

A Prima Facie Assessment of the Prevalence of Certain Emotional Biases in the Investment Decisions of South African Students.



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Abstract

This study investigates the prevalence of emotional biases that influence South African students' decision-making in an investment context. This study advances the understanding of whether the future financial professionals of South Africa are susceptible to irrational decision-making due to the influence of emotional biases.

A questionnaire-based survey was employed to test whether a sample of South African finance students exhibit emotional biases that influence their investment decision-making. The questionnaire posited investment scenarios to which the students would answer intuitively based on the information that was provided to them. This study asked the students to respond using their "gut-feel" to test whether emotional biases were inherent in their decision-making process.

It was found that the respondents were influenced by market trends, otherwise known as the representative bias, making them more susceptible to notice patterns in truly random sequences of data, or making them think that future patterns will resemble previous patterns.

85% of respondents did not show a tendency to anchor to a particular reference point. However, the data showed that 15% of the respondents did not give an answer when asked to answer intuitively, while 100% of the students gave a response when a reference point was introduced.

Just over half of respondents exhibited traits of overconfidence, and, consistent with historical research, males exhibited greater overconfidence than females. However, male and female responses showed mixed results in respect of loss aversion scenarios.

Furthermore, the analysis revealed that 58% of respondents were partial to choosing options that were framed positively. Finally, there was no significant evidence that respondents were influenced by the herding bias or the illusion of control bias.

In summary, this study found at least prima facie evidence of some emotional biases that influence investment decision-making. This conclusion demonstrates a viable basis for future research on the role of emotion (and, pertinently, emotional intelligence) in investment decision-making.

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Introduction

Conventional finance theory depicts investors as rational wealth-maximisers who base their investment strategies purely on risk-return optimisation (Markowitz, 1952). However, market practitioners are human beings, and as such they are prone to behave emotionally and thus irrationally. Individual investors interpret and act on information differently, often letting their emotions guide them to their final decision (Lerner, Li, Valdesolo, & Kassam, 2014). The Efficient Market Hypothesis¹ (EMH) allows for irrational investor behaviour, as EMH states that irrational trades occur at random and cancel each other out, and that market prices are not affected by irrational investors (Fama, 1970). Even if systematic irrational behaviour exists, EMH states that rational arbitrage traders will eliminate this behaviour. EMH does not endeavour to explain phenomena such as market bubbles and crashes, or inexplicable market movements caused by speculation.

Currently, with ever advancing technology, millions of “average” investors can easily access stock exchanges around the world and trade various securities with a push of a cell phone button or computer mouse. While investment decisions are usually based through market analysis with the aids of technical tools and financial modelling, individuals tend to make decisions based on information they are exposed to at the time, and more importantly, decisions based on intuition. Intuition in the context of decision-making is defined as a “non-sequential information-processing mode”. Thus; intuitive decision-making can be described as the method by which information gathered through associated learning and stored in long-term memory is accessed unconsciously to form the basis of a judgment or decision (Sinclair & Ashkanasy, 2005). This “gut feel” tends to succumb individuals to inherent emotional biases that affect their decision-making.

An alternate theory to EMH began in the 1960²'s in an attempt to “fill the gaps” and create a more complete understanding of market behaviour. This field is called Behavioural Finance. Behavioural finance relaxes traditional assumptions of rational investor behaviour by combining psychology and economics to explain why and how people make seemingly irrational or illogical decisions when they spend, invest, save and borrow money (Belsky & Gilovich, 1999). Essentially, Behavioural Finance is the study of the influence psychology on the behaviour of financial practitioners and the subsequent effect on markets (Sewell, 2001).

Empirical evidence in behavioural finance literature shows that individuals do not behave rationally. Barberis and Thaler (2003) provide a good summary of models that try to explain excess volatility, excessive trading, stock return predictability using the Prospect Theory of Kahneman and Tversky (1979). Daniel *et al.* (2002) support the view that markets are not efficient and that investor biases affect security prices substantially. Black (1986), De Long *et al.* (1990), Shleifer and Vishny (1997), Barberis *et al.* (2001), Hirshleifer (2001), Daniel *et al.* (2002), and Subrahmanyam

¹ The efficient market hypothesis is an investment theory that states it is impossible to “beat the market” because stock market efficiency causes existing share prices to always incorporate and reflect all relevant information. According to the EMH, stocks always trade at their fair value on stock exchanges. The only way an investor can possibly obtain higher returns is by purchasing riskier investments.

² Cognitive psychologists Daniel Kahneman and Amos Tversky are considered the fathers of behavioural finance since their initial collaborations in the late 1960s. However, only in the 1980's did excess volatility really begin the important discussions of the consistency of the efficient markets model (Shiller, 2003).

(2007) show that investors are not rational or that markets may not be efficient and hence prices may significantly deviate from fundamental values due to the existence of irrational investors.

Researchers use the intersection of Emotional Intelligence³ (EI) and behavioural finance in an attempt to demonstrate investor behaviours that may influence investment outcomes, for example; Individuals tend to be overconfident in their own knowledge and decisions, they extrapolate recent trends while dismissing the past, and they refuse to accept losses by holding losing positions for too long (Sullivan, 2011). Ameriks, Wranik and Salovey (2009) examined the role of emotions in the investment decision-making process by studying the degree to which investors identify, understand, interpret and effectively use their emotions. Ameriks, Wranik and Salovey (2009) measured the degree of emotional intelligence of investors with retirement accounts and found that those with a higher level of emotional intelligence appeared to manage a smaller allocation to riskier shares and were in so doing able to manage the portfolio risk better than those who had greater exposure to riskier assets. Furthermore, those investors did not make use of a highly active trading strategy and were more conservative.

Research by Crombie (2011) and Görgens-Ekermans, Delpont & Du Preez (2015) showed that a structured intervention is successful in increasing EI amongst participants. This prompts the question of whether an EI intervention (i.e. creating an awareness of EI and the behavioural biases that exist in decision-making) will lead to greater rational decision-making in an investment context. Furthermore, could this increased rational decision-making result in greater investment performance by avoiding unwarranted risky behaviour?

The purpose of this paper is to test for the presence and prevalence of behavioural biases in the investment decision-making process. The sample for this study comprises finance students at the University of Cape Town, South Africa. The approach focuses on four behavioural biases principally: the representative heuristic, anchoring, overconfidence and loss aversion. Furthermore, the study data is analysed to determine whether the biases are more prevalent in one gender or the other.

Previous papers have examined EI in an investment context: for example Cote & Yip (2012) designed two experiments to examine how EI ability and awareness facilitates decision-making in the face of risk. Azouzi & Jarboui (2014) explore the determinants of the financial policies of firms and examine the link between EI, decision biases and an organisation's financial policy efficacy, and Ameriks, Salovey, Wranik (2009) show that investors who score well on tests of emotional intelligence tend to exhibit behaviours that correlate strongly with good investment performance. However, almost all of the prior research was conducted outside of South Africa. In South Africa, Mulder (2009) investigated EI in the workplace and the role EI plays in the daily activities of 11 individuals at a South African investment management firm.

This paper offers a different approach by assisting in bridging the gap between EI and behavioural finance biases with investment decision-making in young South Africans by issuing a behavioural trading proxy questionnaire to final-year students in order to recreate scenarios in which the students would need to make investment related decisions.

³ Emotional Intelligence is the capacity of individuals to recognize their own and other people's emotions, to discriminate between different feelings and label them appropriately, to use emotional information to guide thinking and behaviour, and to manage and/or adjust emotions to adapt environments or achieve one's goals (Coleman, 2008).

The remainder of the paper is structured as follows: section 2 will explore and discuss previous literature on EI and explain various models that score EI in individuals. Section 3 will then link the literature to empirical research on EI in a financial environment and explore behavioural models and personality characteristics that explain biases and irrationality affecting decision-making. Sections 4, 5 and 6 set out the need for the study, methodology and the empirical results, and conclusions are drawn in section 7. Finally, given the limitations of this study and the prima facie evidence obtained, areas of future research are set out in section 8.

Hypothesis

The null hypothesis of this study is that; the sample of South African finance students do not exhibit emotional biases that influence their investment decision-making.

If the null hypothesis is rejected, then there is at least prima facie evidence of the effect of emotional biases on investment decisions. Such a prima facie result will demonstrate a viable basis for future research on the role of emotion (and, pertinently, emotional intelligence) in investment decision-making, notably in attempting to link EI with investment performance, and to test whether an increase in emotional intelligence can lead to greater investment returns.

Literature Review

The body of literature reviewed for this study considers the role of emotional intelligence in investing. The concept of EI is explored and a definition for emotional intelligence is presented. The results of previous empirical studies are cited to highlight the practical application of EI in an investment context. EI models and methods of measurement are also set out. In addition, empirical studies that both support and contradict the practical application of EI and present both complementary and alternative conceptualisations of EI will be reviewed. Finally, empirical findings of EI in the context of financial and investment performance will be discussed.

Emotional Intelligence

Mayer & Salovey (1990) defined emotional intelligence as a set of skills that is shown to assist with the assessment, expression and regulation of emotion in oneself and in others. Mayer & Salovey (1990) state that EI is the use of feelings to design, influence and accomplish in life. A similar definition was provided by Coleman (2008), who described EI as the ability to recognise one's own and other people's emotions, to discriminate between different feelings and label them appropriately, and to use emotional information to guide thinking and behaviour. Matthews, Roberts & Zeidner (2004) define EI as a concept that emphasises the importance of self-awareness and understanding. EI addresses the perceived imbalance between intellect and emotion. The field of EI connects with several advanced areas of psychological science, including the neuroscience of emotion, self-regulation theory, studies of meta-cognition and the search for human cognitive abilities⁴ beyond conventional academic intelligence. Proponents of EI assert that people who are emotionally aware are better able to control their emotions.

Brackett, Rivers & Salovey (2011) also identify EI as a development of two divisions in psychological research; this is consistent with Cherniss (2000) and Caruso, and Meyer & Salovey (2004) who cite literature that indicates the roots of EI in psychology. The first division involves cognition and affect, which explains how emotions and cognition interact to produce thought. The second division is the evolution of intelligence models. This evolution is of the movement in the evaluation of intelligence from a single array of mental ability to the incorporation of creative ability and practical knowledge.

According to Mayer & Salovey (1990), EI may be viewed as a subset of social intelligence. Social intelligence may have a negative connotation in its definition of the ability to manipulate the reaction of other people. However, it extends to the management and understanding of oneself as well as the consideration and perception of the behaviour and motives of others. The independence of social intelligence from EI is not easily demonstrable and it may blend into spatial, verbal or visual intelligence. Further, it is important to discriminate between intelligence itself and models of intelligence. The purpose of intelligence models is to describe the causes of and interrelations between mental activities. Such models are discussed later on in this paper.

To further disaggregate the concept of EI, one can examine the individual definitions of "emotions" and "intelligence". Emotions may be viewed as disorganised interruptions in a person's mental activity, which ought to be controlled so as to prevent potential disruption of and disturbances to an individual. An opposing view is that emotion is an organised response because it is adaptive and

⁴ Cognitive abilities are brain-based skills that involve conscious intellectual effort, such as thinking, reasoning, or remembering.

focuses on cognitive processes and subsequent action (Mayer & Salovey, 1990). The primary forces that direct, sustain, stimulate and prioritise human activity are emotions. Emotions generally arise in response to an internal or external positive or negative event. A person's emotions may potentially transform a social or personal interaction into an intense, enriching experience (Mayer & Salovey, 1990). Caruso, Meyer & Salovey (2004) cite a philosophical view on emotions as follows: "Emotions signal, govern and motivate responses to events. A specific emotion conveys unique emotional information, which is conveyed by a specific communication channel or through a pattern of associated signals".

Although there are many definitions, intelligence relates to the ability to learn, adapt and understand. Intelligence is a property that enables an individual to interact with his/her environment and adapt to different environments or objectives. It also relates to an individual's ability to profit or succeed in achieving goals and targets (Legg & Hutter, 2007). This is consistent with the work by Caruso, Meyer & Salovey (2004), where intelligence is viewed as the ability to carry out abstract thought and the capacity to learn and adapt to an environment. Cherniss (2000) mentions that although intelligence focuses on memory, problem solving and other cognitive abilities, non-cognitive abilities⁵ were also recognised as important. Cherniss (2000) further states that cognitive and non-cognitive abilities are related and suggest that non-cognitive skills may improve cognitive capacity.

