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2024

University of the Witwatersrand, Johannesburg

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Ngcobo, Makhosazana Nomcebo . (2024). The ripple effect of demographics on the entrepreneurial behaviour-performance relationship in the South African tech sector[PhD thesis, University of the Witwatersrand, Johannesburg].WireDSpace.https://hdl.handle.net/10539/44079

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The ripple effect of demographics on the entrepreneurial behaviour-performance relationship in the South African tech sector

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A thesis submitted to the Graduate School of Business Administration, Faculty of Commerce, Law and Management, University of the Witwatersrand, in fulfilment of the requirements for the degree of Doctor of Philosophy in Management

Supervisor: **Dr McEdward Murimbika**

May, 2024

ABSTRACT

South Africa's enduring inequality, stemming from the lingering effects of apartheid laws, disproportionately impacts entrepreneurs across various demographic dimensions, specifically race and age. This study adopts an intersectionality lens to examine how these demographic variables influence entrepreneur means, particularly the reliance on intangible resources, and consequently their impact on the entrepreneur behaviour - firm performance nexus within the South African tech sector. Despite some progress, this area of research remains relatively underexplored, necessitating this study to bridge the existing knowledge gap.

Upholding the utmost confidentiality and anonymity of respondents, in accordance with the approved protocol (H21/10/34) sanctioned by the ethics committee at Wits Business School, the research meticulously explores how demographic variables influence entrepreneur means and the subsequent impact on firm performance. The main objectives of this study are as follows:

1. To investigate the relationship between effectual entrepreneur behaviour and firm performance among technology founders.
2. To examine the relationship between effectual entrepreneur behaviour and firm performance through entrepreneur means (intangible resources).
3. To examine the mediating effect of entrepreneur means in the relationship between effectual entrepreneur behaviour and firm performance, with a specific focus on how this mediating effect might be moderated by race and age.
4. To establish and validate a measurement model for entrepreneur means (intangible resources).

In this quantitative study, a cohort of 159 technology firm founders in South Africa, each with a minimal operational tenure of three years, participated in this study through self-administered online structured questionnaires. To unravel the intricate relationships within the data, the analysis utilised Partial Least Squares Structural Equation Modeling (PLS-SEM) complemented by Statistical Package for Social Sciences (SPSS) alongside SPSS Amos.

The findings shed light on the intricate interplay between effectual entrepreneur behaviour, entrepreneur means, and firm performance, supporting several hypotheses (H). First, a positive correlation was established between effectual entrepreneur behaviour and entrepreneur means, and firm performance, supporting several hypotheses (H).

A significant positive association between effectual entrepreneur behaviour and firm performance validated H_1, underscoring the critical role of intangible resources in driving firm performance. However, the study's examination of the mediating effect of entrepreneur means on the relationship between effectual entrepreneur behaviour and firm performance yielded only partial support. While the mediation was observed to be positive, its strength was moderate, suggesting the presence of unexplored variables beyond the scope of this study, influencing firm performance and providing partial support for H_2. Regarding H_3, the combined influence of race and age did not directly affect reliance on entrepreneur means, but it significantly affected firm performance.

Nonetheless, the interaction among race, age, and entrepreneur means demonstrated the potential for a negative influence on firm performance. Lastly, a positive correlation was established between effectual entrepreneur behaviour and entrepreneur means, affirming H_4.

In conclusion, while this study highlighted the crucial role of effectual entrepreneur behaviour and intangible resources for technology founders, it also suggests the presence of unexamined variables that may exert significant influence on firm performance within South Africa's highly unequal landscape. Despite the influence of race and age on firm performance, their combined impact with entrepreneur means was not as pronounced as anticipated. Further research is warranted to identify and understand these additional factors, thus enriching our understanding of entrepreneur means, behaviour, and firm performance within South Africa's unequal landscape.

Keywords: technology founder, entrepreneur behaviour, effectuation, firm performance, intersectionality, race, age, entrepreneur means.

Pronouns: In line with APA, 7th edition, Section 4.18, 'them, they, their, theirs' are used in third-person singular and plural instances and are regarded as more inclusive pronouns.

DECLARATION

I, Makhosazana Nomcebo Ngcobo, declare that this study is my own, unaided work. It is submitted for the Degree of Doctor of Philosophy in Management at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

Signature of candidate

Signed this 18th day of September 2023 at Sandton, Johannesburg

Research Ethics Clearance Certificate Protocol Number: H21/10/34 (See Appendix A)

DEDICATION

All praises to God for the abundance of resources that made it possible to take the time out for my studies. I prayed for a smooth journey, and for God to take the lead. I was led to a great supervisor, to conference sponsorships, to new friends and new discoveries. I did not have to pay even one cent for my studies, nor did I apply for any scholarships. Yet, I found myself with an award from the University of Witwatersrand's PhD Merit Grant Program. Additionally, my company, Contento Group paid for my editing fees. All delivered on a plate. Everything in perfect alignment. I truly feel like God's favourite. I am soaking in Your grace!

ACKNOWLEDGEMENTS

To the technology founders who participated during data collection. This would not have been possible without you. You did not only respond to the questionnaire, but some went as far as surprising me with calls and emails encouraging me in my journey and showing further interest. What a treasure!

To my supervisor, Dr McEdward Murimbika. You are a superstar of academia. You need to be replicated, bottled, and shared. Cheers to academia and future publications!

To Mrs Mmabatho Leeuw, an unsung hero, thank you for being so responsive and taking care of us.

To Mandisa Malapane, my niece and research assistant, for the hard task of curating an accurate database.

To Angie Urban, my editor, whose meticulous attention to detail has been invaluable. Your dedication to crossing the t's and dotting the i's has instilled in me the confidence to present this work.

To "Malume", my academic promoter, you gave so much of your time and energy, but mostly, I thank you for affirming me and encouraging me to apply for the doctoral program.

To the many friends and fellow academics who took the time to read and give feedback, the best gift you can give to a scholar is time, time to read, time to engage, and you afforded me that. I thank you.

To Dr Pia Lamberti and Team at the Faculty of Commerce, Law, and Management (CLM), the writing retreats you put so much effort into planning were such a treasure. I pray you never stop. Those retreats gave birth to my strongest peer support group, the Eagles!

To the Eagles, never have I ever met such a fun and resourceful group of academics. For many, the PhD. journey is lonely, I am happy to say it has not been the case for me. Drs and future Drs, Braen Migogo for not judging us when we misbehaved, Edward Ngubane for coaching on all things graphics, Mercedes Kunene for the health talks, Mncane Mthunzi for generously giving of your Vaal home and boat during the retreats, Morongwa Mpete for constantly indulging me on all things property and décor, our shared love. Nokuthula Ngubane for those midnight sessions and celebrating even the smallest of my milestones. Nondumiso Bodlela you are such a bad influence, and I love it for me! Tabea Kabinde, a special shout-out to you for structuring the retreats and being very consistent in facilitating those early-morning commitment sessions, you're a superstar. We started as a group of academics retreating together, little did we know, it would turn into a formidable sisterhood and brotherhood. You all made this whole experience a breeze, fly high!

To my business partner Dr Lindelani Mkhize for contending with constant 'Nos' to any new business, as I was rationing my time. To all my colleagues for holding the fort and growing the businesses in spite of my absence. You're a dream team!

To all my cousins and friends, including the "Fruitloops" and "Friendships" groups, for the constant WhatsApp messages that gave me laughter and a smile in the midst of it all. For the travels, the dinners, the tennis games, the walks at the Westcliff Stairs. All those kept me sane; my life is richer because of you.

To my siblings, the one great thing about being a middle child is that it affords one an opportunity to hide whenever you want. Throughout my life, I have escaped being present for extended family functions and other duties because you have always represented me. As an introvert, there is no greater gift than to be afforded to be myself unapologetically, even if it borders on being a tad irresponsible. My nieces, Thuthuka and

Pholisa, and my nephew, Ndonsa, for allowing me to use you as an escape whenever it suited me, without question.

My mother, widowed at 28 with three kids, but single-handedly raising content and self-assured individuals. For all the sacrifices, the constant affirmations and the love, but mostly, for demonstrating and teaching us that nothing is impossible. I wish you didn't have to be a mbokodo, I wish you had been able to live a much softer life in your prime, so, here's to you, the very first doctor, but certainly not the last, from the fruits of your womb. This is for you, and I hope it inspires generations to come to dare to dream.

Makhosazana Nomcebo Ngcobo

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ACRONYMS AND ABBREVIATIONS

AVE	Average Variance Extracted
CFA	Confirmatory Factor Analysis
EEB	Effectual Entrepreneur Behaviour
EFA	Exploratory Factor Analysis
ESE	Entrepreneurial Self-efficacy
EO	Entrepreneurial Orientation
GIP	Growth in Profitability
GIB	Growth in Business
GIT_RKE	Growth in Turnover_Retaining Key Employees
H	Hypothesis
HC	Human Capital
HTMT	Heterotrait-Monotrait
MVPs	Minimum Viable Products
PLS-SEM	Partial Least Squares – Structural Equation Modelling
SC	Social Capital
SEM	Structural Equation Modelling
SPSS	Statistical Package for Social Sciences
TEA	Total Early-stage Activity
VIF	Variance Inflation Factor

CHAPTER 1: INTRODUCTION

1.1 Overview

This chapter provides an overview of the study, beginning with an examination of the background and context. It then proceeds to present the problem statement, research aims, objectives, and questions, as well as the specific contributions of the study. Lastly, it discusses the limitations and delimitations. The chapter emphasises the importance of investigating the influence of race and age on entrepreneur means and their subsequent effect on the relationship between entrepreneur behaviour and firm performance.

1.2 Theoretical Background and Conceptualisation of the Study

Entrepreneur behaviour and decision-making have been of great interest since the early 1940s (Aitken, 2013; Evans, 1949). The study of entrepreneur behaviour and decision-making has evolved from descriptive accounts centred on the theory of the firm to investigations that incorporate various other emerging theories and explanatory variables (Cai et al., 2021; Darmanto & Yuliari, 2018; Pidduck & Clark, 2021; Santoso et al., 2020). While traits of entrepreneurs have been widely studied, recent research shows that macro and microenvironment factors also influence entrepreneur behaviour and decision-making (Ajayi et al., 2022; Gustafsson, 2004; Rocha et al., 2021; Zivdar et al., 2017). However, insufficient emphasis has been placed on exploring the influence of entrepreneurs' resources, particularly intangible ones, on the connection between their behaviour and firm performance. Moreover, there is a lack of understanding regarding how these relationships are shaped by factors such as race and age, especially within an unequal societal context.

Entrepreneur behaviour refers to the actions and decisions taken by entrepreneurs to identify and exploit opportunities and transform them into profitable ventures

(Ayuningtyas & Mukson, 2021; Baron, 2006; Bird, 1988; Bird & Schjoedt, 2017; Chidakwa, 2015; Fisher, 2012; Gartner et al., 2010; Shaheen & AL-Haddad, 2018). This study considered entrepreneur behaviour as a binary variable with two modalities, namely effectuation and causation. The primary focus is on effectuation, specifically exploring its means-at-hand concept as proposed by Sarasvathy (2001), which is referred to as 'entrepreneur means' in this research.

The term entrepreneur means typically pertains to tangible resources; however, in this context, Sarasvathy's (2001, p. 03) framework of three fundamental questions, namely "who am I, what do I know, [and] whom do I know" was adopted to gain a comprehensive understanding of the concept of entrepreneur means. In doing so, connections between these questions and established theories were established. Specifically, the question 'who am I' is linked to entrepreneurial self-efficacy theory (Chen et al., 1998; McGee et al., 2009; Renko et al., 2021; Yang et al., 2020), the question 'what do I know' is associated with human capital theory (Aboobaker & Renjini, 2020; Becker, 1964; Davidsson & Honig, 2003; Schultz, 1959), and the question 'whom do I know' is connected to social capital theory (Alene, 2020; Davidsson & Honig, 2003; Felix-Faure, 2021; Hikido, 2018; Maichal et al., 2018; Pidduck & Clark, 2021; Whetten et al., 2014). This framework formed the basis for proposing a measurement model for entrepreneur means, and the detailed explanation of these connections and theories is provided in Chapter 2 of this thesis.

1.3 Purpose of the Study

The study examined the ripple effect of demographics, specifically race and age, on the entrepreneur behaviour-firm performance relationship in the South African technology sector.

1.4 Context of the Study

South Africa's transition from apartheid to democracy in 1994 marked the end of a dark era of institutionalised racial discrimination and dispossession. The apartheid system, which had been in place for 46 years, had created a stark divide between the privileged white minority and the marginalised black, Asian, and coloured communities. Despite being one of Africa's top economies and the 40th most robust economy globally (World Population Review, 2021), South Africa has one of the highest levels of inequality worldwide (Bešić, 2020; United Nations, 2020). In 2020, South Africa experienced a growth rate of -7 per cent (Statistics South Africa, 2021). Additionally, it has an unemployment rate of 32.6 per cent (Statistics South Africa, 2021), making it clear that the country must take deliberate and informed action to boost its fledgling economy. These challenges necessitate a collective effort to boost economic development and bridge the inequality gap. Entrepreneurship, the bedrock of economic growth worldwide, is one such effort. Entrepreneurship is critical to South Africa's economic development, and several studies have shown a positive correlation between entrepreneurship development and other economic variables such as GDP growth and employment. Considering a score of 10.8 per cent for total early-stage activity (TEA), ranking below the average of 11.2 per cent of the medium entrepreneurial category for TEA and the average top entrepreneurial category of 22.8 per cent (Georgescu & Kinnunen, 2021). This could imply that South Africa is not sufficiently taking advantage of the benefits of entrepreneurship, contributing to the country's economic challenges. However, this low TEA score could be due to various other factors, such as structural barriers, limited access to finance, and inadequate support for entrepreneurs. Therefore, it is necessary to address any underlying issues to promote entrepreneurship and economic growth effectively.

Entrepreneurial policymaking and strategy formulation in South Africa faces several challenges, particularly due to sectoral considerations and high inequality levels across racial lines. South Africa's majority has political power, while the minority holds economic power. Attempts by policymakers to address this dichotomy have led to constant cognitive dissonance. An intersectional approach to policymaking is essential if the country is to make any headway towards an inclusive economy. Fairlie and Robb (2008) posited that many forms of racial inequality, such as education, wealth, and income racial inequalities, are well understood, but the same understanding regarding racial differences in business ownership and performance is lacking. In South Africa, Fried and Tauer (2009) attempted to fill this gap by proposing a multi-factor index of entrepreneurial success that includes several intersectionalities such as race, age, gender, human capital (HC), and even birthplace. While the proposed multi-factor index of entrepreneurial success is a step in the right direction for practitioners, policymakers must thoroughly understand marginalised entrepreneurs' systemic and structural barriers, such as access to capital, networks, and markets. This requires ongoing research, consultation, and collaboration, with diverse stakeholders, including entrepreneurs and scholars, to ensure that policies and strategies are responsive to their needs and aspirations. This approach can help to ensure that policymaking and strategy formulation are grounded in a deep understanding of the complex social, economic, and political factors that shape entrepreneurial success in South Africa.

While a growing number of studies look at individual-level issues surrounding marginalised entrepreneurs, only a few consider the intersections of race and age. Many studies seem to concentrate on one aspect, such as race-based (Hsu Rocha & Dias, 2021), gender-specific (Mirchandani, 1999; Schindehutte et al., 2005), age-specific (Cheraghi & Simarasl, 2021; Holmquist & Sundin, 2021; Weber & Schaper, 2021), and disadvantaged

geographies (Asoba & Patricia, 2021; Dawson, 2021; Felix-Faure, 2021). In cases with inter-categorical intersections, it often centres around the popular intersections of race and gender (Fairlie, 2005; Gornall & Strebulaev, 2020; Wingfield & Taylor, 2016). This study focused on often-neglected points of intersections, specifically race and age, to demonstrate the nuances of lived experiences of entrepreneurs of different racial groups across different age categories.

Entrepreneurship within the technology sector is increasingly receiving attention globally, as it contains eight of the top ten most prominent companies worldwide. Three of the five founders of these technology businesses were under 20 years of age at the time of their establishment (Sharp et al., 2018) but had managed to grow unicorns. Unicorns are private start-up companies with a $1 billion or more value but not listed on the stock exchange (Correia et al., 2021). As of May 2023, no known or formally recorded unicorn companies were based in South Africa. This is not to say there are none in the making, considering the start-up landscape is fast-paced and forever evolving. Some fast-growing start-ups such as JUMO, a fintech platform, YOCO, a mobile point of sale system, Sweepsouth, an on-demand cleaning service, and other such fast-growing start-ups emerge as unicorns. In addition, it is possible that other privately held entities have reached unicorn status but are choosing not to declare such information, while others might have changed territories before declaring this status. Therefore, while the scope of this research did not discriminate against unicorns, and would have, welcomed their participation, the absence of these entities, automatically filters them out.

