk profile SCF with Grable risk tolerance | 0.33** | 0.17* | 0.20* | 0.27** | 0.33* |
| 2. | Risk profile SCF with risk comfort and experience | 0.31** | 0.12 | 0.22* | 0.20** | 0.34* |
| 3. | Risk profile SCF with speculative risk | 0.15* | 0.08 | 0.08 | 0.16* | -0.02 |
| 4. | Risk profile SCF with investment risk | 0.28** | 0.17* | 0.15 | 0.26** | 0.42* |

Significant level is at *p<0.05 and **p<0.01

### 5.4.2 Risk profile and Grable and Lytton

From Table 5.4, risk profile (SCF), as well as the Grable and Lytton risk tolerance scale, were compared against gender as well as the year of study. It can be seen that males have a stronger significant relationship that was positive with risk tolerance and showed a statistical significance at the 1 per cent confidence interval ($p<0.01$) as the coefficient was positive (0.33); whereas, females had a statistical significance although it was at the $p<0.05$ as the coefficient was positive (0.17), indicating that males will be more risk-tolerant. It can also be seen that there is a positive relationship between risk tolerance and education. This is shown by the significance level throughout the years as the first years and second years showed a statistical significance at 5 per cent confidence interval ($p<0.05$) as the coefficient was positive (0.2) and in the third and fourth year there was a statistical significance at the 1 per cent interval ($p<0.01$) and the coefficient was positive (0.27) and the postgraduates displayed a statistical significance at the 5 per cent confidence interval ($p<0.05$) and the coefficient was positive (0.33).

### 5.4.3 Risk profile and risk comfort and experience

In Table 5.4, risk profile (SCF) and risk comfort and experience were compared against gender as well as the year of study. It can be seen that males have a stronger positive significant relationship with risk comfort and showed a statistical significance at the 1 per cent confidence interval ($p<0.01$) and the coefficient was positive (0.31), whereas females did not show a statistical significance at either confidence interval, indicating that males have more risk comfort and experience. It can also be seen that there is a positive relationship between risk comfort and experience and education. This is shown by the significance level throughout the years as the first years and second years showed a statistical significance at 5 per cent confidence interval ($p<0.05$) and the coefficient was positive (0.22) and in the third and fourth year there was a statistical significance at the 1 per cent interval ($p<0.01$) and the coefficient was positive (0.20) and the postgraduates displayed a statistical significance at the 5 per cent confidence interval ($p<0.05$) and the coefficient was positive (0.34).

### 5.4.4 Risk profile with speculative risk

In Table 5.4, risk profile (SCF) and speculative risk were compared against gender as well as the year of study. It can be seen that males have a stronger positive significant relationship with speculative risk and showed a statistical significance at the 5 per cent confidence interval ($p<0.05$) and the coefficient was positive (0.15), whereas females did not show a statistical significance at either confidence interval, indicating that males are speculative at taking risk

than females. It can also be seen that there is a positive relationship between speculative risk and education. This is shown by the significance level throughout the years as the first years and second years did not show a significance level at either confidence interval, the third and fourth year there was a statistical significance at the 5 per cent interval ($p<0.05$) as the coefficient was positive at 0.16 and the postgraduates displayed a negative relationship at no confidence interval.

### 5.4.5 Risk profile and investment risk

In Table 5.4, risk profile (SCF) and investment risk were compared against gender as well as the year of study. It can be seen that males have a stronger positive significant relationship with investment risk and showed a statistical significance at the 1 per cent confidence interval ($p<0.01$) and the coefficient was 0.28, whereas females showed a statistical significance at the 5 per cent confidence interval ($p<0.05$) and the coefficient was (0.17), indicating that males are willing to take more investment risk than females.

It can also be seen that there is a positive relationship between investment risk and education. This is shown by the significance level throughout the years as the first years and second, did not show a statistical significance at any confidence interval but had a positive relationship and in the third and fourth year, there was a statistical significance at the 1 per cent interval ($p<0.01$) as the coefficient was (0.26) and the postgraduates displayed a statistical significance at the 5 per cent confidence interval ($p<0.05$) as the coefficient was positive with 0.42.

These results are contrary to previous studies, such as Lawrenson (2020), which found individuals with lower levels of education to be higher risk tolerant compared to those individuals with higher levels of education, whereas, this studies results stated that the more education a participant has, the higher the risk tolerance for the different categories is. The study although has similar results to Lawrenson (2020) as well as the study by Grable and Roszkowski (2007:801) that showed that males were more risk-tolerant than females, which is effective differentiating and classifying factor (Slovic, 1966:169).

### 5.4.6 Influence of demographic variables on risk level tolerance and risk profile levels

In table 5.5 gender and race were the only two characteristics that were found to have a possible significant influence on the levels of both measures. Marital status could have a significant influence on participants' risk tolerance level, with language and situation possibly influencing

risk profile significantly. None of the other demographic characteristics was found to influence either risk tolerance or the subjective risk profile level.

**Table 5.5**

*Demographics' possible influence on level of risk tolerance and subjective risk profile*

| | | Risk tolerance (GL-RTS) | Risk profile (SCF) |
|---|---|---|---|
| 1. | Age | 0.18 | 0.00 |
| 2. | Gender | -0.12* | -0.11* |
| 3. | Race | -0.14** | -0.13** |
| 4. | Marital status | 0.10* | -0.02 |
| 5. | Language | -0.06 | -0.16** |
| 6. | Qualification | -0.09 | 0.02 |
| 7. | Year group | 0.05 | -0.04 |
| 8. | Situation | -0.06 | -0.11* |
| 9. | Monthly income | 0.07 | 0.04 |
| 10. | Source of income | -0.01 | -0.06 |
| 11. | Number of dependents | -0.06 | -0.08 |
| 12. | Investment type | -0.05 | -0.10* |

* $p < 0.05$
** $p < 0.01$

## 5.5 ANOVA TEST

Independent-samples *t*-tests were used for demographic characteristics that consisted of only two groups to determine possible significant differences between risk tolerance and risk profile, respectively. There were two characteristics *t*-tests were applicable for: Gender and marital status. Although the questionnaire had three options for marital status, only one participant indicated that they were divorced; therefore, the characteristic was divided into two groups, namely single and married.

One-way ANOVAs with Tukey's posthoc test was utilized for the other demographic characteristics to determine significant differences. According to Privitera (2012:349), Tukey's statistic is the most preferred test for performing one-way ANOVA posthoc tests (Privetera, 2012:349).

### 5.5.1 Comparison and significance in mean differences for gender and marital status

The results of the *t*-tests for the characteristics of gender and marital status are reported in Table 5.6. From the results, it is clear that the means for the levels of risk tolerance and risk profile,

respectively, did not differ significantly when compared between single and married participants. With regards to males and females, both risk tolerance ($p$ = 0.02*) and risk profile ($p$ = 0.02*) showed significant differences between means. Both $t$-statistics were positive, indicating the means for males were significantly higher than those for females, with a medium effect: Risk tolerance = 0.23; Risk profile = 0.25.

**Table 5.6**

*Significance of comparison of group means (*t*-test)*

| | Risk tolerance (GL-RTS) | | | Risk profile (SCF) | | |
|---|---|---|---|---|---|---|
| | *t*-statistic | *p* | Cohen's D | *t*-statistic | *p* | Cohen's D |
| Gender | 2.29 | 0.02* | 0.23 | 2.40 | 0.02* | 0.25 |
| Marital status (without divorce) | -1.06 | 0.29 | - | 0.09 | 0.93 | - |

* p < 0.05
** p < 0.01

### 5.5.2 Comparison and significance in mean differences for other demographic characteristics

When employing ANOVAs, the first step is to check whether significant differences in groups' means are present. The outcomes for the remaining demographic characteristics (age group, race, language, qualification, year group, situation, monthly income, source of income, number of dependents and investment type) are provided in Table 5.7. Only race and qualification indicated significant differences in groups' means for both measures, and investment type was shown to have significant mean differences with regards to only risk tolerance. Tukey's post hoc test will only be reported for groups with significant differences.

