

**“An analysis of cognitive biases and risk perceptions on female  
entrepreneurship success”**

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of Master of Business Administration.

## **Abstract**

The proliferation of female entrepreneurs, especially in developing countries, instigated this study, to understand their judgement and decision-making processes in the highly complex and uncertain entrepreneurial landscape within which they need to thrive. The study focused on cognitive bias and its effects on risk perception and firm performance, particularly in female entrepreneurs. This study took a quantitative approach to analyse the effects of cognitive bias. A cross-sectional explanatory research design, using a combination of purposive and snowballing non-probability sampling strategies, yielded a sample of 75 female entrepreneurs. The data collected on their risk perception, which is believed to be a determinant of success, was analysed using Pearson's correlations, paired t-tests and multivariate regression statistical techniques. The key findings of this study are based on the evaluation of four research hypotheses were; a weak negative relationship exists between overconfidence and risk perception; a positive relationship exists between overoptimism and risk perception; and no relationship exists between self-efficacy and risk perception. With regard to firm performance, none of the cognitive biases or risk perceptions were found to have any statistically significant relationship. This study brought a different dimension to the effects of cognitive bias, as its findings mostly contradicted existing literature.

## **Keywords**

Cognitive bias, risk perception, female entrepreneurship, firm performance, entrepreneurship

## **Declaration**

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination at any other university. I further declare that I have obtained the necessary authorisation and permission to carry out this research.

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**Botho Felicia Leburu**

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## CHAPTER 1: INTRODUCTION TO RESEARCH PROBLEM

### 1.1. INTRODUCTION

The extent and pace at which women have become involved in entrepreneurial activities in the last decade or so in South Africa is impressive, yet female entrepreneurs are still not as numerous as their male counterparts. The ratio of entrepreneurial activity by men and women has changed, from 12.5 by men to 8.2 by female entrepreneurs in 2017, to 10.9 males to 9.6 female entrepreneurs in 2019 (Bowmaker-Falconer & Herrington, 2020), which indicates that entrepreneurship among women is on the rise, though it has still not caught up with the rate of participation in entrepreneurship by men.

According to the *Global Entrepreneurship Monitor South Africa* (Bowmaker-Falconer & Herrington, 2020), it is not only South Africa that has seen an increase in women as entrepreneurs. In their report, Bowmaker-Falconer and Herrington (2020) highlight that the increase in women-owned and run businesses on the African continent, in general, constitutes the highest growth rate of such businesses in the world. Women are also said to constitute the fastest growing group of entrepreneurs globally (Sajjad, Kaleem, Chani, & Ahmed, 2020). Despite this increase, the total entrepreneurship activity of men still remains higher, at 8.1%, compared to that of women, at 4.9% (Irene, 2017), which justifies the efforts by government and other stakeholders to channel resources to improve understanding of the dynamics that influence and affect female entrepreneurs.

The probable reasons behind this gender dynamic have been the subject of much research and discussions, in both academia and in practice, due to the recognition and significance of women's participation in economic and socio-economic activity which, if supported, according to Irene (2017), may be crucial to unlocking South Africa's economic prosperity. Whilst several, mostly external, factors have been attributed to the growth and success of female entrepreneurship and business leadership, very few research studies have been directed specifically at understanding internal factors, such as women's entrepreneurship cognitions (Pouria & Abdollah, 2019).

This study, therefore, takes place against the backdrop of the advancement of gender equality. However, support for female entrepreneurs is a key focus area

and priority for governments and the broader society and is necessary to attain economic prosperity (Bowmaker-Falconer & Herrington, 2020; Irene, 2017). A key question that is often asked is how women can be supported in entrepreneurship and business leadership, and how their advancement can be accelerated, and their success ensured. Therefore, academic research to this effect, which informed the subject of this thesis, analysed the role of cognitive biases in influencing risk perception and firm performance of female entrepreneurs, thereby expanding the knowledge base regarding this topic. This knowledge will form an important resource for understanding and determining measures to accelerate women's empowerment in business.

## **1.2. BACKGROUND AND CONTEXT OF RESEARCH PROBLEM**

The role of entrepreneurship is key to advancing economic development; creating opportunities for job and wealth creation, for financial empowerment, and to address diverse social and economic issues (Overall, 2016). It is, therefore, not surprising that the development of entrepreneurship has, in the recent years, attracted a great deal of attention, some of which can be evidenced in the collective efforts by both the private and public sectors to accelerate the growth and success of entrepreneurs. Consequently, these efforts have even extended to academia, where the field of entrepreneurship has become a highly strategic and popular subject and field of study (Zhang, S. X. & Cueto, 2017).

An evolving and crucial aspect of entrepreneurship that warrants more research is the role and advancement of female entrepreneurs (Dempsey & Jennings, 2014; Sajjad et al., 2020), in order to inform and support initiatives of various stakeholders that seek to empower and promote their success. The growth of females in this area promote gender equality, which is deemed to go hand in hand with economic development (Singh & Raina, 2013), and also extends to entrepreneurship. Gender equality and women's empowerment in South Africa is entrenched in the country's Constitution; the law states that there must be equal representation by men and women in business leadership positions and at entrepreneurship levels (Republic of South Africa, 2013). This matter is, therefore, a key priority for government in delivering its constitutional mandate, namely, to ensure not only the participation of

women, but their actual success, and therefore to attain sustainability and returns on the large investments that have been channelled towards this agenda (Irene, 2017). The same extends to business practitioners, such as financiers, for whom entrepreneurship forms part of their ecosystems – the success of entrepreneurs stands to benefit these practitioners too.

The numbers of female entrepreneurs have grown significantly over recent years, particularly in developing economies. It is reported that women represent the fastest growing group within the entrepreneurial space, contributing as much as 40% to the development of economies (Sajjad et al., 2020). However, despite this increase, women still remain underrepresented in many entrepreneurial prospects (Dempsey & Jennings, 2014), evidenced by the prevailing low numbers of women who manage and own businesses, compared to their male counterparts.

In South Africa, where women are said to make up more than 50% of the adult population, the numbers of female compared to male entrepreneurs are not representative of this population statistic (Bowmaker-Falconer & Herrington, 2020). Women in South Africa stand to benefit from the availability of business start-up and working capital funding that is reserved exclusively for female entrepreneurs by both government and other agencies (Bowmaker-Falconer & Herrington, 2020; Irene, 2017). Whilst some women have taken advantage of such facilities and efforts to promote their success, it is reported that 20% of women-owned businesses fail annually, despite these measures of support (Irene, 2017).

This phenomenon could be attributed to differences in gender dynamics; personalities, behaviours and motivations (Ghosh & Sarkar, 2013; Singh & Raina, 2013) that could possibly be explained by cognitive processes. One field of cognitive processes that is often applied to the study of entrepreneurs is heuristics and cognitive biases, which are said to predominantly affect entrepreneurial judgement and decision making (Pouria & Abdollah, 2019; Thomas, 2018; Zhang, S. X. & Cueto, 2017; Shepherd, Williams & Patzelt, 2015). An understanding of this topic is, therefore, crucial for determining how to improve the support for female entrepreneurs, and how to advance their entrepreneurial endeavours, in both the South African context and other developing markets.

It has been established that entrepreneurship inherently involves significant risk-taking (Zhang, S. X. & Cueto, 2017), given the landscape within which it operates. In its nature, entrepreneurship is characterised by complexity, unpredictability, and time pressures amidst a lack of information and resources (Invernizzi, Menozzi, Passarani, Patton, & Viglia, 2017; Overall, 2016; Thomas, 2018). It is within this context that decision-making by entrepreneurs is, then, often reliant on the use of heuristics, and invariably, entrepreneurs are susceptible to cognitive biases (Baron, 2000; Zhang, H., van der Bij, & Song, 2020). Heuristics is described by H. Zhang et al. (2020) as rules of thumb or mental shortcuts that enable and facilitate making quicker judgements and decisions. Heuristics, therefore, help to provide good enough solutions with minimal effort, although without necessarily capturing and considering complexities in their entirety (Blanco, 2020).

However, inherent in heuristics are errors or misinterpretations known as cognitive biases (Zhang, H. et al., 2020; Simon, Houghton, & Aquino, 2000), which are defined as “thought processes that involve erroneous assumptions or inferences” (Shepherd et al., 2015, p. 30). As such, cognitive biases are mostly associated with negative outcomes (Nouri, Imanipour, & Ahmadikafeshani, 2019), as it is also implied in its very definition to be “errors” or “misrepresentations”. These errors emanate from deviations from rational choices (Zhang, S. X. & Cueto, 2017) or rational decision-making that is adopted in the absence of relevant information and resources – doing so typifies decision-making within the entrepreneurship landscape.

Whilst several studies to advance knowledge of entrepreneurship have been undertaken on cognitive biases, very rarely have these studies been focused on female entrepreneurs (Pouria & Abdollah, 2019), in spite of the critical role women play in economic development across the globe (Sajjad et al., 2020). Most of the studies make the assumption that male and female entrepreneurs are homogenous in their proneness to cognitive biases, and will therefore have similar effects (Nouri et al., 2019; Pouria & Abdollah, 2019). Beyond their economic contribution, the participation of female entrepreneurs plays a critical role in achieving both sustainability and socio-economic upliftment (Sajjad et al., 2020). Therefore,

knowledge of the psychology of women, in its many facets, such as their cognitive processes, which extend to cognitive biases, is critical for understanding what influences women's decision-making processes, and what ultimately determines the success of women-owned entrepreneurial ventures.

It is within the context of this background that this study set out to determine the role of cognitive biases in female entrepreneurs; to establish how these biases influence their risk perceptions and, therefore, impact on their firms' performance. This will help to provide an understanding of another aspect of internal factors that affect women in entrepreneurship, and to determine whether the effects thereof result in positive or negative outcomes for them.

### **1.3. RESEARCH PROBLEM STATEMENT**

Success in entrepreneurship by women holds vast scope for the betterment of economies, given women's crucial contributions to both social and economic development (Sajjad et al., 2020). Women's contribution to creating employment and wealth, and poverty alleviation through economic development is, therefore, significant, and vital for economic prosperity (Sajjad et al., 2020; Singh & Raina, 2013). Although there has been a noticeable improvement in the pace of growth of female entrepreneurial activities over recent years, further efforts to advance their progress are warranted, given the disparity in entrepreneurship activity participation between women and their male counterparts.

Seemingly lacking, however, is an understanding of the internal factors that affect female entrepreneurs, and this gap has the potential to hinder their success (Irene, 2017). One of these shortcomings relates to psychological aspects, in particular, the limited research that has been done on cognitive biases, specifically as they affect and influence female entrepreneurs in their entrepreneurial judgements and decision-making, especially in relation to the complexity of the entrepreneurial landscape; in the absence of well-structured and predetermined decision-making processes (Markowska, Grichnik, Brinckmann, & Kapsa, 2019), which is exacerbated by general limitations regarding resources.

#### **1.4. RESEARCH PURPOSE**

The purpose of this study was to understand how cognitive biases impact female entrepreneurial performance, given the extent of complexity and uncertainty that is inherent in entrepreneurship, and also the assumed absence of rationality in making judgements and decisions, all of which are believed to render entrepreneurs more susceptible to biases (Shepherd et al., 2015). Entrepreneurial judgements and decisions are believed to have a bearing on entrepreneurial performance outcomes and, therefore, entrepreneurship success. To fulfil its purpose and address the research problem, the study was focused on analysing three cognitive biases, namely, overconfidence, overoptimism and high self-efficacy, and determining how these biases influence risk perceptions and impact the performance of female entrepreneurs.

An understanding of these cognitive biases could help to provide insights on the limitations encountered by women in entrepreneurship and, therefore, provide explanations for the success or failure of women's business performance and entrepreneurial activities. This knowledge can be applied to determine means by which to support the advancement of female entrepreneurship.

#### **1.5. RELEVANCE OF THE STUDY**

This study intended to bridge the existing knowledge gap in the study of bias and entrepreneurial decision-making and performance (Shepherd et al., 2015, Zhang, S. X. & Cueto, 2017), and bring greater understanding to the entrepreneurship field. The output of this study was envisaged to present probable solutions to the many economic and socio-economic problems currently encountered around the globe. It could contribute to literature on entrepreneurship, and advance knowledge of behaviours, and decision-making that is termed entrepreneurial cognitions, as they relates specifically to female entrepreneurs.

Additionally, the study specifically applied the lens of entrepreneurship by women, which few studies on cognitive biases have focused on (Nouri & AhmadiKafeshani, 2019), particularly from a developing-markets perspective. Female entrepreneurs,



though key to economic development, are still an understudied group within the fields and disciplines of both business and entrepreneurship psychology. An understanding of this topic is, however, vital for providing the much-needed support that will ensure women's advancement.

In this regard, the study helps to provide an understanding of cognitive processes; specifically, cognitive biases, which predominantly influence the judgement and decision-making of female entrepreneurs. Knowledge of these processes can help to guide government, its policy makers and the business sector to provide the support that is needed to further efforts of women in entrepreneurship (Irene, 2017).

Finally, the study could also benefit female entrepreneurs, by prompting their awareness of their limitations, and helping them to understand some of the internal and subconscious factors that may influence their judgement and decision outcomes. This awareness could, therefore, improve the prospects of their entrepreneurial success.

## **1.6. CONCLUSION AND STRUCTURE OF THE RESEARCH**

This chapter provided the background and motivation of the study. Literature points to the limited participation of women in entrepreneurship, despite the significant contribution they stand to make to both economic and social development. Whilst many factors have been studied that affect women's growth and participation in entrepreneurship, and that distinguish the challenges they face and performance relative to their male counterparts, it has often been assumed that the effects of cognitive biases are heterogenous, thereby falling short of making a warranted distinction between women and men in terms of judgement and decision outcomes and, therefore, performance. These factors are key, given the need to help develop female entrepreneurs and to achieve the gender equality agenda.

The study, therefore, focused on how the predominance of overconfidence, overoptimism and self-efficacy influence risk perception by female entrepreneurs,

and what impact these biases had on firm performance, and the contribution they made towards their success.

The next chapter will discuss literature that is relevant to this study. Articulated within Chapter 3 are the research questions and proposed hypotheses the study tested. Chapter 4 will describe the research methodology that was applied to conduct the study. This is followed by Chapter 5, which will report on the analyses of and results from the collected data and tested hypotheses. Chapter 6 will provide a discussion of the research findings in relation to the literature set out in Chapter 2. Lastly, Chapter 7 will provide a conclusion; and will highlight the limitations of this study and make recommendations for future research.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1. INTRODUCTION**

The nature of entrepreneurship, which is characterised by complexity, uncertainty, high pressure, and minimal information and resources in general (Zhang, H. et al., 2020; Overall, 2016), renders entrepreneurs more susceptible to cognitive biases in their judgment and decision-making. Scholars have, over the years, researched both determinants and consequences of various cognitive biases relating to decision-making outcomes and performance of entrepreneurs.

This chapter will present both theoretical and empirical literature on cognitive biases, specifically overconfidence, overoptimism and self-efficacy biases. These cognitive biases will be discussed in the context of their effects on risk perception and firm performance as they affect female entrepreneurs, with a view to bringing insights to the research problem, and thereby achieving the purpose and objectives of the study.

### **2.2. THEORETICAL LITERATURE REVIEW**

#### **2.2.1. Hubris theory of entrepreneurship**

This study applied the lens of the hubris theory of entrepreneurship. This theory, as proposed by Matthew Hayward, is founded on behavioural decision-making literature and sets out to provide explanations of entrepreneurs' behaviour and decision-making outcomes, and the effects thereof on entrepreneurial performance and success (Hayward, Shepherd, & Griffin, 2006).

In their proposition of the hubris theory of entrepreneurship, Hayward et al. (2006, p. 160) set out to explain "why new ventures were still being created in the shadow of high venture failures". They attribute this phenomenon to overconfidence, which, they posit, leads to the entrepreneur's failure to interpret information correctly and, consequently, an inability to allocate resources appropriately.

Hayward et al. (2006) define overconfidence as the overestimation of the likelihood by entrepreneurs to succeed in their entrepreneurial ventures. The theory supposes

that more confident individuals will allocate resources to starting a new venture and, owing to their overconfidence, entrepreneurs overestimate their ability to bring about a positive outcome. This occurs despite information at hand that may suggest otherwise. So, whilst overconfidence could instigate entrepreneurial activity, it could equally be detrimental to the continuation and performance of the firm after its inception. Robinson and Marino (2015) flag this as a paradox in entrepreneurial cognitions.

The main argument posed by the theory is that, whilst, initially, overconfidence may have been the catalyst for the entrepreneur's efforts to engage and pursue entrepreneurial ventures, it is ultimately that same overconfidence that could affect the performance of the business negatively, or even lead to its failure (Hayward et al., 2006).

Although the hubris theory places particular focus on overconfidence and its effects on the entrepreneur's psychology; the broader definition of overconfidence contains descriptions that extend to overoptimism and self-efficacy as consequences of overconfidence. According to the originators of the hubris theory, Hayward et al. (2006), the bias of overconfidence arises from i) overconfidence in predictions, ii) overconfidence in personal abilities, and iii) overconfidence regarding possession of knowledge.

The argument that is put forth is that overconfidence leads entrepreneurs to believe that they possess particular personal skills and knowledge, which points to the definition of high self-efficacy (Gallagher, 2012). Furthermore, the proneness of entrepreneurs to believe their predictions and, therefore, hold unjustified expectations of successful outcomes, is a trait of overoptimism (Trevelyan, 2008), which provides justification for relating the theory to all three cognitive biases under study, to determine their impact on entrepreneurial success.

This study analysed three distinct biases – overconfidence, overoptimism and self-efficacy – which literature has shown to have a degree of interrelatedness (Bernoster, Rietveld, Thurik, & Torrès, 2018), although these cognitive biases are distinctively different (Forbes, 2005; Trevelyan, 2008). The shared effects of these biases have been found to contribute to the initiation and pursuit of entrepreneurial

activities; however, as a result of blind spots that accompany the biases, the biases could also be the reason for poor performance and failure of entrepreneurial ventures.

Furthermore, the theory posits that, as a consequence of overconfidence, entrepreneurs tend to underestimate risk (Hayward et al., 2006). So, whilst overconfidence could lead to bravery and willingness to assume risk and initiate an entrepreneurial venture, it can equally lead to poor performance, thus, failure of the entrepreneurial venture, due to the entrepreneur's inability to objectively evaluate risk. The theory proposes that entrepreneurs with less experience are likely to more susceptible to the effects of hubris, as they will tend to be less familiar with dealing with risk.

It is within these fundamental principles laid out by the hubris theory of entrepreneurship that this study was undertaken to determine the effects of cognitive biases on female entrepreneurs' behaviour and decision outcomes. The study set out to analyse the effects of these three interlinked biases – overconfidence, overoptimism and self-efficacy – on risk perceptions further and, ultimately, their effects on firm performance.

In this section, reference was made to the propositions of the hubris theory, to investigate the relationships between and effects of these biases in female entrepreneurs, so as to answer the key underlying research question: How do cognitive biases of female entrepreneurs influence their judgement and decision outcomes through risk perception, and thereby affect the success of their entrepreneurial performance?

### **2.3. EMPIRICAL LITERATURE REVIEW**

The empirical literature that supports this study is centred on the three main constructs of the study, that is, cognitive bias, risk perceptions and firm performance. The general literature on cognitive bias will be dissected to address each of the cognitive biases – overconfidence, overoptimism and self-efficacy – and the effects of each within the context of their associations with risk perception and firm performance.

To articulate the relationships to be studied better, this section will start by discussing the individual constructs risk perceptions and firm performance. These constructs provide the necessary foundation for a discussion of the relationships between and effects within each of the specific cognitive biases. The framework that is proposed is given in Figure 2.1.



**Figure 2.1: Framework for the analysis of cognitive biases and risk perceptions on entrepreneurial success of women**

### 2.3.1. Risk perception

Risk perception constitutes an integral part of entrepreneurial orientation literature, as risk perception is deemed to be the factor that ultimately influences an entrepreneur's decision and their course of action. Risk perception is defined as the decision-maker's assessment of the underlying risk posed by a situation (Dölarslan, Koçak, & Özer, 2017; Boermans & Willebrands, 2017; Willebrands, Lammers, & Hartog, 2012). Risk perception reflects the degree of uncertainty and the potential loss, which ultimately influences the behaviour of the entrepreneur (Palich & Bagby,

1995). In an entrepreneurship context, the perception of risk can be deemed as a loss or opportunity, and risk plays a vital role, as it influenced the preparedness of entrepreneurs to engage, or not to engage, in entrepreneurial activity (Markowska et al., 2019), therefore affecting whether the entrepreneur's efforts will be successful, or not.

Entrepreneurial activities, in their nature, carry an element of risk-taking, which arises from the very context in which entrepreneurship occurs – its proneness to decision-making under uncertainty (Markowska et al., 2019). It is for this reason that entrepreneurs are thought of as being more keen risk takers, relative to non-entrepreneurs (Willebrands et al., 2012). This conclusion, however, may not necessarily be true, but could rather be a result of the entrepreneurs' perception of risk due to cognitive bias (Palich & Bagby, 1995), which informs their categorisation or framing of information, thus, the assumption of risk. Risk tends to be framed positively more often than negatively, thereby leading to the anticipation of more favourable outcomes by entrepreneurs (Palich & Bagby, 1995).

Cognitive bias explains entrepreneurs' risk-taking behaviour and has been found to have a considerable effect on an entrepreneur's risk perception (Dölarslan et al., 2017; (Barbosa, Fayolle, & Lyon, 2007). According to research, an entrepreneur's perception of risk is influenced by cognitive biases, such as overconfidence, overoptimism and high self-efficacy (Palich & Bagby, 1995). Palich and Bagby established that individuals used cognitive processes to form perceptions. In the case of entrepreneurs, it was their tendency to be overoptimistic that often led them to view the business environment through "rose-coloured glasses" (Palich & Bagby, 1995) – and not that they necessarily had a higher propensity to take on risk.

Inherent in entrepreneurship is the element of risk perception, which Boermans and Willebrands (2017) argue is a determinant of entrepreneurship success. Within the context of entrepreneurship, the perception of risk is instrumental to how the firm performs, as it motivates or influences the behaviour and, thus, decision outcomes (Markowska et al., 2019) – this also applies to female entrepreneurs. However, most research on risk perception analysed its impact on decision-making, with only limited attention being paid to its actual impact on risk propensity or risk-taking

(Boermans & Willebrands, 2017). Risk perception is closely related to firm performance, as it is by taking on a realistic view of the level and impact of risk that the entrepreneur can influence whether an outcome would likely be positive or negative, resulting in either success or failure (Simon et al., 2000; Overall, 2016).

Most research on risk factors (in contrast to risk perception) that is related to firm performance and focused more on risk propensity, or risk-taking (Boermans & Willebrands, 2017). Risk propensity refers to the likelihood of an entrepreneur behaving in a riskier or less risky manner. There is a close relationship between risk propensity and perception, where risk perception acts as an antecedent to risk propensity and risk-taking behaviour. What has often been studied is the effect of risk propensity on entrepreneurship performance (Boermans & Willebrands, 2017). Although literature on decision-making shows that it is not only the inclination to take risk that mattered; equally important is the perception of risk (Willebrands et al., 2012).