The decision to focus on the technology sector aligned with current global trends. The sector holds significant importance because technology is expected to play a major role in the future economy. This sector presents an exciting opportunity for exploration due to its disruptive innovations and constant technological advancements that shape and

revolutionise the world. Despite its immense potential, the technology sector has been found to have significant disparities in resource and opportunity access, especially for entrepreneurs from historically disadvantaged groups who face distinctive challenges, including biased perceptions, discriminatory practices, and limited access to networks and funding. Through an intersectional lens, focusing on the influence of race and age, this study investigated the nuanced relationship between the behaviour and performance of technology entrepreneurs in South Africa, specifically exploring how these factors are interconnected with entrepreneur means and the subsequent impact on firm performance.

1.5 Research Problem

Despite governmental initiatives aimed at addressing post-apartheid disparities within the business sector, significant perfomance gaps persist among entrepreneurs of different racial backgrounds in South Africa. Historically marginalised individuals, predominantly black founders, continue to struggle to access to high-value sectors and achieve comparable success to their white counterparts. These disparities are influenced by social power dynamics and demographic backgrounds. Understanding the behaviours and resource bases, particularly the substitutionary means (intangible resources) that disadvantaged entrepreneurs rely on, is crucial yet underexplored.

This study aims to bridge this gap by investigating how race and age moderator the relationship between effectual entrepreneur behaviour, resources, and firm performance.

The study proposes a measurement model for entrepreneur means (intangible resources) to provide insights into how these resources impact firm performance, offering a nuanced understanding of entrepreneurial outcomes the tech sector in South Africa.

In summary, while among scholars there is a growing consensus that demographic factors significantly shape entrepreneurial outcomes, the relationship between

disadvantage and entrepreneurship remains complex and contested. Scholars have called for further research to assess the impact of race, age, and other demographic factors on entrepreneurial success (Dubey & Sahu, 2022; Kiguru, 2022; Ramana et al., 2009; Sharp et al., 2018; Tripopsakul et al., 2022). Understanding the role of entrepreneur behaviour in this relationship is equally important (Chandler et al., 2011; Sastre et al., 2022; Schmidt et al., 2022). This study addresses this gap by examining how race and age moderate the relationship between effectual entrepreneur behaviour, resources, and firm perfomance among technology entrepreneurs in South Africa.. By exploring these dynamics, the study sheds light on performance disparities and inequalities in the entrepreneurial landscape.

1.6 Research Objectives, Research Questions and Hypotheses

This study took on an intersectionality lens to assess the impact of race and age on entrepreneur means and how this, in turn, affects the relationship between the EEB and firm performance of South African technology founders.

The objectives were as follows:

(1) Investigate the relationship between effectual entrepreneur behaviour and firm performance among technology founders.

(2) Examine the relationship between effectual entrepreneur behaviour and firm performance through entrepreneur means (intangible resources).

(3) Examine the mediating effect of entrepreneur means in the relationship between effectual entrepreneur behaviour and firm performance, with a specific focus on how this mediating effect might be moderated by race and age.

(4) Establish and validate a measurement model for entrepreneur means (intangible resources).

These were fulfilled by answering the following research questions:

(1) What is the relationship between effectual entrepreneur behaviour and firm performance among technology founders?

(2) To what extent does the utilisation of entrepreneur means mediate the relationship between effectual entrepreneur behaviour and firm performance?

(3) To what extent does the mediating effect of entrepreneur means impact on the relationship between effectual entrepreneur behaviour and firm performance, and how is this mediating effect further influenced by the moderating factors of race and age?

(4) To what extent do technology founders rely on intangible means to achieve firm performance?

Based on the above and the literature, the hypotheses is:

(1) H1: (EEB -> FP) There is a significant positive relationship between effectual entrepreneur behavior and firm performance.

(2) H2: (EEB -> Entrepreneur Means -> FP) The relationship between effectual entrepreneur behavior and firm performance is mediated by entrepreneur means, indicating that effectual entrepreneurs' utilization of intangible resources influences their firm's performance.

(3) H3: (AR x EEB -> Entrepreneur Means -> FP) The mediating effect of entrepreneur means in the relationship between effectual entrepreneur behavior and firm performance is significantly moderated by the intersection of race and age, implying that the impact of effectual entrepreneur behaviour on firm performance varies based on the combined influence of race and age.

(4) H4: (Entrepreneur Means -> FP) Technology founders often rely on entrepreneur means (intangible resources) to achieve performance.

1.7 Significance of the Study

In this section, the significance of the research is discussed. This study addressed several gaps and, in doing so, made important contributions.

1.7.1 Contributions to methodology

This study added to past contributions regarding the measurement for intangible resources, which entrepreneurs frequently rely on. By extending Sarasvathy's (2001) means-at-hand concept and its associated three questions, the study argued that these questions reveal intangible resources connected to entrepreneurial self-efficacy (ESE), human capital (HC), and social capital (SC).

1.7.2 Contributions to theory

This study made a significant contribution to theory by bridging the gap between theory and methodology and advancing the understanding of how entrepreneurs navigate resource-constrained environments. Specifically, it shed light on the role of intangible resources (entrepreneur means), including ESE, HC, and SC, in facilitating the journey of entrepreneurs.

By integrating theory and methodology, a comprehensive framework that elucidates the underlying mechanisms and factors influencing the effectiveness of effectuation in entrepreneurship was developed.

The findings highlighted the importance of leveraging intangible resources, such as ESE, which refers to individuals' belief in their ability to succeed as entrepreneurs. Furthermore, the study emphasised the significance of HC, encompassing the knowledge, skills, and expertise possessed by entrepreneurs. It illustrated how entrepreneurs' individual competencies and accumulated knowledge play a pivotal role in resource-constrained settings, enabling them to identify and leverage opportunities effectively. In

addition, the relevance of SC, emphasising the importance of entrepreneurial networks and relationships, was underscored. The research revealed how entrepreneurs' social connections and networks provide access to resources, support, and information, allowing them to navigate resource constraints and enhance their entrepreneurial outcomes.

Moreover, the integrated framework provided practical implications for entrepreneurs, policymakers, and practitioners. It emphasised the importance of fostering and nurturing intangible resources, such as ESE, HC development, and SC formation, to enhance entrepreneurial success in resource constrained contexts.

1.7.3 Contributions to literature

The study made significant contributions to existing literature in several key areas. First, it addressed the need for further research on the influence of demographic factors on entrepreneurial performance and the role of entrepreneur behaviour in understanding entrepreneurial economies. By specifically examining the impact of race and age on the utilisation of intangible resources by South African technology founders who adopt EEB, this study filled an important gap in the literature.

Additionally, this research expanded the understanding of entrepreneur behaviour as a binary variable that has effectuation and causation as its two modalities, and their implications for firm performance, particularly within the technology sector and in the context of developing countries. By delving into these specific domains, the study provided valuable insights into the unique challenges and dynamics faced by entrepreneurs operating in these environments.

Furthermore, this study introduced an innovative analytical approach by incorporating moderated mediation analysis into the field of effectuation research. This presented an early exploration of this methodology within the discipline and contributed to a deeper understanding of the relationship between firm founder demographics,

entrepreneur means, and their subsequent impact on entrepreneur behaviour and firm performance.

1.7.4 Contributions to policy

This research offered valuable insights that policymakers can leverage to develop effective policies aimed at supporting and promoting effectual behaviour among entrepreneurs, including less insistence on predictive measures like business plans. Policymakers can take into account the differential impact of these factors on entrepreneurship and firm performance. By recognising the unique challenges and opportunities faced by entrepreneurs from different demographic backgrounds, policies can be tailored to address the specific needs and aspirations of diverse entrepreneurs.

Moreover, the study underscored the importance of adopting an intersectionality lens in policy design. By considering the complex interplay of various social identities and power relations, policymakers can develop policies that not only promote equal access to entrepreneurship, but also address the structural barriers that hinder or enable entrepreneurial opportunities. This lens allows for a more nuanced understanding of how policies can be designed to foster inclusivity, reduce disparities, and promote equitable access to entrepreneurship for individuals from diverse demographic backgrounds. These evidence-based policy considerations can lead to the development of targeted programs, resources, and support systems that empower aspiring entrepreneurs and create a level playing field for individuals from all walks of life.

1.8 Delimitations of the Study

This study did not cover pre-nascent and early-stage technopreneurs but rather those in operation for at least three years.

1.9 Limitations of the Study

This section covers the limitations of this study and suggests ways that these types of limitations can be improved for future studies:

1.9.1 Self-reporting

The data was collected using a questionnaire that relied on the respondents' providing accurate information. This could lead to over- or understated responses, which could affect the validity of the study's findings. Given resources, this limitation could have been improved by using multiple data sources, such as interviews, and focus group discussions, to triangulate the results and increase the reliability of the data.

1.9.2 External factors

The rapidly changing world, political and economic instability, and the pandemic could all affect the behaviour of respondents. This makes it hard to conduct a study with a large enough sample size to capture these variations. This could have been overcome by collecting data over a more extended period or using longitudinal data to track changes in the behaviour of respondents over time.

1.9.3 Absence of a pre-existing sampling frame

This might limit the sample size, and the distribution might not represent the full diversity of the technology entrepreneurs in the country. A more comprehensive sampling frame could have been used to improve this limitation, although this might require a bigger team since there is no comprehensive national database of technology entrepreneurs.

1.9.4 Sampling bias

The focus on founders of businesses that have been operational for at least three years and are still operational, meant that the findings did not capture the experience of all

entrepreneurs within the sector, only those who have not aborted their missions. This could have been overcome by including a more diverse sample of entrepreneurs, including those who have failed in their ventures. This would provide a more comprehensive understanding of the behaviours and challenges faced by entrepreneurs in the technology sector. This is something to be considered by future researchers exploring this topic.

1.9.5 Convenience vs stratified sampling

The inability to do stratified sampling limits the opportunity to ensure representation around racial and age demographics. To address this limitation, more targeted recruitment strategies could have been used.

1.9.6 Inability to control for some variables

It is impossible to control all variables influencing entrepreneur means, behaviour, and firm performance. This limits the accuracy of findings. To some degree, regression analysis helps identify other critical variables that could affect entrepreneurs.

1.9.7 Lack of generalisability

The findings of a quantitative study conducted in one sector in South Africa might not apply to other sectors in the same country, let alone in other countries. While this study could not deal with this limitation, it is suggested that future comparative studies, focusing in other sectors and other countries to identify similarities and differences in the behaviour of technology entrepreneurs, should address generalisability.

1.10 Definition of Terms

In this study, entrepreneurship was understood as the assumption of risk by an individual or individuals who explored and exploited potentially profitable opportunities that had been identified or created. This definition is a nexus of various authors (Knight,

1921; Schumpeter, 1982; Venkataraman & Sarasvathy, 2001), modified to align with the study's objectives.

Entrepreneur behaviour explains how entrepreneurs conduct themselves and make decisions in an entrepreneurial process when dynamic environments are encountered (Fisher, 2012; Gartner, 1989a; 1989b; Misra & Kumar, 2000).

Causation is a traditional entrepreneur behaviour based on setting goals and predicting the future. A typical entrepreneur who is aligned with causation sets goals and minimises risk by estimating them precisely through different tools such as the business plan. The entrepreneur would then use the same tools to accumulate resources to help fulfil their set goals (Fisher, 2012; Sarasvathy, 2001).

Effectuation is an alternative behaviour of entrepreneurs, which Sarasvathy (2001) coined. It suggests that the environment in which entrepreneurs operate is uncertain, and rather than trying to predict it, the alternative is to control it using the means at one's disposal. It has three distinct constructs: affordable loss, experimentation, and flexibility (Malinga, 2018; Sarasvathy, 2001); a fourth construct, pre-commitment, is shared with causation.

Demographics refer to measurable and static attributes that define a specific population (Rizvi et al., 2019). Race and age were the demographics of importance in this study.

The term 'race', as used in this study pertains to deeply ingrained social structures and patterns of privilege and influence, which are defined by indicators such as skin colour or ancestral background (Poole et al., 2021).

As for 'age', it encompasses a combination of factors, including the time elapsed since one's birth (chronological age), the duration of being a founder of the specific

business under consideration, and its implications concerning accumulated SC, and HC (Meyer & Krüger, 2021).

Intersectionality refers to how various social identities (race, gender, age, location, sexual orientation, and others) of individuals connect and overlap to increase or decrease their experience of power, privilege, and oppression (Bešić, 2020; Hearn & Louvrier, 2016; Poole et al., 2021).

1.11 Chapter Conclusion

In summary, this chapter has outlined the importance of understanding the impact of demographic factors on entrepreneurial outcomes in South Africa. The problem statement highlights the critical gaps in the current literature, specifically focusing on the roles of race and age in moderating the relationship between effectual entrepreneur behaviour and firm performance. The research objectives, questions and hypotheses provide a clear framework for the subsequent investigation, The next chapter delves into the theoretical foundation underpinning this study, reviewing relevant literature on entrepreneurship, entrepreneur behaviour, demographic factors, and firm performance, amongst others.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter reviews relevant literature essential to this study, encompassing significant theories, influential authors, key discussions, and research methods employed, showcasing their strengths and limitations. In addition to addressing fundamental concepts, the sections are organised thematically to align with four research objectives. First, establish and validate a measurement model for entrepreneur means (intangible resources). Second, investigate the relationship between EEB and firm performance. Third, examine the relationship between EEB and firm performance through entrepreneur means (intangible resources). Lastly, examine the mediating effect of entrepreneur means in the relationship between EEB and firm performance, with a specific focus on how this mediating effect might be moderated by race and age.

2.2 Discussion of Key Concepts

This section discusses the following crucial concepts: entrepreneurship, inequality, firm performance, technology sector and start-ups, the ripple effect, and identity and intersectionality. This section provides an in-depth understanding of the background and significance of each of these concepts.

2.2.1 Understanding the entrepreneur

Despite numerous attempts to establish a definitive definition, the concept of entrepreneurship remains elusive (Shane & Venkataraman, 2000). The ever-evolving nature of entrepreneurship has led various influential authors to emphasise different facets of being an entrepreneur. Notable aspects that emerge in the discussion of entrepreneurship

include innovation, opportunity recognition, and risk propensity (Drucker, 1985; Kirzner, 1973; Knight, 1921; Schumpeter, 1982).

The point here is that despite considerable effort, there is no universally agreed-upon definition of entrepreneurship. This lack of consensus highlights the complexity and multifaceted nature of the concept. Numerous scholars and researchers have attempted to capture the essence of entrepreneurship, but the dynamic nature of entrepreneurial activities and the diversity of entrepreneurial contexts make it challenging to establish a singular definition.

To elaborate, various seminal authors have provided valuable insights into different dimensions of entrepreneurship. For example, Drucker (1985) emphasised the role of innovation, recognising that entrepreneurs often introduce new ideas, products, or processes that disrupt existing markets or create new ones. On the other hand, Kirzner (1973) emphasised the ability to recognise opportunities that others might overlook, showcasing the importance of perceptive and entrepreneurial alertness. Knight (1921) focused on the willingness to take risks, highlighting the entrepreneurial mindset of individuals willing to bear uncertainty and venture into uncharted territory. Schumpeter (1982)**,** whose definition is supported by Liang et al. (2014) emphasised the role of entrepreneurs as agents of creative destruction, driving economic development through introducing new technologies, products and organisational forms.

These diverse perspectives contribute to a more comprehensive understanding of entrepreneurship. They demonstrate that entrepreneurship is not a monolithic concept but a multifaceted phenomenon encompassing various dimensions and characteristics. By acknowledging these different aspects, the complexity of entrepreneurship is grasped, and the diverse range of activities and traits associated with entrepreneur behaviour appreciated.

In summary, the concept of entrepreneurship eludes a singular definition despite multiple attempts. Different scholars and influential authors have emphasised various aspects, such as innovation, opportunity recognition, and risk propensity. This multiplicity of perspectives underscores the intricate nature of entrepreneurship, reflecting its dynamic and context-dependent characteristics. The issue of resources and their utilisation is particularly relevant for analysing the effect of EEBs on firm performance through entrepreneur means. However, the above definitions of entrepreneurship are not without their limitations. For instance, the focus on innovation and risk-taking as essential components of entrepreneurship might neglect other important factors contributing to entrepreneurial success, such as market research, strategic planning, and effective leadership. Moreover, the emphasis on individual characteristics and behaviours might overlook the impact of broader social, cultural, and economic factors on entrepreneurial opportunities and outcomes.

In conclusion, while the above definitions provide useful insights into the nature of entrepreneurship, a more nuanced understanding of the phenomenon requires a broader consideration of the individual factors and the social and economic context in which entrepreneurial activities occur. Nonetheless, identifying key components such as innovation, risk-taking, and opportunity recognition can provide a useful framework for understanding and promoting entrepreneurship as a driver of economic growth and social innovation.

2.2.2 Entrepreneurship and inequality

Bruton et al. (2021) challenged the assumption that entrepreneurs' decision-making and behaviour are consistent worldwide, highlighting their variations across cultural settings and national boundaries. Moreover, entrepreneurs in developing economies encounter persistent obstacles originating from institutional frameworks. These challenges

might include bureaucratic hurdles, inadequate infrastructure, legal constraints, and limited access to resources. The interplay among these issues necessitates dedicated studies on entrepreneur behaviour within the context of developing economies. Understanding the influence of different factors on entrepreneurs in their settings is crucial for tailoring effective interventions and policies to support entrepreneurship in diverse contexts and foster sustainable economic development.