In order to give a complete definition, one must understand what EI is not. Matthews, Roberts & Zeidner (2004) address myths about EI. One of the myths is that EI definitions are conceptually coherent. EI proponents claim that EI describes a wide range of social, emotional and personal competencies. However, upon examination of the literature, Matthews, Roberts & Zeidner (2004) found no apparent consensual EI definition. Furthermore, there were neglected conceptual problems that had led to confusion. Another myth discussed by Matthews, Roberts & Zeidner (2004) is the claim that EI is critical to achieving success in the real world. Matthews, Roberts & Zeidner (2004) state that due to the vague and broad conceptualisation of EI, its practical utility is redundant. There is little basis for indicating that EI is strongly predictive in real world outcomes or that any interventions to increase EI in the educational setting will be effective in skill enhancement. Furthermore, there is lack of clarity on whether ability tests actually measure EI. This is contrary to Cherniss (2000), who believes that EI has a firm scientific foundation and offers a platform for psychologists to add value to clients. Cherniss (2000) cites research which suggests that leaders with warmth, understanding, trust and respect are more successful with their employees. Braidfoot and Swanson (2013) support the position of Cherniss (2000) and view EI as vital to workplace efficacy; they also discuss the benefits to people and businesses. With proper training and coaching, it is believed that an individual's emotional circuitry can be reconfigured to improve emotional performance (Cherniss C. , 2000). This is consistent with Brackett, Rivers & Salovey (2011) who believe that EI can be developed over time. Brackett, Rivers & Salovey (2011) also state that EI can be measured objectively and that ability models are preferred as performance tools. This is contrary to Matthews, Roberts and Zeidner (2004) who suggest that ability tests are too vague to accurately measure EI.

⁵ Non-cognitive abilities are related to motivation, integrity, and interpersonal interaction, and are associated with an individual's personality, temperament, and attitudes.

Waterhouse (2006) argues that EI is poorly understood and therefore that it makes generalisation across research difficult. Waterhouse (2006) further argues that EI lacks predictive validity and is not a basis for moral consideration. It is the opinion of Waterhouse (2006) that EI has not been well differentiated from IQ and personality. Consistent with the beliefs of Matthews, Roberts and Zeidner (2004), Waterhouse (2006) states that it would be premature to apply EI to academic settings. In response to the claims of Waterhouse (2006), Cherniss *et al* (2006) comment on the early stage of EI which evolved to generate several further constructs of EI. There is no consensus view of EI because it is still in a developmental phase, but also there is no consensus view on what IQ is and how best to measure it. Cherniss *et al* (2006) indicate that EI is distinct to both personality and IQ. In contrast to Matthews, Roberts and Zeidner (2004) and Waterhouse (2006), Cherniss *et al* (2006) suggest that educational psychology should incorporate EI to foster emotional and social learning within schools and communities.

Although there are contradictory views and hypotheses regarding EI, what is evident is that it is an important component of human interaction, and one cannot ignore the importance of its role in society and the workplace, and what effect EI has on our ability to make the correct decisions.

Emotional Intelligence Models and Measures

According to Lievt (2010), rational thinking and decision-making does not have much room for emotions, and emotions are often considered irrational occurrences that may distort reasoning (Barnes & Thagard, 1996). However, emotional management can arguably be the centrepiece of rational decision-making. It follows that if an investor can effectively manage the emotions affecting decisions that should, under a traditional perspective, be unrelated to that emotion, then the investor will be able make an unbiased, rational and justifiable decision.

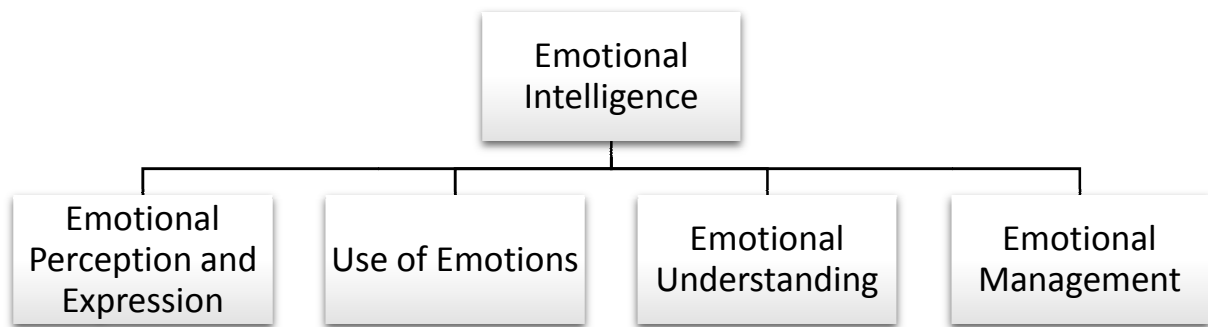
Bodies of literature qualify and quantify this emotional management, or EI, by means of models, personality traits, and emotional biases, some of which are described below. Braidfoot & Swanson (2013) describe four aspects to EI. These are relationship management, self-management, social awareness and self-awareness. EI allows a person to monitor his/her own emotions and the emotions of other people, and it channels emotional information into a positive result. Braidfoot & Swanson (2013) recognise three distinct areas of the brain. The first are is cognition, from which intelligence stems. The second is the affective area of the brain, where emotions and moods are contained. The third area of the mind is motivation, which represents biological instinct as well as trained goal driven behaviour. Being able to identify, regulate and improve these components internally and in other people is representative of EI.

The models described below are used to measure and gauge EI, as well as provide a framework for enhancing techniques.

Four Branch EI Model

The four branch ability model proposed by Caruso, Meyer & Salovey (2004), divides EI into four areas: firstly, to accurately perceive, evaluate and be expressive of emotion; secondly, the ability to access and generate emotions and to assimilate thought; thirdly, to understand and derive knowledge from emotion; and fourthly, to manage and regulate emotion. This is represented in Figure 1 below.

Figure 1: The Four Branch EI Model



Emotional Perception and Expression

This involves the ability for self-awareness; to be aware of one's own feelings as they occur. Furthermore, it is the ability to learn to identify and label specific feelings in oneself and others and the ability to clearly and directly communicate and discuss these emotions. In an investment context, this awareness would allow an individual to circumvent certain emotions that may negatively or improperly influence their decision.

Use of Emotions

This is the ability to let someone's feelings guide them to important thoughts and considerations. This is also the ability to use someone's feelings to help them make decisions which are healthy for that person and everyone else. This use of emotions can be used positively to bring a holistic perspective to a decision, for the betterment of that decision.

Emotional Understanding

Emotional understanding is the ability to understand the purpose of emotions and understand their survival value to the species. Furthermore it is the understanding of relationships between emotions: how and why they can change from one feeling to another. This encompasses the emotions which lead to particular behaviour in the person and in others, and the relationship between thoughts and feelings. It also attempts to identify the causes of emotions and their relationship to human psychological needs, especially unmet emotional needs.

Emotional Management

Emotional management is the ability to take responsibility for one's own feelings and happiness, the ability to turn negative emotions into positive learning and growing opportunities, as well as the ability to help others identify and benefit from their emotions.

Bar-On Model

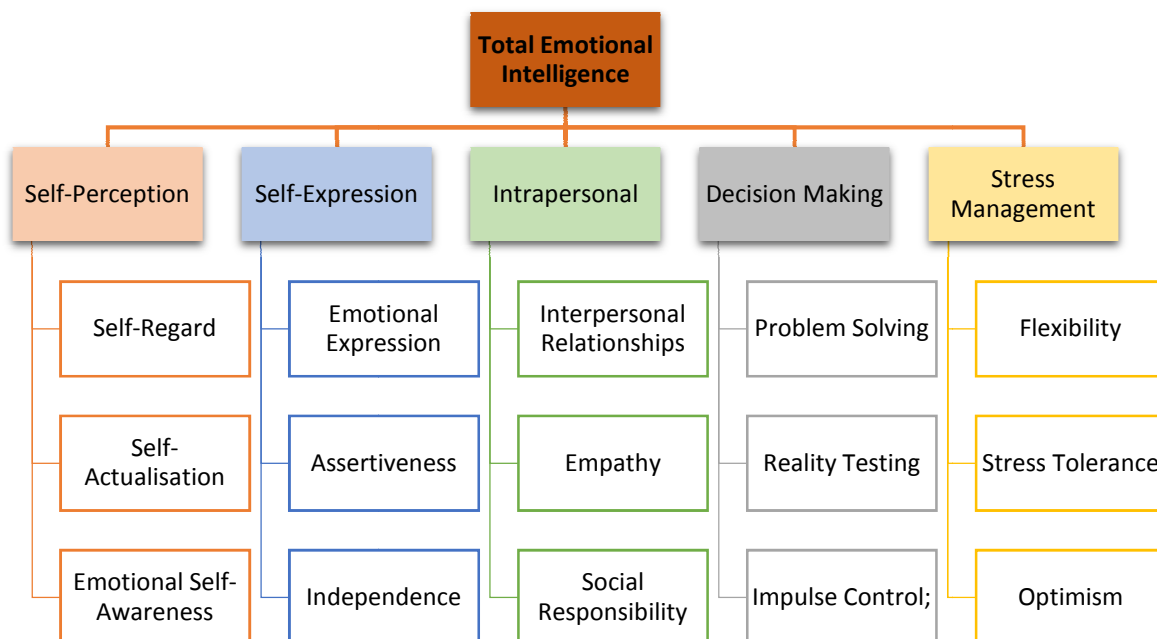
Dr Reuven Bar-On is credited with having built the first commercially available operational index for the assessment of EI. The model created by Bar-On in 2006 defines EI in terms of an array of traits and abilities related to emotional and social knowledge that influences an individual's overall ability to effectively cope with environmental demands. EQ-i was constructed to enable the measurement of the model which Bar-On created. The EQ-i is a self-report measure that measures emotionally and

socially competent behaviour and estimates individuals emotional and social intelligence (Stys & Brown, 2004).

The Bar-On model, as shown in Figure 2 below, comprises measures of certain emotional and social competencies, skills and facilitators, divided into five different areas which interact with each other: intrapersonal (including emotional awareness, assertiveness, independence, self-regard and self-actualisation); interpersonal (including empathy, social responsibility and interpersonal relationships); stress management (including stress tolerance and impulse control); and lastly general mood (including happiness and optimism). Overall, Bar-On (2006) proposed that EI primarily consists of being able to understand oneself and others, to cope with daily environmental demands and to problem solve in changing situations.

Empirical evidence supporting this model comes from studies of neurological patients who have experienced damage to certain areas of the brain (the Ventro-Medial (VM) prefrontal cortex, amygdala and somatosensory cortices). These areas are associated with emotional signalling, and making effective personal and interpersonal decisions (Bar-On R. , 2006). A famous clinical case study was of Phineas Gage (Reuven & Parker, 2000) who suffered an injury to his VM prefrontal cortex. After this injury his behaviour changed radically: he lost interpersonal skills such as being responsible and reliable. More recently, (Reuven, Tranel, Denberg, & Bechara, 2003) measured EI, decision-making ability, social functioning and cognitive intelligence in patients with VM prefrontal cortex, amygdala and somatosensory cortices lesions. Patients with damage to these areas showed low EI and difficulties in social functioning, although they had normal cognitive intelligence (Reuven & Handley, 2003). This shows that EI may be distinct from cognitive intelligence, and that EI is important to both personal and social functioning (Reuven & Handley, 2003)

Figure 2: The Bar-On Model of Social and Emotional Intelligence

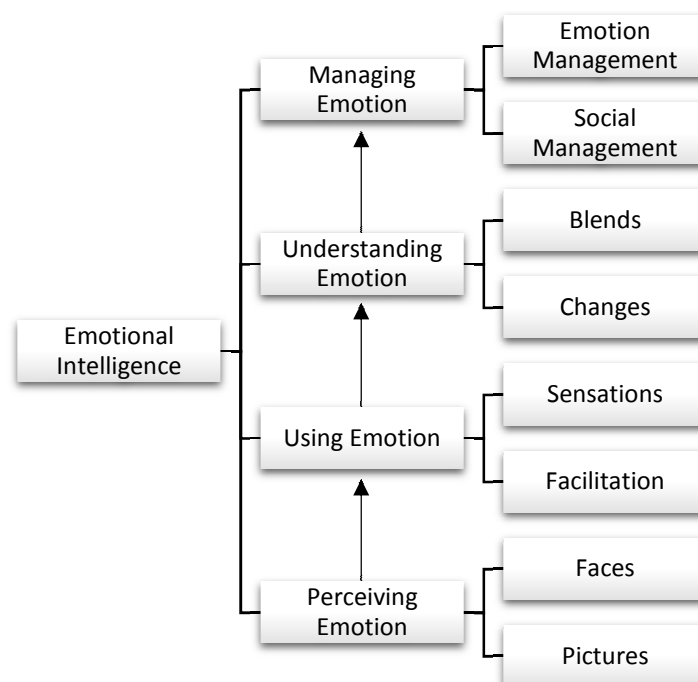


MSCEIT Model

Caruso, Meyer & Salovey (2004) proposed an ability model and the MSCEIT (Mayer Salovey Caruso Emotional Intelligence) model for EI, which is graphically represented in Figure 3 below. The MSCEIT model is based on a series of emotion-based problem-solving items and based on the view that emotions and thoughts work with each other in adaptive ways and modelled on ability-based IQ tests (Salovey & Grewal, 2005). According to Brackett, Rivers & Salovey (2011), the research in the field of EI was in its incipient phase at the time of the development of the MSCEIT; nevertheless, EI can be objectively measured, and the skills that make up the constructs of EI can be developed over time.