**Table 5.7**

*Significance of comparison of group means*

| Variable | | Risk tolerance (GL-RTS) | Risk profile (SCF) |
|---|---|---|---|
| 1. | Age | 0.68 | 0.66 |
| 2. | Race | 0.00** | 0.00** |
| 3. | Language | 0.57 | 0.05 |
| 4. | Qualification | 0.00** | 0.02* |
| 5. | Year group | 0.35 | 0.41 |
| 6. | Situation | 0.66 | 0.10 |
| 7. | Monthly income | 0.30 | 0.92 |
| 8. | Source of income | 0.71 | 0.47 |
| 9. | Number of dependents | 0.56 | 0.05 |
| 10. | Investment type | 0.03* | 0.51 |

* p < 0.05
** p < 0.01

### 5.5.3 Determining significant group mean differences

The ANOVA calculation indicates only whether or not significant differences exist, but do not provide information on exactly where those differences are. To determine where differences are located, Tukey's post hoc test is utilised. In addition to Tukey's post hoc test, homogenous subsets will be reported. Possible homogenous subsets within the selected groups are identified to not only confirm Tukey's post hoc test results but also to indicate where similarities might be found. Tables 5.8 to 5.10 report on the relevant groups identified through the ANOVA process, and Table 5.11 on the possible homogenous subsets within these groups.

**Table 5.8**

*Tukey's post hoc test for race*

| Variable | | Risk tolerance (GL-RTS) | Risk profile (SCF) |
|---|---|---|---|
| | | Mean difference | Mean difference |
| African | White | 1.88* | 0.46* |
| | Coloured | -1.03 | 0.16 |
| | Indian | 6.80 | 1.09 |
| White | Coloured | -2.91 | 0.62 |
| | Indian | 4.93 | 0.63 |
| Coloured | Indian | 7.83* | 1.25 |

* p < 0.05
** p < 0.01

**Table 5.9**

*Tukey's post hoc test for qualification*

| Variable | | Risk tolerance (GL-RTS) | Risk profile (SCF) |
|---|---|---|---|
| | | Mean difference | Mean difference |
| BA degree | BCom degree | -0.93 | -0.17 |
| | BEd degree | 2.52* | 0.35 |
| | BSc degree | -0.29 | -0.1 |
| | BTech degree | -0.36 | -0.25 |

| | | | |
|---|---|---|---|
| | Diploma | 0.77 | -0.08 |
| | Other | -4.26 | -0.1 |
| BCom degree | BEd degree | 3.44* | 0.51* |
| | BSc degree | 0.63 | 0.07 |
| | BTech degree | 0.57 | -0.08 |
| | Diploma | 1.70 | 0.08 |
| | Other | -3.33 | 0.07 |
| BEd degree | BSc degree | -2.81 | -0.44 |
| | BTech degree | -2.87 | -0.59 |
| | Diploma | -1.74 | -0.43* |
| | Other | -6.77 | -0.44 |
| BSc degree | BTech degree | -0.06 | -0.15 |
| | Diploma | 1.07 | 0.01 |
| | Other | -3.96 | 0.00 |
| BTech degree | Diploma | 1.13 | 0.16 |
| | Other | -3.90 | 0.15 |
| Diploma | Other | -5.03 | -0.01 |

* p < 0.05
** p < 0.01

**Table 5.10**

*Tukey's post hoc test for investment type*

| Variable | | Risk tolerance (GL-RTS) |
|---|---|---|
| | | Mean difference |
| Money market account | Government bonds | -3.60 |
| | Derivatives (FOREX, ETFs) | -3.39 |
| | Investment club/group (Stokvel) | -6.2 |
| | Other types | -1.6 |
| | Multiple types | -2.27 |
| | Doesn't invest, would consider | -1.07 |
| | Doesn't invest, would not consider | 1.47 |
| Government bonds | Derivatives (FOREX, ETFs) | 0.21 |
| | Investment club/group (Stokvel) | -2.60 |
| | Other types | 2.00 |
| | Multiple types | 1.33 |
| | Doesn't invest, would consider | 2.53 |
| | Doesn't invest, would not consider | 5.07 |
| Derivatives (FOREX, ETFs) | Investment club/group (Stokvel) | -2.81 |
| | Other types | 1.79 |
| | Multiple types | 1.12 |

| | | |
|---|---|---|
| | Doesn't invest, would consider | 2.32 |
| | Doesn't invest, would not consider | 4.85 |
| Investment club/group (Stokvel) | Other types | 4.60 |
| | Multiple types | 3.93 |
| | Doesn't invest, would consider | 5.13 |
| | Doesn't invest, would not consider | 7.67* |
| Other types | Multiple types | -0.67 |
| | Doesn't invest, would consider | 0.53 |
| | Doesn't invest, would not consider | 3.07 |
| Multiple types | Doesn't invest, would consider | 1.20 |
| | Doesn't invest, would not consider | 3.73 |
| Doesn't invest, would consider | Doesn’t invest, would not consider | 2.53 |

* p < 0.05
** p < 0.01

**Table 5.11**

*Homogenous subsets*

| Variable | | Objective Risk tolerance (GL-RTS) | | Subjective Risk profile (SCF) | |
|---|---|---|---|---|---|
| | | Subset 1 | Subset 2 | Subset 1 | Subset 2 |
| Race | Indian | 20.00 | | 1.67 | |
| | White | 24.93 | 24.93 | 2.30 | 2.30 |
| | African | | 26.80 | | 2.75 |
| | Coloured | | 27.83 | | 2.92 |
| Qualification | BEd degree | 24.23 | | 2.31 | |
| | Diploma | 25.97 | | 2.65 | |
| | BA degree | 26.74 | 26.74 | 2.74 | |
| | BSc degree | 27.04 | 27.04 | 2.75 | |
| | BTech degree | 27.10 | 27.10 | 2.75 | |
| | BCom degree | 27.67 | 27.67 | 2.82 | |
| | Other | | 31.00 | 2.90 | |
| Investment type | Doesn't invest, would not consider | 23.93 | | - | - |
| | Money market account | 25.40 | | - | - |
| | Doesn't invest, would consider | 26.47 | | - | - |
| | Other types | 27.00 | | - | - |
| | Multiple types | 27.67 | | - | - |
| | Derivatives (FOREX, ETFs) | 28.79 | | - | - |
| | Government bonds | 29.00 | | - | - |
| | Investment club/group (Stokvel) | 31.60 | | - | - |

Significant mean differences for both measures were found between African and White participants (GL-RTS = 1.88*; SCF = 0.46*) and for only risk tolerance between Coloured and Indian participants (GL-RTS = 7.83*). It seems that African participants have both higher risk tolerance and risk profile scores when compared to White participants, and Coloured participant has higher risk tolerance than Indian participants. In Table 5.11 two subsets within the race variable for both measures were indicated. For both measures, Indian participants fell into a subset, and African, White and Coloured participants fell into a second subset. White participants were categorised in both subsets, which indicated that the group's mean on risk tolerance and level of subjective risk tolerance profile were close enough to both subsets and could not be classified specifically. When comparing the two scales, objective and subjective, a consensus can be seen in the results. This indicates that there was no difference in the objective and subjective risk tolerance between the different racial groups. These results are not in accordance with previous studies that have been done (Ferreira, 2019:6; Masenya, 2017:102) that found that African investors risk tolerance level is lower than that of white individuals.

BCom degree students and BEd degree students showed significant differences between their means on both risk tolerance and risk profile levels (GL-RTS = 3.44*; SCF = 0.51*), with BCom degree students showing higher levels of both subjective risk tolerance and objective risk tolerance. A mean difference was found between BA degree and BEd degree students in mean levels of risk tolerance (GL-RTS = 2.52*), where BA degree students exhibited higher levels of risk tolerance. With regards to the subjective risk tolerance profile, students studying towards a diploma were willing to take higher risks than BEd students (SCF = -0.43*). When homogenous subsets for risk tolerance were identified, students studying towards a BEd degree or a diploma were placed in the first subset, with students studying for unspecified qualifications placed in the second subset. The other participant groups all had means too close to both subsets to be classified as part of either. All the qualification groups were classified together in one subset for subjective risk profile levels.