Most literature on the effects of risk perception on business outcomes pertains to particular decision outcomes: the decisions to start a new venture and the decision to become an entrepreneur (Robinson & Marino, 2015; Simon et al., 2000). Only a few researchers have extended their interest to studying the effects on firm performance (Simon et al., 2000; Boermans & Willebrands, 2017; Willebrands et al., 2012). In their study, Boermans and Willebrands (2017) established that entrepreneurs with a higher perception of risk in general tended to earn higher revenues. It is assumed that entrepreneurs, relative to non-entrepreneurs, are more likely to focus on opportunities than on threats, under the influence of risk perception. Hence, the perception of risk is likely to impact the firm outcome (Boermans & Willebrands, 2017).

Empirical literature reports a positive relationship between cognitive biases and risk perception, which is said to result in the assumption of risky behaviour (Overall, 2016). Another view is that cognitive bias and risk perception have an indirect behavioural relationship (Overall, 2016). In their study on risk attitudes and business performance, Willebrands et al. (2012) observed a negative relationship between risk propensity and business performance; they also observed a



significantly positive relationship between the perception of risk and revenue, which suggests that it is not only the entrepreneur's willingness to take risk that is important, but also the risk perception.

Literature suggests that higher perception of risk tends to result in mitigation for decision outcomes that are less risky, thereby leading to better firm performance (Willebrands et al., 2012). Furthermore, where there was a higher perception of risk, individuals were less likely to take action and, therefore, less likely to collect a premium for taking risk, so the outcome of firm performance measured as revenue was lower (Willebrands et al., 2012). The entrepreneur with a higher risk perception would institute precautionary measures to contain the risk, therefore, the perception of risk instigates precautionary measures that lead to better performance (Willebrands et al., 2012). The finding by Boermans and Willebrands (2017) confirms the argument that high risk perception leads to containing risk as far as possible and, therefore, risk improves performance.

Researchers have established that entrepreneurs tend to perceive lower risk as a result of cognitive bias (Overall, 2016). Their decisions are informed by subjective factors instead of factual information, as argued by Overall (2016) and supported by others, like Busenitz and Barney (1997) and Simon et al. (2000). Entrepreneurs do not deliberately engage in risky behaviour, instead, they do so because of cognitive bias, that is, they tend to perceive less risk than other people do (Robinson & Marino, 2015; Overall, 2016). It is not that entrepreneurs are not capable of perceiving risk, but that they, because of cognitive bias, they tend to perceive risk more favourably (Overall, 2016). Overly estimating or underestimating risk is what will drive the outcome of a decision and, therefore, impact on performance. In their study relating to attitudes towards risk, Willebrands et al. (2012) established a significant positive relationship between the perception of risk and performance.

Sjöberg (2000) argues that risk perception is difficult to understand, given that it is influenced by several factors, among which cognitive bias. It is a phenomenon that, therefore, requires further explanation and understanding. Differences in perceptions of risk are attributed to the function of subjective probability, hence, its

significance of and link to cognitive bias (Sjöberg, 2000). Biases such as overconfidence, overoptimism and self-efficacy influence how individuals interpret and process information at their disposal, which, in turn, affect how they might perceive risk. Simon et al. (2000) also point to a relationship in the way cognitive biases invariably affect decision outcomes and the performance of entrepreneurs. This finding has led to the inference that cognitive bias leads to different levels or perceptions of risks by individuals (Simon et al., 2000), therefore, resulting in certain people undertaking different decisions that will determine the success or failure of their entrepreneurial ventures.

### **2.3.2. Firm performance**

Literature on the performance of female entrepreneurs presents a great deal of ambiguity relating to the differences between female and male-owned or led businesses. Yusuff, Mohamad and Wahab (2019), however, report a lack of extensive research on the role of and the distinction by gender on business performance. Given the significant contribution of entrepreneurship to economic and social development, Staniewski's (2016) view is that it is critical to understand the factors that influence entrepreneurs' decision-making and, therefore, the entrepreneurial activities that follow. Furthermore, it is essential to realise that success of entrepreneurship ventures refers to more than achieving personal aspirations, but relates to effects on the broader economy too.

Entrepreneurial success is a subjective phenomenon that maybe presented in either qualitative or quantitative fashion (Staniewski, 2016). Firm performance can be evaluated using several performance dimensions, amongst which profits, assets, employment numbers and market share (Isaga, 2018; Boermans & Willebrands, 2017; Staniewski, 2016). It has been established that, in the absence of an agreed universal standard, researchers often make justifications to determine the suitable or most convenient means of evaluating firm performance (Isaga, 2018).

To evaluate the influence of cognitive bias on risk perceptions, and its effect on firm performance, this study used revenue as a measure of firm success. The amount of revenue that a firm turns over is reflective of the firm's productivity (Boermans &

Willebrands, 2017), thus, signalling the extent of its performance. Whilst several other financial indicators could be used to measure entrepreneurial performance, revenue was deemed a simpler way to determine success, as well as being an measure that makes comparisons easy (Staniewski, 2016).

The definition of an entrepreneur, according to Schumpeter, is that these are individuals who put together resources in unique ways with the aim of generating profit (Palich & Bagby, 1995). This definition suggests that, even to the entrepreneur, the financial or monetary aspect is what also motivates entrepreneurial intentions and actions.

The study by Boermans and Willebrands (2017), which is similar to that of Isaga (2018), also adopted revenue, taken as the equivalent to sales as a performance measure, and doing so proved to be a simple and reliable measure. This approach is supported by the argument that the growth of a firm is largely linked to the amount of income or revenue it turns over (Willebrands et al., 2012). This view is justified further by the opinion that risk perception is a factor that influences the success of entrepreneurial decisions measured by revenue and, therefore, a determinant of performance by and success of a business (Willebrands et al. 2012).

The general failure or success of business ventures is mostly associated with entrepreneurial ventures (Overall, 2016). According to the *Global Entrepreneurship Monitor South Africa* (Bowmaker-Falconer & Herrington, 2020), 80% of entrepreneurial ventures in South Africa fail within the first three years. Other global statistics reports that the majority of new entrepreneurial ventures fail within the first six years (Overall, 2016; Boermans & Willebrands, 2017). This is due to overconfidence and overoptimism bias: 95% of entrepreneurs believe their businesses will succeed, whilst only 35% are reported to actually attain this success (Overall, 2016), which points to an inaccurate perception of risk by entrepreneurs. Positive or good firm performance is ultimately what constitutes a major critical outcome that an entrepreneur should aim to achieve, it serves as an indication of success in the entrepreneurial efforts and activities undertaken (Overall, 2016; Willebrands et al. 2012; Staniewski, 2016).

### **2.3.3. Cognitive bias**

Traditional views on human cognition assumes rationality in the choices and judgements that people make (Blanco, 2020), implying that, to reach a decision, sufficient information must be available to aid in the weighing up of costs and benefits to achieve economic maximisation (Simon et al., 2000). The fields of psychology and behavioural economics have, however, challenged this view, highlighting the irrationality of people and their susceptibility to cognitive biases, as a means to simplify the decisions they make to minimise stress and sift through complexity (Blanco, 2020).

Cognitive biases are mental shortcuts that, in the absence of rationality, are then used to make judgements and decisions (Simon et al., 2000). They are described as subjective and often erroneous opinions that arise from particular heuristics, and when more complex and uncertain decision-making is required (Gudmundsson & Lechner, 2013; Overall, 2016; Thomas, 2018). It is for the reason that biases are deemed to be applied mostly in complex environments; these environments characterise entrepreneurial fields, so, cognitive biases are deemed to be more prevalent in entrepreneurs in their decision making (Emami, Welsh, Ramadani, & Davari, 2020). Scholars have debated at length on the issue of irrationality, and have interpreted biases as decision errors (Zhang, S. X. & Cueto, 2017). Such debates present views such as that biases are errors, and that biased decision-making results in errors due to the decisions being made on limited information (Thomas, 2018). Contrasting to this view is the idea that biased decision-making can lead to accurate judgements, because there is efficiency in such decision-making, given the absence of too many details (Thomas, 2018).

It was established from the entrepreneurship literature that biases in entrepreneurs emanate from the type of environments in which they operate, which are characterised by high risk, uncertainty and time pressure (Busenitz & Barney, 1997; Shepherd et al., 2015). Biases are as such believed to lead to the entrepreneur's reliance on mental shortcuts, which are taken to simplify decision-making.

In trying to understand cognitive bias in entrepreneurs, empirical research has extended its focus to look at both their determinants, and their consequences on

entrepreneurial activities (Thomas, 2018). The determinants are personal, environmental and organisational factors that influence cognitive biases (Thomas, 2018). Most studies on consequences covered aspects such as decision-making and venture formation, and few have focused directly on performance as an outcome (Shepherd et al., 2015; Thomas, 2018).

Cognitive biases are useful in the context of entrepreneurship, for simplifying decision-making in situations characterised by information overload, high uncertainty and time pressure (Forbes, 2005; Overall, 2016). However, these biases are also believed to lead to severe and systematic errors (Forbes, 2005), because they inhibit effective decision-making (Overall, 2016). These opposing findings on the effect of cognitive bias ignited studies to find out if cognitive bias could hold value for the entrepreneur (Zhang, H. et al., 2020). Research found that cognitive biases are undesirable, as they may lead to less comprehensive decision-making, and may restrict the performance of new ventures (Zhang, H. et al., 2020). Furthermore, whilst cognitive biases may lead to much quicker decision-making, which is key to starting a new venture, biases could also be detrimental to performance and the continued existence of the firm, as suggested by the hubris theory of entrepreneurship (Hayward et al. 2006). This finding led to the conclusion that biases maybe good for steering entrepreneurship behaviour, but not necessarily for ensuring performance (Zhang, H. et al., 2020). This finding has, however, not been empirically corroborated through extensive research. Research is yet to establish the implications of cognitive bias on performance.

The presence of cognitive bias has been noted to stimulate entrepreneurial action, whilst entrepreneurs' unlimited application of bias is detrimental to both behaviour and performance (Zhang, H. et al., 2020); therefore, the ideal is to achieve a balance. This is particularly applicable within the entrepreneurial context, where the window of opportunity is restricted, given the limitations on information, the presence of time pressure, and the lack of resources. Biases could be ideal for igniting decision-making (Busenitz & Barney, 1997; Shepherd et al., 2015), especially in start-ups, or in the initial stages of an entrepreneurial venture. On the other hand, it may be detrimental to the continued performance of the business, especially as the firm matures (Zhang, H. et al., 2020).

It is argued that cognitive biases have the potential to affect risk perceptions (Simon et al., 2000), given how they influence the observation and interpretation of information. The outcome of the view on risk perception would, as such, determine the decisions undertaken by the entrepreneur, which would affect how the business performs.

Literature indicates that entrepreneurs will, typically, not use or exhibit only a single bias, but rather a series of them (Dölarslan et al., 2017; Zhang, H. et al., 2020; Palich & Bagby, 1995). Therefore, this study focused not only on a single bias, but on the following three biases: self-efficacy, overconfidence and overoptimism.

#### 2.3.3.1. *Overconfidence bias*

##### i. Definition and contextual background of the overconfidence bias

Overconfidence bias is defined as the overestimation of the probability of a positive outcome for an event, compared to the probability of experiencing a negative outcome on the same event (Dias, Avila, Campani, & Maranhão, 2019; Invernizzi et al., 2017). Shepherd et al. (2015, p. 31) explains it, rather simplistically “as overestimating the probability of being right”, and Robinson and Marino (2015), Simon et al. (2000) and Nouri, Imanipour, Talebi and Zali (2018) describe it as the failure by someone to know their limits. Overconfidence is perceived as being related to self-perception. Cossette (2014) defines overconfidence as the tendency to overstate one’s own competencies; skills, abilities or aptitude.

Overconfidence bias forms part of entrepreneurial cognitions, which is an area in psychology that is concerned with the behaviours and decision-making of entrepreneurs (Invernizzi et al., 2017). Overconfidence is deemed to be a bias that affects thinking processes (Thomas, 2018), and influences a broad range of entrepreneurial decisions; such as those related to venture creation, venture exit, and financial and investment decisions (Robinson & Marino, 2015; Simon et al., 2000; Thomas, 2018; Trevelyan, 2008); However minimal research has been directed at its direct impact on performance (Simon et al., 2000; Thomas, 2018).

Complex environments characterised by high uncertainty have been found to induce overconfidence biases, as would be the case within an entrepreneurial context that often warrants simple and quicker facilitation of decision-making (Robinson & Marino, 2015) – and this is why entrepreneurs are deemed to be more prone to overconfidence bias than non-entrepreneurs (Busenitz & Barney, 1997; Forbes, 2005; Robinson & Marino, 2015). This view is corroborated by Simon et al. (2000), who found that overconfidence tended to be high in entrepreneurs.

Whilst overconfidence does occur in both men and women, most literature reports on the high overconfidence levels of men mostly (Invernizzi et al., 2017; Nouri & AhmadiKafeshani, 2019). Nouri and AhmadiKafeshani (2019) established that female entrepreneurs were less susceptible to overconfidence. This notion was evidenced by fewer requests for bank credit by female entrepreneurs compared to their male counterparts (Invernizzi et al., 2017). Invernizzi et al. (2017) attributed this phenomenon to lower self-confidence and a lower risk propensity in women. This finding feeds the common notion that women are less likely than men to pursue entrepreneurship (Invernizzi et al., 2017).

In a summary of findings on the characteristics of entrepreneurs, Cosette (2014) reports that overconfidence in entrepreneurs tended to be higher in more educated people, as well as those with more experience, and who were younger.

#### ii. Effects between overconfidence, risk perceptions and performance

Research literature reports that overconfidence tended to lead to lower perception of risk by entrepreneurs, who, as result, engaged in entrepreneurial activities, some of which had the potential to have detrimental effects on firm performance (Nouri, Imanipour et al., 2018; Trevelyan, 2008). Busenitz and Barney (1997) looked into the differences between entrepreneurs and non-entrepreneurs, and though they did not highlight a distinction between the risk propensity of the two groups, they revealed that perceptions of risk differed as a result of overconfidence bias. In their study, Invernizzi et al. (2017) established a clear association between overconfidence and its negative effect on performance.

Overconfident entrepreneurs tended to underestimate risk relative to non-entrepreneurs (Invernizzi et al., 2017; Shepherd et al., 2015), as a result of the way entrepreneurs process information, given their susceptibility to bias. Palich and Bagby (1995) report that it is not necessarily that entrepreneurs have a greater appetite for risk-taking, relative to non-entrepreneurs, but rather that, as a consequence of their confidence, they hold a positive view on an outcome given the way they interpret information (Dölarslan et al., 2017).

Overconfidence leads to entrepreneurs having a lower perception of risk (Dölarslan et al., 2017; Thomas, 2018) and, as a result, it instigates their risk-taking behaviours (Robinson & Marino, 2015). In their study, Robinson and Marino (2015) found that risk perception played a mediator role between overconfidence and the venture creation, which was the decision-making outcome. They found that entrepreneurs who were more confident perceived less risk than those with a lesser degree of confidence, and this greater confidence motivated them towards entrepreneurship.

Robinson and Marino (2015) point out, furthermore, that overconfidence and the lower perception of risk was associated with lesser firm performance. In fact, it could be that a lower perception of risk is brought about by the entrepreneur framing the business dynamics too positively (Boermans & Willebrands, 2017), resulting in the underestimation of the importance of detail, hence, the lack of risk mitigation. Such underestimation could have a negative impact on firm and entrepreneurial performance. Gudmundsson and Lechner (2013) posit that the risk of business failure increases as entrepreneurs overestimate their levels of the accuracy of their decisions as a result of overconfidence, and they, therefore, underestimate risks.

In general, overconfidence bias is mostly associated with negative consequences and has been pointed to as the reason for the high failure rates of business (Invernizzi et al., 2017; Nouri et al., 2018; Shepherd et al., 2015). The negative impact of overconfidence on business is the result of the poor quality of decision-making and strategic decisions (Simon et al., 2000) that come about as a result of incorrect judgements based on the way entrepreneurs tend to frame information. In



other words, the presence of cognitive bias influences how individuals gather and interpret information (Dölarslan et al., 2017), resulting in the adoption of biased perceptions, which negatively affect sense-making and reasonability (Robinson & Marino, 2015), and lead to incorrect risk perceptions (Dölarslan et al., 2017). These are behaviours that ultimately affect firm performance.

However, contrary to the negative outcomes related to bias, Robinson and Marino (2015) highlight certain advantages that maybe presented by overconfidence, such as the motivation behind entrepreneurs' willingness to pursue identified opportunities; leading to venture creation, which non-entrepreneurs are unlikely to pursue. Nouri et al. (2018) validated the hubris theory of entrepreneurship, and they attribute overconfidence to simultaneous outcomes that are both positive and negative, which is the reason behind the high establishment of new businesses, and at some point also the probable reason for lower returns and, ultimately, high venture failure rates, which formed the basis of Hayward et al.'s (2006) development of the hubris theory of entrepreneurship with the aim of explaining this phenomenon and its combined effects.

Overconfidence has been found to act as a catalyst for the pursuit of entrepreneurial ventures by entrepreneurs (Nouri et al., 2018; Nuijten, Benschop, Rijssenbilt, & Wilmink, 2020). The supposition is that it is the more confident individuals who will allocate resources to starting an entrepreneurial venture, often as a result of their overestimation of their ability to bring about positive outcomes (Forbes, 2005; Nouri et al., 2018). However, as posited by theory, it is overconfidence that, eventually, results in a negative effect on the performance of the business. It is the result of the entrepreneur's disregard for detailed information or the facts at hand, and the bias about their own abilities, as a result of their overconfidence (Hayward et al., 2006).

In their study, Gudmundsson and Lechner (2013) established that overconfidence is amplified by other biases – this finding was a key theme in relation to the failure of firms to survive. The researchers determined that entrepreneurs' overconfidence led to misplaced confident beliefs in their abilities (which pointed to self-efficacy),

which resulted in higher assumption of risk and, consequently, decisional errors that verify the views on the negative outcomes of this bias.

#### 2.3.3.2. *Overoptimism bias*

##### i. Definition and contextual background of the overoptimism bias

Shepherd et al. (2015), Thomas (2018) and S. X. Zhang and Cueto (2017) describe overoptimism as the tendency to expect positive outcomes, even when these expectations are not rationally justified. Overall (2016) explains further that entrepreneurs will typically expect things to turn out well, and will often underrate the likelihood of negative outcomes, by altering their perception of risk. Dölarslan et al. (2017) define optimism bias as the judgment of one's own risk as being less than the risk facing others; which infers a relationship between overoptimism and risk perception.

Overoptimism constitutes one of the two most researched biases in entrepreneurship, alongside overconfidence (Shepherd et al., 2015; Thomas, 2018), due to the close relationship that these two biases have in an entrepreneur's decision-making processes, even though overoptimism and overconfidence are two distinct concepts (Bernoster et al., 2018; Cossette, 2014; Trevelyan, 2008; Zhang, S. X. & Cueto, 2017). Sánchez, Carballo and Gutiérrez (2011) explain how the perception of risk could lead to either pessimistic or optimistic outcomes. Gudmundsson and Lechner (2013) observed a relationship involving optimism bias and an influence on overconfidence.

Overconfidence is deemed to be a singular personality trait that is consistent, and extends across several situations (Trevelyan, 2008) – it is independent of individuals' own influence or thought processes (Zhang, S. X. & Cueto, 2017). According to Trevelyan (2008) and Thomas (2018), overoptimism could influence the behaviour and mood more than it is likely to influence the thought process of the entrepreneur. Typically, entrepreneurs are deemed to be high in optimism (Sánchez et al., 2011), which explains their overestimation of the prospects of success, and their motivation to seek opportunities, even in uncertain environments (Cossette, 2014).

ii. Effects between overoptimism, risk perception and firm performance

Empirical evidence suggests that most entrepreneurs tend to be excessively optimistic relative to non-entrepreneurs (Bernoster et al., 2018). Nevertheless, strong evidence points to a negative relation between overoptimism and rational decision-making, which tends to affect the performance of the enterprise (Bernoster et al., 2018).

A certain level of overoptimism has a positive effect, as it promotes persistence by entrepreneurs (Trevelyan, 2008), and helps them to face challenges optimistically. However, an excess of overoptimism has shown to have negative consequences for performance (Gudmundsson & Lechner, 2013). When present in entrepreneurs, overoptimism helps to focus them and downplay uncertainty and, therefore, motivates the decision to initiate entrepreneurial actions (Trevelyan, 2008; Zhang S. X. & Cueto, 2017).

Overoptimism is a double-edged sword: Whilst it can enhance the positive efforts of entrepreneurs by helping them to deal with obstacles, it can also interfere with their ability to arrive at critical decisions that would ensure the good performance of the firm (Gudmundsson & Lechner, 2013). S. X. Zhang and Cueto (2017) point to empirical evidence that confirmed one of the impacts of overoptimism, namely delaying the exit of entrepreneurial ventures that are not successful, thus, resulting in lower revenues and jeopardizing the survival of firms. Drawing from this supposition, reference can be made to the hubris theory, and that the very motivator that instigates entrepreneurial ventures could be the same factor that compromises success and leads to venture failure.

For instance, the tendency, caused by optimism bias, to downplay uncertainty, can lead to a lesser perception of risk, which leads to an underestimation of the probability of a negative firm performance outcome (Dölarslan et al., 2017), as well as poor strategic decision-making (Cossette, 2014; Gudmundsson & Lechner, 2013). This behaviour leads entrepreneurs to “fall into the portion of the optimism – a performance function beyond an inflection point” (Gudmundsson & Lechner, 2013, p. 280) where optimism eventually impacts negatively on firm performance.

Overoptimism has also been assigned as the reason for delayed exit from nonperforming entrepreneurial ventures (Shepherd et al., 2015). This means the entrepreneur's unsuccessful efforts are prolonged, which ultimately leads to wasted resources and, therefore, reduced firm performance and revenues (Zhang, S. X. & Cueto, 2017). Empirical evidence has found that a negative consequence of overoptimism on financial decision-making issues is a compromised financial orientation – in fact, overoptimism bias is the main reason for the high rate of failure of start-ups (Gudmundsson & Lechner, 2013).

Research has established strong evidence that overoptimism influences a firm's performance; earnings, sales and growth rates, as it impacts on decision-making (Thomas, 2018). Trevelyan (2008) identified a connection between overoptimism and entrepreneurs' inclination to pursue efforts geared to generating potential profits. Whilst various outcomes of overoptimism have been identified, Thomas (2018) also reported a curvilinear relationship between overoptimism and performance, which suggests that some degree of optimism is good, however, overoptimism is negative (Gudmundsson & Lechner, 2013).