In studies by Brackett, Rivers & Salovey (2011), it was found that individuals scoring higher on the MSCEIT model utilised less cognitive effort during problem solving. It was also found individuals who solved social problems more quickly had higher MSCEIT scores. In relation to social functioning, people with high MSCEIT scores were viewed as interpersonally sensitive and tended to engage in better quality relationships. Students at tertiary institutions who had high MSCEIT scores were less prone to drug usage, infighting and stealing. In terms of academic performance, students with high MSCEIT scores were less likely to have negative attitudes towards school and their teachers. In the workplace, higher MSCEIT scores were related to higher job satisfaction and lower MSCEIT scores were related to burnout. Higher MSCEIT scorers also had higher company rank and earned better raises in salary.

Figure 3: MSCEIT Model



Empirical Research on Emotional Intelligence

Cherniss (2000) cites a study by Salovey and Mayer (1990) showing that people with high emotional clarity were able to identify and label a mood being experienced and were able to recover more quickly after watching an upsetting film. Cherniss (2000) also cited another study by Salovey, Bedell, Detweiler, & Mayer (1999) showing that individuals with a greater ability to understand, evaluate and perceive other people's emotions were better able to respond to changes in their environment and create social networks; furthermore, in the same study (Salovey *et al*, 1999) IQ was found to not be very predictive of job performance. Studies by Hunter and Hunter (1984) and Sternberg (1996) found that IQ accounted for 4% to 25% of the variation in the level of performance on the job. More predictive factors were emotional control, capacity to handle frustration and the ability to interact well with others. A study by Feist & Barron (1996) revealed that a person's emotional and social abilities were four times more important in determining job success and prestige than IQ.

These findings are consistent with Singh (2001), who explored the value of EI in business and posited that 20% of a person's success in life is ascribed to IQ while EI accounts for the remaining 80%. Singh (2001) states that individuals with high IQ scores may fail professionally whereas people who do not have high IQ scores may prove to be extremely successful. There is further support for these findings in Emmerling & Goleman (1998) who found IQ to have less predictive power than EI in the field of outstanding leadership. Qualitative research indicates that IQ fails to explain the variation associated with career success among senior leaders and management. Further literature suggests that IQ combined with social and emotional competencies are better predictors of career performance. IQ may also be a limited predictor because there is a restriction applied in organisational settings, whereby senior management and leaders are required to have a threshold competence. Emmerling & Goleman (1998) also claim that all forms of intelligence ought to exhibit low to moderate correlation to be classified as intelligence; therefore, correlations can be expected between IQ and EI. This is consistent with Mayer & Salovey (1990), who viewed EI as a subset of social intelligence, which in turn integrates into visual, verbal and spatial intelligence.

Research by Goleman (1998) supports the belief that EI is better at predicting leadership success. After analysing 500 competence models of leadership from top companies, Goleman (1988) concluded: "the higher the rank of those considered star performers, the more emotional intelligence competencies emerged as the reason for their effectiveness. When the comparison matched star performers against the average ones in senior leadership positions, about 85% of the difference in their profiles was attributable to factors relating to EI rather than to purely cognitive abilities like technical expertise."

Behavioural Finance

Although gains and losses are a normal part of the economic cycle, most investors do not respond similarly to gains and losses. Investors feel positive emotions from a realised gain but relatively stronger negative emotions from a realised loss of the same size (Kahneman & Tversky, 1979). As a result, some investors sell their profitable shares prematurely while hanging on to their losers. Some trade too much, incurring large trading fees, while others trade too little. In the past, behavioural finance research attributed these kinds of mistakes primarily to cognitive heuristics⁶ and biases.

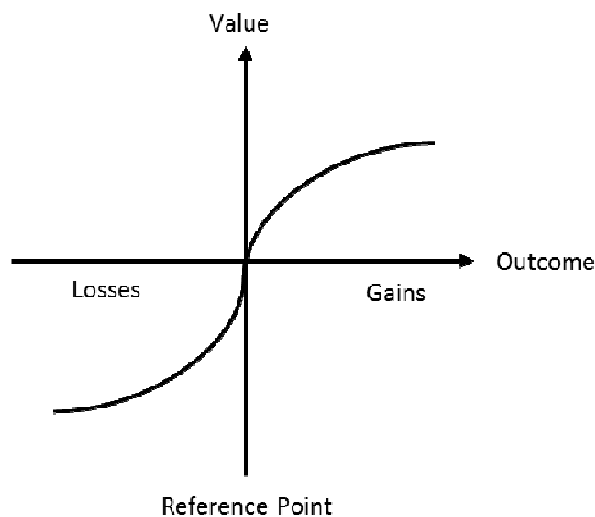
⁶ Heuristics are described as "judgmental shortcuts that generally get us where we need to go – and quickly – but at the cost of occasionally sending us off course." (Gilovich & Savitsky, 1996)

However, psychologists and economists have shown increased interest in the role of emotions in economic behaviour and decision-making. An abundance of evidence now exists that feelings significantly influence decision-making, especially when the decision involves risk and uncertainty. Researchers still have much to learn, however, about the influence of individual differences in these processes and the role these differences and processes play in real financial investment decisions and behaviour (Ameriks, Wraniak, & Salovey, 2009). This is consistent with Agnoli, Pozzoli, Rancan, Rubaltelli (2013) who note that previous literary work on investment decision-making suggests that emotions reduce investor risk-taking and prevent rational investing. Agnoli *et al* (2013) showed that individuals with high EI ought to be more willing to accept investment risk. The data used to create a model showed that EI was able to predict investment willingness when there is both positive and negative expected value (Agnoli *et al*, 2013). The predictive power of EI remained significant even after controlling for variables such as attitude towards money and economic risk.

Prospect Theory

Kahneman and Tversky (1979) presented a critique of expected utility theory⁷ as a descriptive model of decision-making under risk, and developed an alternative model which they called *Prospect Theory*. Kahneman and Tversky (1979) found that people underweight outcomes that are merely probable in comparison with outcomes that are obtained with certainty. Also, it was found that people generally discard components that are shared by all prospects under consideration (Kahneman & Tversky, 1979). Under prospect theory, value is assigned to gains and losses rather than to final assets, and probabilities are replaced by decision weights. The value function is defined on deviations from a reference point and is normally concave for gains (implying risk aversion), and convex for losses (risk seeking) as seen in Figure 4.

Figure 4: Prospect Theory Model



⁷ Expected Utility Theory states that the decision maker chooses between risky or uncertain prospects by comparing their expected utility values – the weighted sums obtained by adding the utility values of outcomes multiplied by their respective probabilities (Davis, Hands, & Maki, 1997).

The convexity of the curve is generally steeper for losses than for gains, illustrating that investors feel losses greater than gains of the same magnitude (Kahneman & Tversky, 1979).

Prospect theory essentially states that individuals make decisions based on the potential value of losses and gains rather than the final outcome, and that people evaluate these losses and gains using certain cognitive heuristics, or biases.

Bias is nothing else but the “predisposition towards error” (Shefrin, 2007). In other words, a bias is a prejudice or a propensity to make decisions while already being influenced by an underlying belief. There are many common biases that humans exhibit. In addition to biases, individuals often make decisions by engaging in other forms of psychological influences, such as the Framing Effect, where one’s decision is influenced by the way a particular issue is presented (Shefrin, 2007). Prospect Theory provides a framework for understanding cognitive biases and can be used to explain various illogical financial behaviours, for example:

Representative Heuristic

Representativeness results in investors labelling an investment as good or bad based on its recent performance. Consequently, they buy stocks after prices have risen expecting those increases to continue and ignore stocks when their prices are below their intrinsic values.

Anchoring

Anchoring is the tendency to hold on to a belief and then apply it as a subjective reference point for making future judgments. Anchoring occurs when an individual lets a specific piece of information control their cognitive decision-making process.

Regret Avoidance Bias

Under the disposition effect, otherwise known as regret avoidance, investors tend to sell profitable stocks too early and hold on to losing stocks for much longer (as opposed to holding on to profitable stocks and cutting their losses by selling losing stocks), resulting in suboptimal returns. The disposition effect can also be explained by rebalancing a portfolio. If there is a large increase in the price of one stock, there will be an increase in the weighting of that stock and therefore an investor will sell the profitable stock in order to rebalance the portfolio.

Local or Home Bias

Home bias is the tendency for investors to invest in a disproportionately large amount of their portfolios in domestic equities, despite the ostensible benefits of diversifying into foreign equities. This bias is believed to have arisen as a result of the extra difficulties associated with investing in foreign equities, such as legal restrictions, but more importantly for the use of this study, the belief that “home is better”. Ultimately, the investor thus loses out on potentially good investments.

Self-Attribution Bias

Self-attribution was first mentioned in a study by Miller & Ross (1975), in which it was established that the bias resulted in individuals engaging in self-protection during times of failure, and self-enhancement in times of success. When experienced by individual investors, this bias manifests itself as the attribution of positive performance to factors within the investor’s control, and negative performance to factors outside of the investor’s control. This bias is also strongly related to overconfidence.

Overconfidence Bias

The overconfidence bias suggests that the way people behave indicates that they believe that they have a greater ability than they do in reality (Chen, Kim, Nofsinger, & Rui, 2007). This causes investors tend to trade more frequently because they overrate their knowledge and abilities.

Closely related to the overconfidence bias is the Illusion of Control. This bias is defined as the “tendency of people to believe they can control or influence outcomes that in reality they have no influence over” (Shefrin, 2007). Illusion of control gives people the wrong impression of outcomes that can be influenced by personal involvement. People who display the Illusion of Control accentuate their predisposition towards error as it is so closely related to overconfidence.

Herding Bias

Herding, from a behavioural finance point of view, is the phenomenon where individual investors act the same way as the broader group of investors. This is cited as one of the main reasons for bubbles and crashes observed in financial markets over time (Lux, 1995).

Personality Characteristics

In addition to EI, certain personality characteristics can influence decision-making. The “Big Five” model attempts to describe personality, and evidence supporting the Big Five model’s power to characterise personality differences began with the research of Allport and Allport (1921) and has been growing over the past century.

The Big Five encompasses the following categories:

Extroversion

Extroversion is “the act, state, or habit of being predominantly concerned with obtaining gratification from what is outside the self” (Merriam-Webster Dictionary, 2015). Extroverts tend to enjoy human interactions and to be enthusiastic, talkative, assertive, and gregarious. Extroverts are energised and thrive when around other people. They take pleasure in activities that involve large social gatherings, such as parties, community activities, public demonstrations, and business or political groups. They also tend to work well in groups (The Myers & Briggs Foundation, 2015).

Agreeableness

“A person with a high level of agreeableness in a personality test is usually warm, friendly, and tactful.” (Matthews, Deary, & Whiteman, 2003). They generally have an optimistic view of human nature and get along well with others. A person who scores low on agreeableness may put their own interests above those of others. They tend to be distant, unfriendly, and uncooperative.

Conscientiousness

Conscientiousness implies a desire to do a task well. Conscientious people are efficient and organised as opposed to easy-going and disorderly. They exhibit a tendency to show self-discipline, act dutifully, and aim for achievement; they display planned rather than spontaneous behaviour; and they are generally organised and dependable. It is manifested in characteristic behaviours such as being neat and systematic.

Neuroticism/Negative Affectivity

Neuroticism can plague an individual with severe mood swings, frequent sadness, worry, and also being easily disturbed. Research shows that negative affectivity relates to different classes of variables: Self-reported stress and coping skills, health complaints, and frequency of unpleasant events. Weight gain and mental health complaints are often also experienced (Watson & Clark, 1984).

Intellect/Openness to Experience

Openness is a general appreciation for art, emotion, adventure, unusual ideas, imagination, curiosity, and variety of experience. People who are open to experience are intellectually curious, open to emotion, sensitive to beauty and willing to try new things. They tend to be, when compared to closed people, more creative and more aware of their feelings. They are also more likely to hold unconventional beliefs (Kaufman, 2013).