There was only one significant difference between means found in the investment type group, and only with regards to risk tolerance, i.e., between participants that invest in clubs or groups, like stokvels, and participants who did not invest that would also not consider investing (GL-RTS = 7.67*). No other important differences in levels of risk tolerance or risk profiles were

found, regardless of the type of investment. Only one subset was identified for all types of investment.

## 5.6 STUDENT INVESTMENT FRAMEWORK

### 5.6.1 Introduction

A structure that can support and hold research that has been done in a study is defined as a theoretical framework. The theoretical framework introduces and describes the theory that explains why a specific problem in a study exists. This framework aims to provide an investment framework based on risk tolerance: a case of Vaal Triangle students. Each step will be explained followed by an example of low-medium and high-risk investment products. To indicate what the student should invest in, a framework has been created to guide students to invest successfully and at the end of the framework, the individual investor life cycle phase alongside the investment options are tabulated.

**Figure 5.1: Framework**


Source: Author

### STEP 1: INVESTOR LIFE CYCLE

The main factor that influences an individual investors risk objective arises from the investor life cycle and what phase of the cycle the individual investor is in; it is, therefore, important

that individual investors know and understand where they are in the individual investor life cycle. The individual investor life cycle has been defined as the various phases of investment ownership from the initial acquisition of the investment. At each phase of the investment life cycle, the needs of the individual investor are different because once his/her life starts changing and the net worth of the individual increases, the investment strategies also change to ensure that their goals and objectives are met.

There are four phases where the investor could be classified in the life cycle, these four phases are the accumulation phase, consolidation phase, spending phase and the gifting phase. The accumulation and consolidation phase are the ones that are going to be focused upon, as these are where most of the students in the study fell into.

**Accumulation phase**

The accumulation phase includes the individuals that find themselves in the early-to-mid years of their working careers. The investors at this stage are accumulating assets and paying off student loans. The individuals in this phase have a small net worth and large amounts of debt. As a result, individuals in this phase are more likely to take on a higher degree of risk in order to make above-average returns, as they have a longer time horizon.

**Consolidation phase**

The consolidation phase in the investor life cycle is when the investors are past the halfway point of their working careers and most, or all their debt has been paid off and their expenses are less than their income. This phase is categorised by the retirement portfolio due to the time horizon until retirement. This phase focuses on capital preservation and the individuals are less likely to take on a high degree of risk.

## STEP 2: INVESTORS OBJECTIVES AND CONSTRAINTS FOR STUDENTS

As individual investors have different investment portfolios due to their different situations and circumstances, objectives and constraints might differ. For financial planners to construct an individual investors policy, the individual investors' objectives and constraints should first be determined.

**Investment objectives for students:**

The objectives of the individual investors are according to their goals stated in terms of both risk and return. The objectives are the factors associated with both the willingness and the ability of the investor to take risk. Three specific steps are undertaken to determine an investors' risk objective:

- Specify a measure of risk: this is the most important challenge for financial planners to create an investment portfolio; this is because risk is either measured in absolute or relative terms. In absolute terms, the measurement of risk will include a specific level of variance or standard deviation of total return, whereas, in relative terms, risk will include a specific tracking risk (Marx, 2009:265).

- Investor willingness: an individual investor's willingness to take risk is different from institutional investors because an individual investor's willingness is determined by psychological or behavioural factors; either spending needs, long term obligations, wealth targets, financial strength or liabilities. These factors could determine the willingness to take risk by the investor (Bodie *et al.*, 2010:11).

- Investor ability: the investor's ability to take risk is dependent on the financial and practical factors that allow the amount of risk taken by the investor. An investor's short-term time frame will negatively affect his/her ability to take risk, which is similar to if the investor's obligations and spending are less than his portfolio, then they have more ability to take on risk (Wilson, 2010:1).

- **Capital appreciation**

  Capital appreciation is described as the increase in the value of an investment over a given period to be able to fulfil a need in the future. The investment growth is through capital gains (Kennan, 2010:1). The objective of this is to achieve returns that are bigger than that of the inflation rate.

- **Total return**

  Capital appreciation and total return are very similar in the sense that the investor aims to increase his/her portfolio in real terms over time to satisfy his/her needs in the future. The growth of capital appreciation takes place from capital gains whereas, with total return, the objective is to increase the capital base by capital appreciation and re-investment of the appreciation (Reilly & Brown, 2012:42).

- **Current income**

  Current income is seen as the goal that a student wants and to be able to achieve it, they need to establish a portfolio that focuses on creating income instead of capital gains. This means that the investor needs to invest in high coupon bonds in the fixed income market because the investor is seeking to receive an income from the investments, rather than a long-term plan (Marx, 2009:267).

**Investment constraints that students have:**

Student investors should consider the investment constraints when they are creating an investment policy. Investment constraints limit the investor to what or how much they can invest, which limits their abilities in specific investment types (Wilson, 2010:1). Investment constraints comprise of five main categories that are liquidity needs, time frame of an investment, tax consideration, legal, as well as regulatory factors and preferences, which are discussed below.

**Liquidity needs**

Marx (2009:268) defines liquidity as the capability to change an asset to cash at its current market price. Liquidity constraints thus consider the individual investor's need for cash or liquidity at the immediate market price (Bodie *et al.*, 2010:698). This is an investment constraint that most investors are exposed to and it differs from each individual investor, depending on personal factors such as age, employment status, tax status, etcetera (Wilson, 2010:1).

**Time horizon**

The time horizon constraint is the time taken between making an investment and needing the funds. There is a relationship between an investor's time horizon, liquidity needs and the ability to handle risk. An investor with a long time horizon will generally require less liquidity and can tolerate greater portfolio risk (CFA, 2019).

**Unique needs and constraints**

The unique needs and preferences of students are important when constructing an investment portfolio. Some of the students may want to exclude certain investments from their portfolio

due to personal preference and or social concerns, for example, the student might not want to invest in SIN TAX companies due to social and environmental concerns (Reilly & Brown, 2012:46). Other preferences might include specific family needs or their preferences.

**STEP 3: RISK TOLERANCE LEVEL FOR STUDENTS**

Risk tolerance is one of the most comprehensive concepts used in the financial industry and a fundamental factor that needs to be taken into consideration when planning an individual's investment strategy (Rutgers, 2014:1). Risk is created from uncertainty and the inability to accurately predict market prices; however, risk that results from uncertainty can be managed (Crouhy *et al.,* 2014:1). An individual encounters risk daily. In general investment terms, risk can be explained as the uncertainty of future returns or potential losses (Van den Berg, 2004:238). An individual's life experiences, to some extent, are linked with his/her understanding of the relationship between risk and return (Crouhy *et al*., 2014:1). The life experiences that the individual has experienced will have a role to play with their time horizon, income, available capital, liquidity requirements, knowledge about investments, emotional resilience as well as their attitude towards price volatility (Fredman, 1996:25; Hanna & Chen, 1997:17).

Financial institutions and planners for investment companies must understand individual investors' risk tolerance and determining their ability as well as their willingness to take on risk as a fundamental component in the investment planning process (Larkin *et al.,* 2013:1). Although risk tolerance, an individual's attitude towards accepting risk, is an important aspect when determining an individual's asset composition or asset portfolio, it is not an easy process due to the fact that risk tolerance, which is regarded as a multidimensional attitude, is an obscure concept that is likely to be influenced by numerous predisposing factors (Grable & Joo, 2004:73). Measuring financial risk tolerance and determining the factors that affect financial risk perception has been of interest to investors and researchers alike for many years (Adem, 2010). There are many variables that, once grouped and discussed, can interpret an individual's risk tolerance level. These variables include age, sex, marital status, occupation and wealth. Individual financial risk tolerance is assumed to be the primary determinant of choice behaviour in a situation that the individual is facing when investing (Bailey & Kinerson, 2005:26; Grabble & Lytton, 2001:43).

**STEP 4: ASSET CLASSES TO INVEST IN FOR STUDENTS**

When a student investor has better knowledge of his/her investment objectives as well as constraints and time horizon, it assists his/her financial planners to create asset allocation for the individual investor's portfolio. Asset allocation involves making decisions about the individual investor's cash and how it could be distributed throughout different asset classes and the amount each asset class could hold. This indicates that a mix of asset classes are chosen that mirror the individual investors' investment objectives and time horizon (Vanguard 2013:14).