The presence of optimism bias produces rather positive traits in entrepreneurs, which, according to Gudmundsson and Lechner (2013), is the reason for their high self-esteem and lesser tendency to experience emotional distress and vulnerability. However, excessive optimism could, due to overconfidence, result in fewer risk mitigations being considered, which illustrates the interaction between overoptimism and overconfidence and the resultant combined perception of risk (Bernoster et al., 2018).

The consequences of overoptimism cannot be looked at in isolation; instead, factors with the potential to influence this bias must also be considered. Personal, environmental and organisational factors have been deemed to have a bearing on overoptimism, although not much research has been undertaken to suggest a conclusive view in this regard (Thomas, 2018). Encompassed within personal factors are aspects such as the entrepreneur's experience and educational background, which have been shown to be key in determining the entrepreneur's ability (Zhang, S. X. & Cueto, 2017). Literature established that overoptimism is

more prevalent in well-educated entrepreneurs and nascent entrepreneurs (Cossette, 2014).

There is a profound overlap between overconfidence and overoptimism: the two biases induce higher abilities and outcome expectations (Bernoster et al., 2018), which can result in better performance (Zhang, S. X. & Cueto, 2017). However, the literature found that these biases, if not well managed, can also have adverse effects on the performance of firms (Hayward et al., 2006). This finding aligns with what the hubris theory posits, and presents the argument that overestimations due to these biases result in cognitive biases that can have both positive and negative outcomes.

#### 2.3.3.3. *Self-efficacy bias*

##### i. Definition and contextual background of self-efficacy bias

Self-efficacy is the belief in one's own personal abilities to successfully perform certain tasks or roles (McGee, Peterson, Mueller, & Sequeira, 2009; Miao, Qian, & Ma, 2017; Newman, Obschonka, Schwarz, Cohen, & Nielsen, 2019; Wilson, Kickul, Marlino, Barbosa, & Griffiths, 2009). Self-efficacy is grounded on some level of overconfidence, as it relates to the confidence in one's abilities to execute actions that are needed to deliver successful outcomes (Gallagher, 2012). Stroe, Parida and Wincent (2018) suggest that self-efficacy provides entrepreneurs with confidence levels needed to pursue their goals successfully, and it acts as a determinant for entrepreneurial decisions.

Self-efficacy is a judgment that is undertaken in uncertainty (Moore & Chang, 2009), as it is measured prior to the actual performance of a task. Therefore, inherent in such a dynamic is a bias towards an individual's overestimation of their own abilities (Moore & Chang, 2009), which is then carried forward into their decisions and actions.

It is believed that entrepreneurs will pursue a particular venture only if they believe they have the requisite skills and abilities (Gielnik, Bledow, & Stark, 2019). In the absence of these skills and abilities, an entrepreneur would not be confident about

pursuing that entrepreneurial venture; therefore, self-efficacy serves as a means to sanction the intentions and goals (Gielnik et al., 2019) premised on the heightened confidence; this “overconfidence“ leads to the belief that they could successfully achieve a particular outcome.

ii. Effects between self-efficacy, risk perceptions and firm performance

Research on the role of gender and its impact on self-efficacy does exist, although it has not been extensively undertaken (Dempsey & Jennings, 2014). The role of self-efficacy in entrepreneurs has been associated mostly with their intention to get involved in venture creation (Hmieleski & Baron, 2008; McGee et al., 2009) and to strive towards individual achievements (Yusuff et al., 2019).

Self-efficacy is important for explaining the behaviour of entrepreneurs, as it influences their choices, decisions and even motivation to persevere (McGee et al., 2009; Yusuff et al., 2019). Literature found a relationship between self-efficacy and overconfidence: entrepreneurs with high self-efficacy had more self-confidence and performed well in their roles, whereas those with low self-efficacy tended to lose confidence easily, thereby reducing their performance levels (Yusuff et al., 2019).

Moore and Chang (2009) established that entrepreneurs with high self-efficacy are more inclined to pursue their goals or objectives and, therefore, increase the likelihood of their firm performing well and achieving success, relative to those who possessed low self-efficacy.

Research often reports that women have lower self-efficacy than men (Dempsey & Jennings, 2014; Newman et al., 2019; Wilson et al., 2009). This perception may be due to women being more likely to have lower expectations of success, as women are claimed to lack the relevant capabilities (Newman et al., 2019; Wilson et al., 2009), consequently, they have lower self-efficacy and, therefore, lower entrepreneurial intentions (Wilson et al., 2009).

Dempsey and Jennings (2014) observed that women tended to have preconceived notions that they are unable to succeed in business. The general reasons for this belief were their level of prior experience, their age, and educational background

(Wilson et al., 2009; Yusuff et al., 2019). Dempsey and Jennings (2014) researched this topic further and include physiological arousal, vicarious experiences and verbal persuasion as determinants of self-efficacy and as some of the reasons behind female entrepreneurs' low self-efficacy levels. In their study to determine the relationship between self-efficacy and entrepreneurial behaviour, Wilson et al. (2009) established that education and experience were key to improving the self-efficacy of female entrepreneurs.

Self-efficacy ignites the motivation and intentions to pursue entrepreneurial actions and achieve high levels of performance, and the behaviour necessary for achieving goals, even amidst negative outcomes, leading to an optimistic outlook (Gielnik et al., 2019). According to Yusuff et al. (2019), self-efficacy acts as a determinant of individual performance, as it influences behaviours, thus, the actions undertaken. Yusuff et al.'s study on the influence of efficacy on female entrepreneurs' performance revealed that higher self-efficacy led to high levels of business performance and success (2019).

The study conducted by Wilson et al. (2009) established that women with high self-efficacy had higher entrepreneurial intentions and, therefore, the drive to perform. Furthermore, it was female entrepreneurs with higher self-efficacy who were more likely to pursue entrepreneurship (Wilson et al., 2009).

Markowska et al. (2019) posit that it is individuals who have direct control over their skills or efforts who are most likely to have a positive approach to risk. Dölarslan et al. (2017) argue that an individual's behaviour is motivated by their perceived ability to deliver on a successful performance, therefore, entrepreneurs who believe and are assured of their abilities and skills will be motivated to perform. Individuals who are, however, not sure of their abilities tend to perceive risk and are not able to act as required (Dölarslan et al., 2017). This finding implies that self-efficacy has an effect on the perception of risk, which suggests that entrepreneurs with high self-efficacy are likely to have positive risk perceptions, validated by knowledge and skills.

Literature has established an interesting phenomenon related to self-efficacy and goals setting by entrepreneurs, and often reports conflicting views. Entrepreneurs

with high self-efficacy tend to set overly difficult-to-achieve and unrealistic goals, resulting in decreased growth of the business and, ultimately, its low performance (Baron, Mueller, & Wolfe, 2016; Gielnik et al., 2019). Baron et al. (2016) suggest that, as a consequence of high self-efficacy, entrepreneurs could hold the belief that they can succeed in achieving any goals they set for themselves. This perception can be the basis of unrealistic and ambitious goals that may interfere with a firm's growth, and which could lead to failure (Baron et al., 2016). Although their study does not prove ultimate failure regarding firm performance, they did establish a positive relationship between self-efficacy and the setting of difficult-to-reach goals. Furthermore, Baron et al. report the effect of self-efficacy on firm performance is influenced by goal-setting (2016).

Self-efficacy bias explains not only the setting of unrealistic goals, but also complacency and minimal allocation of effort by entrepreneurs (Gielnik et al., 2019). This applies, particularly, to cases where overconfidence in one's abilities leads to expectations of performance levels that exceed actual performance (Moore & Chang, 2009), which has negative consequences for performance. This confirms the relationship between self-efficacy and overconfidence, as articulated by Dölarslan et al. (2017).

## **2.4. CONCLUSION**

This chapter presented a literature review on the effects of cognitive biases on judgement and decision-making under conditions of uncertainty, which typically characterise the entrepreneurship environment. Of particular focus was the significance of the role of women in entrepreneurship. Women's role is often understated, though it is important given their contribution to both social and economic development. Literature on decision-making under uncertainty identified the prevalence of cognitive biases, due to the reliance of entrepreneurs on heuristics to simplify and speed up decision-making.

Cognitive biases are generally believed to have negative consequences for decision-making and outcomes, although certain studies report their positive impact on steering entrepreneurship activities. The hubris theory of entrepreneurship proposes that the effects of cognitive bias are paradoxical; being initially positive for



the initiation and motivation of pursuing entrepreneurial ventures, and then resulting in the downfall and failure of firm performance, and eventual venture failure.

Entrepreneurship activity is underpinned by risk taking, which literature reports as being influenced by entrepreneurs' risk perception. Risk perceptions are said to influence entrepreneurial behaviour and, therefore, also affect decision-making outcomes. Cognitive biases influence how entrepreneurs interpret information and, therefore, form perceptions on risk, which will determine their decision-making and actions and, ultimately, impact on the outcome of their firm performance, and their potential success.

This literature study paved the way for this study, which is focused in analysing the relationship between cognitive biases and risk perceptions, and their influence on firm performance in driving entrepreneurial success.

## CHAPTER 3: RESEARCH QUESTIONS AND HYPOTHESES

### 3.1. FORMULATION OF RESEARCH QUESTIONS

This study analysed the relationship between cognitive biases, risk perceptions and firm performance, with the aim of determining how these three factors influence the success of female entrepreneurs.

The focus on women's entrepreneurship was selected due to the importance of women's roles in promoting both economic and socio-economic prosperity, and the importance assigned to the contribution of their businesses to policy achievement (Sajjad et al., 2020). It has been found that entrepreneurs do not apply only a single bias to their decision-making at a certain point in time, but rather a series of biases (Zhang, H. et al., 2020). This phenomenon justifies investigating the three biases that are believed to have a level of interplay (Overall, 2016; Shepherd et al., 2015; Trevelyan, 2008). The prevalence of three main cognitive biases, namely, overconfidence, overoptimism and self-efficacy, in female entrepreneurs was studied; with each bias investigated by consulting established entrepreneurship literature and theory.

The study sought to help close the gap in female entrepreneurs' cognitions, which literature reports limited research studies having investigated; little research has also been done on the impact of cognitive biases on firm performance (Pouria & Abdollah, 2019). Not much research has been extended to the role of gender in cognitive bias and the impact of cognitive bias on business performance.

The research aimed to answer the following two research questions:

#### **Research question 1: How do cognitive biases influence the risk perception of female entrepreneurs?**

Cognitive biases are mental biases that affect how entrepreneurs, both female and male, tend to frame or interpret information (Barbosa et al., 2007). Biases affect the judgment and decision-making of entrepreneurs and extend to influence how they perceive risk (Palich & Bagby, 1995; Robinson & Marino, 2015). Risk perceptions

are typically viewed as being either low or high; positive or negative. The perception of risk is an integral judgement outcome, which informs the entrepreneurial actions to be taken (Overall, 2016). It is, therefore, critical for entrepreneurs to form accurate risk perceptions, given the potential repercussions of misperceptions, which could affect the performance and success of their subsequent entrepreneurial activities.

Literature reports there being a difference between how women and men typically view risk (Pouria & Abdollah, 2019). This question, therefore, sought to determine the effect of cognitive biases from the perspective of a female entrepreneur.

**Research question 2: What is the impact of cognitive biases and risk perceptions on the performance of the firms of female entrepreneurs?**

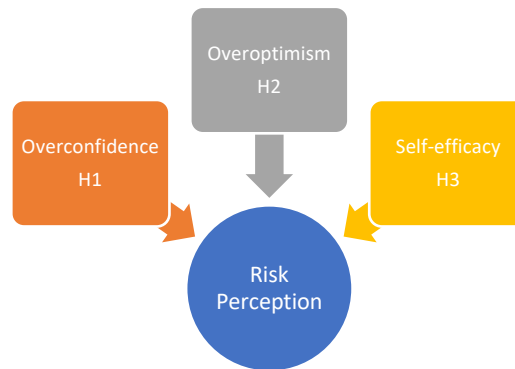
The underlying objective of every entrepreneurial venture is achieving good firm performance and to enable the realisation of any other diverse objectives that an entrepreneur may have set. A key discussion point of the entrepreneurship literature is the distinction between firm performances of businesses owned and managed by women and men respectively (Bowmaker-Falconer & Herrington, 2020).

Whilst these differences could be attributed to several factors or dynamics, the focus of this study and the objective of this question was to determine how, as a result of mental biases and risk perceptions, firm performance of woman-owned businesses is impacted. Within this study, the measure firm performance was assumed to be the annual turnover achieved by a business.

**3.2. PROPOSED RESEARCH HYPOTHESES**

The hypotheses below were constructed to answer the posed research questions (see Figures 3.1 and 3.2).

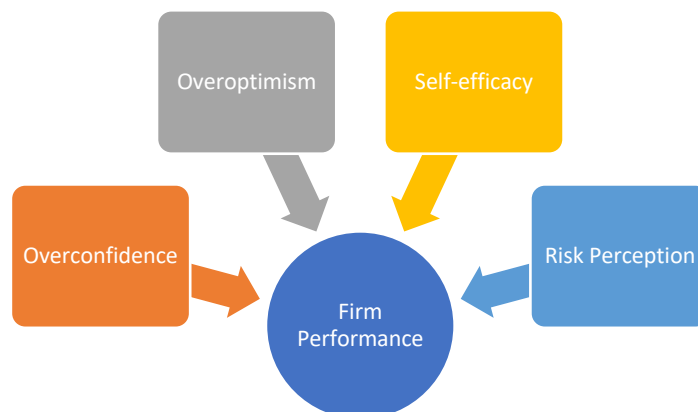
**Research Question 1:** How do cognitive biases influence the risk perception of female entrepreneurs?



**Figure 3.1: Proposed hypotheses tests between the independent variable and dependent variables**

- **Hypothesis 1:** There is a negative relationship between overconfidence and risk perception
- **Hypothesis 2:** There is a negative relationship between overoptimism and risk perception
- **Hypothesis 3:** There is a negative relationship between self-efficacy and risk perception

**Research Question 2:** What is the impact of cognitive biases and risk perceptions on female entrepreneurs' firm performance?



**Figure 3.2: Proposed hypotheses tests between the independent and dependent variable**

- **Hypothesis 4:** *Firm performance of female entrepreneurs will vary depending on their levels of overconfidence, overoptimism, self-efficacy and risk perception.*

## CHAPTER 4: RESEARCH METHODOLOGY

### 4.1. INTRODUCTION

“Research is a systematic and logical study of an issue, problem or phenomenon through scientific method” (Krishnaswami & Satyaprasad, 2010, p. 3). The aim of the study that was undertaken responds to both a theoretical and business problem: to advance the development of female entrepreneurs – a minority group whose participation in economic development is crucial given the profound contribution they stand to make. The study was aimed at understanding how cognitive biases and risk perception influence female entrepreneurs, and how these factors impact the performance of their ventures. By achieving this aim, the study sought to contribute to knowledge on women’s cognitive approaches in the field of entrepreneurship, based on three key constructs: cognitive bias, risk perception and firm performance.

The research followed on a positivist paradigm, which, according to Saunders and Lewis (2018), is based on the belief that observations and experiments can lead to a better understanding through the adoption of objective means. The data was collected, analysed and applied through a quantitative approach. Four key hypotheses were determined, then tested, and the results analysed to determine this impact on risk perception and performance. The outcomes were then interpreted according to the predictions established from existing literature and theory. The following were the hypothesis tested in this study;

- **Hypothesis 1:** *There is a negative relationship between overconfidence and risk perception*
- **Hypothesis 2:** *There is a negative relationship between overoptimism and risk perception*
- **Hypothesis 3:** *There is a negative relationship between self-efficacy and risk perception*
- **Hypothesis 4:** *Firm performance of female entrepreneurs will vary depending on their levels of overconfidence, overoptimism, self-efficacy and risk perception*

## **4.2. RESEARCH METHODOLOGY AND DESIGN**

The study used a deductive approach, which was considered to be the most suitable, given the nature of the research questions posed. As advised by Saunders and Lewis (2018), these questions were based on established theory, and sought to determine logical relationships between the constructs set, through the empirical evidence that was gathered. The research questions tested for the prevalence of existing cognitive biases in female entrepreneurs, followed by an analysis of the impact of these biases on risk perceptions, and the outcome for firm performance. The findings were then interpreted and compared against the existing theory and literature.

## **4.3. RESEARCH DESIGN**

Quantitative research is often associated with studying behaviours and attitudes and generalising the findings to bigger populations and studying the relationships between the identified dependent and independent variables (Saunders & Lewis, 2018). Therefore, for this study, a quantitative research method was applied, given that the focus of the study was to statistically test and analyse the relationship between three independent variables – overconfidence, overoptimism and self-efficacy biases – and risk perception and firm performance, which acted as dependent variables.

Quantitative research methodology aims to test pre-existing theories to establish a particular outcome (Krishnaswami & Satyaprasad, 2010). This aim was applicable to the objective of the study, namely, to test the predetermined hypotheses that are founded on existing entrepreneurship theories. Therefore, the application of quantitative methodology allowed for the description and identification of variables to which statistical methods could be applied to analyse the data.

The choice of the research methodology was also informed by similar studies previously conducted, the majority of which had similarly adopted the quantitative strategy and had applied statistical models to test and analyse data to enable comparative analysis.

The study adopted a cross-sectional design that involved collecting data from several respondents at the same point in time, which Saunders and Lewis (2018) refer to as a 'snapshot' of a study at a particular time. The approach allowed for efficient collection of data and enabled the researcher to explain the relationship between the variables as they occurred to the respondents.

#### **4.3.1. Research type**

The study adopted an explanatory research design, which, according to Saunders and Lewis (2018), is ideal for studying a situation or problem in order to explain relationships between variables.

This research design was chosen to analyse the impact of cognitive biases on the way risk is perceived by female entrepreneurs, and then to determine how both the predisposition to the bias and the perception of risk impacted on the performance of these entrepreneurs' firms. The rationale behind the approach adopted on the study was guided by existing entrepreneurship theories and literature, which was supported by empirical findings and interpretations.

#### **4.3.2. Research strategy**

A survey strategy that made use of an online questionnaire to gather data was adopted. It allowed for the collection of data from the representative population and posed the same set of questions to a number of female respondents representing various industries. This strategy allowed for standardisation, ease of analysis and comparability of the responses obtained (Saunders & Lewis, 2018).

The study intended to collect survey data from a minimum of 120 respondents, to ensure that it provided a good representation on which to base statistical testing and analysis, to explain the relationship between the variables that were studied. Due to limitations experienced during the implementation of the survey, only 75 respondents provided valid responses, which represents 62% of the number of intended responses.



### **4.3.3. Population**

Krishnaswami and Satyaprasad (2010) define a population as the target group to be studied. The aim of the study was to determine how cognitive biases influence risk perceptions and firm performance of female entrepreneurs. The population comprised female entrepreneurs, who are defined by Singh and Raina (2013) as women or groups of women that have started up or organised and operate business enterprises. These female entrepreneurs were targeted in several business sectors, various age groups and different firm sizes.

### **4.3.4. Unit of analysis**

The unit of analysis refers to the major entity that is being analysed (Saunders & Lewis, 2018). For this study, the unit of analysis constituted female entrepreneurs, who are defined as women who start up, organise and operate business enterprises (Rashmi, 2016).

### **4.3.5. Sampling method and size**

A sample, according to Saunders and Lewis (2018), is a subgroup of all group members or the whole population. From the two types of sampling techniques, probability and non-probability sampling, this study used non-probability purposive sampling. Non-probability sampling proved most relevant, given that the exhaustive list of female entrepreneurs in the population was unknown. Therefore, the chance of ascertaining which female entrepreneurs should be chosen is unlikely.

Purposive sampling allows for the selection of the sample size based on key predetermined criteria set by the researcher in order to meet the objectives of the research (Saunders & Lewis, 2018). In this case, only women who qualified as entrepreneurs were purposively selected. After the rollout of the survey, the researcher experienced challenges related to securing the targeted sample in correspondence to the set parameters (also see Section 4.3.2).

The snowball technique was then applied, as it offered efficiencies. This is a sampling technique in which already recruited respondents provide referrals to

recruit other respondents for the research study (Christopoulos, 2009). It is a type of non-probability sampling, where sample members give recommendations for subsequent members (Saunders & Lewis, 2018).

The participants – female entrepreneurs – were targeted from various business and social groups. Participants were secured from a business school and corporate and social networks, and the recruitment was extended to other, similar networks on a referral basis, to reach a larger sample. The sample chosen is believed to have been heterogenous, and possessed diverse characteristics, to attain maximum variation (Saunders & Lewis, 2018). The sample included female entrepreneurs from diverse backgrounds, with different ages and educational qualifications, and the age of their businesses and their amounts of work experience varied.

#### **4.4. SURVEY AS A MEASURING INSTRUMENT**

A survey questionnaire, a quantitative instrument commonly used to collect data from a sizeable population (Adams, Khan, & Raeside, 2013; Saunders & Lewis, 2018), was adopted for this study. It comprised a selection of 19 questions adapted and modified from questionnaires that had been used by similar studies. The survey questionnaire was made up of a series of mandatory closed-ended questions, and a single open-ended question that measured the annual turnover of the female entrepreneurs. (Refer to Appendix A for sample of the survey questionnaire.)

Closed-ended questions were used because they allowed for standardised responses from the participants, to ensure ease of comparability, as well as reduced variability when undertaking interpretations (Adams et al., 2013). The survey questionnaire was self-administered, thereby limiting interference by the researcher.

The questionnaire was distributed electronically and hosted on SurveyMonkey. This approach to data collection was efficient and was a good way to capture high volumes of data from female entrepreneurs based at different locations (Adams et al., 2013).

The questions had to be answered through a combination of Likert scales and multiple-choice answers. The Likert scales were based on attitude statements (Adams et al., 2013) and assessed the level of agreement to the posed questions.

#### **4.5. SURVEY DESIGN**

The survey was designed using SurveyMonkey and was broken down into six key sections: qualifying question, demographics, measures of overconfidence biases, measures of overoptimism biases, measures of self-efficacy biases, measures of risk perceptions, and measure of firm performance.

The survey questionnaire comprised the three main constructs being researched – cognitive bias, risk perception and firm performance – all of which were covered by mandatory questions. The survey instrument comprised questions that had to be answered by either selecting a Likert scale option or selecting an option for closed-ended and multiple-choice questions. Participants were given the opportunity to provide their firm's annual turnover in an open-ended question at the end of the survey.

##### **4.5.1. Participant survey questionnaire**

Refer to Appendix A for a sample of the survey questionnaire issued to the research participants.

##### **4.5.2. Qualifying question**

The first question on the survey was a multiple-choice question that was set to verify if the participant was indeed a female entrepreneur.

##### **4.5.3. Demographics**

The demographics section was designed to identify the personal characteristics of the participants, which included; age, educational background, years of work experience and the age of the firm; this data formed part of descriptive statistics that provided a representation of the characteristics of the sample (Saunders & Lewis, 2018).