According to Ameriks, Wranik & Salovey (2009), this work has been expanded by, among others, Norman (1963), Eysenck (1970), Goldberg (1981), and McCrae and Costa (1987, 1997). Empirical research has found that introversion, lack of neuroticism, and lack of agreeableness determine higher levels of household savings in the real population (Nyhus & Webley, 2001) and that conscientiousness and lack of neuroticism predict pre-retirement planning (Hershey & Mowen, 2000). Other research has shown that extroversion and lack of conscientiousness are related to impulse buying (Verplanken & Herabadi, 2001). While impulsiveness is not directly associated with the Big Five model, studies have linked impulsiveness to higher risks of smoking, drinking, and drug abuse and to aggression, compulsive gambling, severe personality disorders, and attention deficit problems (Ameriks, Wranik, & Salovey, 2009). Impulsiveness can have both positive and negative effects for investment decisions: Ameriks, Wranik & Salovey (2009) found that impulsive investors may engage in more frequent trading than less impulsive investors. Furthermore, impulsive investors may not fully analyse the situations in which they find themselves and thus they may make decisions too hastily.

Emotional Intelligence in an Investment Context

One of the primary drivers of emotional outbursts is financial stress, experienced during mediation and financial planning sessions (Braidfoot and Swanson, 2013). Braidfoot and Swanson (2013) cite research by Britt, Huston, & Durband (2010) as well as Colfax, Rivera, & Perez (2010) that recognised and acknowledged a person's emotional connection with his/her money and financial health. Braidfoot and Swanson (2013) point out that clients share information on their financial goals and aspirations but that this process typically generates an emotional reaction. Issues regarding death, divorce, disclosure of assets and investment loss may lead to displays of emotional volatility from a client. A study by Sussman & Dubofsky (2009) revealed that approximately 25% of a financial planner's time is spent addressing human behaviour, fears and concerns. It was found that 74% of the financial planners in the study had experienced an emotional reaction from a client. Additionally, 40% of these planners had received no non-financial training or coaching.

According to Lerner, Loewenstein & Small (2004), emotional moods, especially those stemming from negative feelings (such as sadness or anger) influence real economic decisions. Investors with the ability to use emotions intelligently make investment decisions when they are in a positive frame of mind (Lerner, Small, & Loewenstein, 2004). Investors with the capacity to understand and manage

their emotions intelligently should be less influenced by the abundance of external information sources than other investors when making investment decisions.

Cote & Yip (2012) designed two experiments to examine how EI ability and awareness facilitates decision-making in the face of risk. It was hypothesised that participants with high degrees of emotional understanding will correctly identify the events that lead to an emotional response and specifically, whether their emotions arise from events unrelated to their current decisions. Cote & Yip (2012) expect that incidental feelings of anxiety, which are not associated with current decisions, reduce risk-taking more significantly among participants with low levels of emotional understanding. The results of the first experiment carried out were consistent with this prediction. In the second experiment, participants were informed about the source of anxiety and it was found that the level of emotional awareness was irrelevant. This suggests that emotional understanding helps people discount the effects of anxiety on risk taking. If irrelevant feelings of anxiety are allowed to influence decision-making, people may employ strategies that are too safe. A poor ability to understand emotion is associated with an increased likelihood of the incorrect classification of feelings of anxiety. An investor with low emotional understanding is probably more influenced by the incidental feelings of anxiety which lead to an avoidance of investment in equities (with the associated higher risk and higher return). This is because the investor is less aware that the source of anxiety arises from an unrelated situation.

Azouzi & Jarboui (2014) explore the determinants of the financial policies of firms and examine the link between EI, decision biases and an organisation's financial policy efficacy. One of the main determinants of organisational issues is the EI level of the CEO. Azouzi & Jarboui (2014) attempted to establish if financial decisions made by the CEO are distorted by behavioural biases. Emphasis is placed on EI because human relationships within business entities are based on emotional rather than rational factors. Successful institutions demand employees who demonstrate emotional control and communicate effectively, in addition to technical ability. Azouzi & Jarboui (2014) hypothesised that the bigger the decline in a CEO's level of optimism, the higher the degree of EI displayed and the more effective the policies of the firm will be. EI improves the ability to process information, detect situations and appraise alternatives. Leaders with high EI are visionary, have better perspective and are able to understand situations globally. Well-developed emotions allow leaders to exploit a firm's productive capacity and its financial policies and they enable individuals to make optimal use of resources and capabilities.

The second hypothesis by Azouzi & Jarboui (2014) is that the larger the decline in a CEO's loss aversion or overconfidence, the higher the level of EI displayed, and the more effective the firm's policies will be. The paper suggests that social emotional success is correlated with greater life satisfaction and sense of well-being, higher self-esteem, and better quality social interactions. CEOs with healthy EI are less susceptible to behavioural biases. Individuals with EI awareness are able to identify factors that affect negative and positive emotions and are therefore more likely to manage emotional bias and channel effective strategy. EI is related to the choice of a firm's capital structure because EI helps to explain managerial decisions. There was found to be positive correlation between a leader's EI and the level of overconfidence and optimism exhibited. A negative correlation existed with EI and the level of a CEO's loss aversion. An overconfident or optimistic leader makes investment specific decisions that improve business competitiveness and has focus on long-term value creation. This leader is also more likely to hedge against loss of compensation and

reputational risk. These managers prefer decisions which reduce cognitive, transaction and agency costs.

Ameriks, Salovey, Wranik (2009) surveyed 2 595 investors from Vanguard⁸. All of these investors were born between 1946 and 1964 and all participants had a traditional IRA⁹. These included Roth IRA, or 401(k)¹⁰ plan assets of at least US \$5,000 with at least US \$1,000 in two different mutual funds.

The study revealed the following systematic relationships for gender, educational attainment, and total assets:

- Women had higher EI scores in both the IRA and 401(k) samples. This gender effect has been found in most research in the domain of EI.
- Women had higher scores for all personality traits except openness.
- Women had lower scores on the impulsiveness tests, which indicate that they have the characteristics of more premeditation and more less than their male counterparts.
- The higher the educational attainment level, the higher the average EI total score, openness score, and urgency score.
- There were no systematic relationships between total assets and the EI or personality characteristics.

The analysis by Ameriks, Wranik & Salovey (2009) focused on five distinct aspects of investment behaviour:

- I. Asset allocation and overall exposure to stock market risk
- II. Frequency of trading or transaction activity
- III. Use of passive, index-based mutual funds
- IV. Adoption of internal equity investing
- V. Internal rate of return on investments

In general, the findings of Ameriks, Wranik & Salovey (2009) revealed that those high in EI were somewhat more conservative and less aggressive in risk taking than those low in EI. In particular, those with higher EI:

- Often held less than 50% of their assets in stocks and were unlikely to hold more than 90% in stocks;
- Were also less likely to trade or make changes to their portfolios; and
- Were more likely to use index funds as a part of their portfolios.

These results suggest that individuals high in EI are less likely to make extreme decisions and prefer to pursue a more balanced investment approach (Ameriks, Wranik, & Salovey, 2009). The Ameriks, Wranik & Salovey (2009) survey found no systematic relationship between EI and either internal rates of return (IRR's) or Sharpe ratios.

⁸ The Vanguard Group is an American investment management company based in Pennsylvania.

⁹ Individual Retirement Account that provides tax advantages for retirement savings.

¹⁰ 401(k) is a tax-qualified defined-contribution pension account.

Each of the Big Five dimensions [Personality Characteristics] played a somewhat different role in investment decision-making. First, openness did not play any systematic role. Second, conscientiousness played only a minor role; the only result was that those who scored high on this trait were less likely to be early adopters of new investment strategies. Third, those high in extroversion were more likely to be early adopters, which may reflect the excitement-seeking dimension of this trait (Ameriks, Wranik, & Salovey, 2009). The survey indicated a relationship between agreeableness and neuroticism. The findings for agreeable investors were mixed: agreeable investors were more likely to place less than 50% of their assets into stocks but also more likely to place more than 90% of their assets into stocks. Also, agreeable investors were less likely to trade within their 401(k) accounts, which shows conservative behaviour. Finally, agreeable investors were neither early nor late adopters of international investing. This result supports a conclusion that they had passive or “wait and see” attitudes (Ameriks, Wranik, & Salovey, 2009).

Emotional Intelligence studies in South Africa

The role of EI in the investment management industry has been evaluated by Mulder (2009) through a case study of a South African investment manager. The study explored the role EI plays within an investment management firm. This was done by reviewing the definition of this concept and exploring the documented business advantages. The overall aim of Mulder’s (2009) study was to determine the emotional intelligence profile by means of an EQ assessment and to use the results to determine the areas that ought to be developed and the potential issues that could exist if those developmental areas were not addressed. Mulder (2009) made the key assumption that intellectual intelligence, or IQ, in the asset management environment can be taken as a given i.e. that investment management firms only employ individuals that are intellectually seen as above average. Focus within this type of organisation is typically placed on a person’s academic competency and background with much effort being spent and resources being attributed to the further development of academic credentials. Unfortunately, in the process, the importance of emotional competency can be overlooked very often (Mulder, 2009).

The study by Mulder (2009) was undertaken to determine whether there is in fact a need to focus on EI within an investment firm and if EI was found to be lacking, to build a business case for development in specific areas identified. Mulder (2009) believed that this development could lead to a more balanced work environment and add significant value to the actual business performance. The subject investment management firm asked for volunteers from their investment team to take part in the study by providing them full information on EI, the reason for their participation in the study, and the feedback that they would receive after completion of the test. Eleven individuals made their time available and completed the online survey. According to Mulder (2009) investment team members usually have a postgraduate degree or a professional qualification. As such, there were not enough participants to enable statistical testing but the case study design presented a natural fit according to the writer and allowed for suitable analysis (Mulder, 2009). The Bar-On EQ-i measure was used to assess the EQ of the 11 participating individuals. Mulder (2009) used the Bar-On EQ-I measure as it has been extensively tested within the South African population, and the South African EQ-i norms appear stable and have little measurement error. For each individual, a Mulder (2009) calculated a composite EQ score from five EQ sub-section scores. The EQ sub-section scores in turn were calculated from 15 components or competency scores, with each sub-section having a varying number of component elements.

The EQ-I scores obtained from Mulder's (2009) sample group are significantly lower than the South African standard score in all, with the exception of one area (impulse control). This is a result that was counterintuitive to the intellectual profile the individuals in Mulder's (2009) study were assumed to have had.

The empirical studies suggest that EI is an important determinant of success in both work and life. Much of the literature on EI has stemmed from Mayer & Salovey (1990), as described by ways in which individuals frame problems that are likely to be related to an internal emotional experience. Individuals with skills related to EI may generate creative and flexible solutions when faced with problems. These individuals are also more apt at integrating emotional aspects in decision making alternatives. EI lends itself to better managerial decisions, investment allocation and financial advice giving. EI helps to create awareness of behavioural biases and subsequently assists in making more informed choices when faced with risk.

The empirical studies provoke the question of whether young people entering the investment industry are subject to emotional biases affecting their decision-making processes. If these inherent emotional biases exist, further research could be done on whether increasing EI, or at least creating an awareness of the emotional biases, would lead to rational decision-making or to greater investment performance.

This paper attempts to take the first step by establishing whether South African students exhibit inherent emotional biases that influence their decision-making.

Need for Study

While researchers such as Mulder (2009) and Cherniss (1998) investigate EI in the workplace and the role EI plays within the participants daily activities, they do not assess the effects that behavioural biases have on decision-making in an investment context, nor do they extend their findings to what extent increasing the EI of the participants affects their decision-making and ultimately their investment performance.

This research paper will assist in bridging the gap between emotional intelligence and behavioural finance biases with investment decision-making and investment performance. This prima facie study will focus on final year South African students and assess whether emotional biases are inherent in their decision-making. The results of which may lead to a better understanding of what affects the decision-making process of future business people in the investment industry of South Africa, and may offer insight to opportunities to educate young people regarding the extent to which emotional biases affect their rational decision-making before entering the workplace.

The hypothesis being tested is whether the students exhibit cognitive biases that influence their decision-making in an investment context, or whether they exhibit rational decision-making.

Methodology

This study conducted a survey using a questionnaire. A trading behaviour proxy survey was issued to a class of students at the University of Cape Town in an effort to identify certain biases that influence decision-making. Mugenda and Mugenda (1999) note that survey research attempts to collect data from members of a population and describes existing phenomena by asking individuals about their opinions, attitudes, behaviour or values. The questionnaire is attached at the end of this paper as Annexure A.

This design was suitable for this kind of study because the author intended to collect data meant to ascertain facts about investment decisions. This kind of research methodology makes use of surveys to solicit investors informed opinion. It is often used to study the general condition of people and organisations as it investigates the behaviour and opinion of people usually through questioning them (Cooper & Schindler, 2003).

Ethics

Ethical approval for the study was approved by the Committee of Ethics and Research of the Commerce Faculty at the University of Cape Town (UCT).