According to Bhorat et al. (2020), South Africa faces complex structural challenges and enduring inequality, particularly driven by historical racial segregation policies. Despite post-apartheid efforts to promote economic inclusion and address inequality, the existing policy framework has proven ineffective. This has only worsened inequality since apartheid ended, as Polus (2020) stated, which characterises the situation as the most persistent case of inequality in modern history. The pre-existing wealth disparities, coupled with the fact that only a minority benefited from the 1994 transition, perpetuated, and created new divisions in the country, deepening the historical racial-, social-, and settlement-based divides. This highlights the urgent need for a comprehensive reassessment of policies and the development of effective strategies to tackle the persistent inequality rooted in South Africa's historical legacy. Policymakers must acknowledge the intricate dynamics at play and work towards holistic approaches that address the underlying structural challenges and promote inclusive economic development in the country.

Scholars worldwide (Auguste, 2020; Beresford, 2021; Bruton et al., 2021; Gold, 2016; Lippmann et al., 2005; Maalaoui, 2021; Michaelides, 2020; Packard & Bylund, 2018) have examined the association between entrepreneurship and inequality in the existing literature. Their collective findings indicate a significant association between economic inequality and entrepreneurial activity, particularly necessity entrepreneurship

(Auguste, 2020; Lippmann et al., 2005). In addition, Lippmann et al. (2005) conducted a literature and theoretical review that established a link between economic inequality and the entrepreneurial process. The authors distinguished between wealth and income inequality and contended that the former had greater relevance to entrepreneurship. These diverse scholarly perspectives contribute to a broader understanding of the intricate interplay between entrepreneurship and inequality, shedding light on the complex mechanisms and contextual factors involved.

Given the above literature, it is evident that South Africa's pronounced inequality is likely to give rise to necessity-based entrepreneurship, predominantly observed along racial lines. Moreover, depending on entrepreneurs' demographic backgrounds, this prevailing inequality might influence their business decisions positively or negatively. In societies characterised by high levels of wealth and income inequality, an uneven distribution of financial and physical resources exists, which are crucial elements in entrepreneurial endeavours and significantly affect the outcomes of such ventures. The underlying assumption in this study was that individuals positioned at the lower end of the inequality spectrum face limited access to these essential resources, consequently affecting the performance of their firms. To counterbalance this disparity, individuals might resort to leveraging non-physical resources, such as ESE, HC, and SC, referred to as 'entrepreneur means' within the scope of this study.

In another study, Mahadea and Kaseeram (2018) argued that active entrepreneurship is crucial to reducing poverty and inequality in the country. However, Meyer and Krüger (2021) suggested that the government's focus on entrepreneurship as a solution to inequality might be misguided. In a study examining the link between entrepreneurship and economic inequality, Bruton et al. (2021) found that not all forms of entrepreneurship have the potential to reduce inequality. Formal sector entrepreneurship

might exacerbate inequality by only benefiting those directly involved. On the other hand, entrepreneurship in the informal sector can reduce inequality. Entrepreneurs in the technology sector typically require specialised skills and knowledge, which makes them more likely to be part of the formal sector. Although supporting them might address inequality, entrepreneurship in the technology sector can drive economic growth and job creation, improving living standards and increasing employment opportunities.

In conclusion, while entrepreneurship can contribute to economic growth and job creation, it is not a silver bullet for addressing inequality in South Africa. The complexity of entrepreneurship within South Africa's structural inequality is evident. While a significant relationship exists between economic inequality and entrepreneurial activity, not all forms of entrepreneurship can reduce inequality. Entrepreneurship in the formal sector might even worsen inequality. Necessity-based entrepreneurship, divided along racial lines, would likely thrive in South Africa's highly unequal society. Limited access to financial and physical resources among individuals at the lower end of the inequality spectrum can affect their firms' performance. Therefore, it is essential to understand the impact of inequality on entrepreneurship and the role of resources, including intangible ones, in promoting entrepreneurial success while ensuring equal opportunities for previously disadvantaged groups to benefit from the technology sector's growth.

2.2.3 Firm performance

Barringer et al. (2005) conducted a quantitative analysis comparing 50 rapid-growth and 50 slow-growth firms to identify the factors contributing to high-growth firms' success and their founders' success. The study found several key variables influencing rapid growth, including founder characteristics, firm attributes, business practices, and human resources management practices. While the study did not claim that rapid growth is the best approach for all firms, it suggested that insights from successful rapid-growth

firms could help understand the general behaviours associated with firm performance. Research by Barringer et al. (2005) revealed significant differences between rapid-growth and slow-growth firms, particularly regarding founder characteristics. The study identified that founders of successful high-growth firms tended to be better educated, possess high ESE, and have extensive industry experience, resulting in a strong industry network. Coincidentally, these qualities are all linked to the constructs of entrepreneur means: entrepreneur self-efficacy, HC, and SC, as proposed in this study.

Del Bosco et al. (2021) examined factors contributing to the development of innovative start-ups; which included entrepreneurs' contextual and personal demographic factors. The findings indicated that certain demographic variables have a greater influence on the significance and effectiveness of local contextual factors. Additionally, certain contextual factors correlate more positively with start-up success than others. This highlights two key points: first, the central focus of the study was the impact of race and age demographic factors on the performance of founder-led firms through the ripple effect. Second, the significance, and definition of 'start-ups' was included.

In conclusion, both studies shed light on factors contributing to the success of high-growth firms and innovative start-ups. However, there is no one-size-fits-all solution, and different contextual and personal demographic factors can significantly influence firm performance. Therefore, it is crucial to consider each firm's specific context and circumstance when analysing its performance.

2.2.4 Technology sector and start-ups

In the past, any new business established by entrepreneurs to introduce a new product or service was categorised as a start-up (Cockayne, 2019; Eisenmann et al., 2012). However, today the term start-up is typically associated with innovative companies that exhibit both repeatability and scalability (Blank, 2013; Blank & Dorf, 2020; Cockayne,

2019; Díaz-Santamaría & Bulchand-Gidumal, 2021; Graham, 2012). This definition aligns with the start-up hypothesis and reflects the sentiments prevalent in the market, as advocated by Kevin Hale and other partners of Y-Combinator (Graham, 2012). These leading practitioners, influential voices in the start-up ecosystem, argued that a start-up is a company designed for growth and expansion. Otherwise, it is simply a regular small business. While a start-up need not necessarily be a technology business, the technology sector is more commonly associated with hyper growth, a key feature of start-ups.

There is no universally accepted definition of a start-up's growth rate. However, according to Díaz-Santamaría and Bulchand-Gidumal (2021), and Graham (2012), a start-up should be scalable, and the founder should have an explicit intention or declaration for achieving hyper-growth. This does not necessarily mean that the company would experience rapid growth from the outset and continuously. It might follow an S-curve trajectory, starting from a setup stage, then proliferating and reaching a peak before slowing down. However, the fundamental purpose of the company remains unchanged. Y-Combinator suggests that a reasonable growth rate for a start-up is between five and seven per cent per week, and anything exceeding 10 per cent per week is exceptional (Graham, 2012). Barringer et al. (2005) stated that a start-up should aim for an annual sales growth rate of over 80 per cent. In contrast, a further definition recommends a yearly growth rate of at least 20 per cent in the employment or sales (Chidakwa, 2015). However, some argue that this level of growth is achievable by any business and is not necessarily exclusive to start-ups. Thus, there is no definitive consensus on the matter.

Some scholars have distinguished between start-ups and scale-ups (Huang et al., 2017; Srinivasan & Venkataraman, 2018). The former focuses on testing and validating a business model, while the latter has already demonstrated significant traction with customers, validated its business model, and perhaps even undergone its first series of

financing (Autio, 2016; Cavallo et al., 2019). Within the scale-up sector, a small subcategory is called a unicorn: an unlisted company that achieves a US$1 billion market value within ten years of establishment (Abardazzou, 2021; Correia et al., 2021).

During the data collection period, there were no formally recorded technology unicorns in South Africa; however, four were present in Africa. As a result, this study did not consider unicorns, as none were formally recorded in the country. Additionally, this study did not distinguish between start-ups and scale-ups. Both were categorised under technology entrepreneurs if they met the criteria of being founder-led, had launched their minimum viable product, and had been operating for at least three years.

In conclusion, this sub-section discusses the evolving definition of a start-up and the characteristics that distinguish it from a regular small business. In addition, it distinguishes between start-ups and scale-ups. Overall, this provides a useful overview of the definition and characteristics of a start-up and highlights the lack of consensus on the matter. The distinction between start-ups and scale-ups is also valuable. Although not part of the scope of this study, other studies should look at the downside of focusing exclusively on repeatability and scalability in start-ups' definitions, potentially neglecting the importance of customer relationships and issues of long-term sustainability.

2.2.5 Ripple effect

Since this study investigated the ripple effect of the intersecting variables of race and age on the entrepreneur behaviour – firm performance relationship through entrepreneur means – it is prudent to delve deeper into the 'ripple effect' as a concept. According to Mishra et al. (2021), the ripple effect is described as a "domino or snowball effect" (p. 132) resulting from complex supply chains. Although some have equated the ripple effect with the bullwhip effect, Birkie and Trucco (2020) argued that the two are fundamentally different. The bullwhip effect only deals with fluctuations in demand and

lead-time (Schmitt et al., 2017), whereas the ripple effect encompasses a much broader range of risk factors (Sodhi & Chopra, 2004). For this study, the focus was on the ripple effect rather than the bullwhip effect. Birkie and Trucco (2020) contended that the impact on performance intensifies as the distance between the source of disruption and the point of measurement of consequences increases, as was the case in this study. The inequalities resulting from apartheid can be considered a disruption affecting firm performance (the point of consequence measurement).

There are several ways to measure the ripple effect, and different studies have used different methods. The choice of a measurement method depends on the research question and the data availability. Researchers might need to combine different approaches to capture the ripple effect phenomenon's complexity fully. For example, Birkie and Trucco (2020) introduced a unique operationalisation, supply chain distance, to study this effect. Conversely, (Taylor et al., 2020) employed the Ripple Effect Mapping (REM) to evaluate both intended and unintended outcomes of a program, along with aspects like social capital and partner reciprocity. Additionally, other studies have examined the economic repercussions of ripple effects, highlighting issues such as job losses, reduced productivity, or decreased revenues (Buera et al., 2021; Hosseini & Ivanov, 2020; Schippers, 2020; Schmitt et al., 2017).

Peng and Lai (2012) stated that covariance-based structural equation modelling has been dominant in measuring such effects, using a two-step format, first by running data without the moderating and mediating variables and then adding them one by one to enable comparison later. However, they advocate using partial least squares structural equation modelling (PLS-SEM), as it can run multiple models and paths simultaneously. SEM is a statistical method used to test causal relationships among multiple variables (Byrne, 2016), which in theory, means it could be applied to investigate the causal

pathways through which disruptions propagate and estimate the magnitude and perhaps even the duration of the ripple effect. Used in conjunction with PLS, designed to handle complex models with latent variables and observed indicators (Henseler & Chin, 2010), it makes PLS-SEM most appropriate to answer the research question of this study.

In conclusion, this section gives a clear overview of the concept of the ripple effect and how it is relevant to the research question of the study. It also highlights the importance of selecting an appropriate measurement method to capture the complexity of the ripple effect phenomenon. Although dealt with in more detail in the methodology section, this indicates the thoughtful consideration in choosing PLS-SEM as the most suitable statistical method.

2.2.6 Identity and intersectionality in entrepreneurship

In a country where there are still visible inequalities and barriers, entrepreneurs are not immune to the societal and systemic issues that affect various identities and social groups. Identity plays a significant role in entrepreneurship in South Africa, including race, age, gender, sexual orientation, level of education, socio-economic background, and even migrant status, among other things. Scholars are increasingly embracing the multifaceted nature of the identity of entrepreneurs, evidenced in the bibliometric study by Mmbaga et al. (2020) which examined the body of work around identity entrepreneurship. The study used the Financial Times list of 50 top journals in business and other management, and entrepreneurship-specific journals globally. This resulted in four categories to classify the conversations: the distinct identity of entrepreneurs, the development of entrepreneurs' identities over time, the various types of entrepreneur identities, and the overlap of these identities with other social structures. This study joined the conversations within the realm of the latter two, which resonated with the call from

(Mmbaga et al. (2020) call for future researchers to adopt multiple theoretical lenses, including integrative identity.

Sharp et al. (2018) undertook a study in the Eastern Cape, South Africa, exploring how race, gender, and age influenced the entrepreneurial orientation (EO) of small businesses. They concluded that the gender and age of entrepreneurs have no bearing on their EO. The findings related to age (Sharp et al., 2018) were later corroborated by Alene (2020), who found that age was an insignificant factor in determining the performance of entrepreneurs. However, they contradicted earlier findings by Sajilan et al. (2015) that the younger an entrepreneur is, the more positive impact they have on the firm's performance, in comparison with their older counterparts. In addition, Soomro (2019) also contradicted these findings in their study on the effect of demographic factors on the success of entrepreneurs in small and medium-sized enterprises in Pakistan; and found that the demographic characteristics of entrepreneurs, including age, have a positive and significant impact on the success of their enterprises. With that said, it must be noted that the reasons for the different findings could be ascribed to the differences in the locations of these studies. It is to be noted that the majority (75 per cent) of respondents in the study by Sharp et al. (2018) were male, and this bias in the sample could be the reason for the differences in results and conclusions. Regardless, it is clear from the above literature that the verdict is still out regarding the role of identity in entrepreneurship.

It is also to be noted that although the above-mentioned studies take cognisance of the value of identity in entrepreneurship, the lens is not intersectional in that the identity characteristics are investigated in a silo rather than in terms of their interconnectedness. Fried and Tauer (2009) argued that for one to grasp entrepreneurial success fully, it is imperative to look at more than just the venture at hand but also the identity of the entrepreneurs, including a mix of characteristics such as age, experience, gender, race,

competitive advantage, education, and birthplace; and how these interact at a societal level. The interconnectedness of a range of these variables can explain the extent to which individuals experience advantage or disadvantage that ultimately shapes their businesses. However, Emejulu and Sobande (2019) and Poole et al. (2021) cautioned against the assumption that these overlapping social variables intensify people's lived experience of advantage or disadvantage without proper research, hence the importance of a study such as this. This study aligned with these sentiments by using intersectionality as a lens for understanding how the integrative identities of entrepreneurs shape their behaviour and, thus, the performance of their businesses. Although the term was coined and popularised by Crenshaw (1997) in the late 80s, there is agreement among authors that intersectionality existed for decades before then (Cole, 2009; Hearn & Louvrier, 2016). Cole (2009) traced its roots to the works of a group of feminists who, without naming the theory, had made submissions about intersectionality on what was termed the Combahee River Collective (1977/1995), where they expressed the inability and reluctance to separate race from class and gender oppression as these were intertwined according to their lived experience.

Intersectionality theory deals with how a range of characteristics of an individual and their environment come together to shape the extent to which they experience advantages or disadvantage (Bešić, 2020; Hearn & Louvrier, 2016; Poole et al., 2021). Bešić (2020) cautioned against seeing this disadvantage in a reductive form, for example, racism added onto sexism or vice versa, but rather as these forms of disadvantage all working simultaneously to create a certain level of disadvantage. While intersectionality theory argues that an individual is a myriad of intersecting identities, this is not its core objective. Its core objective is to explain how some are either included or excluded through a systematised and deep-rooted privilege that is socially constructed (Bešić, 2020).

Romero and Valdez (2016) conducted a literature review to introduce the intersectional approach to studying ethnic enterprises. The findings were that there are no one-dimensional experiences, even with individuals within the same community or culture, due to the intersection of many factors such as race, gender, class, legal status, religion, age, and more. The review also challenged the conventional idea that entrepreneurial activity promotes economic incorporation, as the literature highlights the complexities and nuances faced by the underprivileged. It demonstrates how identity and power intersect to shape entrepreneurship among underprivileged individuals operating within a highly stratified economy. They closed by encouraging the use of the intersectionality lens in entrepreneurship.

Vorobeva (2022) argued that even though intersectionality research on entrepreneurship within the underprivileged is relatively new, it has already made significant contributions to a better understanding of the phenomenon. To create a more inclusive business environment, it might be necessary to provide tailored support and diversity initiatives that challenge the traditional image of an entrepreneur. Intersectionality research in entrepreneurship would help to elevate the underprivileged from being confined to low paying, labour-intensive industries with little growth potential.

Qureshi et al. (2023) concurred and further distilled the problems of intersectionality that go unchecked. They argued that intersectionality prevents marginalised social groups from accessing benefits, and the impact of this varies widely. Further, they reasoned that intersectionality studies would enhance critical discussions that would, in turn, encourage trust and balance the inclusion scales.