#### **4.5.4. Measures of overconfidence bias**

This section contained five general knowledge questions adopted from similar questionnaires of previous research (Ilieva, Brudermann, & Drakulevski, 2018; Michailova, 2010). These were all multiple-choice questions: In what year did Nelson Mandela die? How many countries make up Africa? What is ascorbic acid? Which is the world's largest economy? Which virus causes coronavirus disease? These multiple-choice questions were answered through an embedded 5-point Likert scale (1 very unsure – 5 very sure); after which participants had to rank the perceived accuracy of their responses.

The intention of the questions was not to demonstrate the general knowledge of the participants, but rather to establish their level of confidence in the responses given. An assessment based on general knowledge is deemed quite appropriate, according to Simon et al. (2000), given that entrepreneurs face a diverse range of information when they evaluate decision outcomes.

#### **4.5.5. Measures of overoptimism bias**

This section contained five questions that were adopted from a life orientation test, and measured overoptimism (Scheier, Carver, & Bridges, 1994). The questions were answered on a 5-point Likert scale (1 strongly disagree, 2 disagree, 3 not sure, 4 agree, 5 strongly agree) to determine the prevalence of overoptimism from the entrepreneurs' responses to the following statements: My business will likely survive the effects of COVID-19, The current business landscape presents me with more opportunities to do even better, The challenges facing entrepreneurs are too many to be overcome, My investment mostly promises high capital gain, Economic recession persists over very short time periods.

#### **4.5.6. Measures of self-efficacy bias**

This section contained five questions adopted from a set of questions in an unpublished questionnaire by Isaga (2008) (refer to Appendix D for permission for the use of the questionnaire). This questionnaire sought to establish the extent to

which the respondents believed in their own abilities to execute certain tasks. The questions investigated entrepreneurs' confidence in their ability to Come up with a new idea for a product or service, Get others to identify with you and believe in your vision and plans for your business, Deal effectively with day-to-day problems and crises, Saving money to invest in the business, and Design an effective marketing/advertising campaign for a new product or service. These responses were made on a 5-point Likert scale (1 very unsure – 5 very sure).

#### **4.5.7. Measures of risk perception**

This section contained five questions adopted from an original questionnaire by Blais and Weber (2006), also applied by Boermans and Willebrands (2017). It sought to measure how risky the entrepreneurs perceived risk to be and, therefore, their likelihood of engaging in risky behaviour.

This section used a 7-point Likert scale (not at all risky, slightly risky, somewhat risky, moderately risky, risky, very risky, extremely risky) as responses to questions enquiring into behaviour such as the following: Investing 10% of your annual income in a new business venture, Investing 10% of your annual income in shares, Betting a day's income at a high-stakes card game such a poker. Investing 10% of your annual income in a wonder bank or other schemes that promises you a very high return on savings and Investing 10% of your annual income in a new farming technology.

#### **4.5.8. Measures of firm performance**

The measure of firm performance was based on an indication of the annual turnover of the business, which is an indicator adopted from a similar study by Boermans and Willebrands (2017). Whilst other performance indicators, qualitative and quantitative, can be applied to measure firm performance, this study used annual turnover as a measure of firm performance. Each participant was asked to give an indication of their respective annual turnover. The responses were put into category scales - R 0–500 000; R 501 000 – 1 000 000 and more than R 1 000 000 – to allow for easier and comparable analysis.

#### **4.5.9. Pretesting the survey**

As recommended by Saunders and Lewis (2018) and Adams et al. (2013), is it advisable to conduct a pilot test prior to undertaking the actual survey, to determine if it works, and to make corrections to the questionnaire where deemed necessary. A sample of ten respondents who were similar to those who participated in the final research were selected for the pilot test.

Testing the questionnaire allowed the researcher to ensure that the constructs being measured did not contain bias, and that the survey was clear to the respondents and simple to administer (Saunders & Lewis, 2018; Adams et al., 2013). The pilot test identified several questions that needed to be revised for clarity, based on the feedback of the pilot respondents.

Cronbach's alpha was applied to determine the scale of reliability and internal consistency of the measurement of the questions. Tested for was a minimum acceptable range of 0.6–0.7; a value closer to 1 being ideal (Gliem & Gliem, 2003). However, some of the scores were lower than 0.6, which indicated low interrelatedness between some of the questions, which therefore needed to be revised (refer to Appendix C for the results).

#### **4.6. DATA COLLECTION PROCESS**

This process relates to the gathering and measuring of the actual data that was used in the research. The study only made use of primary data, which was collected using a structured method from a targeted sample comprising female entrepreneurs. The survey questionnaire was cascaded in a methodical way; it was shared with existing business and social contacts, which helped to distribute the survey. The survey was administered over a period of 12 weeks.

The self-administered online survey questionnaire was hosted on SurveyMonkey and distributed to each respondent electronically via a web link. Before respondents started answering the questions in the questionnaire, a consent letter was shared with them, which explained the content of the survey and its purpose,

gave assurance of confidentiality and anonymity of the respondents' responses, and gave the estimated duration of completing the survey (refer to Appendix A).

The selected data gathering method was chosen because it was well suited to elicit responses from a wide range of female entrepreneurs. Furthermore, this was an easy, quick and efficient means to follow for both the researcher and respondents (Saunders & Lewis, 2018). The self-administered questionnaire also gave the respondents the flexibility and convenience to participate in the survey with minimal intervention by the researcher.

Given that the research was undertaken as a cross-sectional study, the survey was administered over a 12-week period, to provide reasonable time to reach the intended minimum of 120 respondents. The study achieved participation by, in total, 144 female entrepreneurs, however some questionnaires had many incomplete responses, and many respondents dropped out of the survey. The reasons for the incomplete responses could not be established.

#### **4.7. QUANTITATIVE DATA ANALYSIS**

The data analysis facilitated the interpretation of the results of the survey. Given the nature of the study and the developed hypotheses, statistical methods were applied to test and analyse the responses given on the questionnaire. Once the survey had closed, quantitative methods were applied to analyse the data using statistical software, SPSS, and an Excel spreadsheet.

After obtaining the data from SurveyMonkey, the data was coded to ensure that all the measures were qualitative in nature, considering the Likert scales that were used to measure each of the three constructs outlined in Chapter 3. Thereafter, the data was evaluated for completeness, and any questionnaires with a non-completion rate of more than 50% were excluded from the analysis. Table 4.1 lists and explains the statistical tests that were applied to the data.

**Table 4.1: Summary of statistical tests conducted**

Statistical test	Description
Histogram	Used to show the distribution of the results (means & standard deviations)
Chi-square	Used to test for a relationship between two categorical variables
Paired t-test	Used applied to two related observations, to determine if the means of these normally distributed interval variables differ one another
Correlation	Used to determine the relationship between two or more normally distributed interval variables
Scatter graph	Used to determine the relationship between two variables and help detect outliers
Multivariate regression	Used to look at the linear relationship between several normally distributed interval predictors, and one normally distributed internal outcome variable

#### **4.7.1. Descriptive statistics**

Descriptive statistics comprised basic summaries relating to the sample. It analysed and helped to describe the trends inherent in the sample, in order to then facilitate the examination of the demographic variables. Mean values were used to interpret the general perceptions of the participants on an aspect. Standard deviation and skewness were used to interpret dispersion of the data around the mean. Graphs depicting bell shapes were produced to indicate the normal distribution of data.

#### **4.7.2. Hypothesis tests: Paired t-tests**

The paired t-test (Hsu & Lachenbruch, 2005) was used to compare the means of two paired groups, risk perceptions and the independent variables. The null hypothesis assumes that the true mean difference between the paired samples is zero, i.e., not different (Hedberg & Ayers, 2015). The paired sample t-test has three main assumptions:



- i. The dependent variable must be continuous (interval/ratio).
- ii. The observations are independent of one another.
- iii. The dependent variable should be approximately normally distributed.

#### **4.7.3. Correlation analysis**

Pearson correlation coefficient ( $r$ ) was used to statistically measure for a linear relationship between two continuous variables (Benesty, Chen, Huang, & Cohen, 2009). It provides information on the degree of the association, its direction and correlation of relationship (Nahler, 2009). The value of  $r$  ranges from +1.0 to -1.0; a negative value of  $r$  indicates an inverse relationship between the variables, whereas a positive value indicates a direct relationship.

#### **4.7.4. Multivariate regression analysis**

This statistical test is used to examine or predict the relationship between a variable in relation to other variables. It was used to look at the linear relationship between several normally distributed interval predictors, and one normally distributed internal outcome variable (Rencher & Christensen, 2012). Multiple regression is an extension of simple linear regression; it was, therefore, used to predict the value of a variable based on the value of two or more other variables.

### **4.8. TEST FOR MEASUREMENT QUALITY**

#### **4.8.1. Reliability**

Reliability, according to Saunders and Lewis (2018), is described as the degree to which data collection methods and analysis produce consistent findings. Cronbach's alpha is a measure of internal consistency (Gliem & Gliem, 2003) and was used to determine the reliability of the scales used. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. The closer Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in the scale. The Cronbach alpha coefficient was applied, targeting a minimum acceptable score of 0.6–0.7.

#### **4.9. DATA PRIVACY AND STORAGE**

To comply with the requirement of storing data for 10 years, a copy of the Excel sheet containing the raw data was saved both on a USB, and electronically in the Cloud. To ensure the protection of the Excel spreadsheet, password protection to restrict access and ensure privacy was built in.

#### **4.10. RESEARCH LIMITATIONS**

The nature of quantitative research methodology makes it susceptible to certain inherent limitations, which this study was also prone to. The reliability of the collected data is dependent on the quality of the responses given, which are, in turn, influenced by both the respondents and the researcher's design of the survey questionnaire. Unless managed, all these factors could influence the outcome and findings of the study.

The study was also susceptible to an insufficient sample size and inadequate representation of the population: The researcher initially intended a minimum response by 120–150 participants and achieved a total number of 144 participants. However, for reasons beyond those that could be mitigated by the researcher, which were probably due to limitations of the selected measurement instrument, many respondents did not complete the survey. This resulted in a final number of 75 responses. This low, significantly reduced number could have compromised the findings of the study, as the findings may not fully reflect the sample of female entrepreneurs, and thereby give an inappropriate representation of the population.

#### **4.11. CONCLUSION**

The particular research methodology and design were adopted to ensure that the study followed a structured; logical and systematic process. It allowed for the scientific analysis of data from 75 female entrepreneurs, to test existing theories on the relationship between three constructs – cognitive bias, risk perception and firm performance. To achieve the objectives of the study, the impact of cognitive bias on risk perception and firm performance was investigated under a broad base of female entrepreneurs. To facilitate this objective, a quantitative study was adopted

and executed through an online self-administered survey for gathering primary data. Multiple statistical tests were then applied for validation, to conduct analysis and to interpret the collected data. Both descriptive and inferential statistics reports were produced, the results of which will be discussed in Chapter 5.

## CHAPTER 5: ANALYSIS AND RESULTS

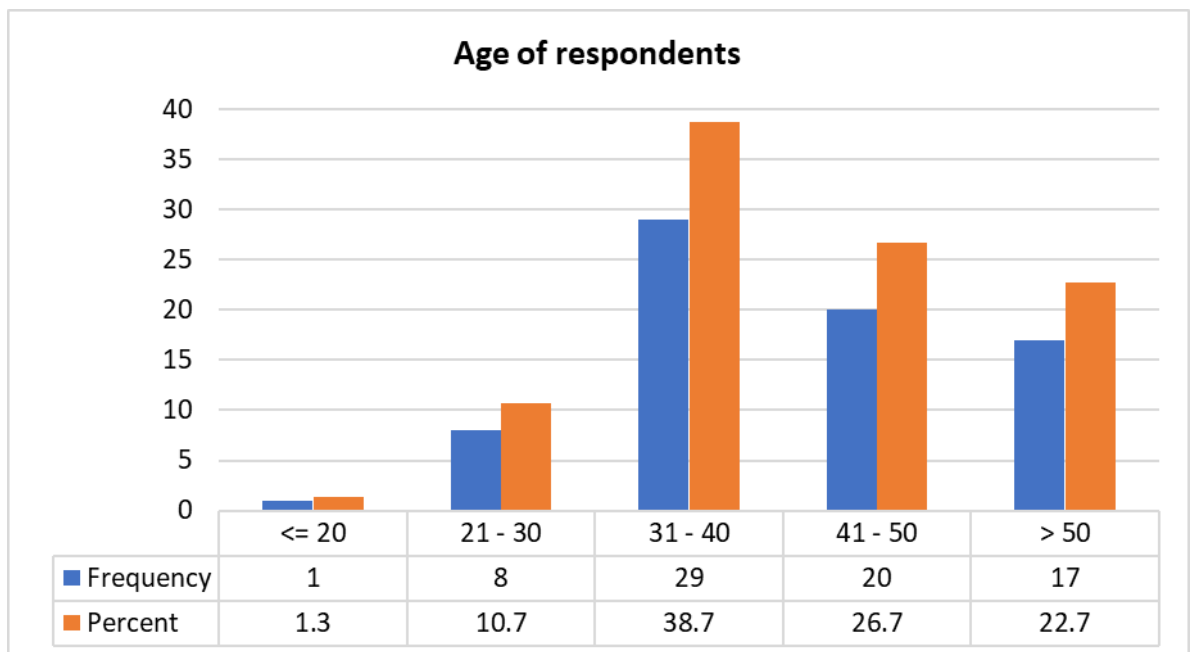
### 5.1. INTRODUCTION

This chapter will provide an analysis of the results of this study. The data was gathered from 75 female entrepreneurs and was analysed by several statistical techniques (see Table 4.1) at 95% confidence interval and at 5% significance level. The analysis will provide the demographic characteristics of the respondents, followed by frequency tables for the four variables in this study (overconfidence, overoptimism, self-efficacy, and risk perception). In each section, descriptive results will be presented in the form of mean scores, to depict the general perception of the respondents regarding that aspect. This presentation will be followed by inferential statistics in the form of correlations, hypothesis testing and multivariate regression.

### 5.2. DEMOGRAPHIC CHARACTERISTICS

#### 5.2.1. Demographic profile of age of female entrepreneurs

Figure 5.1 presents a graph showing the ages of the respondents in this study.

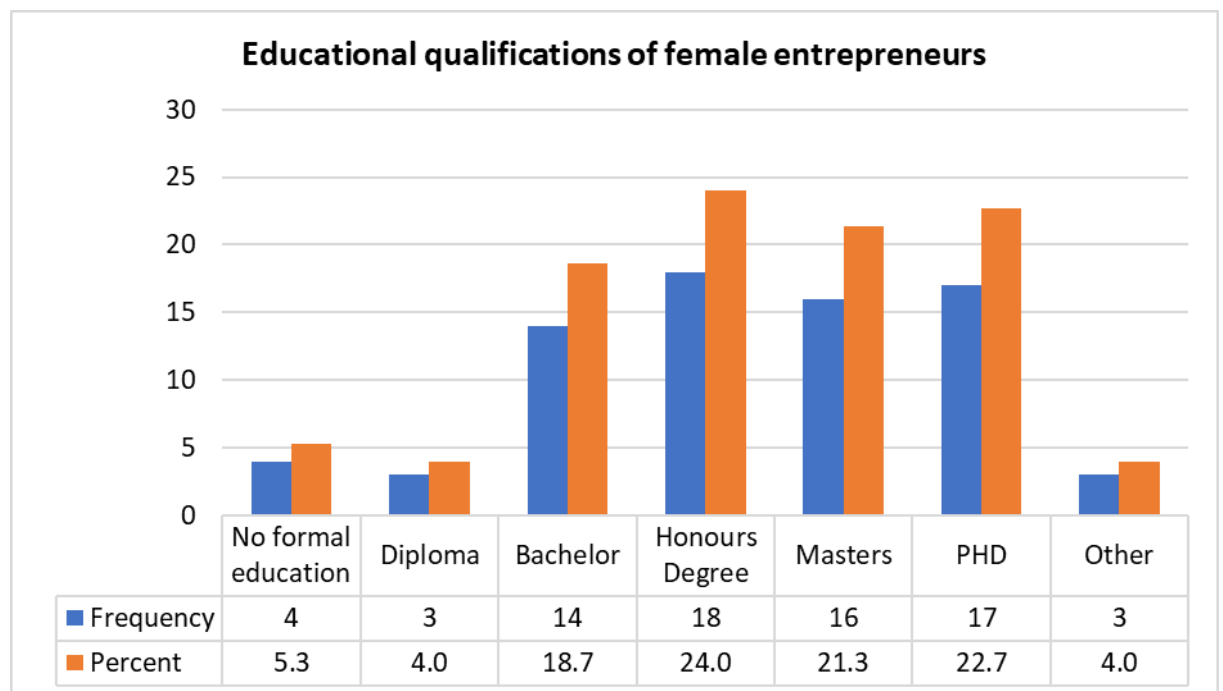


**Figure 5.1: Age distribution of female entrepreneurs who provided data for this study**

Figure 5.1 presents the age categories of the females entrepreneurs who participated in the survey. The respondents were categorised into five groups (<=20, 21–30, 31–40, 41–50, above 50 years). As illustrated by the data, the largest group (38.7%) were female entrepreneurs in the age category 31–40 years, followed by the age category 41–50 years, at 26.7%. The data showed that the least number of respondents (1.3%) were in the <=20 years category. The overall outcome of this data indicates a relatively mature sample of female entrepreneurs: 88.10% of the sample of this study constituted women above the age of 31 years.

### 5.2.2. Educational qualifications of female entrepreneurs

The graph in Figure 5.2 provides information of the educational qualifications of the respondents in this study.



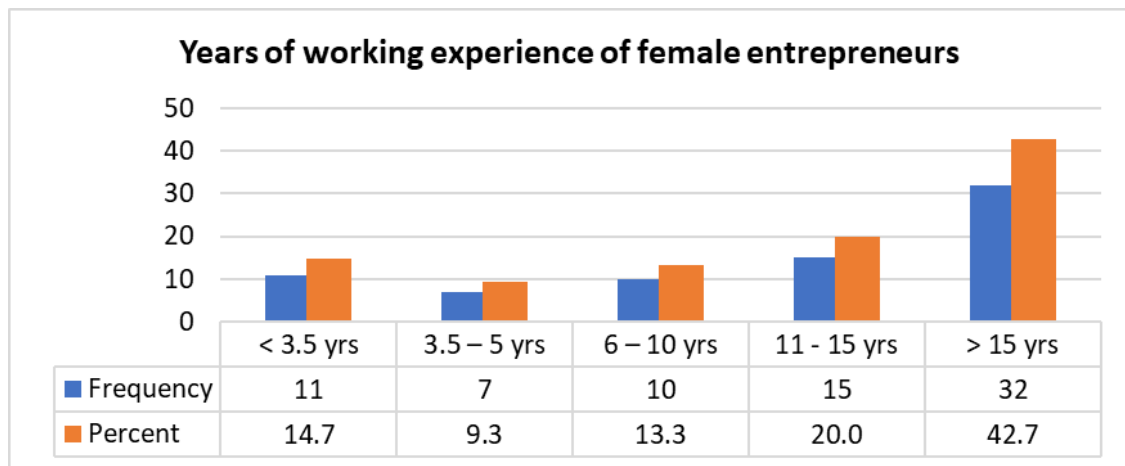
**Figure 5.2: Educational qualifications of female entrepreneurs**

Seven categories of educational levels were observed. Table 5.2 illustrates that the majority (24%) of female entrepreneurs held Honours degrees. The data also indicates that the majority of the respondents (68%) had postgraduate

qualifications. A small minority (4%) reported having undergone no formal education.

### 5.2.3. Years of working experience of female entrepreneurs

Figure 5.3 indicates the years of working experience respondents in this study indicated in the survey questionnaire.

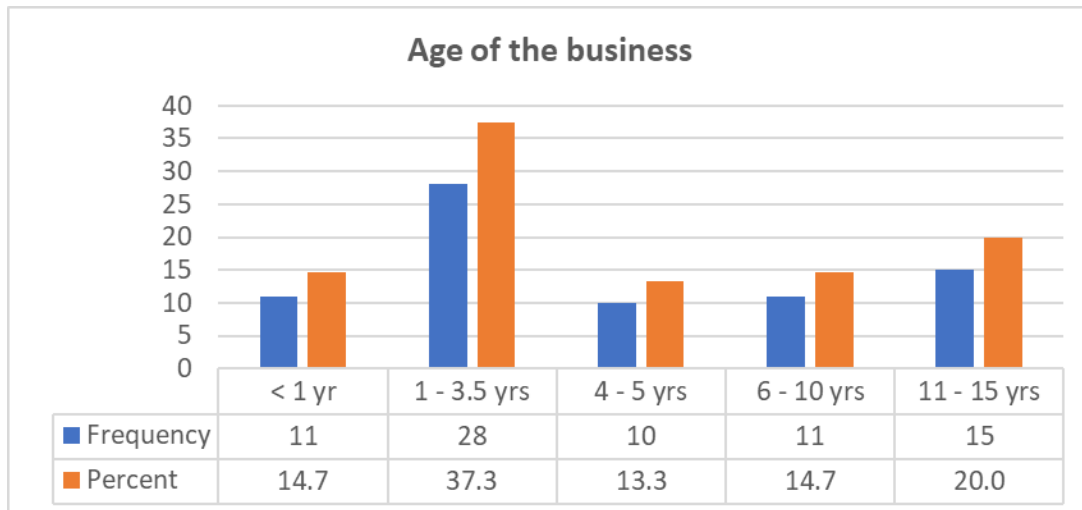


**Figure 5.3: Years of working experience of female entrepreneurs**

In relation to years of work experience as reported by respondents, they were categorised into five groups, as shown on the graph in Table 5.3. The majority (42.7%) of female entrepreneurs had an excess of 15 years of work experience. A minority (9.3%) of respondents had work experience ranging from 3.5 to 5 years.

### 5.2.4. Age of the business

Figure 5.3 is a graph that shows the ages of the respondents' businesses.



**Figure 5.4: Age of the business**

Table 5.4 illustrates the age of the respondent's entrepreneurial businesses. It can be observed that the majority of respondents (37.3%) had owned or run businesses for between 1 and 3.5 years. The same number (14.7%) can be observed for businesses that were <1 year and 6 and 10 years. Old. A minority of respondents (13.3%) had owned businesses for between 4 and 5 years.

### **5.3. DESCRIPTIVE STATISTICS RESULTS (COGNITIVE BIASES)**

#### **5.3.1. Overconfidence bias**

To measure the prevalence of the overconfidence of female entrepreneurs, five general knowledge questions were posed to the respondents, which they answered with a 5-point Likert scale, which each respondent used to rank their level of confidence in the accuracy of the responses given. The focus of this measure was not on the accuracy of the general knowledge question, but rather to establish the respondent's level of confidence shown on the scale. The following tables ( 5.1, 5.2, 5.3, 5.4, 5.5) gives the results of Chi-square ( $X^2$ ) analyses, which were applied to test if the response type (correct/wrong) was independent regarding the confidence of the respondents (McHugh, 2013).