When creating an investment portfolio, the most important question for a student investor and the financial planner is deciding on which asset class needs to be in the investment portfolio as there are five asset classes, which include capital, bonds, equities, assets and exotics (Discovery, 2012:4). Exotic items form part of the non-traditional asset class and are comprised of collectables, for example, art, cars, jewellery, gold, diamonds and stamps. Although this is the case, only cash, equities, bonds, coins and stamps were focused on because most of the students would be able to afford these types of investment options.

- **Cash**

  Cash remains one of the most secure classes but provides the lowest return over time. The investments with cash are on-call deposits in banks, cash management trusts and similar short-term interest-bearing investments. As cash is the most secure form of investment, it is considered as a standard to which other investments are compared to. This implies that when cash rates decrease, other investments come to be more desirable and tend to rise in price (Vanguard, 2013:19). The most liquid fund that is exempt of risk is the money market fund and is provided to individual investors; this means that the return that is gained on the cash-based investment outperforms other investments over the short term. Cash-based investments offer liquidity, which makes it simpler to extract the capital (Vanguard, 2013:19).

- **Equities**

  Stocks and shares are also known as equities because they signify a part of ownership in a company that the individual investor can invest in. Publicly-owned companies that are listed on the stock exchange are invested in by unit trust managers, as the share price is published (Prudential Investment Managers, 2019). According to Coronation Fund Managers (2016:129), the South African collective scheme industry is dominated

by equity-based investments. When individual investors in South Africa invest in equities it means that they are part-owners in companies that are listed on the stock market as well as part owners in unlisted companies (Bodie *et al.,* 2008:4).

Student investors who want a medium- to long-term investment that matures after a period of five years or longer can invest in equities. When an investor invests in equities, they need high probable returns as there is not any guarantee that it will yield high rates of return. There is no assurance of a fixed income stream of cash as it forms a component of the company's ownership, even though equities offer the option for capital growth and can also offer an income stream by means of dividend payments (Monevator, 2012:1).

- **Bonds**

Bonds are long-established asset classes in South Africa and are traded on the bond exchange. Bonds are a form of long-term debt in which the issuing corporation promises to pay the principal sum at a specified maturity date. Bonds are used to increase finances in the long term for government, semi-government organisations and commercial organisations. The bond price as well as the interest rate is decided on a specific date and this is when the bond achieves maturity and can be redeemed (Marx, 2010:207). Bonds pay a fixed interest payment to the bondholders, usually every six months, until the bonds mature (The Savings Institute 2014:1). Although bonds are traded before they mature on a specified date at the rate that occurs on the stock market at that time, they do not have to be held till the maturity date, but can be redeemed then (Marx, 2010:207). There is, however, volatility in the bond market, because of the inverse correlation between the cost of a security and interest rates. In the event that the interest rate decreases, the profit of the security increases (Mayo, 1988:212; Liberty, 2009:1).

- **Coins and stamps**

Purchasing coins as an investment because coin values are cyclical, built on the supply and demand. Rates from coins that are not in long-term demand rise along with a coin's perceived or intrinsic value (Marudhar Arts, 2015:1). Investors buy coins with the expectation that the value of their purchase will increase in the long term (Marudhar

Arts, 2015:1). It is believed that the market for stamps and coins is more liquid than that of arts and antiques.

## STEP 5: DEMOGRAPHIC FACTORS INFLUENCING STUDENT RISK TOLERANCE

Risk tolerance is a fundamental factor that mainly influences an individual's personal financial decisions (Snelbecker *et al.*, 1990:378). Therefore, individual investors, financial planners, researchers as well as policymakers need to understand the factors associated with risk tolerance (Grable, 2016:25). Demographic characteristics are the most widely investigated determinant of financial risk tolerance. This is due to a consensus among investment managers and researchers that the demographics can be used to both differentiate among levels of investor risk tolerance and classify investors into risk tolerance categories. Each investor has his/her risk tolerance level that depends on various demographic factors, such as age, gender, grace, marital status, education, employment status as well as income.

**Table 5.12: Demographics and risk tolerance level**

| *Characteristic* | *Low-risk tolerance* | *High-risk tolerance* |
|---|---|---|
| ***Gender*** | Female | Male |
| ***Age*** | Older | Younger |
| ***Marital status*** | Married | Single |
| ***Occupation*** | Workers and labourers | Professionals |
| ***Self-employment*** | Non-Self employed | Self-employed |
| ***Income*** | Low | High |
| ***Race*** | Non-Whites | Whites |
| ***Education*** | Less | More |

Source: Author

## STEP 6: RISK APPETITE FOR STUDENTS

The degree of risk tolerance individual investors can tolerate is known as the investors' risk appetite. This is the amount of risk an investor wants to take. Risk capacity is the amount of risk an individual investor can afford to take. The two components of risk tolerance are fundamentally diverse, according to Weber *et al.* (2002:222) where risk attitude is referred to as a personality and psychological characteristic of an individual, risk capacity is a financial characteristic of the individual (Lucarelli & Brighetti, 2010:2). Botha *et al.* (2012:541) define risk capacity as the ability to take the risk and have the financial capacity to withstand market loss. These two should also be taken into account. Risk appetite is the total exposed amount

that an investor wishes to undertake based on risk and return trade-offs for one or more desired outcomes (Rims;2012).

## STEP 7: SUBJECTIVE AND OBJECTIVE RISK TOLERANCE

Subjective risk tolerance usually assesses an individual's self-perceived risk tolerance level (Chang *et al.,* 2004:54) and is also based on the economic theory of risk aversion, which refers to the unwillingness of an investor to accept a bargain that has an uncertain outcome rather than one with high levels of certainty, although lower results (Faff *et al.,* 2008:2). Objective risk tolerance looks at an individual's behaviour from past allocations of assets and is based on the notion of the financial situation of the household and the goals of the individual's investment horizon (Malkiel, 1996:401). Malkeil (1996) asserts that the risk an individual can take is dependent on the individual's financial condition where this includes his/her sources of income, excluding income received from investments. Subjective risk tolerance is a measure of the emotional and financial ability of an individual investor to be able to incur losses (Hanna *et al.,* 2001:53).

Objective or subjective measures of risk tolerance would partially do the job in measuring tolerance levels, as it assists in gathering data needed to complete the analyses and once the analyses have been completed, the classification of investors is required to determine their portfolio implications and recorded tolerance scores.

## STEP 8: RISK TOLERANCE CATEGORIES FOR STUDENTS

The majority of the students in the data set indicated that they have a medium risk tolerance level. Some students indicated more of higher risk tolerance than lower risk tolerance. Step 8 takes into consideration these factors and explains the risk tolerance category for moderate risk tolerance investors to aggressive risk tolerance investors.

### Moderate investors

Most investors fall into this category, mainly due to them wanting to invest for daily expenses and long term for retirement purposes, the portfolio generated income is usually several years away, but moderate investors still require good returns and they know that they have to take some risks to get those returns (Olivares *et al.,* 2008:11). These investors have managed portfolios and will, on average, consist of a balanced mix of all major viable asset classes.

These investors are usually middle-aged investors who are married and are looking to save for long-term goals, such as their children's tuition.

**Moderately aggressive**

A moderate aggressive investor takes relatively more downside risk than the market; they are expected to be compensated accordingly when markets are moving upwards. These investors will typically avoid fixed income positions while fully utilising risky asset classes. They usually invest in bonds and other risk-free assets will be managed and will be kept to ensure that the portfolio is fully diversified (Olivares *et al.*, 2008). This category is dominated by males, high-income earners, individuals with financial postgraduate qualifications and those with sufficient knowledge about the markets (Afza & Nazir, 2007:13).

**Aggressive investors**

An aggressive investor values maximising returns and is willing to accept substantial risk. This investor believes maximising long-term returns is more important than protecting capital. An aggressive investor may endure extensive volatility and significant losses. Liquidity is generally not a concern to an aggressive investor. They are looking to substantially outperform the markets, which takes being exposed to much more risk (Stifel *et al*., 2012). These investors usually hold mostly growth, small-cap, sector mutual funds and shares with bonds and other fixed-income assets avoided altogether. Taking the students' results that were analysed above and the investment items of what to invest in and in what stage to invest those items in into consideration, a table was constructed to help guide students on what to invest in, in the different situations that they are in and from what risk tolerance level they carry. In Table 5.12, risk tolerance, phase of the investor, investment opportunities and what life cycle they should be in when investing in these options is described.