Simatele and Kabange (2022) used a sample of informal traders drawn from three provinces in South Africa to investigate how having multiple marginalities influences the choice of start-up capital. They found that multiple marginalising and intersecting

identities matter when accessing finance, but that lack of education is the one factor that contributes to the inability to access finance. Their results confirmed that females are more vulnerable in that they are more likely to utilise unreliable sources of capital but that those with higher education stood a better chance of accessing funding. In addition, education cushioned the impact of race in that better-educated black people stood a better chance than did their uneducated counterparts regarding access to funding; but, that ageing took away that advantage. In summary, they found that higher education moderated the effect of race and gender when accessing start-up capital. Therefore, while they recommended targeted finance programs, they argued that those should be accompanied by education programs so that they stand a better chance in future endeavours (Simatele & Kabange, 2022).

The literature provides valuable insights into the role of identity in entrepreneurship in South Africa and highlights the importance of adopting an intersectional lens in studying this phenomenon. The literature also highlights the need for future researchers to adopt multiple theoretical lenses, including integrative identity, to better understand the complex nature of identity in entrepreneurship. Moreover, this literature highlights the complex and diverse ways different social categories intersect and broadly shape the entrepreneurial experience in South Africa and beyond. Also, it is clear from this literature that the verdict is still out regarding the role of identity in entrepreneurship, and more research is needed to gain a deeper understanding.

2.3 Entrepreneurial Behaviour and Associated Theories

This section covers the entrepreneurial behaviour theories that have been used herein. Further, it traces the literature on where technology entrepreneurs sit in the

effectuation-causation matrix and whether any relationship exists between entrepreneur behaviour and firm performance.

2.3.1 Contrasting effectuation and causation

Entrepreneur behaviour theories are important in understanding how entrepreneurs make decisions and act in their ventures. Various entrepreneur behaviours have advanced over the years, including effectuation and causation, often seen at opposing ends of the scale.

Causation is traditional entrepreneur behaviour; effectuation is an alternative behaviour, coined by Sarasvathy (2001). Effectuation has gained popularity, but Arend et al. (2015) argued for a move away from assuming that effectuation is suitable for all entrepreneurs and in all contexts because many situations call for different behaviours. This assertion aligns with effectuation's seminal author, Sarasvathy (2001), who argued that effectual logic is not an answer to every situation but is somewhat more suited for uncertain conditions. Hence, both effectuation and causation are examined in this review, while only effectuation is measured. Contrasting the two is widely done in the literature. Effectuation is an approach to making decisions where entrepreneurs leverage their existing resources to generate fresh prospects, whereas causation entails entrepreneurs establishing concrete objectives and procuring the requisite resources to accomplish those objectives (Sarasvathy, 2001).

Fisher (2012) distinguished between causation and effectuation at theoretical and operational levels in a study that collates and contrasts traditional versus emerging entrepreneur theories. He propounds how the critical elements of these entrepreneurship theories translate into entrepreneur behaviour. This was significant to this study since the effectuation-causation behaviour framework was the independent variable. Fisher (2012) demonstrated that causation, a much more traditional entrepreneur behaviour,

fundamentally differs from effectuation. The only commonality between the two is that, from the onset, both seek pre-commitments or forge relationships, be it with customers, suppliers, or other organisations (Chandler et al., 2011; Fisher, 2012). Otherwise, they both look at the future through very different lenses. In fact, Sarasvathy and Dew (2008) and Sarasvathy (2001) argued that besides that one commonality, these theoretical perspectives sit on two opposite ends of the entrepreneur behaviour continuum.

There are three unique aspects of effectuation: means-at-hand, affordable loss, and experimentation. Then there are pre-commitments, which are common between the two entrepreneur behaviours. Means at hand refers to aligning the business concept with the resources at hand. Sarasvathy (2001) alluded to intangible resources by introducing three key questions that an entrepreneur following this logic asks them self before proceeding: Who am I? What do I know? Whom do I know? A glaring omission: 'What do I have?', leaves no doubt that Sarasvathy (2001) viewed the means through the lens of intangible resources. However, it is argued that effectual entrepreneurs use these intangible resources to leverage tangible resources indirectly. Affordable loss refers to the idea that entrepreneurs should only invest resources they can afford to lose. This approach allows entrepreneurs to take calculated risks and make decisions based on what they can control rather than trying to predict and control the future (Fisher, 2012; Liu & Siu, 2019; Mthanti & Urban, 2014; Sarasvathy, 2001; Urban & Heydenrych, 2015; Woetmann, 2014). Moreover, effectuation offers flexibility by encouraging experimentation. Effectuation encourages launching minimum viable products (MVPs); some might call these non-perfect products or services.

Conversely, causation is a process in which entrepreneurs set specific goals and acquire the necessary resources to achieve those goals. It requires a certain level of structured planning and prediction towards those set goals and might be more relevant in

contexts with higher certainty and predictability. Those following causal logic stick to their initial plan or objective as much as possible (Fisher, 2012; Liu & Siu, 2019; Sarasvathy, 2001; Woetmann, 2014), thus entertaining little flexibility. This study argued that, generally, this behaviour is more suited to the privileged (mostly white people in the context of South Africa), who have access to physical and financial resources, and that the marginalised default to effectuation out of necessity. Despite the previous assertion, it is important to note that literature suggests that technology entrepreneurs might adopt effectuation not solely due to resource constraints but also for its flexibility and experimentation dimensions, which enable the launch of MVPs and the ability to adjust offerings in an agile manner. However, the flexibility afforded by effectuation should be considered in light of Eyana's (2017) research on the behaviour of entrepreneurs and the impact on small businesses in a developing country context. Notably, Eyana (2017) found that the flexibility component of the effectuation scale was deemed irrelevant in the African context, as entrepreneurs rarely relied on their financial and physical resources to establish a new firm, resulting in limited flexibility.

2.3.2 Entrepreneur means – The intangible resource

Sarasvathy (2001) asserted that the term 'means-at-hand' is employed to describe the various resources that individuals require during their entrepreneurial journey. Sarasvathy (2001) illustrated how the two types of entrepreneurs approach these means differently. The effectuating entrepreneur evaluates the means they already possess and then decides on a viable entrepreneurial venture or path accordingly (Ghorbel et al., 2017; Sarasvathy, 2001). Conversely, the entrepreneur using causal logic views means as a way to achieve a predetermined goal. They first determine what they want to accomplish and then gather the means to fulfil that objective (Sarasvathy, 2001). This approach can be described as 'means-to-an-end' rather than 'means-at-hand'.

The best way to ascertain or evaluate what means an entrepreneur has is to ask three main questions (a) who am I?: own traits, abilities, locus of control; (b) what do I know?: own and partner exposure to knowledge; and (c) who do I know?: all the relevant social networks (Read et al., 2009; Sarasvathy, 2001). Ghorbel et al. (2017) described these as personality, expertise, and social networks. Furthermore, in the context of Tanzania, Pacho and Mushi (2021, p. 822) examined the effects of what they term "effectuation set of means" on new venture performance; they extrapolated this set of means directly from the three questions posed by Sarasvathy (2001). They link the 'who I am' to identity and self-efficacy using social cognitive theory. 'What I know' is linked to expertise, although they do not specify a theory, and 'whom I know' is linked to SC. This is the closest holistic interpretation of these questions used in this study. Pacho and Mushi (2021) found that the effectuation set of means positively affects new venture performance.

Table 2.1 demonstrates an interpretation of means-at-hand (entrepreneur means) as per the literature (Ghorbel et al., 2017; Read et al., 2009; Sarasvathy, 2001) and contributes by linking it to relevant existing theories, ESE, HC, and SC.

Table 2.1: Entrepreneur means

QUESTION	ANTECEDENTS	SUB-CONSTRUCTS	RELATED THEORY
Who am I?	Personality	Locus of control Entrepreneurial expectancies Entrepreneurial intensity	Entrepreneurial Self-Efficacy Theory
What do I know?	Expertise	Level of education Industry experience Management experience	Human Capital Theory
Who do I know?	Social network	Extended family Community Organisational memberships/affiliations	Social Capital Theory

(Adapted from Ghorbel et al., 2017; Read et al., 2009; Sarasvathy, 2001)

2.3.2.1 Entrepreneurial self-efficacy – Who am I?

Entrepreneurial self-efficacy (ESE) refers to the degree of the individual's belief in their ability to perform entrepreneurial activities such as starting and running a business (Chen et al., 1998; McGee et al., 2009; Renko et al., 2021; Yang et al., 2020). ESE is cultivated by a multitude of factors, such as an individual's childhood experiences and social network (Zivdar et al., 2017), and it plays a significant role in how individuals perceive themselves and, ultimately, how they behave in the business (Santos et al., 2010; Tumasjan & Braun, 2012; Zivdar et al., 2017).

Having witnessed previous research that disputed the difference in personality traits between managers and entrepreneurs, Chen et al. (1998) conducted a study to discover an individual characteristic unique to entrepreneurs. They found that ESE is that characteristic. To be precise, they found that founders of entrepreneurial firms have higher self-efficacy about innovation and risk-taking than have non-founders. They further argued that there is an opportunity to enhance ESE by improving the environment through availing and publicising resources, improving policies, and highlighting the positive aspects of entrepreneurship. A decade later, Hmieleski and Baron (2008) confirmed this when they found that the ESE of lead founders is a great predictor of firm performance.

In another study, Maichal et al. (2018) assessed whether there was any mediating role played by entrepreneurial identity and self-efficacy in the relationship between a role model and entrepreneurial performance. The study was conducted with the University of Ciputra students who had been running start-up businesses for between two and three years. Using SEM, they found no significant relationship between the role model and self-efficacy but rather a significant relationship between self-efficacy and entrepreneurial performance.

Newman et al. (2019) conducted a study that outlined several theoretical perspectives that explain how ESE influences entrepreneurial outcomes. They found that ESE does foster entrepreneurial behaviour by increasing the entrepreneurial intentions of individuals.

In another study, Renko et al. (2021) investigated the importance of ESE in stimulating the drive to start a business. They found that while ESE is important under stable conditions, it is even more critical under adverse conditions. While high ESE might lead to a desire to start a business, Renko et al. (2021) pointed out that it does not translate into access to required physical resources or funding. The allocation of these might be predetermined, based on several factors, including race, gender, ethnic background, bribes, or kinship. After considering a variety of sub-constructs for ESE, Schjoedt and Craig (2017) tested and validated several of these sub-constructs and concluded that only three spoke to entrepreneurship and were unidimensional, these are, locus of control, entrepreneurial expectancies, and entrepreneurial intensity. These sub-constructs are the subject of study as part of the entrepreneur means.

The above literature thread clearly demonstrates the importance of ESE as a critical resource in entrepreneurial performance.

2.3.2.2 Human capital – What do I know?

The second type of entrepreneur resource is human capital (HC). A combination of skills and knowledge enables an individual to perform a particular task (Aboobaker & Renjini, 2020; Schultz, 1980). The theory guiding this phenomenon, human capital theory, owes its allegiance to early contributors such as Becker (1964) and Schultz (1959). The theory posits that knowledge increases individuals' cognitive abilities, which leads to an increased capacity to identify and act on opportunities efficiently and productively (Becker, 1964; Davidsson & Honig, 2003; Schultz, 1959). It is thus expected that those

with higher HC have increased potential to benefit in an environment with entrepreneurial opportunities.

Davidsson and Honig (2003) argued that HC increases firm performance, although it does not necessarily contribute to persistence. According to Becker (1964), education and training are the two most significant contributors to HC. On the other hand, Davidsson and Honig (2003) distinguished two types of knowledge. First, tacit knowledge, which refers to know-how and is usually gained informally through experience; family HC, as referred to by Whetten et al. (2014) could be a good example of this. Fairlie and Robb (2008) found that children whose parents are self-employed have three times more propensity to start a business than do their peers. In addition, if those children had worked in the family business before starting their own, then their businesses are likely to perform at least 15 to 27 per cent better than their counterparts who did not enjoy the same benefit. This confirms the value of family HC. The second is explicit knowledge, known as know-what. This is gained through formal education and documented policies and procedures. Thus, according to Davidsson and Honig (2003), a combination of tacit and explicit knowledge is required to increase HC. They further argued that entrepreneurial decision-making draws from both these types of knowledge.

Upon witnessing conflicting data in existing research regarding the efficacy of education and training targeted at entrepreneurs, Aboobaker and Renjini (2020) pursued a study aimed at examining the effect of university-level entrepreneurial training on the HC of students and whether HC mediates the relationship between entrepreneurial training and entrepreneurial intention. There are two dimensions of HC, general and task-specific. Aboobaker and Renjini (2020) and Marvel et al. (2016) argued that both are associated with entrepreneurial ability even though their impact differs depending on the stage in the entrepreneurial journey. They found that entrepreneurial training and education effectively

elicit entrepreneurial intention and that HC mediates this relationship. They argued that entrepreneurs with high levels of HC are more likely to perform better in business; also confirmed by Arshed et al. (2021).

The above affirms Solesvik (2017), who had identified HC as a critical factor in determining the success or failure of entrepreneurial ventures. Hsiao et al. (2016) identified that HC mediates the relationship between an individual's internal locus of control and entrepreneurship. Fisher (2012) found a relationship between means-at-hand and success at the level of opportunity recognition. More specifically, when entrepreneurs focus on the resources at their disposal, there is increased success. This is more realistic and actionable, rather than trying to action opportunities discovered through predictive strategies. From the above, it can be concluded that there is a link between means at individuals' disposal and firm performance. Some questions remain unanswered: What if the entrepreneur means are weakened by the intersection of factors such as race and age? What does this do to the entrepreneur behaviour–performance relationship?

Charney and Libecap (2000), and Sharp et al. (2018) argued that HC gained through a post-graduate qualification would likely lead to technology entrepreneurship. On the other hand, Fairlie and Robb (2008), Lerner et al. (1997), and Meyer (2020) argued that HC emanating from the founder's industry experience has a strong positive correlation to business success.

Both HC and SC are argued to be vital for the business success (Hikido, 2018; Portes & Rumbaut, 2006), and so is ESE (Hmieleski & Baron, 2008; Renko et al., 2021; Wang et al., 2018). This confirms the impact of entrepreneur resources on the performance of businesses, notwithstanding the choice of entrepreneur behaviour.

2.3.2.3 Social capital – Who(m) do I know?

Davidsson and Honig (2003) examined the effects of both HC (level of education and industry experience) and social capital (SC) (extended family, friends and access to organisations) on firm performance. Of particular interest in this section is SC; it is argued that SC is multidimensional in that it happens at both the individual and organisational levels (Davidsson & Honig, 2003; Nahapiet & Ghoshal, 1998). Generally, SC is defined as the sum effect of the network from which resources can be drawn (Bourdieu & Wacquant, 1992; Conley, 2018; Felix-Faure, 2021). However, Davidsson and Honig (2003) broke it into two types; bonding and bridging SC. Bonding capital is when an individual can access family and close friends who own businesses. On the other hand, membership in professional organisations is considered bridging SC. Between the two, bonding capital is considered a strong tie as it provides more consistent secure support and access to resources. Bridging SC is considered a weak tie and is helpful in providing access to information and a platform for networking. They also found that bridging SC tends to be accessed only as a second option, especially when one has weak bonding SC. Overall, they found that individuals with higher bonding SC are more likely to start a business. Once the business starts, bridging SC plays a more significant role. They concluded that maintaining the balance between the two types of SC is essential in the entrepreneurial journey (Davidsson & Honig, 2003).

Having been exposed to the data that some groups of people have a higher inclination to start businesses than others have; Whetten et al. (2014) explored how these groups differ in entrepreneurial activity. They argued that the difference mainly arises from the richness of family capital to which these groups have access. They name three types of family capital that people can tap into, each with its distinctive advantage: HC, SC, and financial capital. Family HC is the informal and formal intergenerational transfer

of information on how to do business, partly what Davidsson and Honig (2003) referred to above as bonding SC. This adds another dimension to the human capital theory. Besides HC gained through education and industry experience, there is HC gained through SC (passed on through family experience, albeit through informal conversations and observations). Family SC relates to the special consideration, value, and recommendations ascribed to family members and the long-term relationships held by those families to eliminate or disempower other potential competitors (Dyer & Singh, 1998; Whetten et al., 2014). On the other hand, family financial capital pertains to financial and physical resources that entrepreneurs can draw upon through the pooling of resources by family members, thus providing quick access to capital and a safety net in times of need (Whetten et al., 2014). In addition, family SC can have a powerful influence on stakeholders because family commitments are likely to be more trusted and enduring because obligations are generally shared within the immediate family and might extend to distant family members.

Overall, Whetten et al. (2014) further argued that the distinct advantage of family capital, regardless of type, is that not only is it impossible to imitate, but it also enables quick mobilisation, is cheaper to secure, and moves swiftly from generation to generation. Prior, Fairlie and Robb (2008) had argued that businesses perform between 15 and 27 per cent better if the founder had been exposed to and worked in a family business before founding their own; this is a result of shared trade secrets and industry knowledge. Having said that, Whetten et al. (2014) argued that the value of this capital lies not in its existence but in the entrepreneur's ability to tap into it, a sentiment previously raised by Davidsson and Honig (2003) and later confirmed by Chidakwa (2015).