**Table 5.1: Overconfidence bias: In what year did Nelson Mandela die?**

		<i>In what year did Nelson Mandela die?</i>							
		2012		2013		2014		Total	
<b>How sure are you of your answer?</b>		<i>Freq.</i>	<i>%</i>	<i>Freq.</i>	<i>%</i>	<i>Freq.</i>	<i>%</i>	<i>Freq.</i>	
	<b>1</b>	1	20.00	2	3.77	2	11.76	5	6.67
	<b>2</b>	2	40.00	0	-	2	11.76	4	5.33
	<b>3</b>	2	40.00	6	11.32	3	17.65	11	14.67
	<b>4</b>	0	-	5	9.43	6	35.29	11	14.67
	<b>5</b>	0	-	40	75.47	4	23.53	44	58.67
<b>Total</b>		5	100.00	53	100.00	17	100.00	75	100.00

Freq: Frequency; Responses on Likert scale: 1 very unsure – 5 very sure

Pearson chi2(8) =36.4855 Pr =0.000

Table 5.1 indicates that most respondents (70.7%, N=53) responded that Nelson Mandela died in 2013, which is correct, while a fifth (22.7%, N=17) reported that he had died in 2014 (incorrect) and a few said it was in 2012 (incorrect).

Of those who gave the right answer, seven out of ten (75.5%) were generally very sure/confident about their response, while 9.4% responded that they were sure of the year Nelson Mandela died.

A fifth (23.5%) of those who gave the answer 2014 were very sure/confident of their response, and a third (35.3%) were sure they were giving the correct year. All of those who responded 2012 were much more likely to be unsure (100%). These results suggest that the majority (84.8%) of respondents had high overconfidence, compared to those who responded 2014 (58.7% sure). The X<sup>2</sup> statistics p-value is significant at 5%, indicating that there were differences in confidence levels between those who got the answer correct and those who got it wrong.



**Table 5.2: Overconfidence bias: How many countries make up Africa?**

		<b>How many countries make up Africa?</b>							
		<b>45</b>		<b>54</b>		<b>64</b>		<b>Total</b>	
		<i>Freq.</i>	<i>%</i>	<i>Freq.</i>	<i>%</i>	<i>Freq.</i>	<i>%</i>	<i>Freq.</i>	<i>%</i>
<b>How sure are you of your answer?</b>	<b>1</b>	0	-	3	4.76	0	-	3	4.00
	<b>2</b>	3	60.00	1	1.59	2	28.57	6	8.00
	<b>3</b>	1	20.00	13	20.63	4	57.14	18	24.00
	<b>4</b>	0	-	15	23.81	1	14.29	16	21.33
	<b>5</b>	1	20.00	31	49.21	0	-	32	42.67
<b>Total</b>		5	100.00	63	100.00	7	100.00	75	100.00

Freq: Frequency; Responses on Likert scale: 1 very unsure – 5 very sure

Pearson chi2(8) =33.5780 Pr =0.000

Table 5.2 indicates that, of those respondents who gave the correct number of countries in Africa, almost five out of ten (49.2%) were very sure and a fifth (23.8%) were sure of their response; while a fifth (20.6%) were doubtful and very few (6.2%) were unsure.

Those who were correct were more likely to be so sure or confident (72%) about their answer compared to those who responded 64 countries (14.2%) or 45 countries (20%). Notably, those who got the answer wrong were more likely to be unsure, while those who got the answer correct were more likely to be confident of their response. *The X<sup>2</sup> statistics p-value is significant at 5%, indicating that there were differences in confidence levels between those who got the answer correct and those who got it wrong.*

**Table 5.3: Overconfidence bias: What is ascorbic acid?**

		<i>What is ascorbic acid?</i>							
		<b>Vitamin A</b>		<b>Vitamin B</b>		<b>Vitamin C</b>		<b>Total</b>	
		<i>Freq.</i>	<i>%</i>	<i>Freq.</i>	<i>%</i>	<i>Freq.</i>	<i>%</i>	<i>Freq.</i>	<i>%</i>
<b>How sure are you of your answer?</b>	1	1	16.67	0	-	2	3.23	3	4.00
	2	1	16.67	4	57.14	4	6.45	9	12.00
	3	2	33.33	2	28.57	4	6.45	8	10.67
	4	1	16.67	0	-	7	11.29	8	10.67
	5	1	16.67	1	14.29	45	72.58	47	62.67
<b>Total</b>		6	100.0	7	100.0	62	100.0	75	100.0

Freq: Frequency; Responses on Likert scale: 1 very unsure – 5 very sure

Pearson chi2(8) =28.9779 Pr =0.000

Table 5.3 indicates that eight out of ten (83.7%) of those who gave the right answer to the question what ascorbic acid was (Vitamin C), were generally positive of their response; while a fifth (20.6%) were doubtful and unsure. Those who responded Vitamin B were likely to be doubtful (28.6%) or unsure (57.2%), as were those who responded Vitamin A (33.3% doubtful and 33.3% unsure). These results show that respondents who gave the answer were more likely to be unsure, while those who gave the correct answer were more likely to be confident of their response. The X<sup>2</sup> statistics p-value is significant at 5%, indicating that there were differences in confidence levels between those who got the answer correct and those who got it wrong.

**Table 5.4: Overconfidence bias: Which is the world's largest economy?**

	<b>Which is the world's largest economy?</b>							
	USA			China			Total	
	<i>Freq.</i>		%	<i>Freq.</i>	%	<i>Freq.</i>	%	<i>Freq.</i>
<b>How sure are you of your answer?</b>	1		2	4.55	0	-	2	2.67
	2		1	2.27	2	6.45	3	4.00
	3		3	6.82	7	22.58	10	13.33
	4		14	31.82	16	51.61	30	40.00
	5		24	54.55	6	19.35	30	40.00
<b>Total</b>			44	100.00	31	100.00	75	100.00

Freq: Frequency; Responses on Likert scale: 1 very unsure – 5 very sure

Pearson  $\chi^2(4) = 13.0040$  Pr = 0.011

Table 5.4 indicates that slightly more respondents (58.7%; N=44) correctly answered that the United States of America had the world's biggest economy, compared to 41.3% (N=31) who provided the wrong answer (China). The results indicate that eight out of ten (86.3%) of those who were correct, were generally positive of their response; while less than 20% of them were doubtful or unsure. Seven out of ten (70.9%) of those who cited China as the world's largest economy were also likely to be confident about their response; 51% were sure while 19.3% were so sure. These results show that those who gave the wrong answer were more likely to be unsure, while those who gave the correct answer were more likely to be confident of their response. *The  $X^2$  statistics p-value is significant at 5%, indicating that there were differences in confidence levels between those who got the answer correct and those who got it wrong.*

**Table 5.5: Overconfidence bias: Which virus causes coronavirus disease?**

	<b>Which virus causes coronavirus disease?</b>						
		COVID-19		SARS-CoV-2		Total	
	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>
<b>How sure are you of your answer?</b>	1	2	5.71	1	2.50	3	4.00
	2	0	-	3	7.50	3	4.00
	3	2	5.71	6	15.00	8	10.67
	4	2	5.71	12	30.00	14	18.67
	5	29	82.86	18	45.00	47	62.67
<b>Total</b>		35	100.00	40	100.00	75	100.00

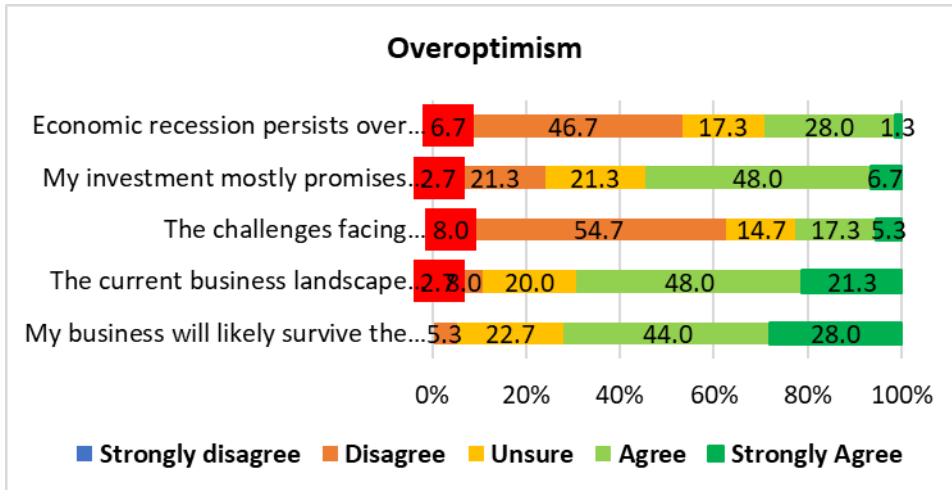
Freq: Frequency; Responses on Likert scale: 1 very unsure – 5 very sure

Pearson  $\chi^2(4) = 14.783$  Pr = 0.005

Table 5.5 indicates that slightly fewer respondents said that coronavirus was caused by COVID-19 (46.7%, N=35) compared to 53.3% (N=40) who said it was caused by SARS-Cov-2. Those who responded that coronavirus was caused by COVID-19 and were very sure were majority (82.9%) compared to those who said it was caused by SARS-Cov -2 (45%). Those who said coronavirus was caused by SARS-Cov-2 were also more likely to be sure 4 - (30%) compared to those who responded COVID-19 (5.7%). Notably, those who responded COVID -19 (88.3%) and SARS-Cov-2 (75%) were both likely to be positive/confident about their responses. *The  $X^2$  statistics p-value is significant at 5%, indicating that there were differences in confidence levels between those who got the answer correct and those who got it wrong.*

### 5.3.2. Overoptimism bias

Figure 5.5 presents the overoptimism bias response chart.



**Figure 5.5: Overoptimism bias response chart**

Seven out of ten (72%) of the respondents believed that their businesses were likely survive the effects of COVID-19, a fifth were uncertain on whether they would survive the COVID-19's effects. Six to seven out of ten (69.3%) were positive that the current business landscape presented them with more opportunities to do even better, a fifth (20%) were uncertain about this, while a tenth (10.7%) disagreed with this statement. Six out of ten (62.7%) of the respondents disagreed that the challenges facing entrepreneurs were too many to be overcome, a fifth (22.7%) agreed that the challenges were too many, while a few were undecided on this aspect. Half (54.7%) of the respondents responded that their investment mostly promised high capital gain, a fifth were uncertain (21.3%) and another fifth (24%) were negative. This means that 45% of them were negative or uncertain whether the challenges facing entrepreneurs were too many to overcome or not. Half the respondents (53.3%) disagreed that economic recession persists over very short time periods; up to a quarter (29.3%) agreed to this statement, while less than 20% were uncertain about this aspect of overoptimism.

**Table 5.6: Overoptimism bias**

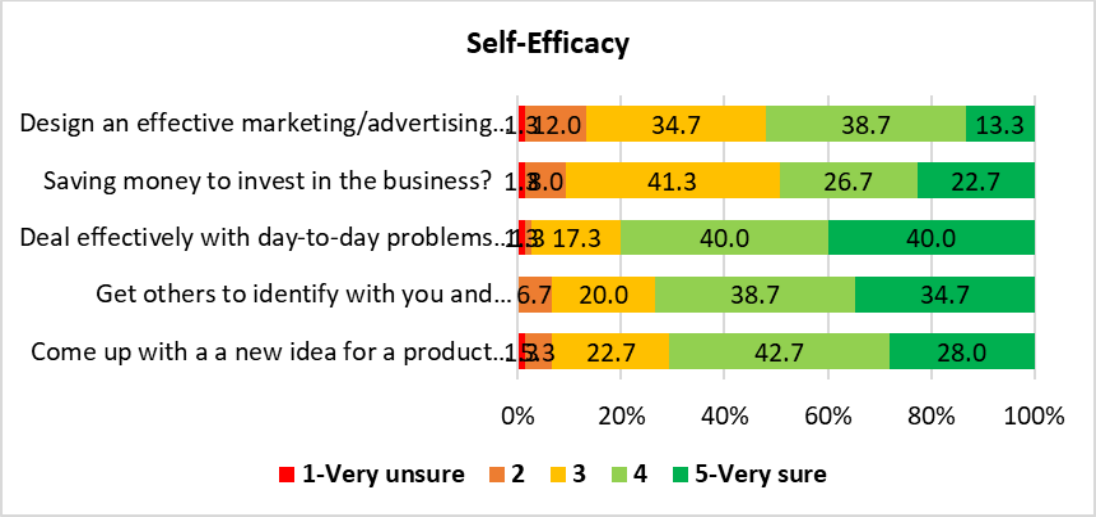
Statement	N	Min.	Max.	Mean	Std. dev.	Skewness	Kurtosis
<b>My business will likely survive the effects of COVID-19.</b>	75	2	5	<b>3.95</b>	.853	-.434	-.436
<b>The current business landscape presents me with more opportunities to do even better.</b>	75	1	5	<b>3.77</b>	.967	-.816	.556
<b>The challenges facing entrepreneurs are too many to be overcome.</b>	75	1	5	<b>2.57</b>	1.042	.794	-.215
<b>My investment mostly promises high capital gain.</b>	75	1	5	<b>3.35</b>	.979	-.487	-.619
<b>Economic recession persists over very short time periods.</b>	75	1	5	<b>2.71</b>	.997	.289	-1.083
<b>Valid N (listwise)</b>	75						

The highest-rated aspect/perception in this subscale is that respondents' businesses were likely to survive the effects of COVID-19 (M=4.0; SD=0.853), followed by the belief that the current business landscape presents them with more opportunities to do even better (M=3.8; SD=0.967). They were uncertain whether their investment mostly promised high capital gain (M=3.4; SD=0.979). They generally disagreed or were doubtful that economic recession persists over very short time periods (M=2.7; SD=0.997) and that the challenges facing entrepreneurs were too many to be overcome (M=2.6; SD=1.042).

### **5.3.3. Self-efficacy bias**

This test sought to determine the extent to which female entrepreneurs had confidence in their own skills and abilities to perform certain tasks. Five questions with responses ranked on a five-point Likert scale were posed, warranting each

respondent to then rank their self-efficacy levels on a range; from 1 Very unsure to 5 Very sure of their ability.



**Figure 5.6: Self -efficacy response chart**

Seven out of ten (70.7%) respondents were positive that they had come up with a new idea for a product or service, a fifth (22.7%) were doubtful about this, while very few (6.7%) were negative on this aspect. Similarly, seven out of ten (73.3%) respondents were positive that they could get others to identify with them and believed in their vision and plans for their business, a fifth (20%) were neutral and very few were negative (6.7%) on this aspect. Eight out of ten (80%) respondents were sure that they could deal effectively with day-to-day problems and crises, fewer (17.3%) were neutral or negative (2.7%). Almost half the respondents (49.3%) were sure that they were able to save money to invest in the business, four out of ten (41.3%) were doubtful, while 9.3% were unsure about investing in the business. Half (52%) of respondents were positive/certain they were able to design an effective marketing/advertising campaign for a new product or service, a third (34.7%) were doubtful, while a tenth (13.3%) were negative about it.

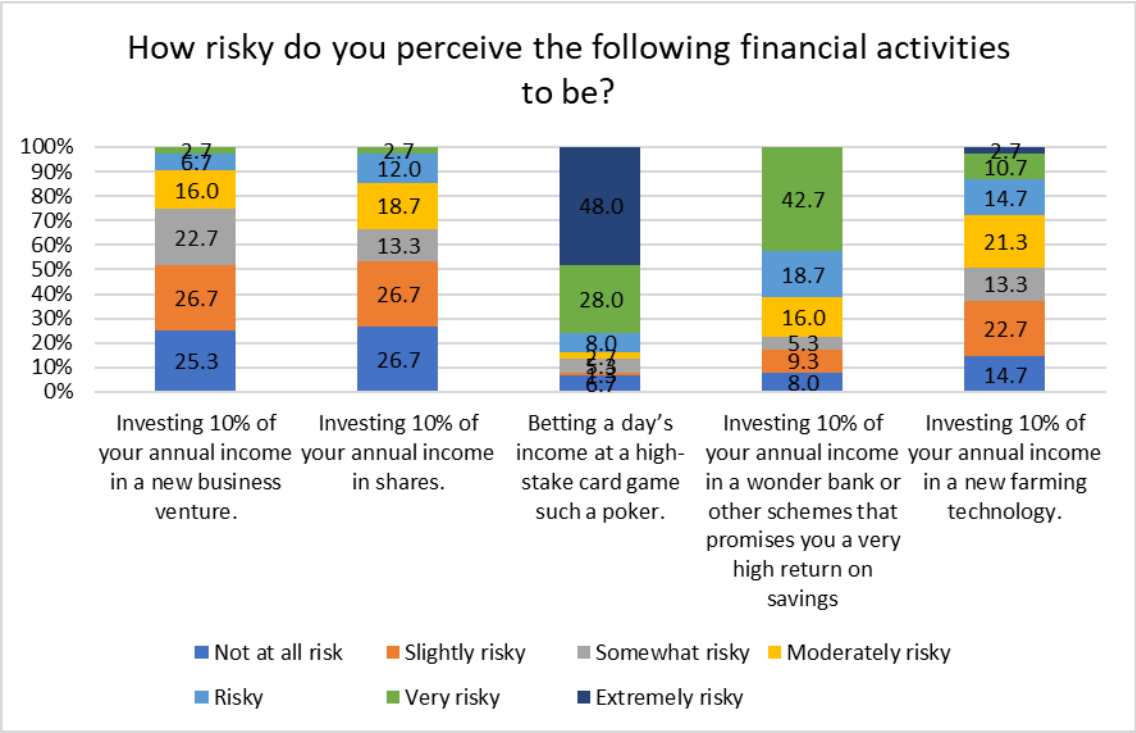
**Table 5.7: Self-efficacy descriptive statistics**

	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. dev</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>Come up with a new idea for a product or service?</b>	75	1	5	<b>3.91</b>	.918	-.673	.296
<b>Get others to identify with you and believe in your vision and plans for your business?</b>	75	2	5	<b>4.01</b>	.908	-.583	-.480
<b>Deal effectively with day-to-day problems and crises?</b>	75	1	5	<b>4.16</b>	.855	-.984	1.264
<b>Saving money to invest in the business?</b>	75	1	5	<b>3.61</b>	.971	-.056	-.572
<b>Design an effective marketing/advertising campaign for a new product or service?</b>	75	1	5	<b>3.51</b>	.921	-.233	-.292
<b>Valid N (listwise)</b>	75						

Table 5.7 indicates that the two highest-rated aspects in terms of confidence in the self-efficacy (SE) subscale is dealing effectively with day-to-day problems and crises (M=4.1; SD=0.918), followed by confidence in getting others to identify with them and believe in their vision and plans for the business (M=4; SD=0.908). Slightly diminished confidence was observed for coming up with new ideas for a product or service (M=3.9; SD=0.908) and ability to save money to invest in the business (M=3.6; SD=0.971). The lowest-rated aspect in this scale was ability to design an effective marketing/advertising campaign for a new product or service (M=3.5; SD=0.921).



**5.4. DESCRIPTIVE STATISTICS RESULTS (RISK PERCEPTIONS)**



**Figure 5.7: Risk perceptions response chart**

A quarter (25.3%) of respondents felt it was not at all risky to invest 10% of their annual income in a new business venture, another quarter felt this was slightly risky (26.7%) and a fifth (22.7%) felt doing so was somewhat risky. These results suggest three quarters (74.7%) of them felt doing so was not taking a risk. Very few of them moderately (16%) felt this was risky or risky (9.3%). Respondents felt that investing 10% of their annual income in shares was not at all risky (25.3%), slightly risky (26.7%) and somewhat risky (22.7%). These results suggest that up to two thirds of them generally felt there was little or no risk in investing 10% of their income shares, fewer did not feel so -14.7% felt this was taking a risk. It seems that the majority of respondents felt it was generally risky to bet a day's income at a high-stake card game such a poker (extremely risky-48%; very risky-28%; risky-8%). Very few perceived this as not risky (16%). A quarter (25.3%) of respondents felt it was not at all risky to invest 10% of their annual income in a new business venture, another quarter felt this was slightly risky (26.7%) and a fifth (22.7%) felt doing so was somewhat risky. These results suggest three quarters (74.7%) of

them felt doing so was not a taking a risk. Very few of them moderately (16%) felt this was risky or risky (9.3%).

Respondents felt that investing 10% of their annual income in shares was not at all risky (25.3%), slightly risky (26.7%) and somewhat risky (22.7%). These results suggest that up to two thirds of them generally felt there was little or no risk in investing 10% of their income shares, fewer did not feel so -14.7% felt this was taking a risk. It seems that the majority of respondents (84%) felt it was generally risky to bet a day's income at a high-stake card game such a poker (extremely risky-48%; very risky-28%; risky-8%). Very few perceived this as not risky (16%). Six out of ten (61.3%) of them felt that investing 10% of their annual income in a wonder bank or other schemes that promises them a very high return on savings was generally risky, a fifth (22.7%) felt this was not risky while 16% were uncertain whether this was risky or not. Half of the respondents (50%) felt that it was generally not risky to invest 10% of their annual income in a new farming technology, at least quarter felt this was risky to do, while a fifth (21%) were uncertain whether this was true or not.

**Table 5.8: Risk perceptions descriptive statistics**

	<b>N</b>	<b>Mean</b>	<b>Std. dev</b>	<b>Skew-ness</b>	<b>Kurtosis</b>
<b>Investing 10% of your annual income in a new business venture.</b>	75	<b>2.60</b>	1.346	.567	-.414
<b>Investing 10% of your annual income in shares.</b>	75	<b>2.71</b>	1.478	.448	-.979
<b>Betting a day's income at a high-stake card game such a poker.</b>	75	<b>5.80</b>	1.740	-1.708	2.003
<b>Investing 10% of your annual income in a wonder bank or other schemes that promises you a very high return on savings.</b>	75	<b>5.39</b>	1.993	-1.145	.014
<b>Investing 10% of your annual income in a new farming technology.</b>	75	<b>3.41</b>	1.693	.213	-.983
<b>Valid N (listwise)</b>	75				

Two aspects of this scale were rated as presenting the highest level of risk, namely; investing 10% of your annual income in a wonder bank or other scheme that promises you a very high return on savings (M=5.4; SD=1.99), and betting a day's income at a high-stakes card game, such a poker (M=5.8; SD=1.74). Respondents were most undecided about whether investing 10% of their annual income in a new farming technology (M=3.4; SD=1.69) was risky or not. They rated two aspects as not risky – investing 10% of their annual income in shares (M=2.7; SD=1.47) and investing 10% of their annual income in a new business venture (M=2.6; SD=1.34).