The study was voluntary, and participants gave their consent for the results obtained to be used for research purposes by taking part in the study. Strict confidentiality was upheld during the study as no participant was required to submit any individually identifiable information.

Study Design

Participants

UCT was founded in 1829 as the South African College, and is the oldest university in South Africa. UCT is one of the highest quality and internationally recognised institutions in South Africa and its Commerce Faculties are consistently placed among the hundred best internationally¹¹.

The participants were final-year Finance students registered with the Commerce Faculty at UCT. As final-year students, they are assumed to have the necessary knowledge to be considered investment- and finance-savvy, and they are further assumed to have above-average knowledge about the financial industry. There were no inclusion/exclusion criteria imposed and the participants were informed about the nature and objectives of the research study, and that their participation was voluntary.

Measurement of Behavioural Biases

All participants were issued with a questionnaire to test for behavioural biases. The participants were informed that there was no time limit to answer the questionnaire, but that the test would take approximately 10 minutes to complete. The participants were made aware that there was no correct answer to any of the questions, and that they should answer the questions intuitively.

¹¹ QS World University Rankings, the Times Higher Education World University Rankings, and the Academic Ranking of World Universities.

As intuitive decision-making can be described as the method by which information gathered through associated learning and stored in long-term memory is accessed unconsciously to form the basis of a judgment or decision (Sinclair & Ashkanasy, 2005). The premise behind asking the students to respond using their “gut-feel” was to test whether emotional biases were inherent in their decision-making process.

The questionnaire was issued to derive a baseline for the following:

- Sample size;
- Gender;
- Exposure to real-world investments;
- Response to questions relating to the representative heuristic;
- Response to questions relating to overconfidence;
- Response to questions relating to loss aversion;
- Financial behaviours towards lesser-known biases, namely; the herding bias, the illusion of control bias, and the framing effect.

These lesser-known biases were chosen due to their close ties with overconfidence and the extent to which they ultimately affect the decision-making process. For example; individuals tend to display overconfidence in conjunction with illusion of control, accentuating their predisposition towards error (Chira, Adams, & Thornton, 2008).

The baseline mean results were calculated to determine the overall presence of the biases. This is used as a starting point, or benchmark, to be used for comparison and analysis of the prevalence of biases amongst the students.

Analysis of biases amongst the sample

The baseline mean results were assessed to determine the extent to which the students are affected by the biases.

Limitations

Unpredictability of Sample

The design of this study was constrained by the inherent unpredictability of student behaviour. Individuals who chose not to participate in the study, deliberately blemish answers by the addition of opinions and out-of-context comments, or simply did not deem this study important enough to make a sincere contribution may have a material effect testing the hypothesis. Further research would need to provide an adequate incentive for the sample to participate earnestly in order to gather accurate data.

Research Data was Confined to a Small Sample of Students

Whilst the final-year students in the sample were assumed to have the technical knowledge of the financial industry, there was an absence of real-life investment experience in the sample as results from the survey indicated that 58% of the students said they have never traded shares before. Also, owing to the unpredictability of student behaviour (limitation 1) the original sample was drastically reduced as there were about 300 registered students for the class, yet only 155 usable questionnaires were received from those who attended class that day. The findings in this study of

the relationship between EI and decision-making and investment performance were based exclusively on the research data from the small sample of students, and therefore cannot (indeed, should not) be generalised to individuals in real-world finance and investment. If research into the role of EI in investment performance is to generate findings and new knowledge that is relevant across the full range of individuals on an investment-related decision-making position, future studies must draw representative data from multiple samples from experienced individuals across various financial industries.

Research Data was Limited to Behavioural Proxy Questionnaires

The design of this study was constrained by inaccessibility to participants who were exposed to real-time trading data and investment related scenarios. Whilst this limitation still allowed the study to test the hypothesis by means of a questionnaire, it would have also been desirable to show data and findings on actual quantifiable trading data. Thus, future studies of an EI intervention on investment performance should endeavour to obtain ethics approval and reliable, willing participants to analyse and report results on a real-world quantifiable level and generate a data set based on live trading results.

No Adjustments were Made for Assumptions and Possible Variables

Assumptions of similarity made in this study that, if were different, could potentially have affected the results. For example, assumptions were made that the sample had adequate financial knowledge. Thus future research studies must exercise caution with regard to assumptions and variables and, where necessary, appropriate adjustments must be made.

Results

Out of the registered class of final-year students, 155 usable survey responses were received (n=155) and thus determined the sample size for the study.

The survey results revealed that out of the sample, 44% of the participants were male, 53% were female, and 3% chose not to disclose their gender. This provides an approximate balance between males and females in the sample, and responses regarding EI can be analysed and compared between genders.

In an attempt to assess the real-world experience of the sample, participants were asked if they had an account at a financial institution, and whether or not they invested in anything other than bank savings. 98% of the participants indicated that they had an account at a financial institution; however, only 48% invested in anything other than bank savings. This indicates that less than half of the sample had any experience with investment products and thus the balance of the sample were not in a suitably informed position to make investment-related decisions, alternatively lack sufficient experience. Out of the participants who indicated that they did hold investment accounts, 68% were males and 32% were females.

Participants who had investment accounts other than bank savings were then asked how often on average they bought or sold shares. 1% of this group responded that they traded about once a day, 3% traded about once a week, 8% traded about once a month, 12% traded once every six months, and 23% traded about once a year, or once every few years. A summary of the findings is shown Figure 5:

Figure 5: Survey Results - Sample Size and Trading Experience

	Sample	Male Participants	Female Participants
n (sample size)	155	44%	53%
Have an account at a financial institution	98%	97%	99%
Invest in anything other than bank savings	48%	68%	34%
Trade shares more than once a day	0%	0%	0%
Trade shares about once a day	1%	1%	0%
Trade shares about once a week	3%	4%	2%
Trade shares about once a month	8%	16%	2%
Trade shares about once every six-months	12%	20%	5%
Trade about once a year, or once every few years	23%	25%	23%
Do not trade	52%	32%	68%

Representative Heuristic

The representative heuristic was measured by asking the participants to choose between certain trends on the JSE/FTSE All Share index, as to when they thought it would be a good time to buy or sell shares on the index. The trends presented to the participants were that the share price had gone up by 10%, or 20% in the last week, the share price had fallen by 10% or 20% in the last week, and finally if the share price had not fluctuated much in the last week. Secondly, the participants were

given a scenario where they were asked to assume that they did their shopping at a largely well-known company, namely Woolworths, and had always received great goods and service from Woolworths. The students were then asked if they believed that buying shares in Woolworths would represent a good investment choice based on their experiences. The options were whether the students strongly agreed, agreed, disagreed or strongly disagreed with the scenario. The aim was to determine whether the participants allowed a pattern or personal experience to influence their decision to buy or sell shares or not. The findings are summarised in Figure 6.

Figure 6: Survey Results - Representative Heuristic

	Sample	Male Participants	Female Participants
Trends in the market that shows a good time to buy:			
Increased by 10% in the last week	24%	23%	26%
Increased by 20% in the last week	6%	3%	9%
No fluctuation in the last week	19%	13%	24%
Decreased by 10% in the last week	25%	26%	23%
Decreased by 20% in the last week	25%	30%	18%
Trends in the market that shows a good time to sell:			
Increased by 10% in the last week	8%	9%	5%
Increased by 20% in the last week	57%	67%	49%
No fluctuation in the last week	8%	9%	9%
Decreased by 10% in the last week	13%	6%	20%
Decreased by 20% in the last week	13%	7%	18%
Woolworths Scenario:			
Strongly agree	6%	3%	9%
Agree	46%	43%	49%
Disagree	41%	48%	34%
Strongly disagree	8%	6%	9%

Historical market price fluctuations, in the eye of a rational investor, should have little effect in determining the intrinsic value of a security. A rational investor would wait for the appropriate price using fundamental techniques in order to trade securities. In order for participants to exhibit the representative heuristic, the majority of responses should signal that a large upward movement in the market would result in a good time to buy, and conversely a large downward market movement would result in a good time to sell shares.

24% of the participants indicated that they thought it would be a good time to buy shares if the trend showed that the share price had increased by 10% in the last week, and 6% believed that a share price increase if 20% indicated a good time to buy. Conversely, 25% of the participants believed that thought it would be a good time to buy shares if the trend showed that the share price had decreased by 10% and 20% respectively. Lastly, 19% of the participants believed that a minimal fluctuation of the share price indicated a good time to buy, and 1% chose not to answer.

8% of the participants indicated that they thought it would be a good time to sell shares if the trend showed that the share price had increased by 10% in the last week, and 57% believed that a share

price increase if 20% indicated a good time to sell. Conversely, 13% of the participants believed that thought it would be a good time to buy shares if the trend showed that the share price had decreased by 10% and 20% respectively. Lastly, 8% of the participants believed that a minimal fluctuation of the share price indicated a good time to buy, and 1% chose not to answer.

Results indicated that both male and female participants were influenced by market trends. Female participants appeared more risk averse when it came time to sell shares; 20% responded that they believed it was a good time to sell the shares after a 10% decline in the share price over the last week and 18% believed it was a good time to sell once the share price had declined 20% over the last week, compared to 6% and 7% of male students respectively. This result indicates that the female students tended to be more influenced by a downward movement in share prices than males, demonstrating a tendency to be more risk averse in an attempt to avoid losses.

Participants were then asked to assume that they frequently shopped at Woolworths, and always received good quality goods and friendly service. They were then asked whether they agreed or disagreed that buying shares in Woolworths would represent a good investment decision based on their experiences. In order for the participants to be affected by the representative heuristic, the majority of responses should be in favour of buying Woolworths shares solely based on personal experience. 6% strongly agreed with the statement, and 46% agreed, while 41% disagreed with the statement and 8% strongly disagreed. While the majority of the sample agreed with the statement, the decision-making of female participants was slightly more affected than the male participants as 9% of female students indicated that they strongly agreed, and 49% of female students indicated that they agreed, compared to 3% and 43% of males respectively.

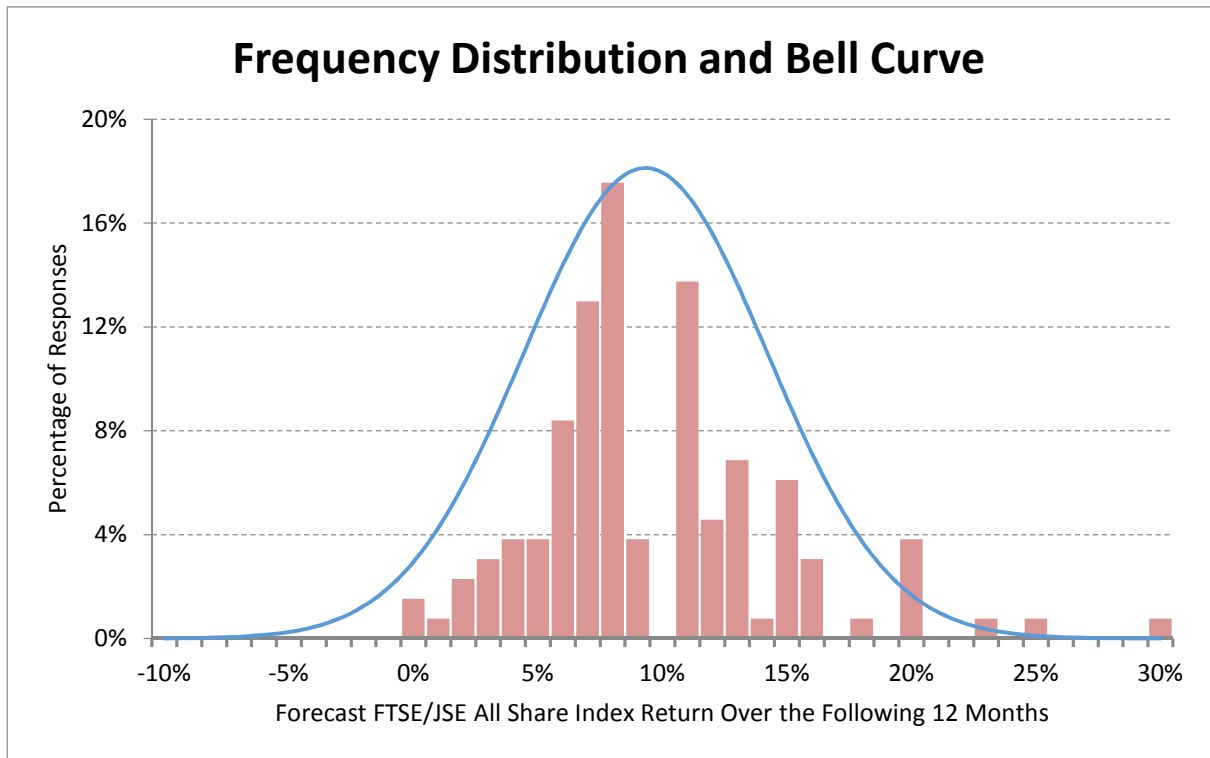
Anchoring

Participants were asked to indicate what they believed the JSE/FTSE All Share Index would return over the following 12-month period. The question allowed the participants to answer intuitively what they felt the JSE/FTSE All Share Index would return without the mention of any reference point to influence their decision. The following ranges were obtained from the survey: 15% of the sample indicated that they did not know, or had chosen not to answer; the remaining 85% of the results reflected a minimum forecasted return of 0%, and a maximum forecasted return of 30%. The mean forecasted return was 9% and the median was 8%. Figure 7 graphically demonstrates the frequency distribution and theoretical normal distribution bell curve for the responses of the sample.