Chidakwa (2015) also affirmed the importance of individuals' SC and argued that it could be considered as one's means at hand. Through the extended effectuation framework, they posited that what is central to the entrepreneurial journey is converting

SC into opportunities and other physical resources needed in business. After all, the SC theory is about individuals' ability to extract benefits from the social networks provided by extended family, friends, colleagues, and organisations (Davidsson & Honig, 2003).

Hikido (2018) investigated the interracial SC in South Africa concerning black women operating township-based tourism businesses. They argued that black women who have been systematically excluded from the economy have had to strengthen their SC by developing ties with white Europeans and South Africans, to draw from their capital. They argued that this interracial transference demonstrates the deep inequalities that exist and the extent of the undertakings that the marginalised must go through to access resources. They nurture these weak ties with their white counterparts into strong ties that enable their growth.

Alene (2020) explored what determines the performance of women entrepreneurs in micro and small businesses operating in Gondar City, Ethiopia. They found that a combination of social, human, and physical capital attributes are significant contributors, while personal attributes such as age and marital status have less of an impact. The hypotheses (H) proposed in this study agreed with Alene (2020) regarding the significant contributors, but proposed differently regarding personal attributes like age.

Tsotetsi, 2020) found evidence that entrepreneurs tap into 'whom they know' SC as available means to identify opportunities and develop and grow their businesses. Vasconcelos Scazziota et al. (2020) also sought to understand the possible overlaps between strategies employed in bricolage and EEBs. They argued that SC is a shared strategy between the two and that its value as a resource is more apparent under pressure-filled conditions and in instances of institutional gaps. The reference to SC as means is noticeable.

Pidduck and Clark (2021) tapped into prior research (Friedman et al., 2015; Friedman & Laurison, 2020) that argued that in some instances, strong community-based SC can provide better resources needed for business than family SC and family HC. They argued that sociocultural resources soften the blow caused by barriers to resource accumulation faced by marginalised entrepreneurs.

Felix-Faure (2021) undertook a study to unpack the barriers to township entrepreneurship in South Africa concerning the persisting effects of racial discrimination and segregationist policies of the apartheid government. They found that most people who live in the township are of low economic status. Therefore, their social networks are not conducive to strong SC that can contribute effectively to their entrepreneurial journey.

The above literature demonstrates that SC is important as one of the resources that entrepreneurs can tap into in their entrepreneurial journey. However, there are nuances to the types of this capital; it is not a one-size-fits-all phenomenon.

Both HC and SC are argued to be vital for the business success (Hikido, 2018; Portes & Rumbaut, 2006), and so is ESE (Hmieleski & Baron, 2008; Renko et al., 2021; Wang et al., 2018). This confirms the impact of entrepreneur resources on the performance of businesses, notwithstanding the choice of entrepreneur behaviour.

Based on the above literature review about intangible resources (entrepreneur means), the following was hypothesised:

- **Hypothesis** Technology founders often rely on entrepreneur means (intangible resources) to achieve performance.

2.4 Effectuation and Firm Performance in the Technology Sector

The effectuation-causation behaviour framework has been widely used in entrepreneurship research, as it provides a useful way to understand how entrepreneurs

make decisions and act in their ventures. Effectuation has been described as a “logic of control”, as it focuses on leveraging existing resources and networks to create new opportunities (Sarasvathy, 2001b, p. 2). This approach is particularly relevant in technology entrepreneurship, where entrepreneurs often have limited resources and must be creative and flexible to succeed. In this context, several studies have examined where technology entrepreneurs sit in the effectuation-causation matrix. For example, Sarasvathy (2001) found that successful technology entrepreneurs use effectuation more than causation, as they focus on leveraging their existing resources and networks to create new opportunities.

Chandler et al. (2011) conducted an empirical study of decision-making by entrepreneurs under conditions of uncertainty, developing and validating measures for both causation and effectuation approaches appropriate for new venture creation. Their study tested these measures using two samples of entrepreneurs operating in young ventures. The results were the development of Likert-type measures for effectual constructs. These validated measures have been used widely and were applied in this study, albeit on a seven- instead of five-point Likert scale. Of more interest in the discussion of their study is that experimentation, which is a construct of effectuation, is positively associated with uncertainty. Based on this, it can be deduced, albeit cautiously, that there is a positive link between technology entrepreneurs and effectuation merely because they are known to operate under conditions of uncertainty (Sarasvathy, 2001). This caution is warranted since Tran (2020) found that the relationship between effectuation and uncertainty had unexpected consequences.

Urban and Heydenrych (2015) affirmed the above deduction through their findings about uncertainty in the technology sector and the link it has to effectuation. The context of their study was South Africa’s renewable energy sector. Their primary aim was to

understand the relationship between effectuation, technology orientation, and firm performance. They found that some effectuation constructs are positively associated with firm performance and technology orientation. They argued that the highly prevalent uncertainty in technology-orientated firms links it to effectuation. This uncertainty is due to several factors, including differences in the return on investment and the output generated; the constant threat of rivals that can completely topple the company even before the returns are realised. They argued that this level of uncertainty makes non-predictive strategies, closely associated with effectuation, necessary. Their study is relevant and of interest to this study because it was also done quantitatively in a developing country context, specifically South Africa and the technology sector.

In 2012, Mthanti (2012) conducted a study to examine the potential of effectuation in enhancing technology commercialisation among medium- and high-level technology companies in South Africa. They investigated three relationships through a quantitative survey that employed multi-regression analysis and made several significant discoveries. The research revealed that EO in technology companies and a challenging business environment stimulates effectual behaviour. Consequently, Mthanti (2012) advocates against financiers and other stakeholders relying on predictive measures like business plans when dealing with technology entrepreneurs. Instead, they should consider funding small-scale pilots and experimental efforts to benefit the technology ecosystem.

In another study, Chidakwa (2015) investigated the relationship between effectuation and the performance of technology-based firms in Zimbabwe. The study was quantitative, and data was collected from 127 technology firms. The findings revealed that effectuation positively influences the performance of technology-based firms. In addition, effectual entrepreneurs are more likely to identify and exploit business opportunities, have a higher tolerance for uncertainty, and better adapt to a changing environment. The study

also found that effectuation had a stronger positive influence on small- and medium-sized technology firms' performance, than it did on larger ones. Chidakwa (2015) concluded that effectuation is a useful approach for technology firms, particularly small- and medium-sized firms, to improve their performance by enabling them to identify and exploit opportunities while dealing with uncertainty and rapidly changing market conditions.

The link between effectuation and uncertainty is a recurring theme in the literature. Technology entrepreneurs often operate under conditions of high uncertainty, making effectuation an appealing approach. The studies conducted by Chidakwa (2015), Mthanti (2012), Sarasvathy (2001), and Urban and Heydenrych (2015) provided evidence of the positive association between effectuation and uncertainty in the technology sector. The findings suggested that effectuation allows entrepreneurs to navigate uncertainty by employing non-predictive strategies and adapting to rapidly changing market conditions. However, Tran (2020) presented a counterpoint by challenging the assumed relationship between effectuation and uncertainty.

Tran (2020) conducted a study to identify two conceptual drivers of effectuation-causation, uncertainty and culture, and explore their influence on entrepreneurs' decision-making in new venture creation. The study argued that the tightness of an entrepreneur's perceived culture and their interpretation of uncertainty as a threat can influence their decision-making, potentially leading to a preference for causation. Tran (2020), however, did not find any evidence in support of the seminal idea by Sarasvathy (2001) and the findings of many others (Alsos et al., 2016; Chandler et al., 2011; Chidakwa, 2015; Mthanti, 2012; Urban & Heydenrych, 2015) that effectuation is preferred over causation under conditions of uncertainty. This is a significant revelation since the link between effectuation and uncertainty has been assumed for as long as effectuation has been in the scholarly corridors.

Moreover, a meta-analysis conducted by Chen et al. (2021) revealed a stronger relationship between effectuation and performance in high-technology industries compared to other industries. This aligns with the findings of previous studies that have specifically linked effectuation to technology and high-level technology firms.

Overall, the literature reviewed underscores the relevance of the dichotomy of effectuation and causation behaviour in understanding the decision-making process of technology entrepreneurs. While effectuation appears to be a valuable approach, particularly in the face of uncertainty, contextual factors, such as cultural and economic influences and individual perceptions, can shape the choice between effectuation and causation. Future research should continue to explore these nuances and further investigate the conditions under which effectuation is most beneficial for technology entrepreneurs.

2.5 Entrepreneur Behaviours and Firm Performance through Entrepreneur Means

This section analyses extant scholarly literature on the relationship between effectual and causal entrepreneur behaviours, their impact on firm performance, and the role of entrepreneur means. The available evidence indicates a significant connection between entrepreneur behaviour and the overall performance of firms (Sampson, 2017; Wiklund & Dean, 2003). Entrepreneur behaviour encompasses the underlying reasons, and decision-making processes individuals employ during their entrepreneurial endeavours (Hinz, 2017; McMullen & Shepherd, 2006). In addition, McDougall et al. (2003) contended that although considerable attention has been given to the study of entrepreneur behaviour within developed economies, the findings might not necessarily be directly applicable to developing economies.

Many authors (Kolakowski, 2017; Malinga, 2018; Mthanti, 2012; Urban & Heydenrych, 2015) have responded to the call made by Chandler et al. (2011), Perry et al. (2012), and Read et al. (2009) to advance effectuation research by testing its constructs against other variables in entrepreneurship research. This advanced enquiry moves the theory of effectuation from just a description of entrepreneurial behaviour to one that builds up performance measures, thus offering insight into drivers of entrepreneurial success (Heydenrych, 2013).

In a study that sought to investigate whether causation and effectuation are interchangeable in entrepreneurial firms, Kolakowski (2017) found that effectuation could be related to profit growth in environments of high technical and market uncertainty and that causation negatively correlates with profit growth.

Heydenrych (2013) conducted a quantitative study of 73 firms in the renewable energy sector in South Africa to investigate the critical drivers of success by showing the levels of effectual logic and technology orientation and the resultant impact on performance within those firms. The significance of their study is the insight it gives for high-level technology, hyper-growth sectors concerning the use of effectual logic. They found that the positive impact of effectuation on firm performance was stronger for firms with lower levels of resource availability, suggesting that effectuation could be a valuable approach for firms operating in resource-constrained environments.

Yu et al. (2018) investigated the contingent effects of causation and effectuation on firm performance in 312 technology firms in China. They concluded that causation dominates in situations with a lower uncertainty in emerging economies, while effectuation is adopted when environmental uncertainty is high. Both causation and effectuation correlate with firm performance in emerging markets, albeit in different ways, depending on the level of environmental uncertainty. Besides the study being conducted in an

emerging market, another commonality between the studies of Heydenrych (2013) and Yu et al. (2018) is that both used validated scales developed by Chandler et al. (2011). However, they used a combination of seven- and five-point Likert scales, whereas this study used a seven-point Likert scale for both effectuation and causation.

Laskovaia et al. (2022) explored the link between harmonious passion, effectuation, and firm performance in 105 United States firms. They discovered positive correlations between harmonious passion and effectuation, as well as between effectuation and firm performance. Moreover, the study found that effectuation mediated the relationship between harmonious passion and firm performance. Although not discussed at length in the study by Laskovaia et al. (2022), it is important to note that their study was not limited to the mediation analysis but was extended to other relationships, including a moderated mediation, like this study.

Another comprehensive review by Zhang et al. (2023) examined 31 studies on the effectuation-causation entrepreneur behaviour framework and firm performance. Their findings supported that entrepreneur behaviours significantly correlate with firm performance, with effectuation demonstrating a slightly stronger relationship. They also confirmed that effectuation is particularly effective for firm performance within emerging market environments, consistent with the findings of Yu et al. (2018).

In conclusion, the literature review on the relationship between entrepreneur behaviour and firm performance highlights several key findings and insights. Many authors have responded to the call for advancing effectuation research by examining its constructs in relation to other variables in entrepreneurship research. This advancement has shifted the theory of effectuation from a mere description of entrepreneur behaviour to one that contributes to performance measures and offers valuable insights into the drivers of entrepreneurial success. Overall, these studies contribute to a deeper understanding of

the relationship between entrepreneur behaviour and firm performance and highlight the importance of considering contextual factors such as environmental uncertainty and resource availability. Furthermore, they demonstrate the potential value of effectuation as a strategic approach for entrepreneurs operating in dynamic and resource-constrained environments. However, further research is needed to explore the nuances and contingencies of this relationship in different contexts and industries. Therefore, the following has been hypothesised:

- **Hypothesis** There is a significant positive relationship between effectual entrepreneur behaviour and firm performance in the South African technology sector.
- **Hypothesis** The relationship between effectual entrepreneur behaviour and firm performance is mediated by entrepreneur means.

2.6 Effect of Race and Age on Entrepreneur Means

Intersectionality demonstrates the complexity of various factors that affect the marginalised (Martinez Dy, 2020). An intersectional lens recognises that people are more than just one aspect of their lives but that their lived experiences result from the interconnectedness of various attributes (Acker, 2000; Martinez Dy, 2020). Seen in the context of race in South Africa within an entrepreneurial environment, this means not all Black entrepreneurs experience inequality similarly. For example, there is a difference between how a black 21-year-old male and a black 40-year-old male would experience a business start-up. There are many variations, for example, LGBTQ+, disabled, and immigrant; these iterations affect resource distribution and general positionality in society differently.

Overall, this study explored the intersections of race and age as simultaneous processes of identity that influence entrepreneur means, affecting the relationship between entrepreneurial behaviour and firm performance. The intersections of race and age have not been widely studied, at least not in the context of entrepreneurship; popular intersectionality studies centre on race and gender (Fairlie, 2005; Gornall & Strebulaev, 2020; Wingfield & Taylor, 2016). While there are several studies on race and entrepreneurship and a few on age and entrepreneurship, very few look at the intersections of both; very few, if any, consider how that affects entrepreneur means. Fried and Tauer (2009) attempted to close this gap by creating a multi-factor index of entrepreneurial success; they considered the effects of the founders' age, experience, gender, race, competitive advantage, education, and even birthplace.

Scholars that have looked at the intersectionality of race and age within the entrepreneurial sphere include Sharp et al. (2018), who conducted an empirical study to test the influence of the demographic variables of gender, age, and race on the EO of small businesses in the Eastern Cape. The findings were that gender and age do not influence the EO dimensions investigated, whereas racial differences were noted on a dimension of EO, whereby white individuals were more risk-averse than non-white individuals.

Regarding race, there is a temptation to theorise against the lens of the critical race theory. Critical race theory is about providing a voice against a pervasive system of white supremacy and its resultant impact (Poole et al., 2021). Moreover, it is about deliberately opposing white supremacy and all its effects. Their study considered and referred to the framework of critical race theory; however, since it is concerned with the ripple effect of the interconnectedness of two demographic variables, the main lens is intersectionality theory.

Intersectionality theory is linked to the seminal works of Crenshaw (2011), which looked at the different ways that people experience privilege or prejudice due to an overlap of various demographic factors or social constructs (Poole et al., 2021). This study sought to move from fighting, challenging, or advocating against white supremacy to understanding its effects and nuances so that redress can occur. In fact, this study argued for conceptualising the intersections of race and age within the social practice of entrepreneurship in South Africa. Deskins and Ross (2018) acknowledged that several studies have explored many factors that explain the disparity in black and white entrepreneurship. These studies have alluded to various reasons, including prejudice by financiers (Blanchard et al., 2008; Deskins & Ross, 2018; Fairlie & Robb, 2008).

Beresford (2021) conducted a 13-month ethnographic study of white South African entrepreneurs versus black South African entrepreneurs concerning resource distribution. The study concluded that the capacity of entrepreneurs to produce is highly dependent on what Beresford (2021) referred to as distributive resources that are at their disposal. It also concluded that these do not function optimally for all entrepreneurs in a country with high racial inequality. Their study further concluded that more studies on distributive activities among entrepreneurs of different socio-economic statuses would help clarify how distribution affects the entrepreneurial path.

On the other hand, Michaelides (2020) conducted a study in South Africa and arrived at similar conclusions that almost all white entrepreneurs, even those from average wealth families, had at their disposal, access to pools of financial and non-financial intergenerational wealth, which helped in either starting or sustaining their businesses. In addition, white entrepreneurs had direct social networks that gave them access to various resources, whereas their black counterparts primarily relied on access provided by government agencies such as SEDA.

Fairlie and Robb (2008) posited that beyond the issues of business ownership by the previously disadvantaged, society should be concerned with finding the reasons why their businesses tend to be smaller and less successful than their counterparts. This was affirmed by Ramana et al. (2009), who argued that not much attention had been given to the effect of demographic factors on entrepreneurial success.

Zivdar et al. (2017) conducted an explorative study of inputs of the decision-making process of technology entrepreneurs in their new venture creation. Although this was in the context of Iran, the study found that both the national macro-environmental factors and individual factors play a significant role in shaping the behaviour of a technopreneur, and those economic factors have a permanent impact on the decision-making of entrepreneurs.

It is argued that racial effects are best understood when race is intersected with other personal and group effects (Jackson et al., 2010). In the case of this study, it was intersected with the age of the entrepreneur; the age variable is linked to the lifespan theory and argues for the importance of looking at the different personal and societal variables, including the historical context and structural positioning factors along demographic lines that affect the behaviour of entrepreneurs and, consequently, their firm performance.