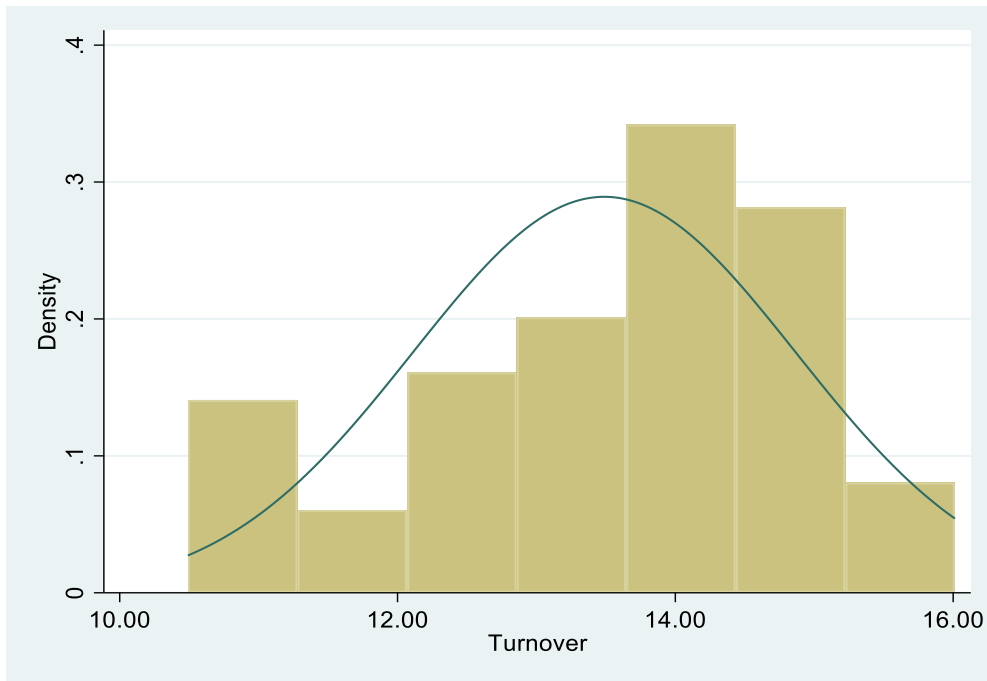
## 5.5. DESCRIPTIVE STATISTICS (FIRM PERFORMANCE)

Respondents were given the opportunity to provide their firm turnover in an open-ended question at the end of the survey. Each participant was asked to give an indication of their respective annual turnover. The responses were placed into category scales, R 0–500 000; R 501 000 – 1 000 000 and more than R 1 000 000, to allow for easier and comparable analysis. The turnover data was not normally distributed and was transformed into a natural logarithm. Table 5.9 provides the turnover of respondents' business in terms of below or above average. Note that 12 respondents did not provide their annual turnover.

**Table 5.9: What is your approximate annual turnover?**

		Frequency	Percent	Valid Percent
Valid	Below average	30	40.0	47.6
	Above average	33	44.0	52.4
	Total	63	84.0	100.0
Missing	System	12*	16.0	
Total		75	100.0	

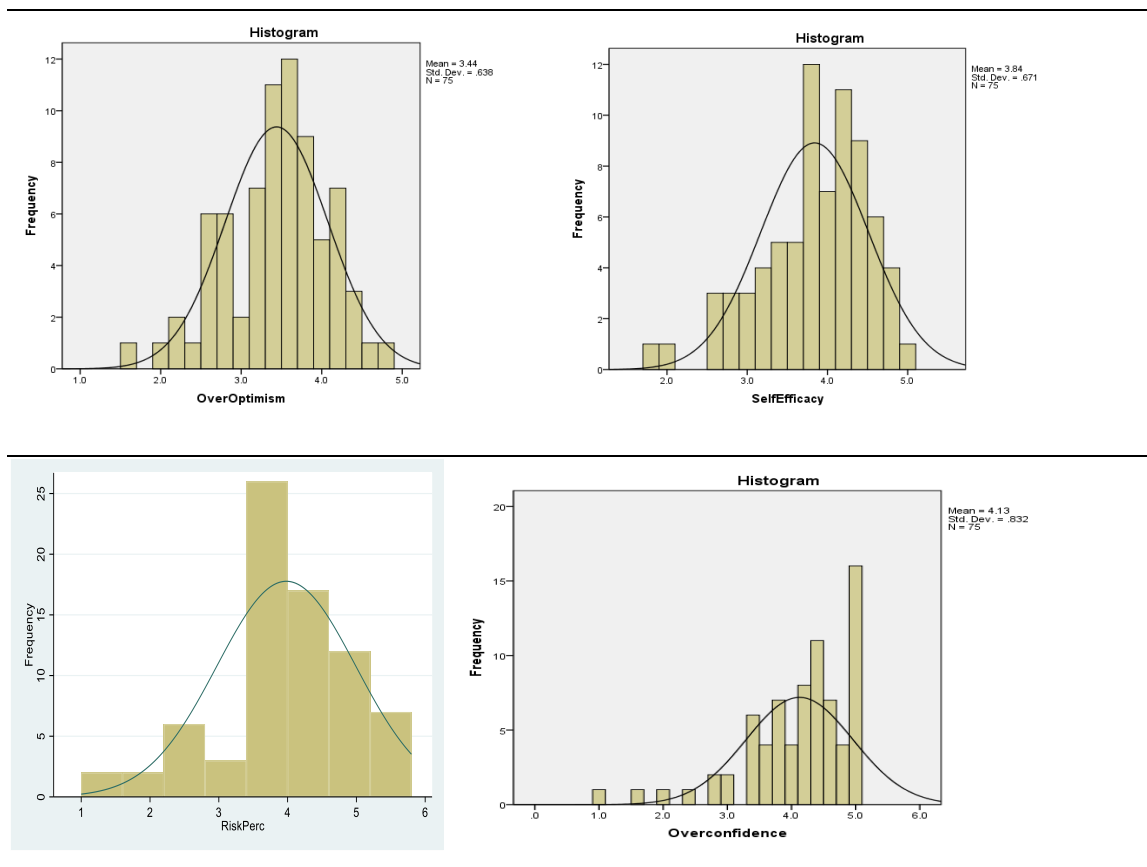
\* 12 missing values on the variable "turnover"



**Figure 5.8: Turnover graph**

## **5.6. NORMALITY TEST RESULTS**

Figure 5.9 shows the charts of the results of the normality tests



**Figure 5.9: Normal distribution charts**

Figures 1-Overoptimism and 2-Self Efficacy have mean scores of 3.84 and 3.44 respectively, with bell-shape curves that do not deviate from the normal distribution. Overconfidence scale has a mean score of 4.10 and, although the data seems rightly skewed, it does not part from the normal distribution. Inferential statistics (correlation, hypothesis testing and regression analysis) in the following sections will make assumptions in relation to normality.

## 5.7. RELIABILITY OF RESULTS

When using Likert-type scales, it is imperative to calculate and report Cronbach's alpha coefficient for internal consistency reliability for any scales or subscales the researcher uses. Cronbach's alpha reliability coefficient normally ranges between 0 and 1; the closer Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in the scale.

**Table 5.10: Cronbach alpha results**

Item	Obs	Sign	item-test	item-rest	interitem	alpha
			corr.	corr.	cov.	
CONF1	75	+	0.71	0.5023	0.541502	0.7519
CONF2	75	+	0.71	0.5204	0.548318	0.7436
CONF3	75	+	0.67	0.449	0.572282	0.7711
CONF4	75	+	0.82	0.7208	0.499219	0.6867
CONF5	75	+	0.75	0.6022	0.524444	0.7171
Test scale					<b>0.537153</b>	<b>0.7754</b>
SELF1	75	+	0.75	0.587	0.344535	0.7369
SELF2	75	+	0.82	0.6917	0.311291	0.7015
SELF3	75	+	0.67	0.4902	0.390781	0.7675
SELF4	75	+	0.73	0.5461	0.349129	0.7513
SELF5	75	+	0.69	0.5014	0.374715	0.765
Test scale					<b>0.35409</b>	<b>0.7855</b>
OPTI1	75	+	0.78	0.6393	0.223153	0.5368
OPTI2	75	+	0.80	0.6362	0.202342	0.5227
OPTI3	75	+	0.49	0.1893	0.364505	0.7301
OPTI4	75	+	0.75	0.5585	0.225856	0.5602
OPTI5	75	+	0.50	0.2152	0.356396	0.7143
Test scale					<b>0.274451</b>	<b>0.6734</b>
RISK1	75	+	0.60	0.3859	0.592823	0.495
RISK2	75	+	0.61	0.3696	0.578859	0.4974
RISK3	75	+	0.61	0.3196	0.580661	0.522
RISK4	75	+	0.61	0.2687	0.602463	0.5631
RISK5	75	+	0.62	0.3464	0.56015	0.506
Test scale					<b>0.582991</b>	<b>0.5712</b>

George and Mallery (2003) provide the following rules of thumb: “\_ > .9 – Excellent, \_ > .8 – Good, \_ > .7 – Acceptable, \_ > .6 – Questionable, \_ > .5 – Poor, and \_ < .5 – Unacceptable”. Table 5.10 indicates that the overconfidence (0.775) and self-efficacy (0.785) scales have the highest reliability of the data. Overoptimism (0.673) has reliability that is acceptable while the risk perception scale has questionable reliability, probably due to the 7-scale Likert scale used for responses. This means that caution should be applied when interpreting results on risk perception.

## 5.8. INFERENCE STATISTICS RESULTS

### 5.8.1. Pairwise correlation

Figure 5.11 is a correlations scatterplot.



**Table 5.11: Correlations scatterplot**

The scatterplot in Figure 5.11 determines whether a relationship between the independent variables and risk perceptions is linear, and also detects outliers. A scatterplot graphically presents a relationship between two continuous variables.



There seems to be a linear relationship between overoptimism and self-efficacy with two extreme outliers. Another relationship seems to be between self-efficacy and overconfidence, with outliers. The linear relationships between risk perception (dependent variable) and the independent variables are not clear graphically, as data points are clustered together without a clear linear pattern, with many outliers that may affect the hypothesis and regression models.

### 5.8.2. Pearson's correlation

Table 5.12 presents Pearson's correlations, which show weak associations between risk perception and the three independent variables.

**Table 5.12: Pearson's correlations results**

	RiskPerc	Overco~e	SelfEf~y	OverOp~m	Ln_Tur~r
RiskPerc	1				
Overconfidence	-0.1058	1			
Self-Efficacy	0.0202	0.3614*	1		
Overoptimism	0.1872	0.1349	0.3922*	1	
Ln_Turnover	0.0065	0.0163	0.0139	0.0668	1
Age	-0.1386	0.1862	-0.0153	0.0051	-0.0338
EducationL~l	0.1144	0.0177	0.1452	0.1442	0.2095
YearsofExp~e	-0.0133	0.1271	0.0027	0.2442*	0.3329*
AgeofBusin~s	-0.0151	0.0554	0.1593	0.1156	0.2308

### 5.8.3. Paired t-test (hypothesis testing)

Paired t-test analysis was used to test the means of two measurements taken from the same sample; in this case, between risk perception and the three independent variables. The purpose of the test was to determine whether there is statistical

evidence that the mean difference between paired observations is significantly different from zero, i.e., is not the same (Hsu & Lachenbruch, 2005).

5.8.3.1. *Hypothesis 1: There is a negative relationship between overconfidence and risk perception*

**Table 5.13: Paired t-test results (overconfidence and risk perceptions)**

Variable	Obs.	Mean	Std err.	Std dev.	[95% Conf.	Interval]
Overco~e	75	<b>4.13</b>	0.096	0.832	3.934	4.317
RiskPerc	75	<b>3.98</b>	0.117	1.010	3.749	4.214
diff	75	<b>0.14</b>	0.159	1.375	(0.172)	0.460

Mean(diff) – mean (Overconfidence - RiskPerc) t = 0.906 Pr(|T| > |t|) = **0.3675**

Table 5.13 indicates that there were negligible differences between the general risk perception (RP) and overconfidence (0.14). The p-value is greater than 5%, hence, the null hypothesis (Ho: mean(diff) = 0) is NOT rejected.

5.8.3.2. *Hypothesis 2: There is a negative relationship between overoptimism and risk perception*

**Table 5.14: Paired t-test results (overoptimism and risk perceptions)**

Variable	Obs.	Mean	Std err.	Std dev.	[95% Conf.	Interval]
Overoptimism	75	3.44	0.074	0.638	3.293	3.587
Risk Perceptions	75	3.98	0.117	1.010	3.749	4.214
diff	75	(0.54)	0.126	1.089	(0.792)	(0.291)

Obs. ?

Mean(diff) = mean (Overoptimism - Risk Perception) t = -4.3034 Pr (|T| > |t|) = **0.0001**

Table 5.14 indicates that there were negligible differences between the general risk perception (RP) and overoptimism (0.54). The p-value is less than 5%, hence, the null hypothesis (Ho: mean(diff) =0) IS rejected.

5.8.3.3. *Hypothesis 3: There is a negative relationship between self-efficacy and risk perception*

**Table 5.15: Paired t-test results (self-efficacy and risk perceptions)**

Variable	Obs	Mean	Std err.	Std dev.	[95% Conf.	Interval]
SelfEf~y	75	<b>3.84</b>	0.078	0.671	3.686	3.994
RiskPerc	75	<b>3.98</b>	0.117	1.010	3.749	4.214
diff	75	<b>(0.14)</b>	0.139	1.202	(0.418)	0.135

Mean(diff) =mean (SelfEfficacy - RiskPerc)    t =-1.018    Pr(|T| > |t|) **0.3117**

Table 5.14 indicates that there were negligible differences between the general risk perception (RP) and self-efficacy (SE) (0.14). The p-value (Pr(|T| > |t|) =0.3117) is greater than 5%, hence, the null hypothesis (Ho: mean(diff) =0) is NOT rejected.

**5.8.4. Multivariate regression**

The multivariate regression analysis can be mathematically written as follows:

Y (Risk perception) = $\beta$ Turnover +  $\beta$  overoptimism + $\beta$  self-efficacy +  $\beta$  overconfidence) + demographic variables  $\beta$  is the coefficient of variation (coeff) in the regression model.

**Table 5.16: Multivariate regressions (risk perceptions)**

RiskPerc (No risk)	Coef.	Std err.	t	P>t	[95% Conf.	Interval]
<b>Overoptimism</b>	0.498	0.22	2.27	0.027	0.058	0.938
<b>Overconfidence</b>	-0.298	0.17	-1.75	0.086	-0.641	0.044
<b>Self-efficacy</b>	-0.109	0.21	-0.52	0.608	-0.532	0.315
<b>Age</b>						
21–30	-1.239	1.35	-0.92	0.361	-3.937	1.459
31–40	-0.798	1.37	-0.58	0.563	-3.55	1.954
41–50	-1.165	1.36	-0.85	0.397	-3.9	1.571
> 50	-1.404	1.41	-0.99	0.325	-4.241	1.433
<b>Years of experience</b>						
3.5–5 years	0.488	0.54	0.9	0.37	-0.593	1.569
6–10 years	-0.088	0.47	-0.19	0.851	-1.025	0.848
11–15 years	0.075	0.49	0.15	0.878	-0.902	1.053
> 15 years	0.087	0.46	0.19	0.851	-0.837	1.011
<b>Education level (no formal education)</b>						
Diploma	0.507	0.9	0.56	0.576	-1.3	2.315
Bachelor	1.591	0.6	2.66	0.01	0.392	2.79
Honours degree	1.789	0.57	3.16	0.003	0.654	2.925
Master's degree	1.562	0.57	2.76	0.008	0.427	2.698
PhD	1.414	0.55	2.55	0.014	0.301	2.526
Other	0.611	0.76	0.8	0.426	-0.917	2.14
<b>Age of business</b>						
1–3.5 years	0.605	0.38	1.59	0.117	-0.157	1.367

RiskPerc (No risk)	Coef.	Std err.	t	P>t	[95% Conf.	Interval]
4–5 years	-0.117	0.49	-0.24	0.813	-1.105	0.871
6–10 years	1.192	0.48	2.5	0.016	0.235	2.148
11–15 years	0.396	0.46	0.85	0.397	-0.533	1.326
_cons	3.014	1.39	2.17	0.035	0.226	5.802

Obs=75 RMSE "R-sq"=0.3451 F=5.321 P=0.0199

5.8.4.1. *Hypothesis 1: There is a negative relationship between overconfidence and risk perception*

A negative relationship is observed between overconfidence and risk perception, as shown by weak evidence provided by results that are significant at the 10% level ( $\beta=-0.298$ ;  $p>0.05$ ). These results suggest that overconfidence was likely to result in the negative risk perceptions. Practically, this implies that high overconfidence bias is likely to lower risk perceptions.

5.8.4.2. *Hypothesis 2: There is a negative relationship between overoptimism and risk perception*

Table 17 indicates that there was a relationship between overoptimism and risk perception among female entrepreneurs who participated in this study ( $\beta=0.498$ ;  $p<0.05$ ). The results are significant at the 5% level. These results indicate that a unit improvement/increase in overoptimism was likely to result in as much as 49.8% increase in positive risk perceptions. These results imply, in a practical sense, that a high prevalence of overoptimism increases the perception of risk.

5.8.4.3. *Hypothesis 3: There is a negative relationship between self-efficacy and risk perception*

Observations of the results regarding the relation between self-efficacy and risk perception are that they are not significant at the 5% level ( $\beta=0.109$ ;  $p>0.05$ ).

However, they provide the insight that self-efficacy is likely to decrease positive risk perceptions. Practically this implies that self-efficacy is likely to lower risk perceptions.

#### 5.8.4.4. *Other relationships observed*

Results show that there was a positive relationship between educational levels and risk perception ( $p < 0.05$ ). As levels of education improved, the more positive the perception of risk held by the respondents. There were significant relationships between age of business and risk perception, as respondents with relatively more years in business had more positive (higher) risk perceptions.

#### 5.8.4.5. *Hypothesis 4: Firm performance will vary depending on their levels of overconfidence, overoptimism, self-efficacy and risk perception*

The multivariate regression analysis can be mathematically written as follows;

$$Y \text{ (Turnover)} = \beta \text{ risk-perception} + \beta \text{ overoptimism} + \beta \text{ self-efficacy} + \beta \text{ overconfidence}$$

**Table 5.17: Multivariate regressions (turnover)**

Turnover (above average)	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval ]
Risk perception	-0.167	0.185	-0.900	0.371	-0.538	0.204
Overconfidence	0.074	0.093	0.800	0.427	-0.112	0.260
Self-efficacy	-0.135	0.108	-1.250	0.216	-0.351	0.081
Overoptimism	0.038	0.112	0.340	0.733	-0.187	0.264
Education level	0.045	0.043	1.050	0.300	-0.041	0.131
Years of experience	0.045	0.055	0.820	0.417	-0.065	0.155
Age of business	0.089	0.058	1.530	0.132	-0.028	0.205
_cons	0.167	0.599	0.280	0.782	-1.034	1.368

Obs=63 RMSE "R-sq"=0.3451 F=5.321 P=0.0199

Table 5.17 indicates that the results on firm performance as measured by turnover were not significant, probably because 12 data points are missing in the turnover variable and there is insufficient data to yield meaningful relationships between firm performance and any of the dependent variables – overconfidence, overoptimism, self-efficacy – and risk perception.

## **5.9. CONCLUSION**

The primary aim of this chapter was to evaluate the proposed research hypotheses formulated in Chapter 3. After presenting the descriptive statistics and confirming the reliability and normality of each of the cognitive biases and risk perceptions, the researcher tested each of the research hypotheses by conducting multivariate regression analysis. It was found that a weak negative relationship exists between overconfidence and risk perceptions; a positive relationship exists between overoptimism and risk perceptions; and no relationship exists between self-efficacy and risk perceptions. With regard to firm performance, none of the cognitive biases or risk perceptions were found to have statistically significant relationships. The next chapter will discuss the theoretical linkages relating to the findings presented in this chapter.

## **CHAPTER 6: DISCUSSION OF FINDINGS**

### **6.1. INTRODUCTION**

This chapter will discuss the research findings that were provided in Chapter 5, and based on the outcomes of the statistical analysis of data that was collected from a sample of 75 female entrepreneurs. The goal of the analysis is to determine the relationship between cognitive biases, risks perceptions and firm performance.

These findings will be discussed within the context of the academic literature that had been reviewed in Chapter 2. This chapter will compare and contrast the findings with reference to what literature states, to either confirm or refute the reviews presented and the findings of data results, that is, the hypotheses that were tested, and the observed relationships between the constructs evidenced by the regression test results.

The context of the analysis is premised on the hubris entrepreneurship theory, which speaks to the behavioural decision-making outcomes of entrepreneurs. The theory supposes that overconfidence, overoptimism and high self-efficacy levels in entrepreneurs may initially positively influence them towards pursuing entrepreneurial ventures; however, those same biases could later cause an adverse effect on firm performance, and possibly be the reason for the high failure rate of entrepreneurial ventures (Hayward et al., 2006).

It is against this theoretical background, together with the empirical evidence that was gathered, that the study sought to deduce conclusions that could help to answer the two research questions posed by this study: firstly, how do overconfidence, overoptimism and self-efficacy biases influence the risk perceptions of female entrepreneurs, and secondly, how levels of cognitive bias and risk perception affect a firm's performance (determined as a firm's annual turnover).



## **6.2. DEMOGRAPHIC CHARACTERISTICS**

The study was targeted at female entrepreneurs, of whom 75 contributed to the actual final findings of this study. The descriptive statistical analysis of the demographic data indicated a heterogeneous sample, given that the female entrepreneurs originated from diverse backgrounds, different age groups, varied educational backgrounds and a range of years of work experience; their businesses were also of different sizes. It can, therefore, be concluded that the study was representational of a varied sample.

Whilst these demographics did not constitute a focal point of the study, they are significant for providing context and a broader understanding of the findings of the research. The variety in demographics amongst entrepreneurs can also account for the degree to which cognitive bias may affect them (Forbes, 2005). Furthermore, the range in demographic data is important, given that the study had adopted a gender lens, and aimed to understand female entrepreneurs better. The demographics, therefore, provided insight into the characteristics of the subjects under study.

### **6.2.1. Age**

The women who participated in this study represented different age groups, as the study did not target a particular age group. Nevertheless, the data shows that the majority of the sample was concentrated in the age group 31–40 years. Overall, the majority of the participants (49.4%) were female entrepreneurs older than 40 years, which signals a relatively mature sample. Literature on the determinants of cognitive bias have found that age does affect cognitive bias. Several studies indicate that young entrepreneurs, generally, tend to have higher levels of overconfidence than more mature entrepreneurs (Cossette, 2014; Forbes, 2005).

### **6.2.2. Educational level**

The female entrepreneurs who participated in the study were well educated, as the majority (68%) held postgraduate qualifications. High education levels of

entrepreneurs have been associated with both high overconfidence and overoptimism (Cossette, 2014). Empirical findings also show a positive relationship between self-efficacy and the educational levels of female entrepreneurs. High educational levels positively influence female entrepreneurs' self-efficacy levels (Yusuff et al., 2019).

### **6.2.3. Years of work experience**

The majority (42.7%) of female entrepreneurs in this study had more than 15 years of work experience. Experience has been shown to have an impact on both overconfidence and self-efficacy – according to Cossette (2014), these biases are stronger in relation to years of work experience. In turn, high overoptimism is mostly associated with nascent entrepreneurs, and it is likely that overoptimism declines with experience (Cossette, 2014). Thomas (2018) presented a contrary view to this claim, namely, that the negative impact of optimism was heightened by experience.