**Step 9: Summary of investment options in different phases of the life cycle**

Table 5.13 gives a summary on some investment options that are available for different periods of the investor's life cycle. Starting with the life-cycle phase then the risk appetite of the investor followed by the risk profile and the investment goals and investment options and why these are good investment options, it also has the amount that is needed to make those investments. As most of the students are in the accumulation phase, this was the main one that was focused on followed by the rest of the individual life cycle. Most of the students had a

moderate to high-risk tolerance, the table below is specifically for individuals with a medium-high risk tolerance that is in the accumulation phase.

**Table 5.13: Risk tolerance and investment opportunities**

| Life-cycle phase | Risk appetite | Risk profile | Investment Goals | Investment Options | Amount needed to Invest | Explanation |
|---|---|---|---|---|---|---|
| Accumulation phase | High | Moderate-Aggressive | Retirement planning, assets, paying off short term debt, mortgage planning | Equity-oriented and aggressive funds. Retirement options, investment portfolios (Treasury bills, options, derivatives), life insurance. | R300-R1000p.m | -These types of investments prepare you well for are good retirement. The investment horizon can range from 7 years to 30 years. |
| Accumulation phase | Medium | Low-Moderate | Retirement savings, asset allocation, life insurance, mortgage planning | Investment savings, short term treasuries, domestic government bonds | R100-R500p.m | -These types of investments are not high-risk investments, these are moderate investments with a time horizon of 7 to 30 years |
| Consolidation phase | Medium | Moderate | Vacations, take care of parents, real estate, car purchase, school fees for children. | Long term maturity debt funds, conservative to moderate funds, investment trusts, exchange-traded finds, stocks. | R500-R3000 | These funds can be used when the investment horizon for goals is 3-5 years. Debt funds are suitable for more conservative investors. |
| Spending and gifting phase | Low | Conservative | Short term cash requirement, regular income. | Liquid and short maturity debt funds, bonds, real estate, annuities. | R500-R1000 | These funds provide stable returns to investors over the short term. |

Source (Author compilation, 2019)

## 5.7 SYNOPSIS

Chapter 5 presented the results that were gathered from the empirical portion of this study and consisted of six sections. Section 5.2 entails the data-gathering process that was used in a previous study and this is followed by Section 5.3 that comprises the demographics and participation in investment analysis and analysis all the results from the demographic part of the questionnaire. Section 5.3.3 discussed the participants' investor risk tolerance using the 13-item scale by Grable and Lytton. It can be concluded from this section that the majority of the sample is in the accumulation phase of the investor life cycle. Section 5.4 is the correlation analysis to determine the relationships as well as the strength and direction of the relationships between student investors subjective risk tolerance, actual risk tolerance (GL-RTS) as well as the investor life cycle. Section 5.5 reported on ANOVA, followed by Section 5.6, which provided the tabulation of the risk tolerance levels and investment opportunities for student investors.

In chapter 6, the summary and findings of the study and recommendations, limitations as well as the avenues for further research are provided, followed by the final synopsis regarding this study.

# CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

## 6.1 INTRODUCTION

This chapter highlights the conclusions of the study and makes recommendations. Masenya (2017) conducted a study on student investment knowledge and risk tolerance. The study found that 11 per cent of students from the study sample invest. The students also listed that (1) they do not know how to invest and (2) they do not know how to start investing. The main reason that students do not invest is that they do not know where to start. The main purpose of the study was to construct an investment framework for students based on their risk tolerance. The final section of the study proposed an investment framework that can serve as a benchmark framework for students to be able to choose the correct investment option accordingly.

This study provided an analysis of risk tolerance levels during the investor life cycle within the context of South African students and an investment framework for students was proposed for them to follow when wanting to invest. The theoretical objectives gave an in-depth analysis of the investor life cycle and different asset classes and assisted in the achievements of the empirical objectives of the study.

Chapter 1 provided an introduction (Section 1.1) for the study as well as the problem statement (Section 1.2). The primary objectives, as well as the empirical objectives, were also discussed (Section 1.3) along with the research design and methodology (Section 1.4).

Chapter 2 discussed the individual investors' life cycle; this is important because the main factor that influences a decision made by an investor depends on which phase they are in, in the investor life cycle. Investors can be categorised into four phases, namely the accumulation, consolidation, spending and the gifting phases. The investment portfolio of an individual investor depends on what phase of the investor life cycle they are in, along with the circumstances in which they find themselves. The individual investors' ability to tolerate risk is a significant factor that needs to be taken into consideration when planning individual investors risk and investments.

Chapter 3 introduced the theory of risk perception and risk tolerance. Risk is something that investors need to consider before they start investing, as an appropriate balance between risk

and return needs to be achieved. The demographic factors influencing risk tolerance were also discussed, along with the different risk appetites of individuals, subjective and objective risk tolerance, the different phases of risk tolerance in the investor life cycle and the financial risk portfolio formation and risk tolerance categories.

Chapter 4 discussed the empirical portion of the study. Chapter 4 included the study design and the study paradigm that was used in the study along with the origin of the primary data. The research approach and the sample size were also discussed. In the final section of Chapter 4, the questionnaire and the layout were discussed. A quantitative research approach was applied in the study whereby a positivist paradigm was used.

Chapter 5 included an analysis and interpretation of the empirical analysis. The chapter included a discussion on the results of the data analysis, demographics and participation in investment analysis, the descriptive statistics and the reliability of the data, correlation test results and presented the findings and results of the empirical analysis. It also provided an investment framework for students to follow when investing.

This chapter provides a final discussion of the study. The overview and the conclusion drawn from the study are discussed. The results along with the recommendations that were drawn from the study are summarised and avenues for further studies are provided together with an overview of the contributions made to the field of study. Limitations encountered in this study are also highlighted.

The following section, Section 6.2, provides a summary of the results as per the empirical objectives of the study.

## 6.2 SUMMARY OF RESULTS

The primary objective of this study was to construct an investment framework for students based on their demographics and risk tolerance levels and the accomplishment of the following empirical objectives assisted in the fulfilment of the primary objective.

### 6.2.1 Empirical objective 1: Determine risk tolerance levels of university students in the Vaal Triangle district

The first empirical objective was to determine the risk tolerance levels of students in the Vaal Triangle region. This was achieved by using the sample description for the demographics,

investments and the risk tolerance of the students. Age, gender, race, marital status, nationality, home language, qualification, year of study, the study situation, monthly income, source of income, number of dependents along with the investments that they invest in were all taken into consideration. Grable and Lytton

's risk tolerance was measured in three different levels, these being low risk, medium risk and high-risk tolerance followed by the SCF that measured risk tolerance in four different levels, namely no risk, average risk, above-average risk and substantial risk.

The total Grable and Lytton risk tolerance found that most of the participants had a medium risk tolerance, followed by high-risk tolerance and low-risk tolerance. The investment risk of the participants was also measured, and it was found that most of the students have a medium investment risk tolerance level, followed by high-risk tolerance and low-risk tolerance. Speculative risk was also measured and it was found that most participants have a medium risk tolerance when considering speculative risk. Furthermore, 35.6 of the participants have a high-risk tolerance and 9.1 per cent have a low-risk tolerance when taking speculative risk into account.

Regarding risk comfort and experience, it was found that most of the students have a medium risk tolerance level followed by low-risk tolerance and high-risk tolerance. The SCF risk tolerance was measured and it was found that the participants indicated that they would be willing to take average investment risk as they would like to earn returns.

The two results from the 13-item scale and the single-item scale for measuring risk tolerance indicated that the participants have a medium risk tolerance level. Since the 13-item risk tolerance scale and the SCF scale have similar results and the 13-item risk tolerance measures risk tolerance from multidimensional levels, the results from both the SCF as well as the 13-item risk tolerance scale results were used throughout the rest of the study, similar to previous studies.