Lifespan theory posits that although development occurs through the passage of time, it is affected by both the cultural and historical contexts of individuals (Jackson et al., 2010), and with the change in these contextual factors, so do the behavioural and developmental effects change (Baltes & Nasselroade, 1979; Jackson et al., 2010).

In a book chapter seeking to offer an understanding of how inequality affects the life course and lifespan development (Fingerman, 2011; Jackson et al., 2010), and that advantaged individuals have greater access to material, as well as social and economic

resources, thus giving them a better chance at withstanding any adverse life experiences, individually and as a group. Further, they hypothesised that the lack of resources available to disadvantaged individuals leads them to rely more on their own resilience and strength. Because these are so varied, as a group, their ability to weather the storm varies widely and is unpredictable. Fingerman (2011) and Jackson et al. (2010) concluded that social disparities have a profound effect on the behavioural and developmental effects of individuals. They argued that these disparities take place at individual, group, and structural levels and include filters such as race, gender, age and even geographical locations; power dynamics are at the core of these disparities, which ultimately culminate in differential inter-individual and intergroup outcomes (Fingerman, 2011; Griffin & Jackson, 2009; Jackson et al., 2010). Moreover, they contended that comprehending this connection is crucial due to the multi-linear and unpredictable nature of human development, from birth to their demise (Baltes & Nasselroade, 1979; Jackson et al., 2010). Consequently, studying lifespan development necessitates a thorough exploration of the intricate interplay between the social context (specifically, an unequal society in the context of this study), other variables (such as demographic factors), and their diverse effects on individuals' responses to various situations (focusing on entrepreneur behaviour in this study). Although it cannot be asserted that shared identities result in uniform outcomes, the intersectionality theory can be employed to grasp how social inequalities influence and contextualise lifespan development, without following a hierarchical structure.

Liang et al. (2018) posited that entrepreneurial capability depends on two problems linked to age. The first is that unencumbered young individuals are capable of innovation and original thought, but this ability and kind of freethinking declines with age. The second is business acumen, which is gained through experience and exposure and

increases with age. They further explored the relationship between race and age and entrepreneurship, highlighting the inverted U-shape pattern of entrepreneurial capability, with young individuals having innovation potential and older individuals accumulating business acumen through experience. They suggested that effectuation might be more prevalent among experienced entrepreneurs, possibly due to their access to accumulated means and robust HC and SC. Liang et al. (2018) concluded that age is the most important determinant of entrepreneurial activities, with the likelihood of entrepreneurship peaking at young-middle-age.

According to several authors (Sarasvathy, 2001; Sarasvathy & Dew, 2008; Woetmann, 2014), there exists a distinction between the decision-making process of novice entrepreneurs and experienced entrepreneurs. It has been observed that established entrepreneurs more commonly adopt effectuation than do novices. Experienced entrepreneurs tend to focus on what they can achieve based on their existing resources, rather than what they should aim to accomplish. The authors propose that novice entrepreneurs should be encouraged to adopt effectuation, as they face higher levels of uncertainty where effectuation might be better suited. This raises the question of whether effectuation is more prevalent among expert entrepreneurs due to their accumulated expertise or their access to resources that come with time and experience, resulting in stronger HC and SC. The term ‘expert’ implies the accumulation of experience, which requires time and effort, consequently contributing to HC and SC. This leads to the question of whether ‘age’ is positively correlated with entrepreneur resources.

The reviewed studies shed light on the disparities faced by black entrepreneurs, including issues of access to resources, prejudice from financiers, and the role of distributive activities in shaping entrepreneurial paths. The authors also emphasise the role of contextual factors, historical context, and structural positioning along demographic lines

in influencing entrepreneurial behaviour and development. Additionally, the review explored the relationship between race, age, and entrepreneurship, highlighting the inverted U-shape pattern of entrepreneurial capability, with young individuals having innovation potential and older individuals accumulating business acumen through experience. The literature suggested that effectuation might be more prevalent among experienced entrepreneurs, possibly due to their access to accumulated means and robust HC and SC. Overall, these studies underscore the importance of considering the intersections of race and age as simultaneous identity processes within the entrepreneurial sphere. It called for further research investigating the complex relationships among demographic variables, social context, and their impact on entrepreneur behaviour and firm performance. By recognising the interconnectedness of various demographic factors, the studies offer a nuanced perspective on the experiences of marginalised individuals in entrepreneurship. The studies acknowledged that social disparities exist at individual, group, and structural levels, emphasising the importance of power dynamics in shaping differential outcomes. However, what was apparent in the review is the relatively limited number of studies specifically focusing on the intersectionality of race and age within entrepreneurship. While there is extensive research on race and entrepreneurship and some on age and entrepreneurship, the intersectional analysis remains underexplored. This limitation underscores the need for further empirical studies that explicitly investigate the joint effects of race and age on entrepreneur behaviour and firm performance. Another gap is that of studies demonstrating the underlying mechanisms and processes linking intersectional identities, entrepreneur means, and firm performance. Exploring the mediating and moderating factors within this context would enhance the understanding of complex relationships. Therefore, the following has been hypothesised:

Hypothesis The mediating effect of entrepreneur means in the relationship between effectual entrepreneur behaviour and firm performance is significantly moderated by the intersection of race and age.

2.7 Chapter Conclusion

Based on the comprehensive literature review, it is evident that entrepreneurs in various stages of their businesses, including those in South Africa, widely adopt effectual logic. Multiple studies concur that the use effectuation positively correlates with entrepreneurial success. Consequently, it is recommended that effectual principles be instilled from the nascent stage of business to enhance firm performance (Leong et al., 2016; Sarasvathy, 2001; Sarasvathy & Dew, 2008; Woetmann, 2014). The relationship between effectuation and firm performance is particularly pronounced among technology entrepreneurs.

Additionally, substantial evidence supports the link between entrepreneur means and the demographics of individual entrepreneurs (Greve & Salaff, 2003; Liang et al., 2018; Pidduck & Clark, 2021; Sarasvathy, 2001). Essential entrepreneur means, such as ESE, HC, and SC, have been established (Hikido, 2018; Hmieleski & Baron, 2008; Portes & Rumbaut, 2006; Renko et al., 2021; Wang et al., 2018) but they have often been studied separately instead of being considered as interrelated components. This study contributed significantly to recognising these forms of capital as interconnected sub-constructs of entrepreneur means.

Furthermore, the literature provides strong evidence of the influence of entrepreneur means on business performance. However, there remains uncertainty about how precisely it has an impact on the choice of entrepreneur behaviour. The application of the intersectionality lens to entrepreneurship is relatively new, particularly in the context of

South Africa. Nonetheless, its significance in entrepreneurship studies cannot be underestimated. In conclusion, the conceptual framework of this study (see Figure 2.1), as discussed in the initial chapters, captured the key elements and relationships explored in the literature review.

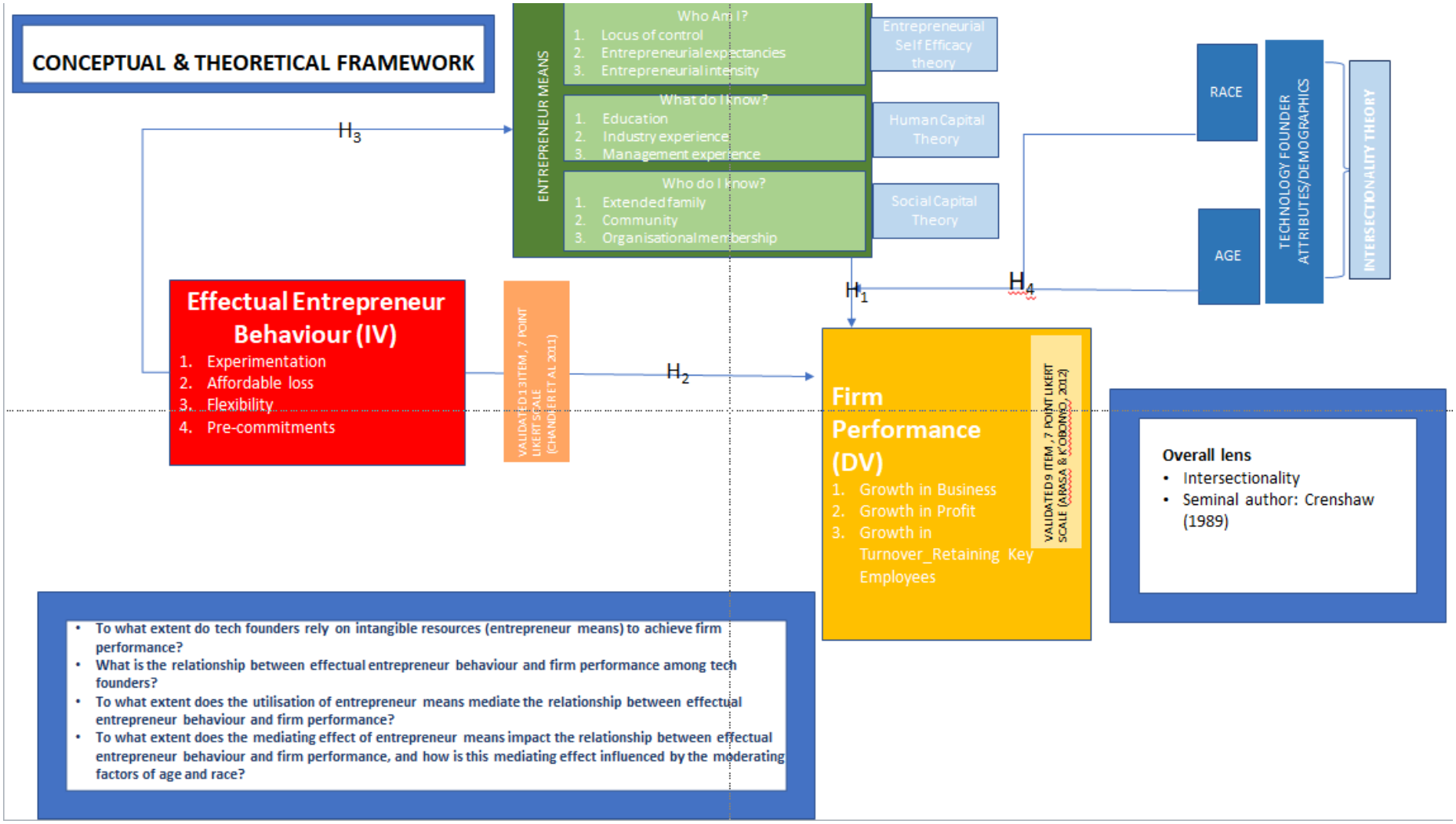

Figure 2.1: Conceptual and theoretical framework

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Introduction

Research serves various purposes, leading to the adoption of specific research types tailored to the study's objectives. As identified by Dani (2021), four distinct research types include exploratory, descriptive, diagnostic, and hypothesis testing. This study aligned with the hypothesis testing research type, as it aimed to empirically examine and evaluate relationships between different variables.

This chapter provides a comprehensive overview of the research methodology utilised in this study, covering essential aspects. First, the research philosophy underpinning this study is elucidated, establishing the theoretical framework that shaped the overall approach. Additionally, the chapter expounds on the chosen research design, outlining the overall structure and strategy used to address the research questions. Moreover, the conceptual framework employed in this study is presented, defining the relationships between concepts.

Furthermore, significant elements like essential variables, measurement models, and instruments are detailed, as they play pivotal roles in operationalising the research constructs. The methods used for data collection and data analysis are also explicated, shedding light on the techniques employed to acquire and analyse relevant data.

It is worth noting that the decisions concerning the research methodology were guided by the research objectives and questions, following the research onion model developed by Saunders et al. (2020), which provided a systematic and layered framework for designing and implementing the study, as depicted in Figure 3.1.

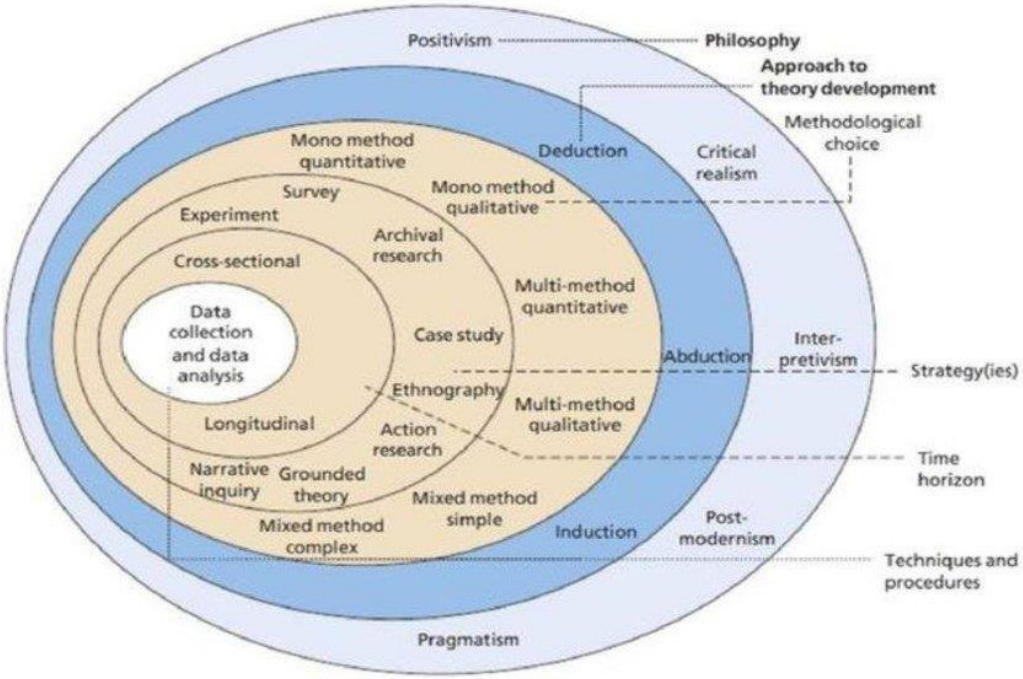

Figure 3.1: Research onion

(Saunders et al., 2020, p. 124)

3.2 Research Philosophy and Approaches to Development

Creswell and Creswell (2018), and Saunders et al. (2020) highlighted the importance of considering philosophical assumptions in research planning, as these influence research design and methods. This study adopted a critical realist philosophy, which aims to explain observable behaviour by investigating the multi-layered social structures that have shaped them. This suggests that social events and outcomes are not solely determined by observable patterns but are influenced by deeper underlying mechanisms and socially embedded structures that might operate context-dependently. While critical realism excels in recognising that social realities are shaped by historical, cultural, and structural factors, enabling a comprehensive analysis of the broader context in which social phenomena occur, it can present difficulties in identifying and comprehending the fundamental causal mechanisms and structures that shape social reality. However, by combining quantitative methods with critical realism in this study,

numerical data can be interpreted within its social context, uncovering underlying causes and mechanisms.

Linked to the critical realist philosophy is abductive reasoning with a shared goal of understanding and explaining phenomena. Abductive reasoning can be seen as a tool for critical realists to formulate and test hypotheses used within critical realism to generate plausible explanations for the observed phenomena, which involves researchers observing social occurrences, developing hypotheses and testing them, ultimately contributing to theory development (Ketoviki & Mantere, 2010; Muhaise et al., 2020; Saunders et al., 2020).

3.3 Research Strategy

A research strategy is an essential framework that guides researchers in answering their research questions. In line with Saunders et al. (2020), who presented various research strategies, including experiment, survey, archival/documentary research, case study, ethnography, action research, narrative inquiry, or grounded theory, the chosen research strategy should be carefully justified and aligned with the research objectives. In this study, a quantitative cross-sectional survey was deemed the most appropriate methodological choice to incorporate an intersectionality lens in investigating how the race and age of entrepreneurs affect their means and the relationship between their chosen behaviour and the performance of their firms.

To implement the survey method, respondents were requested to reflect on a specific point in their entrepreneurial journey, categorised based on the first three years post-launch and the most recent three years. It is worth noting that some respondents might have fallen into both categories if their operational period spans only a few years. This methodological choice was deemed adequate for addressing the research questions and

was feasible considering the resources available to the researcher. Nevertheless, it is crucial to acknowledge the limitations and challenges associated with this research strategy. One potential limitation could be the reliance on self-reported data, which might introduce response biases or inaccuracies. To mitigate this, steps were taken to ensure the questionnaire was designed with clear and unbiased questions, and in some instances, the same questions were asked in different ways. Another limitation was resource constraints such as time, funding, and access to the target population. These were carefully managed by setting realistic timelines and maximising available networks and enlisting research assistants during participant recruitment. Incorporating these considerations into the research strategy ensured that the study benefited from a well-defined methodology, transparency in approach, and acknowledgement of potential limitations, ultimately strengthening the overall research design.