### **6.2.4. Age of business**

It is interesting that, in spite of the majority of the female entrepreneur in this study reporting extensive years of work experience, most of them were relatively young entrepreneurs, given that the majority (52%) were owners of businesses that had been operating for less than five years. Entrepreneurial ventures are said to fail during the first six years after their establishment (Overall, 2016). This implies that the majority of ventures of the female entrepreneurs of this study could be highly susceptible to risk.

## **6.3. DISCUSSIONS OF HYPOTHESES**

The hypotheses were formulated (see Section 3.2) to test theory and arguments that state that cognitive bias directly influenced risk perception (Simon et al., 2000), which, consequently, affected their entrepreneurial actions and decision outcomes (Nouri et al., 2018), including firm performance.

Scholars have mostly pessimistic views about cognitive bias, and largely associated biases with negative and adverse decision outcomes (Nouri et al., 2019), such as venture failure, inappropriate assignment of resources, flawed decision-making and wrong strategic decisions (Invernizzi et al., 2017; Nouri et al., 2018; Shepherd et al., 2015).

Entrepreneurs' perception of risk as it relates to entrepreneurship activities is critical. Literature states that this perception influences the risk-taking behaviour of entrepreneurs, and ultimately affects their decision-making outcomes and, in turn, the performance of the business (Overall, 2016; Boermans & Willebrands, 2017). Research has shown that risk perception – the assessment of an underlying risk within a situation (Dölarslan et al., 2017; Boermans & Willebrands, 2017) – is affected by cognitive bias, which influences the way individuals interpret or frame information.

The hypotheses were developed such that they could test and validate whether these arguments about cognitive bias and risk perception in relation to entrepreneurship are, in fact, valid. Three hypotheses tested the relationships between each bias – overconfidence, overoptimism and self-efficacy – and risk perception. Furthermore, a fourth hypothesis tested the influence of each of the biases and risk perception on firm performance.

### **6.3.1. Hypothesis 1: There is a negative relationship between overconfidence and risk perception**

Given the negative connotations associated with cognitive bias, which relate to mental errors in decision-making or judgment, most research has tended to focus more on the negative consequences of the overconfidence bias (Invernizzi et al., 2017; Nouri et al., 2019; Shepherd et al., 2015; Thomas, 2018). Several studies relate that overconfidence is a highly prevalent cognitive bias in entrepreneurs (Cossette, 2014), and that it has a mostly negative influence on entrepreneurs' judgment and entrepreneurial decision outcomes (Dölarslan et al., 2017). It has been argued that overconfidence directly affects an entrepreneur's perceptions of risk (Simon et al., 2000), and firm performance. However, a question that has not

been extensively research is whether there is a distinction between the way overconfidence bias affects women and and (Nouri et al., 2019; Pouria & Abdollah, 2019). Few studies distinguish between genders in the research approach taken.

The first hypothesis of this study aimed to test the relationship between overconfidence bias and risk perception of female entrepreneurs. To evaluate these constructs, both descriptive and inferential tests were undertaken to determine the relationship between the two constructs.

The findings of this study show that the female entrepreneurs had a predisposition to generally high overconfidence levels. The sample of female entrepreneurs did accommodate and show differences in their overconfidence levels, signalled by  $X^2$  statistics p-values that were significant at 5%. This finding refers to the certainty of respondents that the answers they gave to general knowledge questions were correct. Five questions were posed to evaluate this construct, and even in the case of incorrect answers, the majority of respondents consistently indicated that they were 'very sure' that their answers were correct, implying inherently high overconfidence levels. This outcome validated the description by S. X. Zhang and Cueto (2017), who explain overconfidence as being the difference between the subjective certainty of a judgement relative to its actual objective accuracy. This finding also confirms the argument in literature that entrepreneurs inherently tend to have high confidence levels (Cossette, 2014; Forbes, 2005; Nuijten et al., 2020). This claim is borne out by the complexity and uncertainty of the environment that entrepreneurs work in, which warrants simplification and rapid decision-making (Forbes, 2005; Robinson & Marino, 2015).

This finding was, however, contradicted by the view of Pouria and Abdolla (2019), namely, that female entrepreneurs tended to have lower self-confidence levels and were, therefore, less likely relative to men to pursue entrepreneurship activities. The present study, however, affirmed the presence of what appeared to be a generally inherent predisposition to high overconfidence levels in female entrepreneurs.

Furthermore, literature reports certain positive effects of high overconfidence levels. Reference is made to the hubris theory, which notes the positive effect of overconfidence in entrepreneurs, and describes it as the motivation behind an entrepreneurial spirit, and trigger for venture creation (Hayward et al., 2006). Overconfidence has also been recognised as a cognitive trait that is associated with several positive entrepreneurial outcomes, financial and investment decisions, decision-making and venture formation (Robinson & Marino, 2015; Simon et al., 2000; Thomas, 2018; Trevelyan, 2008) – even forming the motivation for the decision to become an entrepreneur (Robinson & Marino, 2015). This trend could explain relative youth of the female entrepreneurs' businesses, of which the majority (37.3%) had existed for only 1–3.5 years.

According to literature, overconfidence bias influences the perception of risk by entrepreneurs (Simon et al., 2000; Trevelyan, 2008; Boermans & Willebrands, 2017; Zhang, S. X. & Cueto, 2017), and could result in a negative relationship between the two: overconfidence lowers the perception of risk (Dölarslan et al., 2017; Thomas, 2018) and, therefore, increases the risk-taking behaviours of entrepreneurs and subsequently impacts on performance (Invernizzi et al., 2017).

To test for associations between risk perception and overconfidence, Pearson's correlations were undertaken, and showed a weak negative correlation (-0.1058), which suggested that further testing was needed to validate this conclusion. The paired t-test revealed a negligible difference between the risk perception and overconfidence (Std err. 0.14). The p-value was greater than 0.05, hence, the null hypothesis ( $H_0: \text{mean}(\text{diff}) = 0$ ) was NOT rejected.

The outcome of this paired t-test suggests that overconfidence of female entrepreneurs is unlikely to affect or influence their perception of risk. If this is the case, this finding concurs with a finding by Simon et al. (2000). Simon et al. analysed the relationship between overconfidence and risk perception, and found that overconfidence did not lower risk perceptions. This finding Simon et al. (2000) attribute to two possible reasons: first, that whilst entrepreneurs may have convinced of the accuracy of their assumptions, this conviction may not necessary translate into optimistic conclusions on a particular decision outcome, and second,

that the measure of overconfidence may not be directly linked to a specific decision outcome, but rather to diverse aspects (Simon et al., 2000). The same argument could be used to justify or explain the outcomes of this study's finding, given that a similar measurement was applied by this study to evaluate overconfidence namely, an array of general knowledge questions.

The risk perception construct signalled risk consciousness of the female entrepreneurs, as evidenced by high mean scores (M=5.4; SD 1.99 and M=5.8; SD=1.74) for the following statements regarding risky behaviour respectively: Investing 10% of your annual income in a wonder bank or other scheme that promises you a very high return on savings, and betting a day's income at a high-stakes card game, such a poker. These two statements, when compared to the other three statements whose means were lower (M=2.60; SD=1.35, M=2.71; SD=1.47 and M=3.41; SD=1.69) were not directly related to risk perceptions pertaining to specific business outcomes, but were, rather, 'risk taking' views that were not directly within entrepreneurs' sphere of control, thus, related to mainstream business decisions. Responses indicating lower perception of risk were given for statements whose outcomes or decisions were within entrepreneurs' control, and directly related to their entrepreneurial outcomes. The majority of this sample of female entrepreneurs had lower risk perceptions, which could be attributed to their high overconfidence levels, which Busenitz and Barney (1997) say is what causes the difference in perceptions of risk between entrepreneurs and non-entrepreneurs. These results, however, should be interpreted with caution, as the risk perception scale has been criticised for its lack of validation and, therefore, high variations in the general conclusions deduced from its findings (Thomas, 2018).

However, to validate the results of the paired t-test, the outcome of the multivariate regression showed that there was a weak negative relationship between overconfidence and risk perception. The results provide weak evidence: significance at 10% level ( $\beta=-0.298$ ;  $p<0.10$ ), which suggests that overconfidence is likely to result in lower risk perception. This finding is consistent with that of prior studies, albeit to a lesser extent, that argue that high overconfidence leads to lower risk perception, as a result of bias relating to the way an entrepreneur would

typically interpret information (Dölarslan et al., 2017). The information would, thus, be framed more positively, contrary to its actuality and, therefore, give rise to poor decision outcomes (Robinson & Marino, 2015). This finding is aligned with most literature and, therefore, signals a warning about the decision-making of and actions taken by entrepreneurs, given the potentially negative outcomes of a failure to accurately perceive risk – a failure that has been associated with poor performance, and even venture failure (Robinson & Marino, 2015).

The conclusion on hypothesis 1 is that there is a negative, although weak, at the 10% significance level, relationship between overconfidence and risk perception. These findings confirm the vast amount of literature that suggest the negative relationship and, therefore, entrepreneurs are cautioned to be aware of this blind spot as a bias. This finding suggests that overconfidence in female entrepreneurs has the potential to influence their perception of risk, and directly impact their risk-taking behaviour and entrepreneurial outcomes – for good or bad.

### **6.3.2. Hypothesis 2: There is a negative relationship between overoptimism and risk perception**

Literature defines overoptimism as the tendency to expect positive outcomes even though such outcomes are not being rationally justifiable (Shepherd et al., 2015; Thomas, 2018; Zhang, Z. X. & Cueto, 2017) – a trait that is said to be prevalent in entrepreneurs (Sánchez et al., 2011). As a consequence, overoptimism has shown to lead to a lesser perception of risk, the effects of which are associated with poor decision outcomes (Dölarslan et al., 2017; Gudmundsson & Lechner, 2013; Shepherd et al., 2015), and delayed decisions to exit unsuccessful ventures, and a wastage of limited resources (Zhang, S. X. & Cueto, 2017).

This hypothesis was developed to test for a negative relationship between overoptimism and risk perception, as suggested by literature. The findings of the descriptive statistics applied on overoptimism bias point to high overoptimism in the sample of female entrepreneurs. In response to the five questions posed to measure overoptimism levels, the majority of the respondents chose the option Agree/Strong Agree for positive prospects relating to their business outlook: My

business will likely survive the effects of COVID-19 (M=4.0; SD=0.853); The current business landscape presents more opportunities to do even better (M=3.8; SD=0.967); Challenges facing entrepreneurs were too many to be overcome (M=2.6; SD=1.042); and My investments mostly promise high capital gain (M=3.4; SD=0.979). These outcomes confirm the view that entrepreneurs tend to have higher levels of overoptimism than non-entrepreneurs, as a result of their high overconfidence (Cossette, 2014).

The high scores of the responses to these particular questions are surprising, given the prevailing landscape, which is characterised by a great deal of uncertainty, due to the COVID-19 pandemic. Nevertheless, the entrepreneurs' high levels of overoptimism persist. This finding reflects and confirms the view that overoptimism in individuals tends to be higher in ambiguous environments, and that high optimism in entrepreneurs encourages them to pursue opportunities and see prospects of success, even in uncertain environments (Cossette, 2014). Emani et al. (2020) claims that entrepreneurs' overoptimism regarding risk-taking is a further consequence of their high overconfidence.

Literature cautions that the very presence of overoptimism could be a reason for negative decision outcomes associated with business failure (Cossette, 2014; Dölarslan et al., 2017; Shepherd et al., 2015). The one statement that was ranked low – strongly disagree/disagree – was that economic recessions persist over very short time periods (M=2.7; SD=0.997). In spite of this low response, the entrepreneurs, nonetheless, remained optimistic regarding the majority of the statements. This finding emphasises their tendency to foresee positive outcomes, even when they are unjustified.

The association between risk perception and overoptimism, according to Pearson's correlation, is 0.1872, which signals a positive though weak association. Further testing through the paired t-test found negligible differences between general risk perception and overoptimism (0.54). The p-value is, however, less than 0.05, hence, the null hypothesis ( $H_0: \text{mean}(\text{diff})=0$ ) is rejected. The statistical regression test that was applied, however, confirmed a relationship between overoptimism and risk perception in female entrepreneurs in this sample, albeit a weak one ( $\beta=0.49$ ;



$p < 0.05$ ), significant at the 5% level. The finding suggests that overoptimism increases the perception of risk, which is contrary to the findings of the majority of other studies.

In their study, Boermans and Willebrand (2017) found that elevated perceptions of risk due to cognitive bias were associated with higher revenues, which suggests that a high perception of risk leads entrepreneurs to apply mitigation and assume decision outcomes that are less risky (Boermans & Willebrands, 2017). However, the regression results between risk perception and turnover had a weak coefficient ( $\beta = -0.167$ ;  $p > 0.05$ ), significant at the 5% level, which proves contradictory to the argument.

The conclusion on the findings of hypothesis 2 confirm the findings of the literature, that overoptimism bias is indeed prevalent in entrepreneurs. However, there was actually a positive association between overoptimism and risk perception. The regression analysis points to a positive relationship, which is contradictory to literature, which often found that overoptimism resulted in lower risk perception, and which suggests that, whilst female entrepreneurs may have high overoptimism, it is unlikely that their perception of risk will be lowered by this bias.

### **6.3.3. Hypothesis 3: There is a negative relationship between self-efficacy and risk perception**

Literature states that entrepreneurs tend to have a high self-efficacy bias; which is high confidence or overestimation of their own abilities and skills to perform certain tasks successfully (Miao et al., 2017; Newman et al., 2019). The self-efficacy bias serves as an antecedent to their motivation for and intention towards entrepreneurial pursuits (Gielnik et al., 2019).

Furthermore, literature points to lower levels of self-efficacy in female entrepreneurs (Dempsey & Jennings, 2014; Newman et al., 2019; Wilson et al., 2009), as these women tend to not believe in their own capability to succeed, as a result of limitations in their backgrounds, such as education and experience (Wilson et al., 2009; Yusuff et al., 2019).

The findings of the test to measure the construct self-efficacy revealed that the majority of the female entrepreneurs who participated in the study had high self-efficacy levels. Of the five statements used to determine self-efficacy levels, three questions were ranked high – Very sure/Sure. The highest rated scores were for the following statements: Deal effectively with day-to-day problems and crises (M=4.1; SD=0.918), being confident about getting others to identify with them, and believing in their vision and plans for the business (M=4; SD=0.908). Slightly reduced self-efficacy levels were observed for coming up with new ideas for a product or service (M=3.9; SD=0.908), and saving money to invest in the business (M=3.6; SD=0.971). The overall results indicate an innate over-self-efficacy in the female entrepreneurs in this sample, which is contrary to the empirical evidence of Dempsey and Jennings (2014).

Wilson et al. (2009) posit that it is women with higher self-efficacy who are most likely to pursue entrepreneurship. These findings could provide the reason for women taking the entrepreneurship path. This finding is justified further by the observed high levels of education and experience of the majority of women in this study, which Wilson et al. (2009) and Yussuff et al. (2019) claim tend to drive higher self-efficacy levels in female entrepreneurs.

It is argued that it is entrepreneurs with lower self-efficacy, who are uncertain of their abilities to perform, and who doubt their abilities to pursue the necessary actions, who tend to hold a higher perception of risk (Dölarslan et al., 2017). This claim supposes a negative relationship between an entrepreneur's self-efficacy levels and their perception of risk.

The Pearson's correlation test found no relationship (0.0202) between self-efficacy and risk perception. The paired t-test also indicated negligible differences between risk perception and self-efficacy (0.14), with a p-value of 0.3117. The regression test confirmed a relationship between self-efficacy and risk perception that is not significant. These findings are supported by that of Gielnik et al. (2019), who found that self-efficacy serves as a means to sanction an entrepreneur's intentions and goals, which suggests that, during periods of extreme uncertainty, such as that experienced during the COVID-19 lockdown period, female entrepreneurs are not

likely to actively pursue predetermined goals; but would rather pursue efforts to survive the harsh economic conditions. It is against this backdrop that self-efficacy would be unlikely have any negative influence on risk perceptions.

#### **6.3.4. Hypothesis 4: Firm performance of female entrepreneurs will vary depending on their levels of overconfidence, overoptimism, self-efficacy and risk perception**

The determinant of firm performance –which signals the success of the entrepreneur – was measured by annual turnover of their firms as reported delivered by female entrepreneurs. The measure used for firm performance (turnover) showed that the majority (52.4%) of the female entrepreneurs' firms generated revenues above the sample's average.

Empirical research argues that cognitive bias affects how entrepreneurs perceive risk, which consequently determines the decision-making and other actions undertaken (Dölarslan et al., 2017; Invernizzi et al., 2017; Thomas, 2018). These actions could have a positive or negative impact on the performance of entrepreneurs' entrepreneurial ventures, and the outcome will determine whether biases lead to positive or negative outcomes for entrepreneurs (Zhang, H. et al., 2020).

Hypothesis 4 was developed in this context, to establish how the level of cognitive bias – as expressed by overconfidence, overoptimism, self-efficacy, and risk perceptions – affected performance outcomes of female entrepreneurs. It was established by the findings of this study that, generally, relationships were insignificant, due to the reduced sample size, which resulted from 12 points being missing from the turnover variable. Nevertheless, some useful insights could still be drawn from the outcomes.

## **6.4. DISCUSSION ON PERSPECTIVES OF THE CONSTRUCTS**

### **6.4.1. Effects of overconfidence on firm performance**

The results indicate that there is no relationship between overconfidence and turnover ( $\beta=0.074$ ;  $p>0.05$ ). Whilst in-depth research on the influence of overconfidence on performance remains low (Isaga, 2018) several studies have identified a negative relationship between overconfidence and turnover (Thomas, 2018). High overconfidence levels are argued to be one of the main reasons behind high rates of venture failure (Invernizzi et al., 2017; Nouri et al., 2018; Shepherd et al., 2015), which is brought about by incorrect judgments and poor decision outcomes by entrepreneurs (Dölarslan et al., 2017). This is also the view of Hayward et al. (2006) in their hubris theory of entrepreneurship.

A high prevalence of overconfidence was observed amongst the majority of female entrepreneurs under study, which, according to empirical research, would render them susceptible to such biases or errors. It is argued that, as a result of overconfidence, entrepreneurs tend to possess biased perceptions in their interpretation and processing of information (Dölarslan et al., 2017), resulting in inaccurate conclusions that point to lower perception of risk, and which could be to the detriment of a firm's performance (Hayward et al., 2006). Such conclusions could lead to the underestimation of risk, and lead to negative decision outcomes. The findings of this study corroborate this view, given the results of the regression test ( $\beta=-0.298$ ;  $p<0.1$ ) between risk perception and overconfidence.

The implied effect of this relationship could, therefore, be that firm performance could be affected negatively. However, this study found no relationship between cognitive bias and firm performance, given the results of the regression test ( $\beta=0.074$ ;  $p>0.05$ ). The positive effects of overconfidence are mostly associated with initial or early entrepreneurial activities, such as venture creation or instigating the pursuit of entrepreneurial opportunities (Robinson & Marino, 2015); rarely is it directly associated with firm performance. The hubris theory suggests a similar effect, that high overconfidence could, initially, instigate entrepreneurial intentions

and result in venture creation; however, over time, overconfidence will lead to venture failures (Hayward et al., 2006).

With reference to the age of the entrepreneurial ventures of these female entrepreneurs, of which the majority (65.3%) have existed for less than five years – a period within which most entrepreneurial ventures fail (Overall, 2016) – it could be implied that, whilst the reported annual revenues of the firms of the female entrepreneurs were high, it is difficult to reach a conclusion on the success of their performance, given their vulnerability or risk of survival, due to the age of their firms.

#### **6.4.2. Effects of overoptimism on firm performance**

The regression coefficients ( $\beta=0.038$ ;  $p>0.05$ ) indicate, similar to that of overconfidence, the existence of no relationship between overoptimism and firm performance of female entrepreneurs. The study found that the majority of female entrepreneurs had a high predisposition towards overoptimism, given the high mean scores (3.95; 3.77; 3.35) on the majority of the questions that measured the overoptimism construct. Literature deems optimism to be a positive trait for entrepreneurs to have, as it heightens self-esteem and lowers emotional distress (Gudmundsson & Lechner, 2013).

Research has found that overoptimism influences firm performance; it has been found to affect sales, earnings and growth rate (Isaga, 2018). Its impact on performance is presented as twofold; first, leading to positive outcomes as it ignites and drives entrepreneurial motivations and intentions by giving the entrepreneur the persistence to overcome any challenges (Trevelyan, 2008) and, second, having negative consequences on performance, such as delaying the decision to exit non-performing businesses and wasting resources (Shepherd et al., 2015). The findings of the study, however, indicate that overoptimism does not necessarily impact on performance outcomes of the ventures of female entrepreneurs.

The effect of overoptimism on performance, too, is rarely studied directly, but only through its association with risk perceptions (Zhang, S.X. & Cueto, 2017).

Overoptimism has been found to result in entrepreneurs downplaying the uncertainty that is inherent in an anticipated future outcome, thereby resulting in an underestimation of risk, thus, lesser risk perceptions, which could lead to poor performance outcomes (Cossette, 2014; Dölarslan et al., 2017). Overoptimism is cited as the main reason behind the high failure rate of firms, which results from incorrect judgement calls and led by a negative relationship between the bias and risk perception (Cossette, 2014; Overall, 2016). Contrary to this view, the current study found a positive relationship between overoptimism and risk perceptions ( $\beta=0.49$ ;  $p<0.05$ ), significant at the 5% level, in the female entrepreneurs. It went on to find no relationship between overoptimism and performance.

This result supposes that, whilst female entrepreneurs had a high optimism bias, it did not necessarily lead to an underestimation of the risk (therefore, did not lead to lower risk perception); as such, it did not have any effect on firm performance.

#### **6.4.3. Effects of self-efficacy on firm performance**

The regression results of this study show that high self-efficacy of female entrepreneurs has no relationship with firm performance ( $\beta=-0.135$ ;  $p>0.05$ ). Literature, however, posits that high self-efficacy in female entrepreneurs leads to better business performance (Yusuff et al., 2019), which implies a positive effect, and is contrary to what this study established.

High self-efficacy is said to ignite motivations and intentions of entrepreneurs, which influence their behaviour to achieve higher levels of individual performance as a result of a personal inclination to succeed (Yusuff et al., 2019). This view is, however, not often applied to women, given women's tendency to have poor perceptions of their abilities, thus, low self-efficacy (Dempsey & Jennings, 2014), which compromises their ability to deliver high performance from the outset. However, this study found high self-efficacy levels in the majority of the female entrepreneurs.

Performance outcome is often related to the perception of risk that the entrepreneur holds, where given high self-efficacy levels it is argued will result in positive

perception of risk (Dölarslan et al., 2017) anchored by their perceived abilities in self. A view which this study opposed, as no relationship was observed between self-efficacy and risk perception.