### 6.2.2 Empirical objective 2: To determine how a change in demographics affects the risk tolerance level of a student that resides in the Vaal Triangle district

The second empirical objective of the study is to determine whether there is a difference in risk tolerance levels based on the demographics. To achieve this, ANOVA had to be implemented.

The outcomes for the remaining demographic characteristics (age group, race, language, qualification, year group, situation, monthly income, source of income, number of dependents and investment type) were provided. Only race and qualification indicated significant differences in groups means for both measures, and investment type was shown to have significant mean differences with regards to only risk tolerance. Tukey's post hoc test was used to report for groups that had significant differences. Significant mean differences for both measures were found between African and White participants (GL-RTS = 1.88*; SCF = 0.46*) and for only risk tolerance between Coloured and Indian participants (GL-RTS = 7.83*). It seems that African participants have both higher risk tolerance and risk profile scores when compared to White participants, and Coloured participant has higher risk tolerance than Indian participants.

BCom degree students and BEd degree students showed significant differences between their means on both risk tolerance and risk profile levels (GL-RTS = 3.44*; SCF = 0.51*), with BCom degree students showing higher levels of both risk tolerance and risk profile. A mean difference was found between BA degree and BEd degree students in mean levels of risk tolerance (GL-RTS = 2.52*), where BA degree students exhibited higher levels of risk tolerance. With regards to risk profile levels, students studying towards a diploma were willing to take higher risks than BEd students (SCF = -0.43*). When homogenous subsets for risk tolerance were identified, students studying towards a BEd degree or a diploma were placed in the first subset, with students studying for unspecified qualifications placed in the second subset. The other participant groups all had means too close to both subsets to be classified as part of either. All the qualification groups were classified together in one subset for risk profile levels.

There was only one significant difference between means found in the investment type group, and only with regards to risk tolerance, i.e., between participants that invest in clubs or groups, like stokvels, and participants who did not invest that would also not consider investing (GL-RTS = 7.67*). No other important differences in levels of risk tolerance or risk profiles were found, regardless of type of investment. Only one subset was identified for all types of investment.

### 6.2.3 Empirical objective 3: Determine the risk tolerance relationship of students based on gender and year of study

The third empirical objective was to determine the risk tolerance relationship of students based on gender and year of study. This was achieved by using correlation tests that utilised gender and year of study to the different risk factors. In regards to gender and year of study, it was concluded that there was a relationship with the Grable scale total and risk profile with gender at a significance level of 0.05 and was also significant with investment risk at 0.01. There was no particular relationship that was identified between the student's year of study and their risk tolerance level.

The results are contrary to previous studies such as Lawrenson (2020) that found individuals with lower levels of education to be higher risk tolerant compared to those individuals with higher education levels, whereas, this study's results stated that the more education a participant has, the higher the risk tolerance for the different categories is. The study has similar results to Lawrenson (2020) as well as Grable and Roszkowski (2007:801) that showed that males were more risk-tolerant than females, which is a consensus and an effective differentiating and classifying factor (Slovic, 1966:169).

### 6.2.4 Empirical objective 4: Determine the objective and subjective risk tolerance according to demographics

In terms of gender, both the objective risk tolerance scale and the subjective risk tolerance profile indicated a significant difference in risk tolerance. Hence, both scales reported similar results. There was no difference in the objective and subjective risk tolerance between the different racial groups. Both scales indicated a difference in risk tolerance within the groups. Students studying towards a BEd degree or a diploma were placed in the first subset, with students studying for unspecified qualifications placed in the second subset. The other participant groups all had means too close to both subsets to be classified as part of either. All the qualification groups were classified together in one subset for subjective risk profile levels. For the other demographics, year group, situation, monthly income, source of that income and the number of dependents, no statistical difference in the mean values were found between groups for both objective risk tolerance and the subjective risk tolerance profile.

### 6.2.4 Empirical objective 5: Construct a theoretical investment framework based on student demographics and their risk tolerance level

The final section of the study provided an investment framework and solutions based on the investor life cycle and the level of risk students are willing to take. The investment framework serves as a benchmark for students where they can choose the correct investment option according to their risk tolerance.

It can be concluded that most of the investors were in the accumulation phase because they are students and had a moderate risk tolerance. The best investment options for the accumulation phase are as follows:

**Table 6.1: Investment option according to lifecycle phase**

| LIFE CYCLE PHASE | RISK APPETITE | INVESTMENT OPTIONS |
|---|---|---|
| **Accumulation phase** | High | Equity-oriented and aggressive funds. Retirement options, investment portfolios (Treasury bills, options, derivatives), life insurance. |
| **Accumulation phase** | Low-moderate | Investment savings, short term treasuries, domestic government bonds |

Some of the part-time students were in the consolidation phase as they were between the ages of 29-50. The best investment options for them are as follows:

| LIFE CYCLE PHASE | RISK APPETITE | INVESTMENT OPTIONS |
|---|---|---|
| **Consolidation phase** | Moderate | Long term maturity debt funds, conservative to moderate funds, investment trusts, exchange-traded funds, stocks. |
| **Spending and gifting phase** | Conservative | Liquid and short maturity debt funds, bonds, real estate, annuities. |

For the conclusion of the individual investor life cycle, the following are the best options for the spending and gifting phase, even though there were no participants in these phases during the time of the research:

## 6.3 CONTRIBUTIONS OF THE STUDY

The findings of this study contribute to the available literature regarding the investment activities of students in the Vaal triangle, South Africa. This was achieved by measuring South African students' investment potential by using two well-known scales, which are:

- Survey of Consumer Finances (SCF) that focused on gathering data on assets, liabilities, financial attitudes and behaviours.
- Grable and Lytton's risk tolerance scale that uses a 13-item questionnaire, which measures financial risk tolerance.

## 6.4 LIMITATIONS AND FUTURE RESEARCH

### 6.4.1 Study limitations

- Although the study achieved all the set objectives, there were certain limitations to the study. The first limitation that was encountered was that the sample size was only of 300 students within the Vaal Triangle District, which consisted of two universities, one traditional and one university of technology and also that studied specific courses. The sample size could have been more if more institutions were included in the study, such as colleges and/or all degrees that are offered at these universities.
- Secondly, the sample that was used did not have an equal distribution of students from the two universities, the best ratio would have been a 50 per cent ratio from each, however, it was split into a ratio of 70 per cent from a traditional university and 30 per cent from a university of technology.

### 6.4.2 Areas for future research

- Future research could include more Higher Education Institutions (HEI) in the country, instead of just two from the Vaal Triangle region and by including more HEIs, a more accurate analysis could be done on students within South Africa and students within the Vaal Triangle district.

- The study could also be replicated in universities in other countries. This will assist researchers to determine the investment options for students as well as compare the results that they receive to students within South Africa. This will also assist in measuring and to see if students in other countries are affected in the same way as South African students and to see if the investment options offered in other studies are similar to the investment options offered in this study.
- The test of the empirical objectives of the study can be replicated using a wider variety of classifying factors, such as the behaviours, attitudes and any other socioeconomic characteristics. This could assist in contributing to determine the importance of other demographical factors in differentiation of the levels of risk tolerance.

## 6.5 RECOMMENDATIONS

Students have a limited knowledge of investing and a lack of awareness of their risk tolerance level; they find it difficult to know what to invest in and how much to invest. This study suggests that students need to increase their level of investment knowledge as this could benefit them soon to make the best investment decisions that suit their needs. Based on the findings of the study, the following recommendations are made:

- **Increase risk tolerance awareness**

  To increase risk tolerance levels, students are encouraged to learn more about different investment options and how their risk tolerance level affects their risk-taking decisions. Students will be able to understand and be more aware of their risk tolerance levels, this will assist in making better investment decisions when it comes to investing and will assist them in adopting new investment behaviours.

- **Development of investment products for students**

  Financial institutions have a gap in their financial instruments and this gap is the student market. Financial instruments are mostly made for working individuals that earn an income monthly. Hence, financial institutions should create investments that are solely based on student's risk tolerance levels and what students can afford this could assist students and financial institutions alike. This will also assist the financial institution in creating a reliable brand for students and could build relationships with these students for future endeavours.