3.4 Research Design

The survey instrument was formulated based on prior-validated scales encompassing key variables such as causation, effectuation, firm performance, ESE, HC, and SC . Participants provided their responses on a seven-point Likert scale, allowing for nuanced assessments of the variables of interest, in addition to providing demographic details. The survey instrument was rigorously piloted on 42 respondents to ensure clarity, validity, and reliability. The study employed a cross-sectional design and collected data from a niche sample of technology entrepreneurs who had been in operation for at least three years.

Data collected through the survey was analysed using PLS-SEM, enabling the examination of direct and indirect effects. This enabled an examination of the relationship between EEB, firm performance, the mediating effect of an entrepreneur’s means and the

moderating effects of race and age on these relationships. Employing PLS-SEM aimed to provide a comprehensive understanding of the research question.

In conclusion, the research design, including the choice of survey distribution platform, data collection instruments, and statistical analysis technique, provided valuable insights into the relationship between entrepreneur behaviour and firm performance, the mediating effects of entrepreneur means and the moderating effects of race and age.

3.5 Population and Sampling Technique

The population for this study consisted of technology founders who had been operating for at least three years. A sampling frame of 760 individuals in this population was curated specifically for this research. These technology founders were identified through extensive research and industry databases, ensuring that they represented diverse backgrounds and experiences within the technology industry. The questionnaire was distributed to all 760 technology founders in the population rather than using a sampling method. This approach allowed for maximum coverage and representation of the population.

3.6 Sample Size Determination

Determining an appropriate sample size is a crucial aspect of research methodology, and various approaches have been proposed in the literature. In the field of sample size determination, Rahi et al. (2019) presented multiple options from various researchers, including Bollen (1989), Cochran (1977), Comrey and Lee (1992), Hair (2010), Hair et al. (2007), Jöreskog and Örbom (1996), Rahi, (2018), Rahi et al. (2019), and Tabachnick and Fidell (2007). Ultimately, each researcher has to choose the most appropriate sample size strategy to enhance the quality of their studies.

For studies utilising SEM, Hair et al. (2008) suggested a sample size ranging between 200 and 400, while Purwanto and Sudargini (2021) recommend a range of 100 to 200 respondents. Considering the relatively small sample frame of 760 for this study, the target sample size was reasonably set at 150 datasets during the planning phase. Subsequently, upon completion of data collection, an a-priori sample size analysis was conducted as an additional measure.

The sample size determination was done using Daniel Soper a-priori method (Soper, 2022) and the inverse square root method (Ezeugwa et al., 2022; Hair et al., 2021a; Kock & Hadaya, 2018). This analysis revealed an ideal sample size of 155. By adhering to the recommended sample size guidelines and conducting a comprehensive sample size analysis and determination exercise, robust and reliable results were ensured.

3.6.1 A-priori sample size analysis

PLS-SEM is renowned for its ability to work effectively with smaller sample sizes (Hair et al., 2021b; Rahi et al., 2019; Rigdon, 2016). However, researchers should not interpret this as a justification for selecting small samples without considering the characteristics of the population (Rigdon, 2016). Neglecting established sampling techniques and using insufficient sample sizes can lead to type II errors, where the findings from a small sample might not generalise to a larger population. To address this issue and ensure robust results, an a-priori sample size calculation was conducted for this study in addition to the sample size calculation done prior to data collection.

3.6.2 Daniel Soper A-priori method

The first step taken was utilising the Daniel Soper sample size calculator, which is recommended for a-priori sample size determination in SEM (Soper, 2022). This calculator provides the minimum sample size required to detect the desired effect and the minimum

sample needed based on the structural complexity of the model. The calculation requires specifying the number of observed and latent variables in the model, the anticipated effect size, and the desired probability and statistical power levels.

As suggested by Cohen (1988), effect sizes can range from negligible (0.1) to medium (0.3) to considerable (0.5) effects. For this study, a considerable effect size of 0.5 was chosen. Statistical power, conversely, indicates the likelihood of correctly detecting an effect when it truly exists (Jobst et al., 2021). A recommended statistical power level of 0.8 or higher is typically suggested, as higher levels minimise the risk of obtaining incorrect statistical results (Jobst et al., 2021). In this case, a desired statistical power of 0.8 was selected. As for probability levels (also known as the p-values, alpha level, or type 1 error), a value equal to or less than 0.05 is commonly used to claim statistical significance in the social sciences (Aguirre-Urreta & Rönkkö, 2015; Bentler & Yuan, 1999; Hair et al., 2021b). In line with this convention, a probability level of 0.05 was utilised in this study.

Furthermore, the model under investigation consisted of seven latent variables measured through a total of 37 indicator variables. Taking all these factors into account and employing Soper's (2022) a-priori sample size online calculator, a minimum sample size requirement of 42 was determined to detect the effect, while a recommended minimum sample size of 119 was suggested based on the model's structural complexity (refer to Table 3.1).

Table 3.1: A-priori sample size calculation for SEM

DETAIL	PARAMETER	SAMPLE SIZE
Anticipated effect size	0.5	
Desired statistical power level	0.8	
Number of latent variables	7	
Number of observed variables	37	
Probability level	0.05	
Minimum sample size to detect effect		42
Minimum sample size for model structure		119
Recommended minimum sample size		119

Soper (2022)

3.6.3 Inverse square root method

The second method considered was the inverse square root method proposed by Kock and Hadaya (2018) and supported by Ezeugwa et al. (2022), and Hair et al. 2021b). This approach considers the probability that the ratio of a path coefficient to its standard error exceeds the critical value of a given significance level. The results obtained using this method are not dependent solely on a single path coefficient, the complexity of the regression in the formative model, or the overall model size. To calculate the sample size using this approach, assuming a power level of 80 per cent, a significance level of one per cent, five per cent, and 10 per cent can be chosen. For this study, the standard significance level of five per cent was selected, leading to a minimum sample (Nmin) size of 155 as indicated in Table 3.2, which shows the requirements for the different significance levels and varying ranges of path coefficients.

Table 3.2: Minimum sample size requirements

RANGE	SIGNIFICANCE LEVEL		
Pmin	1%	5%	10%
0.05-0.1	1004	619	451
0.11-0.2	251	155	113
0.21-0.3	112	69	51
0.31-0.4	63	39	29
0.41-0.5	41	25	19

3.6.4 Additional considerations

Furthermore, recommendations from Purwanto and Sudargini (2019) suggested a total sample size ranging between 100 and 200. Taking these three approaches into account, Table 3.3 presents the minimum sample size requirements, which were followed to ensure the rigour of the study.

Table 3.3: Minimum sample size calculation

METHOD	MINIMUM SAMPLE SIZE FOR EFFECT	MINIMUM SAMPLE SIZE FOR MODEL STRUCTURE	RECOMMENDED MINIMUM SAMPLE SIZE	REFERENCE
Daniel Soper A-priori Method	42	119	119	Soper (2022); Cohen (1988)
Inverse Square Root Method	155	155	155	Hair et al. (2021b); Kock and Hadaya (2018)
Absolute numbers recommendation	-	-	100-200	Purwanto and Sudargini (2019)

3.6.5 Final sample size for this study

To gather responses, the database was uploaded in its entirety onto the Qualtrics platform, enabling the automatic distribution of questionnaires. Through persistent follow-

ups and reminders, 240 responses (31.6 per cent) were received, some of which were incomplete. Subsequently, after a careful dataset clean-up, a final sample of 159 responses (20.9 per cent) remained for final analysis (n=159).

The data clean up followed the list-wise deletion technique, which allows for the removal of cases with missing pertinent variable data. This approach, recommended by Shibly et al. (2022), and Wang and Aronow (2022), ensures the elimination of bias during case deletion (Mthanti & Urban, 2014). In this study, only those cases that lacked responses for the relationships that were being tested were eliminated. In particular, cases lacking responses for the independent variable (IV), dependent variable (DV), mediator (M) and moderator (W) were removed. This led to the exclusion of 81 cases from the analysis. It is worth noting that most of the cases that were deleted had only provided demographic information and would not have added any value in terms of the relationships being tested.

Overall, these rigorous data collection and clean-up procedures resulted in a robust dataset for analysis, addressing the research objectives with a representative sample of founders of technology companies in South Africa.

3.7 Research Instrument

A research questionnaire was developed using the Qualtrics platform, employing a structured format. The questions relating to the various constructs were presented on a Likert scale, excluding the demographic questions. The Likert scale is widely recognised and utilised for measuring behaviours and attitudes in research studies. Jebb et al. (2021) conducted a comprehensive review spanning 25 years and concluded that the Likert scale remains one of the most effective measurement methods for numerous constructs, thus supporting this significance.

Several reasons influenced the decision to use a seven-point Likert scale in this study. First, the seven-point Likert scale instrument captures participants' true evaluations, while participants are more likely to interpolate responses on a five-point Likert scale, resulting in inaccuracies and manipulated responses (Finstad, 2010). Additionally, employing a seven-point Likert scale helps to mitigate acquiescence bias, which refers to respondents answering without thoughtful consideration (Primi et al., 2019; Spector, 2019). Spector (2019) argued that increasing the number of response options makes it more challenging for the respondents to choose options absent-mindedly. Furthermore, Frey et al. (2018) suggested that a seven-point Likert scale allows respondents to express a broader range of opinions, facilitating differentiation between subtle differences. This enhances the scale's sensitivity, flexibility, accuracy, and reliability (Creswell, 2014; Gliem & Gliem, 2019), thereby bolstering its validity and reliability (Gliem & Gliem, 2019). Additionally, Guo (2019) highlighted that a seven-point Likert scale provides a sufficient range of options to apply parametric statistical analysis techniques, which often rely on multiple response options for increased accuracy and reliability.

To ensure the reliability and validity of the research instrument, validated measures from previous studies were incorporated. Moreover, a pilot study was conducted with 42 respondents to assess factor loadings and identify any potential revisions needed. For the full version of the questionnaire, see Appendix B, however, the structure of the questionnaire is outlined in Table 3.4.

Table 3.4: Questionnaire structure

SECTION	CONTENT
Opening Section	Welcome note and filter questions
Section 1	Demographics & Organisational data – follows the format of Statistics SA & GEM report
Section 2	Firm Performance – follows the five-item scale, seven-point Likert scale format of a measure validated by Sir (2012) and amended to a four-item scale to fit the objectives of this study
Section 3	Entrepreneur behaviour – based on a 17-item scale developed and validated by Chandler et al., 2011) adjusted to a seven-Likert scale
Section 4	Entrepreneur means – based on the three constructs of means posited by Sarasvathy (2001); which are operationalised using a three-item self-efficacy scale developed and validated by Schjoedt and Craig (2017); the four-item human capital scale was developed and validated by Davidsson and Honig (2003)

3.8 Measurement Models

This section examines the different variables and how they were measured and validated in the study. This study had multiple variables that interact at multi-level points. While most of the measures used were based on validated scales, another scale validation exercise was done in the form of a pilot survey. This was done on the first 42 respondents using Statistical Package for the Social Sciences (SPSS). The primary objective of this exercise was to test and refine the research instrument and procedures before proceeding with data collection.

The pilot study results indicated that no amendments were required for the instrument, as most factors demonstrated satisfactory loadings. The assessment of the factor loadings was conducted using Cronbach's alpha, which measures the internal consistency and reliability of a multi-item rating scale. Cronbach's alpha ranges from zero to one, with higher values indicating a greater internal consistency (Schober et al., 2021). In this pilot study, Cronbach's alpha scores for HC and effectuation were below the desired

threshold of 0.70, albeit acceptable at 0.66 and 0.67, respectively. However, the remaining factors exhibited satisfactory scores, ranging from 0.79 for self-efficacy to 0.94 for firm performance. Additionally, an item deletion exercise was performed for both the HC and effectuation factors, resulting in a slight improvement. It was reasonably assumed that a larger cohort of responses would further enhance factor loading. In addition, item deletion during statistical analysis offered the possibility of improving the loadings should the need have arisen. Based on the results of the pilot, there was no need to make any modifications or refinements to the research instrument. Furthermore, the 42 respondents formed part of the final respondents since no modifications were made to the original instrument.

3.8.1 Dependent variables

The firm performance, which served as the sole dependent variable in this study, was operationalised by considering multiple indicators. Specifically, the study focused on three main indicators: growth in profitability (GIP), growth in business (GIB) and growth in turnover_retaining key employees (GIT_RKE). The operationalisation of firm performance was based on a scale developed by Sir (2012) and this study selectively used four of the five indicators from their scale. Esubalew and Raghurama (2021) employed a similar approach by selecting only certain indicators from the scale developed by Sir (2012), just like in this study. This was measured subjectively on a Likert scale through the entrepreneurs' perceptions.

The scale employed in this study encompassed various factors to assess firm performance. First, growth in profitability was measured using three items: growth in net profit, improvement in return on investment from the business and improvement in return on assets from the business, all over the past three years. Second, GIB was measured using four items: achievement of business goals, improvement in life standards after starting the business, growth in personal income since the beginning of the business, and improvement

in income level when comparing before and after the business launch. Third, GIT_RKE was measured using four items: growth in sales from the business and growth in sales compared to competitors, an increase in the number of employees since the beginning of the business and the ability of the industry to retain the organisations' best and most talented people.

Respondents' perceptions of their firm's performance were assessed using a Likert scale. This quantitative framework allowed for the evaluation of subjective assessments of firm performance. The Likert scale consisted of multiple items expressed in statements designed to prompt respondents to reflect on two distinct periods in their entrepreneurial journey: the first three years of their business and the most recent three years.

In the literature, Sir (2012) discussed firm performance as the ability of a company to utilise its resources effectively in the face of competition and other external pressures. This aligned with the conceptualisation of firm performance in this study. Furthermore, the work of Wheelen et al. (2015) and Adebisi et al. (2015) also supported the idea that business performance is linked to the efficient utilisation of resources, including both financial and non-financial measures.

3.8.2 Independent variables

This study considered EEB as the independent variable. Through the measurement of this variable, implicit exploration of causal entrepreneur behaviour occurred, as the latter represents a behaviour situated at the extreme opposite end of the effectuation spectrum. It is important to note that Sarasvathy's (2001) conceptual threshold suggested that entrepreneurs tend to exhibit either an effectual or causal mode of thinking.

To assess the levels of effectual logic, a scale developed and validated by Chandler et al. (2011) was utilised. While the researchers originally employed a five-point Likert scale, for this study, the scale was adapted to a seven-point Likert scale ranging from

strongly disagree to strongly agree. Effectual logic was operationalised through eight items, capturing factors such as experimentation, affordable loss, flexibility, and pre-commitments. This study aimed not to measure variability in effectuation levels versus causal levels, but to examine the levels of effectual logic in the participants and their individual relationships to firm performance.

3.8.3 Mediating variable

The mediating variable for this study was entrepreneur means (intangible resources), which was operationalised using Sarasvathy (2001), where they argued that means-at-hand could be best understood by asking three questions, 'who am I', 'what do I know', and 'whom do I know'. These questions reveal intangible resources connected to ESE, SC, and HC, as follows:

- *Who am I?* – This was measured using ESE, covering locus of control, entrepreneurial expectancies, and entrepreneurial intensity. An amended version of a unidimensional three-item self-efficacy scale for assessing a person's self-belief in successfully creating a new business, as developed and validated by Schjoedt and Craig (2017) was utilised. In the original study, the three items demonstrated stability with a Cronbach score of 0.70 on a five-point Likert scale. However, this study modified it into a seven-point Likert scale; no other amendments were made.
- *What do I know?* – This was measured using a four-item human capital scale covering the level of education, management experience in years, overall work experience in years and previous start-up experience. The original developer of this validated scale is Davidsson and Honig (2003).
- *Whom do I know?* – This could be understood by looking at an individual's network or sphere of influence, referred to as SC. It was measured using a four-item social capital scale covering parents who are in business, encouragement by

friends or family, close friends or neighbours who are in business, and the respondent's marital status. Davidsson and Honig (2003) developed and validated this scale.

3.8.4 Moderating variables

The demographic data collected encompassed the age and race of the founders and their co-founders. The data were pertinent and was intersected and used as moderating variables in the conditional mediation (CoMe) analysis. CoMe analysis merges both mediation and moderation assessments to explore and validate theories regarding how mediated associations change based on context, limits or even individual variances (Cheah et al., 2021). It was argued that the strength of the indirect relationship between the independent variable, mediator, and dependent variable varied across different race/age combinations.

3.9 Distribution

The questionnaire for this quantitative study was administered through Qualtrics platform links for all the 760 names on the especially curated sampling frame, ensuring accessibility and ease of participation for respondents. Various reminders were sent to this database for those who had started but had not finished and for those who had not started at all.

3.10 Data Processing and Analysis

The choice of using SEM over a hierarchical multiple regression analysis was made due to the complexity of this study, as SEM is considered more powerful and suitable. SEM is a statistical technique that allows for the testing of hypotheses and the generalisability of findings. It can assess multiple relationships involving both latent and

observed variables. In this study, SEM was implemented using SmartPLS 4 software, which offers advantages in data processing, model building, and analysis. Furthermore, SmartPLS 4 integrates well with other software. Several other factors necessitated the choice of SmartPLS 4 over other software such as SPSS, allowing for easy data import.