There was an even split between the responses from female students, 40% indicating a return less than 10% and 40% indicating a return of 10% or higher, while 60% of male students believed the JSE/FTSE All Share Index would perform less than 10%.

20% of female students did not answer the question, or indicated that they “did not know”, compared to 10% of male students, indicating that female students were less likely to give an intuitive answer than their male counterparts.

Figure 7: Survey Results - Frequency Distribution and Bell Curve



Later, a question was asked (towards the end of the survey) as to whether the participants believed that the JSE/FTSE All share Index would return more, or less than 10% over the following 12-month period. By introducing a reference point, the aim was to determine if the participants adjusted their responses to reach their estimate. 37% believed that the JSE/FTSE All Share index would return more than 10%, 62% believed that the index would return less, while 1% indicated that they did not know, or had chosen not to answer. This corresponds with the data collected from initial question, indicating that the introduction of a reference point had little effect on the students' responses, as shown in Figure 8.

The data does reflect that the participants were more likely to give a response to the second question with a reference point, than give an intuitive answer as this time; only 1% of the students did not answer the question. Notwithstanding, the majority of participants did not show a tendency to anchor to a particular reference point.

Figure 8: Survey Results - Anchoring Bias

	Sample	Male Participants	Female Participants
JSE/FTSE All Share Index return over the following 12-month period:			
Mean	9%	9%	10%
Median	8%	8%	10%
Standard Deviation	5%	4%	6%
Less than 10%	48%	60%	40%
Greater than or equal to 10%	35%	30%	40%
No response	15%	10%	20%
JSE/FTSE All share Index return more or less than 10% over the following 12-month period:			
Less than 10%	62%	70%	57%
Greater than or equal to 10%	37%	30%	43%

Overconfidence

In an attempt to gather corroborative evidence, four questions were asked throughout the questionnaire in order to determine whether the students were prone to being overconfident. A summary of the responses is given in Figure 9. The first question asked the participants to assess their own knowledge of finance and the economy, and to categorise their knowledge (with the categories given as “a lot more than average”, “a little more than average”, “average”, “a little below average”, and a “lot below average”). 19% of the participants categorised their knowledge as a lot more than average, and 50% of the participants assessed their knowledge as a little better than average. 26% indicated that they thought their knowledge was average, while 5% and 1% thought their knowledge was a little below and a lot below average respectively. Although this question did not indicate a benchmark for “average”, a combined 69% of the students thought their knowledge was better than average. The answers to this question clearly display overconfidence. Furthermore, males tended to be more overconfident than females, as 88% of males indicated that their knowledge of finance and the economy was better than average, compared to 54% of females.

The second question relating to overconfidence asked the participants to assume that a friend had asked them to take care of R1,000,000 for them. The question then asked how well the participants thought they would be able to manage their friend’s money, with the five options ranging from “very poorly” to “very well”. 1% of the participants answered “very poorly”, 8% answered “somewhat poorly”, while 37% answered “somewhat well”, and 5% answered “very well”. 50% of the students answered “hard to say”.

Unlike the previous question, this question did not reveal an overall inclination to be overconfident. Whilst 37% of the students believed they would do somewhat well managing money, 50% of the students indicated that the outcome of managing money was uncertain. This may be attributed to the idea that future market movements are uncertain and unpredictable.

When disaggregating the responses by gender, a total of 57% of males answered they would be able manage the money well, and 35% said it was hard to determine, whereas only 30% of females

thought they would be able manage the money well, and 61% said it was hard to determine. This result reinforces the previous noting of males exhibiting greater overconfidence than females.

The third question relating to overconfidence asked the participants to choose between receiving a specified amount of money today, or receiving some other amount of money after one year. The students were offered five different options, each offering the students R1,000,000 today, or an amount equal to the yearly return of 0%, 2%, 6%, 10% and finally 20% on the R1,000,000. The answers were as follows:

- 98% would prefer R1,000,000 today while 2% would prefer R1,000,000 in one year;
- 77% would prefer R1,000,000 today while 23% would prefer R1,020,000 in one year;
- 52% would prefer R1,000,000 today while 48% would prefer R1,060,000 in one year;
- 24% would prefer R1,000,000 today while 76% would prefer R1,100,000 in one year;
- 7% would prefer R1,000,000 today while 93% would prefer R1,200,000 in one year.

Given the data gathered from the representative heuristic questions asking the students what they thought the JSE/FTSE All Share Index would return over the following year, the general consensus was that the market would return less than 10%. This was generally in line with the answers reflected above as the majority of students were more inclined to receive a set return of 10% or more rather than settling for a return of 6% or less.

When given the choice to receive R1,060,000 after one year (a return of 10%) 76% of the students indicated that they would wait a year, and 24% of the students instead chose to receive the R1,000,000 today. Assuming the 24% of students would take the money and invest it today, rather than receiving a set return that was greater than what they originally thought the average market return would be, the students thought they were able to beat the expected returns and thus showing signs of overconfidence by believing they could beat the market.

The fourth question aimed to determine if the participants will give obvious results and engage in making the behavioural mistake closely linked to the overconfidence bias, namely the confirmation bias. This question asked the participants how willing they would be to accept an idea that would most probably result in a positive outcome, even though the idea was contrary to their current beliefs or views regarding a certain situation. The options given were “not willing”, “probably willing”, or “willing”.

Answering “not willing” would have shown that the students exhibited the confirmation bias and made decisions based on previously held knowledge or beliefs rather than the objectivity of the outcome; the corollary to this is that overconfidence is manifested in that their existing beliefs are assumed to be better. 21% of the participants answered “not willing”, 55% “probably willing”, and 25% “willing”. The majority of the participants indicated that they were “probably willing” to make the decision even if it is against what they previously believed, resulting in the students not necessarily prone to engage in the confirmation bias, and thus not significantly overconfident.

Figure 9: Survey Results - Overconfidence Bias

	Sample	Male Participants	Female Participants
How would you assess your knowledge on finance or the economy?			
A lot more than average	19%	25%	15%
A little more than average	50%	64%	39%
Average	26%	12%	38%
A little below average	5%	0%	7%
A lot below average	1%	0%	1%
A friend asked you to manage R1,000,000. How well do you think you would take care of it?			
Very poorly	1%	0%	1%
Somewhat poorly	8%	9%	7%
Hard to say	50%	35%	61%
Somewhat well	37%	49%	27%
Very well	5%	7%	4%
Receiving money after one year VS receiving R1,000,000 today.			
R1,000,000	2%	1%	2%
R1,020,000	23%	12%	33%
R1,060,000	48%	32%	61%
R1,100,000	76%	72%	79%
R1,200,000	93%	99%	88%
Willing to accept an idea that would most probably result in a positive outcome even though the idea was contrary to their current beliefs.			
Not willing	21%	14%	24%
Probably	55%	52%	57%
Willing	25%	33%	18%

Loss Aversion

On the assumption that people are loss averse in general, four questions were asked to determine whether the participants encountered the same behavioural difficulty when making investment-related decisions. The first question on this aspect asked at which points they would intend to sell if they lost money in the stock market. The options given were: "I don't have a set point", "I sell as soon as I see a loss", "I sell if I lose 10% of the investment", "I sell if I lose 20% of the investment", "I sell if I lose 30% of the investment", "I sell if I lose over 40% of the investment", or "I don't intend to sell"

26% of the students indicated that they did not have a set point at which they would sell, and 22% did not intend to sell at all. 8% answered that they would sell as soon as they saw a loss, and 16% answered that they would sell if they saw a loss of 10% of the investment, while 18% answered that they would sell if they saw a loss of 20% of their investment. 6% of the participants indicated they would sell if they saw a loss of 30%, and 3% answered that they would sell if they saw a loss of 40% or more of their investment. The results indicate that the participants were not particularly risk

averse; rather, they appear to have quite a high tolerance for risk. However, various factors such as their potentially longer investment horizon might explain their more risk-seeking disposition.

The second question relating to loss aversion was asked in two parts. The participants were asked to choose between:

- (1A) winning R20,000 with certainty, or
- (1B) having an 81% chance of winning R27,000 and 19% chance of winning nothing.

Then, the participants were asked if they would intuitively prefer:

- (2A) a 34% chance of winning R24,000 and a 66% chance of winning nothing, or
- (2B) a 33% chance of winning R27,000 and a 67% chance of winning nothing.

In this case, 47% of participants chose 1A and 53% of participants chose 1B, while 27% of participants chose 2A and 73% of the participants chose 2B. Mathematically the participants have shown consistent utility, illustrated as follows:

- $1u(20000) < 0.81u(27000) + 0.19u(0)$
 $20000u < 21816u$
 $u < 1.09$
- $0.34u(24000) + 0.66u(0) < 0.33u(27000) + 0.67u(0)$
 $8160u < 8910u$
 $u < 1.09$

However, female participants showed inconsistent utility: 59% chose 1A and 41% chose 1B, while 33% chose 2A and 67% chose 2B.

The third question relating to loss aversion told participants to assume that they already won a R5,000 cash prize. They then had a choice between receiving an additional R5,000 by doing absolutely nothing, or flipping a fair coin to have a chance to receive a further R20,000 if heads came up, or to lose everything if tails came up. If loss averse, most people would choose the first option. In fact 92% of the participants chose to take the additional R5,000, while only 8% chose to take the risk and flip the coin.

The fourth question, in an attempt to gather corroborative evidence from question 2, was also asked in two parts. This question was designed to test the tendency to perceive an outcome as certain, when in actuality, it is not. The participants were asked if they preferred:

- 1(A) 25% chance to win R30,000 and 75% chance to win nothing; or
- 1(B) 20% chance to win R45,000 and 80% chance to win nothing.

Furthermore, they were asked if they would intuitively prefer:

- 2(A) a sure win of R30,000; or
- 2(B) 80% chance of winning R45,000 and 20% chance of winning nothing.

The results indicated that 46% chose 1A and 54% chose 1B, while 69% chose 2A and 31% chose 2B. Mathematically this displays inconsistent utility, as illustrated below:

$$\begin{aligned}\text{III. } & 0.25u(30000) + 0.75u(0) < 0.2u(45000) + 0.8u(0) \\ & 7500u < 9000u \\ & u < 1.2\end{aligned}$$

$$\begin{aligned}\text{IV. } & 1u(30000) > 0.8u(45000) + 0.2u(0) \\ & 30000u > 36000u \\ & u > 1.2\end{aligned}$$

Again, female participants demonstrated inconsistent utility: 51% chose 1A and 49% chose 1B, while 78% chose 2A and 22% chose 2B.

Although the results of the questions mixed, overall the majority of the responses pointed to the students being risk-averse, and that they exhibit the tendency to strongly prefer avoiding losses than acquiring gains.

Lesser-Known Biases

Although the study did not specifically concentrate on measuring the presence of lesser-known heuristics, it was desirable to determine if the students displayed them, especially given that some of them usually accompany overconfidence (Chira, Adams, & Thornton, 2008). Questions attempting to capture the herding bias, the illusion of control bias, and the framing effect were asked. A summary of the results are shown in Figure 10.

The first question related to the herding bias, and participants were asked which sources of information relating to equity investments they value most. The options included financial statements, ratings agencies, market movements, recommendations, share analysis, and information from friends. 17% of the participants answered that they valued financial statements the most, 3% valued ratings agencies, 14% valued information from the market movements, 6% valued recommendations, 32% valued share analysis, and only 2% valued information from their friends. The remaining 26% of the students answered with a combination of the available options, with the majority (21%) including market movements, recommendations and information from friends.

If the students did display a tendency to “follow the herd” the majority of the responses would have chosen the selection of subjective options suggesting that the students would be more inclined to listen to their friends and all invest in the same shares. However, the majority of responses related to objective, quantifiable sources of information and thus, the students did not present a strong tendency to be influenced by the Herding Bias.