- **High schools and universities providing financial lessons to all students**

  To improve financial knowledge, high schools and universities should be encouraged in creating a specific lecture or class for students to teach them about financial products. This could increase the knowledge of students and assist them in making the right choices when investing or taking credit. This would benefit the university, financial institutions and most importantly, students, to assist them in increasing their wealth. Social media platforms are also available and students should be encouraged to learn financials and financial implications.

## 6.6 GENERAL CONCLUSION

Based on the findings of the study, it can be concluded that risk tolerance is a pivotal factor that should be taken into consideration when planning individual investors' investment strategies. It is also important for these individuals to know and understand how their demographics affect their risk tolerance level and how important it is to have basic financial knowledge before investing. An in-depth analysis of the theoretical objectives was given on risk tolerance, which included the demographics and how each factor contributed to risk tolerance levels. The theoretical objectives also assisted in achieving the primary objective by contributing to the empirical objectives. All four of the empirical objectives were completed and contributed to the completion of the primary objective.

It was found that the income that students receive for their expenses every month is a very limited amount to be able to start investing, but they can start investing small amounts in investments that can grow over a period of time with a small amount of capital. Students also have a lack of investment knowledge, which contributes to them not measuring their risk tolerance accordingly, which affects their investment strategies; therefore, the framework was created to guide students in investing.

Students must increase the knowledge that they have on investing to assist them in creating an investment portfolio before they start working to gain wealth from an earlier age than most individuals. If their risk tolerance and investment knowledge improve it could contribute to better investment decisions to assist in securing their financial well-being and to improve their quality of life.

This study contributed to previous research on risk tolerance as it provided a framework for student investors to analyse their risk tolerance during the investor lifecycle. The study also provided insight and recommendations in ways that could improve student's investment knowledge and what instruments to invest in along with their awareness of risk tolerance.

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**ANNEXURE A: QUESTIONNAIRE**


***Measuring student investment potential: a mixed methods approach***

**Please do not put your name, surname, student number or any identifying marks on your questionnaire.**

You are being invited to take part in a research project that forms part of a MCom study in Risk Management. The purpose of the study is to measure student investment potential by identifying and analysing the extent of South African students' investing behavior.

Please take some time to read the information presented here, which will explain the details of this project. Please ask the researcher any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how you could be involved. Also, your participation is entirely voluntary and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you did agree to take part. You are kindly requested not to withdraw without careful consideration, since it may have a detrimental effect on, inter alia, the statistical reliability of the project.

By agreeing to take part in the project, you are also giving consent for the data that will be generated to be used by the researchers for scientific purposes as they see fit. The data will be **confidential** and your results will be reported in aggregate (as part of the whole sample) and not individually. The questionnaire should take, on average, less than 30 minutes to complete.

This study has received ethical clearance from the Social and Technological Sciences Research Ethics Committee of the Faculty of Economic Sciences & IT of the North-West University and received the following ethics clearance number: ECONIT-2017-022. The study has also received clearance from the NWU Research Data Gatekeeper Committee

(NWU-RDGC) with the following reference number: ECONIT-2017-022. The study will be conducted according to the ethical guidelines and principles as prescribed to by the North-West University (www.nwu.ac.za). It might be necessary for the research ethics committee members or relevant authorities to inspect the research records to make sure that we (the researchers) are conducting research in an ethical manner.

Should you have any queries please contact Rearabetswe Masenya at riahmasenya@gmail.com or Antonios Evangelou at evangelou.antonios@gmail.com. Alternatively, you can contact Dr Diana Viljoen at (016) 910-3403, Diana.Viljoen@nwu.ac.za.

If you have any concerns or complaints that have not been adequately addressed by the researcher you can contact the chair of the Social and Technological Sciences Research Ethics Committee (Prof Dawid Jordaan) at (016) 910- 3260 or Dawid.Jordaan@nwu.ac.za.

For office use only:

**SECTION A**

| | |
|---|---|
| **Age** | |

| | | |
|---|---|---|
| **Gender** | Male | 1 |
| | Female | 2 |

| | | |
|---|---|---|
| **Race** | African | 1 |
| | White | 2 |
| | Coloured | 3 |
| | Asian/Indian | 4 |

| | | |
|---|---|---|
| **Marital status:** | Never married | 1 |
| | Married | 2 |
| | Divorced | 3 |

| | | |
|---|---|---|
| **Nationality** | South African | 1 |

Other:_____

| | |
|---|---|
| **What is your home province (if you live in South Africa?)** | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **What language do you mostly speak at home?** | Sesotho | 1 | Tshivenda | 4 | SiSwati | 7 | Setswana | 10 |
| | IsiZulu | 2 | IsiNdebele | 5 | English | 8 | Xitsonga | 11 |
| | Sepedi | 3 | IsiXhosa | 6 | Afrikaans | 9 | Other | 12 |

| | | |
|---|---|---|
| **What degree are you enrolled in?** | 1 | BA |
| | 2 | BCom |
| | 3 | BEd |
| | 4 | BSc |
| | 5 | BTech |
| | 6 | Diploma |
| | 7 | Other |

| | | |
|---|---|---|
| **Which academic year of study are you in?** | 1 | 1st |
| | 2 | 2nd |
| | 3 | 3rd / 4th |
| | 4 | Hons |
| | 5 | MCom |
| | 6 | PhD |

| | | | | |
|---|---|---|---|---|
| **Indicate your current situation:** | Full-time student only | Part-time student only | Full-time student/ Part-time worker | Part-time student/ Full-time worker |

| | | | | |
|---|---|---|---|---|
| **Indicate your monthly income/allowance:** | R500 or less | R1001 to R1500 | R2001 to R2500 | More than R3000 |
| | R501 to R1000 | R1501 to R2000 | R2501 to R3000 | |

| | | | | |
|---|---|---|---|---|
| **Most of your income/allowance comes from?** | Allowance (Parents/Relatives) | Bursary/ Scholarship | Salary (Part-time or full-time job) | Savings |
| | Other (specify): | | | |

| | | |
|---|---|---|
| **Do you have any dependents?** | 1 | Yes |
| | 2 | No |

| | |
|---|---|
| **If yes, please indicate the number of dependents:** | |

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## SECTION B

| | | |
|---|---|---|
| **Do you save?** | 1 | Yes |
| | 2 | No |

| | | |
|---|---|---|
| **If yes, what type of savings account do you have?** | 1 | Flexible savings |
| | 2 | Fixed-term savings |
| | 3 | Tax-free savings/call account |
| | 4 | Call deposit |
| | 5 | Not sure |

| | | |
|---|---|---|
| **Do you invest? If yes, please move to *Section C*. If no, continue below.** | 1 | Yes |
| | 2 | No |

| | | |
|---|---|---|
| **What are your reasons for not investing?** | 1 | Don't know where to start |
| | 2 | Lack of investment knowledge |
| | 3 | Too much effort |
| | 4 | Lack of time |
| | 5 | Investing is intimidating |
| | 6 | Other (specify): |

| | | |
|---|---|---|
| **If you do not invest, would you consider investing?** | 1 | Yes |
| | 2 | No |

| | | |
|---|---|---|
| **What percentage of your income *would* you invest?** | 1 | 0% - 5% |
| | 2 | 5% - 10% |
| | 3 | 10% - 25% |
| | 4 | 25% - 50% |
| | 5 | 50% or more |

## SECTION C

| **1** | **What type of investments do you have?** |
|---|---|
| 1 | Money market account |
| 2 | Government bonds |
| 3 | Pension/Retirement annuity |
| 4 | Stocks/Shares |
| 5 | Derivatives (FOREX, ETFs) |
| 6 | Investment club/group (e.g. stokvel) |
| 7 | Other (specify): |

| | | |
|---|---|---|
| **What percentage of your income do you invest?** | 1 | 0% - 5% |
| | 2 | 5% - 10% |
| | 3 | 10% - 25% |
| | 4 | 25% - 50% |
| | 5 | 50% or more |

For office use only:

| 2 | **How long have you had the investments mentioned in Question 1?** |
|---|---|
| | a) Less than 6 months |
| | b) 6 months |
| | c) 1 year |
| | d) More than 1 year |
| | e) 2-5 years |
| | f) 5 years or more |