It is also argued that high self-efficacy levels result in high and, perhaps, more unattainable goals, which could compromise firm performance (Moores & Chang, 2009; Baron et al., 2016). The absence of any relationship between self-efficacy and firm performance found by this study could perhaps be the consequence of the COVID-19 lockdown context, which may have reduced goal setting. On the other hand, it would be expected that the observed prevalence of higher educational levels and more years of experience of the female entrepreneurs would lead to greater goal setting. The majority (68%) of female entrepreneurs in this study were in possession of postgraduate qualifications, and the majority (62.7%) had in excess of 15 years' experience. Yussuff et al. (2019) posit that higher levels of education and experience of female entrepreneurs improves their self-efficacy and could possibly lead to them setting higher or unrealistic goals, which could be detrimental to firm performance.

Moores and Chang (2009) point to the negative effect of self-efficacy on firm performance as a result of complacency and minimal effort, especially if someone holds overly high expectations of the effect of their personal abilities, relative to the output that is actually delivered. However, the findings of this study do not support any negative impact that self-efficacy might have on firm performance, as no statistically significant relationship was found ( $\beta=-0.135$ ;  $p>0.05$ ).

#### **6.4.4. Effects of risk perception on firm performance**

Most studies on risk perception focused mostly on its effect on particular decision outcomes, venture creation and innovation, but rarely on firm performance (Simon et al., 2000; Boermans & Willebrands, 2017; Willebrands et al., 2012). This study, however, set out to evaluate the direct impact of risk perception on firm performance. A regression test was run directly between risk perceptions and firm performance (turnover), and no relationship between risk perception and firm performance was found ( $\beta=-0.167$ ;  $p>0.05$ ). This is contrary to prior studies, which

argue that the effect of risk on firm performance is a determinant of entrepreneurial success (Boermans & Willebrands, 2017), as it influences behaviours and decision outcomes directly (Markowska et al., 2019). Risk perception is closely related to firm performance, given that a correct call or view of risk is what will result in either a positive or negative action or decision, thereby leading to the success or failure of an entrepreneurial venture (Overall, 2016; Simon et al., 2000).

The majority (74.7%) of female entrepreneurs under study showed lower perceptions of risk in activities that directly affected their businesses, and higher perceptions regarding those decisions that were not directly within their sphere of influence (betting a day's income at a high-stakes card game, such a poker, and investing 10% of your annual income in a wonder bank or other scheme that promises a very high return on savings).

Lower risk perceptions are often associated with the entrepreneur framing business dynamics too positively, therefore, underestimating actual risks (Boermans & Willebrands, 2017), which could affect firm performance negatively. This is an outcome that is not supported by the findings of this study, which found female entrepreneurs to have a general disposition towards lower risk perceptions, though there were no statistically significant effects of risk perception on firm performance ( $\beta = -0.135$ ;  $p > 0.05$ ).

## **6.5. CONCLUSION**

The analysis of the relationship between cognitive bias, risk perception and firm performance generally contrasted views that were posited by most of the empirical literature that had been reviewed. It appears that cognitive bias affects female entrepreneurs in ways that are different to what most studies generalised as positions of entrepreneurs.

Although the majority of the findings presented weak or low significance levels, the information attained was still credible enough to provide insights on the findings specific to female entrepreneurs.



## **CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS**

### **7.1. INTRODUCTION**

This chapter will outline the key findings of the study, its implications, limitations and recommendations for future research. It will highlight the main findings of the research and pull together the results with the literature into a cohesive set of conclusions that effectively respond to the research questions. It will also include recommendations to stakeholders, including managerial implications, based directly on the findings; highlight the limitations of the research, and give recommendations for future research.

The tendency of women to become involved in entrepreneurship activities, and the significant role that they stand to play in advancing social and economic development, motivated this study, which sought to understand women's entrepreneurship-related cognitive processes. Literature suggests that, inherent in entrepreneurs' cognitive processes, are errors or cognitive biases that arise from their reliance on the use of mental shortcuts, which are often applied in situations characterised by high levels of complexity and uncertainty, and within which female entrepreneurs nonetheless have to compete and survive. The effects of cognitive bias were studied in their relation to their impact on two key relationships, that is, with risk perception and firm performance. Knowledge of these interrelationships is key to better understanding the outcomes of female entrepreneurs' judgment and decision-making, which is relevant to supporting their success in entrepreneurship.

### **7.2 Key findings**

The study approached the topic with a lens provided by the hubris theory of entrepreneurship, which assigned the failure of entrepreneurial ventures to the effects of overconfidence and extending the causes of failure to overoptimism and self-efficacy (Hayward et al., 2006). Unlike most research findings, which either declare the effects of overconfidence, overoptimism and self-efficacy to be either positive or negative, the hubris theory combines both effects of cognitive biases, by acknowledging its positive influence on establishing entrepreneurial ventures, and

its negative influence, which could lead to poor firm performance and eventual failures. The hubris theory supposes a high predisposition in entrepreneurs to these biases, as Busenitz and Barney (1997) and other more recent studies in cognitive biases report.

The findings of this study did validate the high prevalence of these biases in females. Contradictory to the literature, which reports that women tend to have low confidence and self-efficacy biases (Dempsey & Jennings, 2014; Newman et al., 2019; Nouri & AhmadiKafeshani, 2019), the finding of this study is that, although women may inherently possess high overconfidence, overoptimism and self-efficacy biases, and whilst these may have instigated their pursuit of entrepreneurship – as proposed by most literature (Robinson & Marino, 2015) and the hubris theory of entrepreneurship – these biases did not necessarily always serve as blind spots that influenced their perceptions of risk, or even the performance of their firms.

In confirmation of existing theory, this study observed a relationship between overconfidence and low risk perception. Women with high overconfidence showed a lower risk perception, which, according to literature is, believed to lead to incorrect decision outcomes, because they underestimate risks (Dölarslan et al., 2017; Hayward et al., 2006; Robinson & Marino, 2015). All other findings were in contrast to the general findings reported by the literature. For instance, a positive relationship was observed between overoptimism and risk perception, suggesting that overoptimism led to a higher consciousness of risk by female entrepreneurs, contrary to the view by the literature that overoptimism lowered the perception of risk and was, therefore, the one bias that mostly contributed to poor performance and venture failure (Shepherd et al., 2015; Zhang, S. X. & Cueto, 2017). Neutrality to risk perception was observed amongst women with high self-efficacy, as no relationship was observed between self-efficacy and risk perception.

So, whilst most research argues that cognitive bias lowers the perception of risk and, therefore, promotes negative risk-taking behaviour (Barbosa et al., 2007; Dölarslan et al., 2017; Emami et al., 2020), the findings of this study suggest that, much as risk perception may be an antecedent of an entrepreneur's risk-taking

behaviour that could influence decision outcomes, risk perceptions may not be solely motivated by or be a direct consequence of cognitive biases (Overall, 2016).

Furthermore, the study also found there was no relationship between cognitive bias and risk perception to firm performance amongst female entrepreneurs. This finding also contradicts the literature (Simon et al., 2000; Boermans & Willebrands, 2017) and the notion put forth by the hubris theory of entrepreneurship, that seeks to link the three cognitive biases to poor performance outcomes and venture failure (Hayward et al., 2006). This study found no association between these constructs.

In conclusion, the key findings of this study, based on the evaluation of the research hypotheses (see Section 3.2) are that a weak negative relationship exists between overconfidence and risk perception; a positive relationship exists between overoptimism and risk perception; and no relationship exists between self-efficacy and risk perception. With regard to firm performance, none of the cognitive biases or risk perception were found to have any statistically significant relationship with firm performance. The implications of these findings are presented in the next section.

## **7.2. IMPLICATIONS OF THE STUDY**

This study contributes to the body of knowledge on entrepreneurial cognitions, especially as it pertains to female entrepreneurs in a developing market, to which few research efforts have been directed. It supplements existing business and entrepreneurial literature through the adoption of a psychology-based perspective, namely, cognitive bias, which constitutes a part of internal factors that affect the judgment, behaviour and decision outcomes, and are believed to impact on the performance of female entrepreneurs. In this regard, the study provides a new dimension to understanding internal factors that could affect the success of female entrepreneurs, knowledge of which is highlighted by Irene (2017) as important for availing relevant support to female entrepreneurs, and thereby to close the gender gap that currently exists, as reported by Bowmaker-Falconer and Herrington (2020) in the 2019/2020 *Global Entrepreneurship Monitor South Africa* report.

The findings of this study are largely contradictory to the majority of existing literature on the effects of cognitive bias on entrepreneurial activity. This conclusion signals the need for further research on the effects of cognitive bias, the need to study women as a distinct group of entrepreneurs, and also being conscious of the external environment and its impact on the activities of this group of entrepreneurs. The majority of existing research has been based in developed markets and assumed no distinction between female and male entrepreneurs (Pouria & Abdollah, 2019). Therefore, the findings of this study question the applicability and reliability of some of this literature, given different environmental context and gender group.

The main implications of the study for theory and practice are that overconfidence in female entrepreneurs has the potential to influence their perception of risk and, therefore, impact directly on their risk-taking behaviour, thus, leading to unfavourable entrepreneurial decision outcomes. In addition, overoptimism can result in higher risk perception, implying that, whilst women may have high overoptimism, it is unlikely that their perception of risk would be lowered by this bias. High self-efficacy in female entrepreneurs does not translate to any effect on risk perceptions. This study also found that cognitive bias, together with risk perceptions of female entrepreneurs, do not have any direct impact on firm performance. Whilst this finding may have come about as a result of a reduced sample size, a relative comparison was made to studies by Trevelyan (2008) as well as Palich and Bagby (1995) whose findings were based on similar sample sizes.

This study should, therefore, prompt policymakers, including those in the field of academia, to intensify both their efforts and resources towards further research on the dynamics affecting the cognitive processes of female entrepreneurs, to understand how best to support their efforts by channelling efforts and resources appropriately to address any challenges they may face, to improve their success rate. In South Africa, this rate is reported to remain low, despite significant financial advancements made by government to promote women's entrepreneurship (Irene, 2017).

From an academic perspective, research on entrepreneurial cognition as it pertains to women remains limited. Aside from a focus on women, in general, research literature on cognitive bias and its impact on firm performance also remains limited. A study by Thomas (2018) that reviewed two decades of research on cognitive bias in entrepreneurship points to a lack of in-depth studies on the consequences of cognitive bias, amongst which risk perception and firm performance. This study will contribute to the existing body of knowledge in this area.

### **7.3. LIMITATIONS OF THE RESEARCH**

The literature points out that entrepreneurs operate in a complex environment that requires quick decision-making with limited information, and it is believed is that this situation renders entrepreneurs more prone to exercising cognitive bias (Busenitz & Barney, 1997; Overall, 2016; Thomas, 2018). It is, therefore, implied that the dynamics that increase complexity in the external environment are likely to affect entrepreneurs' thinking, risk behaviours and even decision outcomes (Thomas, 2018). Given that this study was undertaken in the midst of a pandemic, it could be that the pandemic added to the level of complexity and, therefore, influenced not only entrepreneurs' cognitive bias, risk perception and performance in relation to their actual businesses, but also their actual responses to this study. The exact extent of this effect cannot, however, be established, given the infancy of the pandemic and the limitations facing research on its effects. It could be that, if this research is undertaken under different external circumstances, the findings could be different.

Other observed limitations related to the research methodology applied. The adoption of a cross-sectional study, where data was collected at only a point in time, does not cater for mitigation for any anomalies or major deviations from the norm, such as the possible effects of the prevailing pandemic on the collected data. For instance, the requested indication of the entrepreneurs' annual firm turnover, which was used to measure performance, was based on a single reading. A longitudinal study may have been more ideal, to allow for collection of data over a period of time and to facilitate a trend analysis to minimise the effects of any major fluctuations. Following a similar approach to that undertaken by Boermans and

Willebrands (2017), in their study to understand the impact of cognitive bias on firm performance, could be considered. Another limitation posed by the methodology, the use of self-reported psychology-based scales to measure attitudes of entrepreneurs, even though this approach is well established, posed an inherent risk to elicit biased responses – a challenge that was also observed by Invernizzi et al. (2017).

Furthermore, this study focused on cognitive bias, and the consequences of its outcome for risk perception and firm performance. Not elaborately covered within its scope, although critical, was the actual determinants or factors that influence cognitive biases, which could be instrumental to providing greater insight on the responses given, and help to explain the varying levels of bias, as expressed by overconfidence, overoptimism and self-efficacy, in female entrepreneurs, and justifications for risk perceptions and firm performance outcomes that were observed.

#### **7.4. SUGGESTIONS FOR FUTURE RESEARCH**

This study provided a quantitative, therefore logical, applied analysis of the relationship between cognitive bias, risk perception and firm performance, to determine the effects of this phenomenon on female entrepreneurs. Further studies should consider undertaking on a qualitative approach, to find the meaning and gain an understanding of these relationships. By its nature, quantitative research and its positivist paradigm eliminates meanings and interpretations from data, as its focus is mainly to quantify a phenomenon (Adzeh, 2015), therefore, it limits the depth of understanding of the context behind the subject matter that can be achieved. Given that the findings of this study varied considerably from what has been proposed by other empirical evidence as reported in the literature, it would be interesting to probe further and to get meaning and explanations on the actual motivations and determinants that inform these entrepreneurs' cognitive biases.

Future research should continue efforts to expand on the body of knowledge that studies the effects of cognitive bias through a gender-based lens, as these studies have been few (Nouri et al., 2019; Pouria & Abdollah, 2019), specifically amongst

female entrepreneurs in developing markets, given the extensive need for economic development and efforts to close the gender inequality gap and to grow women into successful entrepreneurs (Sajjad et al., 2020). Most studies have focused on developed markets, however, environmental dynamics, amongst which culture, are likely to affect the behaviours of entrepreneurs in different ways, and would, therefore, affect them quite differently (Thomas, 2018).

Lastly, to understand the motivations and behaviours of female entrepreneurs, future research should focus on personal characteristics, such as age, educational background and experience as determinants of cognitive biases. Whilst this study did briefly look into personal factors that influence may cognitive bias, this was only done as a means of providing a background to understanding the characteristics of the sample of female entrepreneurs who took part in the study. However, in order to advance a deeper understanding of what affects the varying influence of overconfidence, overoptimism and self-efficacy bias on risk perceptions and performance, future research should take a step back and investigate these personal factors. Literature also points out that limited research has been done on this aspect (Thomas, 2018). These findings could be instrumental in explaining the contradictory findings of this study in relation to the literature.

## **7.5. CONCLUSION**

The findings of this study brought a different perspective to the relationship between cognitive bias and its effects on risk perception and firm performance. The majority of this study's findings are contradictory to what most literature and empirical findings have reported. These differences may be justified, given that the literature generally makes no distinction between genders, and were primarily based in developed markets, were environmental or external dynamics differ considerably relative the setting of this study.

The research was undertaken to answer two main questions: How do cognitive biases affect risk perception, and how do cognitive biases and risk perception affect firm performance? From the findings about the relations between cognitive biases and risk perception, only the one relationship could be established with the classic

theory of cognitive biases, namely, that overconfidence lowered risk perception. The relationship between overoptimism showed an opposing positive relationship to risk perception, and self-efficacy completely defied literature, and showed no relationship to risk perception.

The findings relating to the second research question of this study also showed no relationships between any of the cognitive biases, or between risk perception and performance. These findings, therefore, confirm the need for further research efforts, to understand the effects of cognitive bias on judgment and decision outcomes; risk perception and firm performance, perhaps, more specifically as they affect women and in developing market contexts. This knowledge could help efforts by interested stakeholders – policy makers, the business sector and academia – to advance the progress of women from an understanding of entrepreneurial cognitions and help efforts to achieve gender equality and economic development.



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## Appendix A: Survey questionnaire

### Cognitive biases, Risk Perception & Firm Performance – female entrepreneurship success

#### Introduction

Dear Participant,

I am an MBA Student at the Gordon's Institute of Business Science, University of Pretoria.

As part of my final research dissertation, I am conducting research on prevalent cognitive biases amongst female entrepreneurs, and the impact that these have on their risk perceptions and firm performance.

To that end, you are asked to follow this link and complete an online survey.

The survey should take no more than 10 minutes of your time.

Your participation is anonymous and only aggregated data will be reported. By completing the survey, you indicate that you voluntarily participate in this research.

**Your participation is voluntary, and you can withdraw at any time without penalty.**

If you have any concerns, please contact my supervisor or myself. Our details are provided below

Thanking you in advance,

#### **Researcher details**

Name: Ms. Botho Felicia Leburu  
Email: [19410809@mygibs.co.za](mailto:19410809@mygibs.co.za)  
Phone: +27 83 9571801

#### **Supervisor details**

Mr. Ian Macleod  
[macleodi@gibs.co.za](mailto:macleodi@gibs.co.za)  
+27 76 890 9517

\* 1. Are you a female entrepreneur (i.e. female that has started, or runs their own business venture)?

- Yes  
 No

Demographical Information

\* 2. Age:

<= 20

21 - 30

31 - 40

41 - 50

> 50

\* 3. Education Level

No formal education

Diploma

Bachelors Degree

Other (please specify)

Honours Degree

Masters

PHD

\* 4. Years of Experience

< 3.5 yrs

3.5 – 5 yrs

6 – 10 yrs

11 - 15 yrs

> 15 yrs

\* 5. Age of Business:

< 1 yr

1 - 3.5 yrs

4 - 5 yrs

6 - 10 yrs

11 - 15 yrs

Overconfidence

\* 6. In what year did Nelson Mandela die?

- 2012
- 2013
- 2014

\* 7. On a scale of 1 (very unsure) - 5 (very sure), how sure are you of your answer?

- 1
- 2
- 3
- 4
- 5

\* 8. How many countries make up Africa?

- 45
- 54
- 64

\* 9. On a scale of 1 (very unsure) - 5 (very sure), how sure are you of your answer?

- 1
- 2
- 3
- 4
- 5

\* 10. What is ascorbic acid?

- Vitamin A
- Vitamin B
- Vitamin C

\* 11. On a scale of 1 (very unsure) - 5 (very sure), how sure are you of your answer?

- 1
- 2
- 3
- 4
- 5

\* 12. Which is the world's largest economy?

- USA
- South Africa
- China

\* 13. On a scale of 1 (very unsure) - 5 (very sure), how sure are you of your answer?

- 1
- 2
- 3
- 4
- 5

\* 14. Which virus causes coronavirus disease?

- COVID-19
- SARS-CoV-2
- H1N1

\* 15. On a scale of 1 (very unsure) - 5 (very sure), how sure are you of your answer?

- 1
- 2
- 3
- 4
- 5

## Self-Efficacy

\* 16. On a scale of 1 (very unsure) - 5 (very sure), how confident are you in your ability to:

	1 (very unsure)	2	3	4	5 (very sure)
come up with a a new idea for a product or service?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
get others to identify with you and believe in your vision and plans for your business?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
deal effectively with day-to-day problems and crises?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
saving money to invest in the business?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
design an effective marketing/advertising campaign for a new product or service?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Overoptimism

\* 17. Please indicate to what extent you agree or disagree with the following statements:

	Strongly Disagree	Disagree	I'm not sure	Agree	Strongly Agree
My business will likely survive the effects of COVID-19.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The current business landscape presents me with more opportunities to do even better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The challenges facing entrepreneurs are too many to be overcome.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My investment mostly promises high capital gain.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic recession persists over very short time periods.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Risk Perception

\* 18. How risky do you perceive the following financial activities to be?

	Not at all Risky	Slightly Risky	Somewhat Risky	Moderately Risky	Risky	Very Risky	Extremely Risky
Investing 10% of your annual income in a new business venture.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Investing 10% of your annual income in shares.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Betting a day's income at a high-stake card game such a poker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Investing 10% of your annual income in a wonder bank or other schemes that promises you a very high return on savings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Investing 10% of your annual income in a new farming technology.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Determinants of firm performance

\* 19. What is your approximate annual turnover:



## Appendix B: Ethical clearance

Ethical Clearance Approved Inbox x



MastersResearch2020 <MastersResearch2020@gibs.co.za>  
to me, MastersResearch2020 ▾

Mon, 2 Nov 2020, 16:26 ☆ ↶ ⋮

**Gordon Institute  
of Business Science**  
University of Pretoria

**Ethical Clearance  
Approved**

Dear Botho Leburu,

Please be advised that your application for **Ethical Clearance** has been **approved**.  
You are therefore allowed to continue collecting your data.  
We wish you everything of the best for the rest of the project.

[Ethical Clearance Form](#)

Kind Regards

This email has been sent from an unmonitored email account. If you have any comments or concerns, please contact the GIBS Research Admin team.

### Appendix C: Pilot study reliability results

Item	Obs	Sign	Alpha if deleted
CONF1	10	+	0.9086
CONF2	10	+	0.8971
CONF3	10	+	0.9075
CONF4	10	+	0.9305
CONF5	10	+	0.9116
<b>Pilot Scale Alpha</b>			<b>0.9283</b>
Item	Obs	Sign	Alpha if deleted
SELF1	10	+	0.8663
SELF2	10	+	0.8474
SELF3	10	+	0.8748
SELF4	10	+	0.8842
SELF5	10	+	0.8747
<b>Pilot Scale Alpha</b>			<b>0.8927</b>
Item	Obs	Sign	Alpha if deleted
OPTI1	10	+	0.3118
OPTI2	10	+	0.4419
OPTI3	10	-	0.6479
OPTI4	10	+	-.055
OPTI5	10	+	0.1440
<b>Pilot Scale Alpha</b>			<b>0.3984</b>
Item	Obs	Sign	Alpha if deleted
RISK1	10	+	0.4612
RISK2	10	+	0.3953
RISK3	10	+	0.5300
RISK4	10	+	0.6283
RISK5	10	+	0.6299
<b>Pilot Scale Alpha</b>			<b>0.5978</b>

## Appendix D: Consent – unpublished questionnaire on self-efficacy bias

Re: Questionnaire- Self Efficacy Inbox x



**Botho Leburu** <19410809@mygibs.co.za>  
to nisaga ▾

Sat, 20 Mar, 18:18



Dear Nsubili

I hope this email finds you well.

I am an MBA student at Gordon's Institute of Business in Johannesburg. I wish to do my dissertation on the influence cognitive biases amongst female entrepreneurs on their firm's performance.

As such one of the biases under investigation is self efficacy. I have as such been looking for measurement scales I could use for this, and I came across your PHD entrepreneurship questionnaire ( refer to attached)

I would therefore like to adopt your questionnaire for my study.

I kindly request that you please allow me to use it. Referencing will be duly made.

Thank you.

Kind Regards,

Botho Leburu  
Direct Number: +27 83 957 1801  
Whatsapp: +267 72303004

**Nsubili isaga** <nisaga@mzumbe.ac.tz>  
to me ▾

20 Mar 2021, 20:16



Dear Botho

Greetings

It is nice to hear from you and the area of your research.

With email, I am allowing you to use my questionnaire so that we can continue to validate it in Africa.

All the best and keep me posted.

Regards

\*\*\*

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Nsubili Isaga (PhD)  
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