The following question was asked to determine if participants displayed the illusion of control bias: “Do you think you are more likely to win the lottery if you pick the numbers yourself than a quick

pick?”¹² The answer options were “strongly agree”, “agree”, “disagree” and “strongly disagree”. 3% of the participants strongly agreed, 21% agreed, 35% disagreed and 40% strongly disagreed. If participants had the tendency to display the illusion of control, the majority would have chosen to pick the numbers themselves, believing they had a better chance at winning using their own predictions, instead of luck.

A combined 25% did choose the first two options, while 75% did not, showing that the students did not present a strong tendency to be influenced by the illusion of control bias.

The last question was asked to determine how different phrasing (i.e. framing) affected the participants’ responses to a choice in a hypothetical life and death situation. The question mimicked the study by Tversky & Kahneman (1981) where the students were asked to choose between two treatments for 600 people affected by a deadly disease. Treatment A was predicted to result in 400 deaths, whereas treatment B had a 33% chance that no one would die but a 66% chance that everyone would die. This choice was then presented to participants either with positive framing or with negative framing (Tversky & Kahneman, 1981). 58% of the participants in this study chose treatment A with the positive framing, 18% chose treatment B with the negative framing, while 24% of the students indicated that the options were the same, and were indifferent. People tend to avoid risk when a positive frame is presented but seek risks when a negative frame is presented (Tversky & Kahneman, 1981). Thus, the outcome of this question determined that the students tended to be more risk averse, inline with earlier findings.

¹² In the South African National Lottery, the “quick pick” allows for the purchase of a lottery ticket with randomly generated numbers.

Figure 10: Summary of Results - Lesser-Known Biases

	Sample	Male Participants	Female Participants
Which of the following sources of information do you value most in the share environment?			
Financial Statements	22%	17%	17%
Ratings	4%	3%	4%
Market trends	19%	14%	15%
Recommendations	9%	4%	9%
Share analysis	42%	30%	32%
Information from your friends	4%	1%	2%
combination of the available options	26%	29%	22%
Suppose 600 people have been affected by a deadly disease. Which option would you chose in order to treat the people?			
Positive framing	58%	51%	65%
Negative framing	18%	20%	17%
Indifferent	24%	29%	18%
Do you think you are more likely to win the lottery if you pick the numbers yourself than a quick pick?			
Strongly agree	3%	3%	4%
Agree	21%	16%	26%
Disagree	35%	29%	40%
Strongly disagree	40%	52%	30%

Conclusion

Empirical studies in the behavioural finance literature find that individuals do not behave rationally. However it is clear that individuals do not always make the choice that will maximise their utility and the final decision-making process could lead to a deviation from the expected rational behaviour. These behavioural biases govern individual's decisions and can affect financial markets. This is mainly due to the fact that individuals are not emotionless creatures; they have emotions which in themselves are barriers to rationality. However, the studies that have shown this focus mainly on the US and Europe.

The objective of this study is to determine whether South African finance students exhibit emotional biases that influence their decision-making by analysing the prevalence of the following biases amongst final-year finance students in South Africa: the representative heuristic, anchoring, overconfidence, loss aversion, herding, illusion of control, and the framing effect.

The majority of the sample was affected by representative heuristic. Female participants were more prone to the representative heuristic compared to male participants. It should be kept in mind that it is extremely difficult to find a single proxy to measure representative heuristic as it may arise as a result of many different factors. Owing to the presence of this bias, the survey participants would be more prone to buy stocks after prices had risen expecting those increases to continue and ignore stocks when their prices are below their intrinsic values. Or perhaps they might be tempted to forecast future earnings using the short histories of high, or low, earnings growth observed in the past. The students would also be susceptible to notice patterns in truly random sequences of data, or think that future patterns will resemble past ones.

South African finance students do not seem to be influenced by a reference point, and thus, are not inclined to be affected by the anchoring bias. However, a greater number of participants reached a decision when a reference point was given, rather than when asked to provide only an intuitive answer. However, this was not the case for the majority, and thus not significant for the study.

Overconfidence appears prevalent among the South African students. The majority of the students believed they had a better-than-average knowledge of the financial environment and overestimated or exaggerated their ability to successfully perform a particular task. In accordance with previous literature; males are more overconfident than female students. Overconfident students tend to believe they are better than others at choosing the best stocks and best times to enter, or exit a position. Unfortunately, the students who may conduct the most trades would, on average, receive significantly lower yields than the market.

Although the data gathered exhibited contradictory results for the loss aversion bias due to different factors such as longer investment horizons and the compelling urge to receive instant cash now, the majority of the South African students exhibited inconstant utilities when faced with decisions focusing the students on the potential value of losses and gains rather than the final outcome, with the students preferring to avoid losses than acquiring gains. These students are more susceptible to losing out on potentially good investments due to the fear of feeling the losses more deeply than acquiring gains of the same value.

Whilst the majority of students were affected by the emotional biases above, the students did not seem affected by the herding bias, or the illusion of control bias, and consistent with previous literature, tended to avoid risk when a positive frame is presented and thus seek risks when a negative frame is presented.

Although the research was not comprehensive enough to examine all sources of biases and heuristics, from the evidence presented by descriptive statistics, the null hypothesis [Hypothesis] can be rejected and in conclusion, it was found that there were varied behaviours in the South African students, thus accepting that South African finance students exhibit emotional biases that influence their decision-making in an investment context.

Areas for Future Research

The original scope of this study was curtailed due to the destructive politicking protests at the University of Cape Town toward the end of 2016; the time an EI Awareness Intervention was to take place for the study. The demonstrations that temporarily shut down the university had a knock-on effect causing a disruption in lecture times, which in turn, caused the university lecturers to fall behind on their own curriculum ahead of the approaching year-end examinations. While the nature of the study was presented to the sample and the initial survey was issued, the original study could not be completed due to the setback as there was insufficient time for this study to take over the sample, as university academics took preference. A solution, as discussed with the supervisor of this study, was decided to rather examine the prevalence of behavioural biases in investment related decision-making among students in South Africa.

When originally conceived, this study aimed to address the effect of EI on investment decisions directly. That extension would have necessitated the conduct of an “EI intervention”, which is described below for the purposes of future research.

It is recommended that a control group should be selected randomly from within the sample. Testing the effect of an EI intervention (with the aim to raise awareness of EI as well as the biases that individuals face when making decisions) on the control group could be instructive. A MSCEIT test could be administered to the control group to determine a baseline EI score, while the entire sample could be used to determine baseline evidence of behavioural biases from the pre-intervention measurements.

The design of the intervention method can be modelled on the work by Crombie (2011) on the role of emotional intelligence in sports performance. Crombie (2011) designed an intervention in which he randomised the participants into two equal groups: a control group and an intervention group. Crombie (2011) conducted a MSCEIT test to determine a comparable baseline mean EI score of both groups. A workshop consisting of ten three-hour sessions was conducted with the intervention group. At the first session two cohesion EI experiential case studies, one generic and one specifically cricket related were introduced, together with an EI analytical framework that served as a unifying guide throughout the program to empower the participants to identify the role of the four branches of EI, both individually and collectively in shaping the case studies performance outcomes, ranging from failure to success (Crombie, 2011). The hypothesis tested by Crombie (2011) was that the EI scores of individual cricketers could be developed through the intervention of an EI training and development program. The intervention was successful in significantly increasing the Total EI scores relative to the control group scores which showed only a slight change from the baseline scores for each year (Crombie, 2011).

Further importance of an EI intervention can be referenced to Görgens-Ekermans, Delpont & Du Preez (2015). Görgens-Ekermans, Delpont & Du Preez (2015) investigated the extent an EI intervention impacts the level of EI in first-year extended degree programme students at the University of Stellenbosch, and tested their first hypothesis of whether total scores on Emotional Intelligence will increase significantly following participation in the EI development intervention. Görgens-Ekermans, Delpont & Du Preez (2015) used a two-group non-equivalent design, implying that the participants were not randomly assigned to the groups and only the experimental group was exposed to the EI training intervention. The findings indicated that there were significant

differences between the experimental and control groups, and post-hoc comparisons revealed that the experimental group showed significant increases for EI levels from the pre-test to the first post-test (Görgens-Ekermans, Delport, & Du Preez, 2015).

Upon the completion of the intervention seminar, the control group may be subjected to a final MSCEIT test to determine whether the intervention was successful in raising EI awareness, and all participants should be issued with a final questionnaire-based survey in order to derive the post-intervention data for responses to financial bias and heuristic related questions. According to Goldstein (1993) the necessary time period between the intervention and post-test is difficult to estimate, but Goldstein (1993) states that participants should have been in the transfer situation for a “reasonable time” period before the post-test is administered (Goldstein, 1993).

The information gathered from the post-intervention questionnaire can then be used to measure any changes in the behaviour of the participants in terms of the responses per behavioural bias from pre to post measurement, and the mean change for each bias can be calculated. This mean change between the control group and the sample group will determine the final result of the hypothesis.

The result may determine whether EI can indirectly contribute to investment success. If the necessary empirical evidence can be provided for the effectiveness of an EI programme in an investment context, it could be the first step towards sensitising investment managers’ non-cognitive capacity to assist in financial decision-making.

References

- Agnoli, S., Pozzoli, T., Rancan, M., & Rubaltelli, E. (2013). *Emotional Intelligence and Risk-Taking in Investment Decision-Making*. Retrieved from Emotion and Investment Behaviour : <http://www.busman.qmul.ac.uk/research/Behavioural%20Finance%20Working%20Group/133049.pdf>
- Ameriks, J., Wrانik, T., & Salovey, P. (2009). *Emotional Intelligence and Investor Behavior*. USA: The Research Foundation of CFA Institute.
- Azouzi, A., & Jarboui, A. (2014). CEO Emotional Intelligence and Firms' Financial Policies. Bayesian Network Method. *Contemporary Economics, Vol. 8, No. 1* , 5-24.
- Barnes, A., & Thagard, P. (1996). Emotional decisions. *Proceedings of the Eighteenth Annual Conference of the Cognitive Science Society* , 426–429.
- Bar-On, R. (2006). *The BarOn Model of Social and Emotional Intelligence (ESI)*. University of Texas Medical Branch.
- Bar-On, R., Handlev, R., & Fund, S. (2005). *The Impact of Emotional Intelligence on Performance*. Lawrence Erlbaum Associates Inc.
- Belsky, G., & Gilovich, T. (1999). *Why Smart People Make Big Money Mistakes And How To Correct Them: Lessons From The New Science Of Behavioral Economics*. New York: Simon & Schuster.
- Book, H. E., & Stein, S. J. (2001). *The EQ Edge: Emotional Intelligence and Your Success, 3rd Edition*. Toronto: John Wiley & Sons.
- Boyatzis, R. E. (1999). Self-Directed Change and Learning as a Necessary Meta-Competency for Success and Effectiveness in the 21st Century. In R. Sims, & J. G. Veres, *Keys to Employee Success in the Coming Decades* (pp. 15-32). Westport, CN: Greenwood Publishing.
- Brackett, M. A., Rivers, S. E., & Salovey, P. (2001). Emotional Intelligence: Implications for Personal, Social, Academic, and Workplace Success. *Social and Personality Psychology Compass. vol. 5. No. 1* , 88-103.
- Braidfoot , R., & Swanson , A. C. (2013). Emotional Intelligence of Financial Planners in Mediation. *Review of Business and Finance Studies, vol. 4. No. 2* , 11-20.
- Caruso, D., Emmerling , R. J., & Goleman, D. (2003). *Defining the inkblot called Emotional Intelligence. Issues and Recent Developments in Emotional Intelligence*.
- Chen, G., Kim, K. A., Nofsinger, J. R., & Rui, O. M. (2007). Trading Performance , Disposition Effect , Overconfidence , Representativeness Bias and Experience 57 of Emerging Market Investors. *Journal of Behavioural Decision Making, 20(4)* , 425-451.
- Cherniss, C. (2000). *Emotional Intelligence: What it is and why it matters*. New Orleans: Graduate School of Applied and Professional Psychology.