**SECTION D**

***For each of the following statements, please indicate how risky you perceive each activity or behaviour to be.***

| | | Extremely unlikely | Moderately unlikely | Somewhat unlikely | Not sure | Somewhat Likely | Moderately Likely | Extremely Likely |
|---|---|---|---|---|---|---|---|---|
| 1 | Betting a day's income at the horse races | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | Investing 10% of your annual income in a moderate growth mutual fund | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | Investing 5% of your annual income in a very speculative stock | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | Betting a day's income on the outcome of a sporting event | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | Investing 10% of your annual income in a new business venture | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**SECTION E**

| 1 | **When you hear "financial risk", what do you think of? *Choose one*.** |
|---|---|
| | a) Loss |
| | b) Uncertainty |
| | c) Opportunity |
| | d) Thrill |
| **2** | **In general, how would you describe yourself as a financial risk taker?** |
| | a) Willing to take as much risk as possible to get desired profit |
| | b) Willing to take risks after completing adequate research |
| | c) Cautious |
| | d) Avoid risk as much as possible |

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| | |
|---|---|
| **3** | **You are on a TV game show and can choose one of the following. Which would you choose (one option only)?** |
| | a) R 1 000 in cash |
| | b) A 50% chance to win R 5 000 |
| | c) A 25% chance to win R 10 000 |
| | d) A 5% chance to win R100 000 |
| **4** | **You have just finished saving for a "once-in-a-lifetime" holiday. Three weeks before you plan to leave, you lose your job. You would:** |
| | a) Cancel the holiday |
| | b) Take a much more modest vacation |
| | c) Go as scheduled, reasoning that you need the time to prepare for a job search |
| | d) Extend your vacation, because this might be your last chance to go first-class |
| **5** | **If you unexpectedly received R 20 000 to invest, what would you do?** |
| | a) Deposit it in a bank account, money market account, or an insured certificate of deposit (low risk) |
| | b) Invest it in safe high-quality bonds or bond mutual funds (medium risk) |
| | c) Invest it in stocks or stock mutual funds (high risk) |
| **6** | **In terms of experience, how comfortable are you investing in high or medium risk investments such as stocks or stock mutual funds?** |
| | a) Not at all comfortable |
| | b) Somewhat comfortable |
| | c) Very comfortable |
| **7** | **Some experts are predicting prices of assets such as gold, jewels, and real estate (hard assets) to increase in value. Bond prices (low risk) may fall as a result. If most of your investments are in high interest government bonds, what would you do?** |
| | a) Keep the bonds |
| | b) Sell the bonds, put half the money into a high interest savings account, and purchase hard assets with the other half |
| | c) Sell the bonds and put all the money into hard assets |
| | d) Sell the bonds, put all the money into hard assets, and borrow money to buy more |
| **8** | **Given the best and worst case returns of the four investment choices below, which would you prefer?** |
| | a) R 200 gain best case; R 0 gain/loss worst case |
| | b) R 800 gain best case; R 200 loss worst case |
| | c) R 2 600 gain best case; R 800 loss worst case |
| | d) R 4 800 gain best case; R 2 400 loss worst case |

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| | |
|---|---|
| **9** | **In addition to whatever you own, you have been given R 2 000. You are now asked to choose between:** |
| | a) A sure gain of R 500 |
| | b) A 50% chance to gain R 1 000 and a 50% chance to gain nothing |
| **10** | **In addition to whatever you own, you have been given R 2 000. You are now asked to choose between:** |
| | a) A sure loss of R 500 |
| | b) A 50% chance to lose R 1 000 and a 50% chance to lose nothing |
| **11** | **Suppose a relative left you an inheritance of R 100 000, stipulating in the will that you invest ALL the money in ONE of the following choices. Which one would you select?** |
| | a) A savings account or money market mutual fund (low risk) |
| | b) A mutual fund that owns stocks and bonds (medium risk) |
| | c) A portfolio of 15 stocks (high risk) |
| | d) Commodities like gold, silver, and oil (high risk) |
| **12** | **If you had to invest R 20 000, which of the following investment choices would you find most appealing?** |
| | a) 60% in low-risk investments, 30% in medium-risk investments, 10% in high-risk investments |
| | b) 30% in low-risk investments, 40% in medium-risk investments, 30% in high-risk investments |
| | c) 10% in low-risk investments, 40% in medium-risk investments, 50% in high-risk investments |
| **13** | **Your trusted friend and neighbour, an experienced geologist, is putting together a group of investors to fund an exploratory gold mining venture. The venture could pay back 50 to 100 times the investment if successful. If the mine is a bust, the entire investment is worthless. Your friend estimates the chance of success is only 20%. If you had the money, how much would you invest?** |
| | a) Nothing |
| | b) One month's salary |
| | c) Three month's salary |
| | d) Six month's salary |

**SECTION F**

| | | |
|---|---|---|
| **Which of the following statements comes closest to the amount of financial risk that you are willing to take when making an investment?** | 1 | Take substantial financial risks expecting to earn substantial returns |
| | 2 | Take above average financial risks expecting to earn above average returns |
| | 3 | Take average financial risks expecting to earn average returns |
| | 4 | Not willing to take any financial risks |

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| *For each of the following statements, please indicate the degree to which you agree or disagree with the following statement.* | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Extremely unlikely | Moderately unlikely | Somewhat unlikely | Somewhat Likely | Moderately Likely | Extremely Likely |
| 1 | I know much about investment | 1 | 2 | 3 | 4 | 5 | 6 |
| 2 | I know how to judge the quality of an investment opportunity | 1 | 2 | 3 | 4 | 5 | 6 |
| 3 | I think I know enough about investment to feel pretty confident when I make an investment decision | 1 | 2 | 3 | 4 | 5 | 6 |
| 4 | I do not feel very knowledgeable about investment | 1 | 2 | 3 | 4 | 5 | 6 |
| 5 | Among my circle of friends, I'm one of the experts on investment | 1 | 2 | 3 | 4 | 5 | 6 |
| 6 | Compared to most other people, I know less about investment | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | I have heard of most of the new investment products that are around | 1 | 2 | 3 | 4 | 5 | 6 |
| 8 | When it comes to investment, I really don't know a lot | 1 | 2 | 3 | 4 | 5 | 6 |
| 9 | I can tell if an investment is worth the price or not | 1 | 2 | 3 | 4 | 5 | 6 |

**THANK YOU!**

**ANNEXURE B: LANGUAGE EDITOR**

Linda Scott
Editing Services

Masters (Linguistics: Intercultural Communication); BA (Hons) Lang Prac; ACE; NPDE
Reg. Member of SATI and SACE

English language editing
SATI membership number: 1002595
Tel: 083 654 4156
E-mail: lindascott1984@gmail.com

**08 March, 2020**

To whom it may concern

This is to confirm that I, the undersigned, have language edited the **dissertation/theses** of

**Antonios Evangelou**

for the degree

**MAGISTER TECHNOLOGIAE:**

entitled:

***An investment framework based on risk tolerance: a case of Vaal Triangle students***

The responsibility of implementing the recommended language changes rests with the author of the document.

Yours truly,

Linda Scott

## ANNEXURE C: ETHICAL CLEARANCE

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Private Bag X6001, Potchefstroom
South Africa 2520

Tel: 018 299-1111/2222
Web: http://www.nwu.ac.za

Economic and Management Sciences Research
Ethics Committee (EMS-REC)
Tel: 018 299-1427
Email: Bennie.Linde@nwu.ac.za

23 November 2018

Mr A Evangelou
*Per e-mail*

Dear Mr A Evangelou,

**FEEDBACK – ETHICS APPLICATION – A EVANGELOU (24006068) BCOM HONNS RISK MANAGEMENT**

Your ethical application on *An investment framework based on risk tolerance: A case of Vaal Triangle students – Ms S Ferreira,* that serve on the EMS-REC meeting of 23 November 2018 refers.

**Outcome:**

The ethics application is approved as a low-risk study. Application for ethics number (A) forwarded.

Kind regards,

Prof B Linde
Chairperson: Economic and Management Sciences Research Ethics Committee (EMS-REC)