- Cherniss, E., Extein, M., Goleman, D., & Weissberg, R. P. (2006). Emotional Intelligence: What Does the Research Really Indicate? *Educational Psychologist*, vol. 41, No. 4, 239-246.
- Chira, I., Adams, M., & Thornton, B. (2008). Behavioral Bias Within The Decision Making Process. *Journal of Business & Economics Research*, Volume 6, Number 8.
- Coleman, M. A. (2008). *A Dictionary of Psychology (3rd Edition)*. United Kingdom: Oxford University Press.
- Cooper, D. R., & Schindler, S. P. (2003). *Business Research Methods*. NY: McGraw-Hill/Irwin.
- Cote, S., & Yip, J. A. (2012). *The Emotionally Intelligent Decision Maker : Emotion-Understanding Ability Reduces the Effect of Incidental Anxiety on Risk Taking*. London: Sage Publications.
- Crombie, D. T. (2011). Increasing Emotional Intelligence in Cricketers: An Intervention Study. *International Journal of Sports Science & Coaching*.
- Davis, J., Hands, W., & Maki, U. (1997). Expected Utility Theory. *Handbook of Economic Methodology*, 342-350.
- Deaves, R., Luders, E., & Luo, G. Y. (2008). An Experimental Test of the Impact of Overconfidence and Gender on Trading Activity. *Review of Finance*, 13(3), 555-575.
- Emmerling, J. R., & Goleman, D. (1998 йил October). *Consortium for Research on Emotional Intelligence in Organisations*. From Emotional Intelligence: Issues and Common Misunderstandings: http://www.eiconsortium.org/reprints/ei_issues_and_common_misunderstandings.html
- Emmerling, R. J., & Goleman, D. (2003). *Emotional intelligence: Issues and common misunderstandings*. The Consortium for Research on Emotional Intelligence in Organization.
- Farma, E. F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *Journal of Finance*.
- Gilovich, T., & Savitsky, K. (1996). Like Goes with Like: The Role of Representativeness in Erroneous and Pseudo-Scientific Beliefs. *Skeptical Inquirer*, 20 (2): 34-40.
- Goldstein, I. L. (1993). *Training in organisations: Needs assessment, development and evaluation (3rd edn.)*. Belmont, CA: Thomas Brooks/Cole Publishing Company.
- Goleman, D. (1995). *Emotional Intelligence: Why It Can Matter More Than IQ*. London: Bloomsbury Publishing.
- Goleman, D. (1988). *Working with Emotional Intelligence*. London: Bloomsbury Publishing.
- Görgens-Ekermans, G., Delport, M., & Du Preez, R. (2015). Developing Emotional Intelligence as a key psychological resource reservoir for sustained student success. *SA Journal of Industrial Psychology/SA Tydskrif vir Bedryfsielkunde*, 41(1), Art. #1251.
- Hershey, D. A., & Mowen, J. C. (2000). Psychological Determinants of Financial Preparedness for Retirement. *Gerontologist*, vol. 40, 687-697.

- Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica: Journal of the Econometric Society* , 263-291.
- Kaufman, S. B. (2013, November 25). *Scientific American*. Retrieved from Openness to Experience and Creative Achievement: <http://blogs.scientificamerican.com/beautiful-minds/openness-to-experience-and-creative-achievement/>
- Lerner, J. S., Small, D. A., & Loewenstein, G. (2004). Heart Strings and Purse Strigs: Carryover Effects on Economic Decisions. *Psychological Science, Vol. 15* , 337-341.
- Legg, S., & Hutter, M. (2007). *A Collection of Definitions of Intelligence*. Switzerland.
- Lerner, J., Li, Y., Valdesolo, P., & Kassam, K. (2014). Emotion and Decision Making. *Annual Review of Psychology* .
- Lievt, P. (2010). Rational choice, neuroeconomy and mixed emotions. *Philosophical transactions of the Royal Society* , 265, 259-269.
- Lux, T. (1995). Herd Behaviour, Bubbles and Crashes. *The Economic Journal, 105(431)* , 881-896.
- Markowitz, H. (1952). Portfolio Selection. *The Journal of Finance* , Vol. 7, No. 1, 77-91.
- Matthews, G., Deary, I., & Whiteman, M. (2003). *Personality Traits*. Cambridge : Cambridge University Press.
- Matthews, G., Roberts, R. D., & Zeidner, M. (2004). Seven Myths About Emotional Intelligence. *Psychological Inquiry. Vol. 15, No 3* , 179-196.
- Mayer, J. D., & Salovey, P. (1990). *Emotional Intelligence*. Baywood Publishing Co, Inc.
- Mayer, J. D., Salovey, P., & Caruso, D. R. (2004). Emotional Intelligence: Theory, Findings & Implications. *Psychological Inquiry. vol. 15, no. 3* , 197-215.
- McClelland, D. (1998). *Human motivation*. Glenview, IL: Scott, Foresman & Co.
- McCrae, R. R., & Costa, P. T. (2003). *Personality in adulthood: A Five-Factor Theory perspective (2nd Edition)*. New York: Guilford Press.
- Merriam-Webster Dictionary. (2015). *Extroversion*. Retrieved from Merriam-Webster Dictionary: <http://www.merriam-webster.com/dictionary/extroversion>
- Miller, d. T., & Ross, M. (1975). Self-serving biases in the attribution of causality: Fact or fiction? *Psychological Bulletin, 82(2)* , 213-225.
- Mulder, S. (2009). *The Role of Emotional Intelligence in the Investment Management Industry - A Case Study of a South African Investment Manager*. Stellenbosch: University of Stellenbosch.
- Nyhus, E., & Webley, P. (2001). The Role of Personality in Household Saving and Borrowing Behaviour. . *European Journal of Personality, vol. 15* , S85–S103.
- Reuven, B.-O., & Handley, R. (2003). *The Bar-On EQ-360*. Toronto, Canada: Multi-Health Systems.

- Reuven, B.-O., & Parker, J. D. (2000). *The Bar-On Emotional Quotient Inventory: Youth Version (EQ-i: YV) Technical Manual*. Toronto, Canada: Multi Health Systems, Inc.
- Reuven, B.-O., Tranel, D., Denberg, N. L., & Bechara, A. (2003). Exploring the neurological substrate of emotional and social intelligence. *Brain*, *126*, 1790-1800.
- Salovey, P., & Grewal, D. (2005). The Science of Emotional Intelligence. *Current Directions in Psychological Science*.
- Sewell, M. (2001). *Behavioural Finance*. University of Cambridge.
- Shefrin, H. (2007). Behavioral Corporate Finance. *Decisions that Create Value*.
- Shiller, R. J. (2003). From Efficient Markets Theory to Behavioral Finance. *The Journal of Economic Perspectives*, *17*, 83-104.
- Sinclair, M., & Ashkanasy, M. N. (2005). Intuition: myth or a decision-making tool? . *Management Learning*, *36*(3), 353–370.
- Singh, D. (2001). *Emotional Intelligence at Work: A Professional Guide*. New Delhi: Response Books.
- Stys, Y., & Brown, S. (2004). *A Review of the Emotional Intelligence Literature and Implications for Corrections*. Canada : Research Branch Correctional Service of Canada .
- Sullivan, R. (2011). Deploying Financial Emotional Intelligence. *Financial Analysts Journal*.
- Sussman, L., & Dubofsky, D. (2009). The changing role of the financial planner part 2: Prescriptions for coaching and life planning. *Journal of Financial Planning*, *50-52*, 54-56.
- The Myers & Briggs Foundation. (2015). *Extraversion or Introversion*. Retrieved from The Myers & Briggs Foundation: <http://www.myersbriggs.org/my-mbti-personality-type/mbti-basics/extraversion-or-introversion.htm>
- Tversky, A., & Kahneman, D. (1981). The Framing of decisions and the psychology of choice. *Science*, *211* (4481): 453–458.
- Verplanken, B., & Herabadi, A. (2001). “Individual Differences in Impulse Buying Tendency: Feeling and No Thinking. . *European Journal of Personality*, *vol. 15*, S71–S83.
- Ware, J., & Dethmer, J. (2006). *High Performing Investments Teams: How to Achieve Best Practices from Top Firms*. New Jersey: John Wiley & Sons, Inc.
- Waterhouse, L. (2006). Inadequate Evidence for Multiple Intelligences, Mozart Effect, and Emotional Intelligence Theories. *Educational Psychologist*. *vol. 41. No. 4*, 247-255.
- Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin*, *Vol 96*(3), 465-490.



Trading Behaviour Proxy Survey

Date of implementation: 22 August 2016

The questionnaire will take approximately 10 minutes to complete. Please note that this questionnaire is voluntary, and all responses will be kept confidential.

There is no correct answer; please select the answer(s) you feel are most appropriate to you.

1. Please indicate your gender

- a. Male
- b. Female
- c. I prefer not to answer

2. Do you have an account at a financial institution?

- a. Yes
- b. No

3. Do you invest in anything other than bank savings?

- a. Yes
- b. No

4. How often do you buy or sell shares on average?

- a. About once a day
- b. About once a week
- c. About once a month
- d. About once in six-months
- e. About once a year, or once every few years
- f. Not applicable

5. In which of the following share-related products would you feel comfortable investing in?

- a. Individual shares
- b. Mutual funds
- c. Exchange Traded Funds
- d. Futures trading
- e. Derivatives

6. If you lose money in the stock market, at which point would you intend to sell?

- a. I don't have a set point
- b. I sell as soon as I see a loss
- c. I sell if I lose 10% of the investment
- d. I sell if I lose 20% of the investment
- e. I sell if I lose 30% of the investment
- f. I sell if I lose over 40% of the investment
- g. I don't intend to sell

- 7. Which of the following sources of information do you value most in the share environment?**
- Financial statements
 - Ratings
 - Market trends
 - Recommendations
 - Share analysis
 - Information from your friends
- 8. Which of the following trends in the JSE, or the share price of an individual company, do you think shows a good time to buy?**
- The share price has gone up 10% in the last week
 - The share price has gone up 20% in the last week
 - The share price has not fluctuated much in the last week
 - The share price has gone down 10% in the last week
 - The share price has gone down 20% in the last week
- 9. Which of the following trends in the JSE, or the share price of an individual company, do you think shows a good time to sell?**
- The share price has gone up 10% in the last week
 - The share price has gone up 20% in the last week
 - The share price has not fluctuated much in the last week
 - The share price has gone down 10% in the last week
 - The share price has gone down 20% in the last week
- 10. How would you assess your knowledge on finance or the economy?**
- A lot more than average
 - A little more than average
 - Average
 - A little below average
 - A lot below average
- 11. What do you believe the JSE Index will return over the next 12 months (as a percentage)?**
- _____
- 12. Suppose a friend asked you to manage R1,000,000. How well do you think you would take care of it?**
- Very poorly
 - Somewhat poorly
 - Hard to say
 - Somewhat well
 - Very well
- 13. Which of the following best describes the concept of diversification?**
- One should own both shares and bonds in their portfolio
 - One should not invest in the same product for long periods of time
 - One should invest in a variety of products to reduce the risk inherent in one product.
 - One should invest in as many products as possible
 - One should avoid products with overly high risk

14. Suppose you had to choose between receiving a specified amount of money today [A], or receiving some other amount of money after one year [B]. Please select whether you would choose [A] or [B] for each option below by marking an X in the appropriate column.

		Receive money today [A]	Receive money after 1 year [B]	
14.1.	R1,000,000			R1,000,000
14.2.	R1,000,000			R1,020,000
14.3.	R1,000,000			R1,060,000
14.4.	R1,000,000			R1,100,000
14.5.	R1,000,000			R1,200,000

15.1. Choose between the following two options:

- a. Winning R20,000 with certainty.
- b. 33/34 chance of winning R27,000, and 1/34 chance of winning nothing.

15.2. Now which of these two options would you intuitively prefer?

- c. 34% chance of winning R24,000, and 66% chance of winning nothing.
- d. 33% chance of winning R27,000, and 67% chance of winning nothing.

16.1. Choose between the following two options:

- a. 25% chance to win R30,000 and 75% chance to win nothing
- b. 20% chance to win R45,000 and 80% chance to win nothing

16.2. Now which of these two options would you intuitively prefer?

- c. A sure win of R30,000
- d. 80% chance to win R45,000 and 20% chance to win nothing

17. Suppose 600 people have been affected by a deadly disease. Which option would you chose in order to treat the people?

- a. A 33% chance of saving all 600 people, 66% possibility of saving no one.
- b. A 33% chance that no people will die, 66% probability that all 600 will die.

18. Do you think you are more likely to win the lottery if you pick the numbers yourself than a quick pick?

- a. Strongly agree
- b. Agree
- c. Disagree
- d. Strongly disagree

19. How willing or open are you to an idea that will result in a good chance of a positive outcome, even though the idea is contrary to your current beliefs?

- a. Not willing
- b. Probably
- c. Willing

- 20. Assume you frequently shop at Woolworths, and always receive great goods and service from Woolworths. Would you believe that buying shares in Woolworths would represent a good investment choice?**
- a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
- 21. Assume you have won a R5,000 cash prize. Say you have a choice of either receiving another R5,000 by doing absolutely nothing, or flip a fair coin and receive another R20,000 if heads came up, or lose the original prize winnings if tails comes up. Which would you choose?**
- a. Take the extra R5,000
 - b. Flip the coin
- 22. Do you think the JSE Index will return more or less than 10% in the next 12 months?**
- a. More
 - b. Less