One of the major advantages of SmartPLS 4 is its ability to handle small to medium sample sizes through its bootstrapping, a technique that generates multiple samples from the original dataset (Bentler & Yuan, 1999; Sarstedt et al., 2021). This mitigates the impact of small sample sizes and enhances results accuracy (Hair et al., 2021a, 2021b). SmartPLS 4 is specifically designed to handle complex models with latent variables and observed indicators (Henseler & Chin, 2010), making it suitable for this study, which involved testing for a moderated mediation (Hair et al., 2013, 2021b).

In addition, SmartPLS 4's user-friendly interface enables scholars, including those new to statistics, to easily construct and analyse models. Moreover, SmartPLS 4 is versatile in handling both continuous and categorical data, which was advantageous for this study as the data collected consists of both types. It can robustly handle missing data, simplifying the data analysis process. Additionally, SmartPLS 4 provides advanced visualisation tools that aid in the in the interpretation of results (Hair et al., 2019), facilitating a better understanding of the findings.

In summary, the selection of SEM in SmartPLS 4 was driven to handle the complexity of the study, its compatibility with various data types, user-friendliness, robustness in handling missing data, and advanced visualisation capabilities. These collectively made SmartPLS 4 well suited for the objectives and requirements of this study.

3.11 Validity and Reliability

In any study, validity and reliability are crucial factors that can make or break the credibility of data analysis; hence, in this study a two-step approach for a comprehensive assessment of the measurement model was employed, first through confirmatory factor analysis (CFA), exploratory factor analysis (EFA), and subsequently PLS-SEM.

Validity refers to the extent to which a measurement accurately captures the concept it intends to measure, while reliability indicates the consistency and stability of the measurement. Reliability is important because it ensures that the instruments used in the research would yield consistent results when repeated (Creswell & Creswell, 2018; Saunders et al., 2020).

3.11.1 Reliability

There are several types of reliability: internal consistency, test-retest, inter-rater, parallel forms, split-half, and alternate forms reliability, all of which assess different aspects of the measure. In this study, internal consistency reliability, which measures the consistency of responses within an instrument, was the focus. To ensure internal consistency, Cronbach's alpha coefficients were calculated for each scale used in the questionnaire. This statistical measure assesses the degree of correlation between different items or questions within a scale, and a score between 0.7 and 0.9 indicates a high level of reliability and is deemed acceptable.

3.11.2 Validity

Validity refers to the extent to which a measurement tool accurately measures what it intends to measure. There are four types of validity: content, construct, internal and external validity.

3.11.2.1 Content validity

Content validity ensures that the study covers all the relevant aspects of a phenomenon. Several steps were taken to ensure this. First, a thorough literature review was done. Second all constructs were clearly defined and grounded in theory to capture their dimensions. Specifically, for the two independent variables, effectuation and causation theories from the works of Sarasvathy (2001) and Fisher (2012), who distinguish between the two at the theoretical and operational levels, were used. For the dependent variable, firm performance, the works of Sir (2012) was used. The mediating variable, entrepreneur means, was viewed in this study as an intangible resource. The study referred to Sarasvathy (2001), who asked the questions 'who am I', 'what do I know', and 'whom do I know', and in turn linked it to the works of Davidsson and Honing (2003) on HC and SC, and the works of Schjoedt and Craig (2017) and Chen et al. (1998) on entrepreneur self-efficacy. Furthermore, a pilot study was conducted to ensure the soundness of participant selection criteria, the comprehensibility of the instruments, the appropriate loading of factors, and the suitability of the tools for analysis. This pilot helped identify any potential issues of ambiguities with the instrument and allowed for necessary refinements.

3.11.2.2 Construct validity

Construct validity ensures that the used definition of the study is the same throughout the study. To ensure the construct validity of the study, from the onset, first, a clear theoretical framework was developed, showing all constructs of interest, their underlying dimensions, and their inter-relationships. This was helpful in acting as a guide during measurement tool development. Second, the convergent validity of the instrument was established by assessing the extent to which constructs correlate positively with other measures related to the construct. A strong positive correlation with other similar

constructs demonstrates that the measure is capturing what is intended. Third, an assessment of discriminant validity of the measurement tool was done by examining its correlations with measures that are conceptually distinct from the construct. In this case, weak correlations indicated that the measure was not capturing unrelated constructs, thus establishing that the measure was distinct and specific to the construct of interest. Lastly, through literature review, specific hypotheses that align with the theoretical framework were developed, and later tested using SEM. Although there are several other factors that contribute to this, for example sample size, a measurement tool that demonstrates relationships between variables that are consistent with literature provides evidence of construct validity.

3.11.2.3 Internal validity

Internal validity ensures that the study design has no confounding variables that could affect the results or bring about the possibility of alternative explanations. This study first ensured that the measurement tool was reliable and valid and accurately captured the different constructs. This was done by using established and validated measurement scales. Second, a seven-point-Likert scale was used as it is known for reducing respondent selection bias during data collection. Lastly, in the preamble to the instrument, just enough, but not too much, information was given regarding the study in order to reduce respondent expectancy effects.

3.11.2.4 External validity

On the other hand, external validity ensures that the study's findings can be generalised to the population of interest. In this study, this was done by first clearly defining and confining the target population to technology founders with a footprint in South Africa and in operation for at least three years. Table 4.9 shows examples of the subsectors that fall under the technology sector. These subsectors acted as a guide when

the database of technology founders was curated and ensured there was no confusion as to whom to include or exclude. Second, choosing to distribute to the entire sampling frame instead of a specific sampling technique aided generalisability. However, given a bigger sampling frame, a stratified random sampling technique could have been used to enhance diversity and variability within the sample. Related future studies with better resources could consider this. Third, using SmartPLS 4, which allows for replication of the datasets, helped increase the sample size and the robustness of the model, generalisability, and stability of the results across multiple datasets.

In conclusion, this study prioritised validity and reliability by focusing on internal consistency reliability, conducting a comprehensive literature review for content validity, establishing construct validity through a theoretical framework and testing of hypotheses, and addressing confounding variables for internal validity. External validity was enhanced by clearly defining the target population, distributing the questionnaire to the entire sampling frame, and utilising SmartPLS 4 for dataset replication, thereby increasing the sample size and improving the generalisability, robustness, and stability of results. These measures contributed to the credibility and external validity of the findings.

3.12 Ethical Considerations

Business and management research involving human participants necessitates careful consideration of ethical concerns throughout the research process (Saunders et al., 2020). Ethical considerations are not a one-time task but require continuous reflection and evaluation.

This study employed internet-mediated access primarily through email and various media platforms such as LinkedIn, a business-social media platform.

The questionnaire ensured participant anonymity, with no personal identifier details collected or used for analysis. Participants were informed of their right to withdraw, and incomplete questionnaires were treated as opt-outs. Data collected was stored digitally with personal identifiers removed, ensuring protection against unauthorised access or cyber-attacks.

Furthermore, ethical clearance from the University's ethics committee was obtained prior to data collection, and adherence to the approved guidelines was strictly followed. The ethics clearance certificate can be found in Appendix A.

3.12 Chapter Conclusion

In conclusion, Chapter 3 has provided an in-depth examination of the research methodology employed in this study. We explored the foundational research philosophy, critical realism, and discussed the research design and strategy, emphasizing the use of a quantitative cross-sectional survey. We also detailed the sampling techniques and size determination methods, ensuring the robustness and reliability of our data collection process. The chapter also covered the research instrument and measurement models, highlighting their validity and reliability, and outlined the data processing and analysis methods using SmartPLS 4 software. Ethical considerations were also meticulously addressed to ensure the integrity of the research.

Moving to Chapter 4, the focus shifts to the presentation of results and data analysis. This chapter offers a comprehensive analysis of the data collected, using the methodological framework established here in Chapter 3.

CHAPTER 4: RESULTS AND DATA ANALYSIS

4.1 Introduction

This chapter presents the findings of the study, starting with the demographic details of the respondents, essential for understanding the composition and representativeness of the sample, particularly in relation to age group and race distribution. These factors were considered significant as potential moderating variables and any issues of over or under-representation were identified and would be further explored in Chapter 5.

The analytical approach employed in this study is SEM, a statistical technique already discussed in Chapter 3. SmartPLS 4 software was used for analysis, while the demographic data underwent processing via SPSS. Consequently, the reporting style aligns with the conventions recommended by Dijkstra (2014), Dijkstra and Henseler (2015), and Henseler and Chin (2010) in the context of PLS analysis.

The presentation of findings is divided into two sections: assessing the measurement model and validating the SEM. The measurement model is evaluated for its validity and reliability, including internal consistency, indicator reliability, convergent validity, and discriminant validity, following the guidelines by Hair et al. (2019, 2021b). The validation of the SEM involved assessing collinearity among latent variables, examining the significance of path coefficients, evaluating predictive relevance through Q^2 and R^2 values, and considering the Q^2 and F^2 effect sizes.

Given that this study aimed to assess a moderated mediation model (CoMe), involving the intersection of race and age as a moderator, impacting the relationship between choice of entrepreneur behaviour (independent variable) and firm performance

(dependent variable) through entrepreneur means (mediator); the CoMe results are presented following the guidelines proposed by Hair et al. (2019, 2021b).

The hypotheses proposed in this study were as follows:

- *Hypothesis $_1$: Effectual entrepreneur behaviour (EEB) -> FP* – There is a significant positive relationship between effectual entrepreneur behaviour and firm performance.
- *Hypothesis $_2$: EEB -> Entrepreneur means -> FP* – The relationship between effectual entrepreneur behaviour and firm performance is mediated by entrepreneur means.
- *Hypothesis $_3$: Race and age (RA) x EEB -> Entrepreneur means -> FP* – The mediating effect of entrepreneur means in the relationship between effectual entrepreneur behaviour and firm performance is significantly moderated by the intersection of race and age.
- *Hypothesis $_4$: Entrepreneur means -> Firm performance (FP)* – Technology founders often rely on entrepreneur means (intangible resources) to achieve firm performance.

Finally, this chapter concludes by presenting the results of the hypothesis testing, a hypothesis-informed theoretical framework, and a summary of findings.

4.2 Demographic Profile of Respondents

The demographic profile of the respondents gives insights into the different characteristics of the respondents who participated in the study. The respondents were asked two types of questions, founder-level questions as well as firm-level questions. Founder-level questions included data about the race, age, and gender distribution of firm founders, and their level of education. At the firm level, the respondents were asked about

the sub-sector of operation, operational footprint, number of years since the launching of the business, and the black ownership status of the business both at launch and when filling out the questionnaire. In this section, the summary statistics for each of the demographic variables are presented.

4.2.1 Race distribution of founders

The race composition of the founders in this study was originally categorised into four groups: black African, white, Asian, and coloured. However, upon analysis, it was observed that the number of responses from Asian and coloured individuals was statistically insignificant. Consequently, these two groups were combined, consolidating categories and a subsequent reduction to three racial categories. The founders and co-founders in the sample group consisted of the following representation black African individuals (n=61, 38.4 per cent), white individuals (n=68, 42.8 per cent) and a combined group of Asian and coloured individuals (n=8, 5 per cent). There were also multi-racial co-founder teams (n=22, 13.8 per cent). These proportions are summarised in Table 4.1 and visually presented in Figure 4.1, illustrating respondents' distribution of racial categories.

Table 4.1: Race of founders

RACE	N	PERCENTAGE
Asian & coloured	8	5.0%
Black African	61	38.4%
White	68	42.8%
Multiracial	22	13.8%

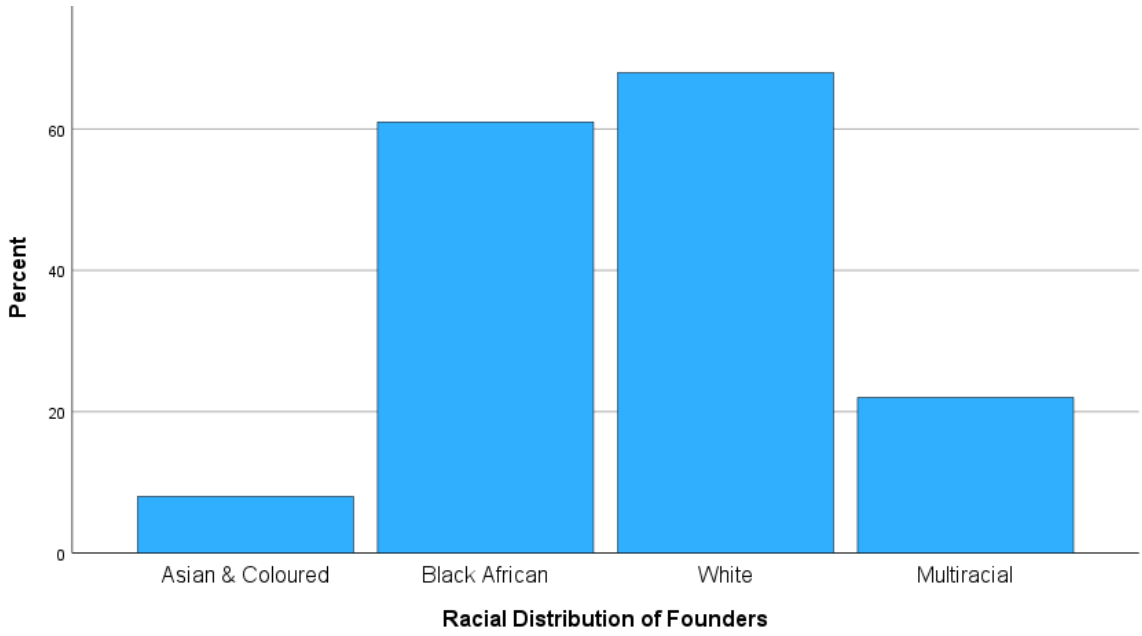

Figure 4.1: Race of founders

These findings highlight the racial diversity among the founders, with the majority of individuals being white, followed by black African and a smaller representation from the combined group of Asian and coloured. This information provided valuable insights into the demographic composition of the sample. It established a foundation for further analysis in understanding race's role within this study's context.

4.2.2 Black ownership in the business

In the context of the B-BBEE Act (RSA, 2003), black ownership in South African businesses holds significant importance. To gain insights into this aspect, respondents were asked about the percentage of ownership by black individuals at the inception of their businesses and the ownership status at the time of completing the questionnaire. They were given three options: less than 25 per cent, 25 to 50 per cent and over 50 per cent.

Table 4.2: Black ownership at launch of business

RANGE	N	PERCENTAGE
Less than 25%	79	49.7%
25-25%	7	4.4%
Over 50%	73	45.9%

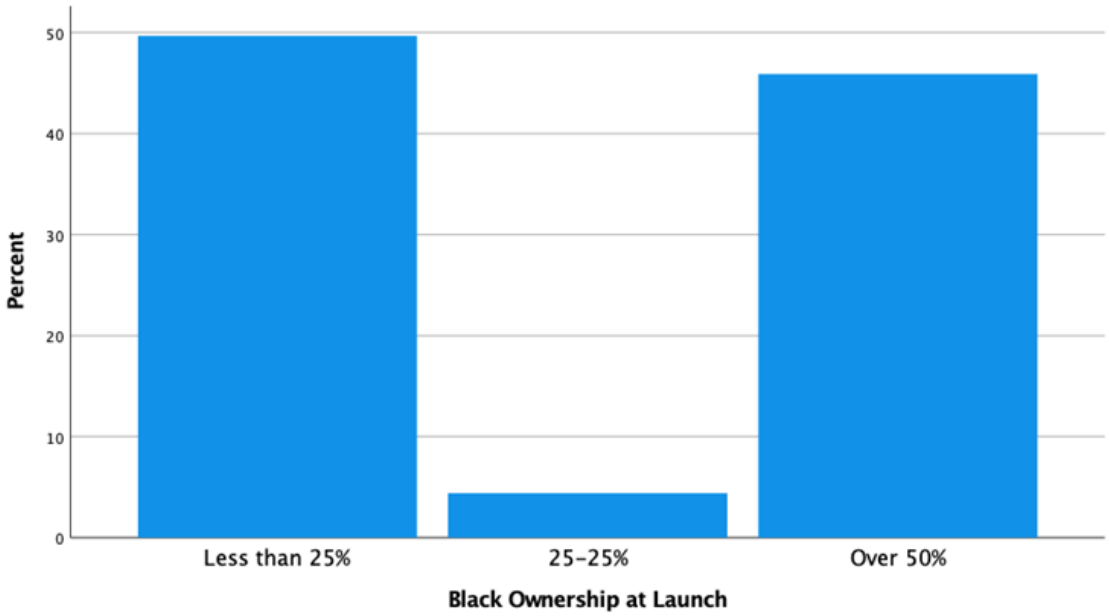

Figure 4.2: Black ownership at launch of business

The findings reveal that a considerable proportion of the respondents reported having black ownership in excess of 25 per cent in their businesses. Specifically, seven of the respondents (4.4 per cent) reported having 25-50 per cent and 73 (45.9 per cent) reported having over 50 per cent black ownership.

Table 4.3: Black ownership at time of responding to questionnaire

RANGE	N	PERCENTAGE
Less than 25%	59	37.1%
25-50%	11	6.9%
Over 50%	89	56.0%

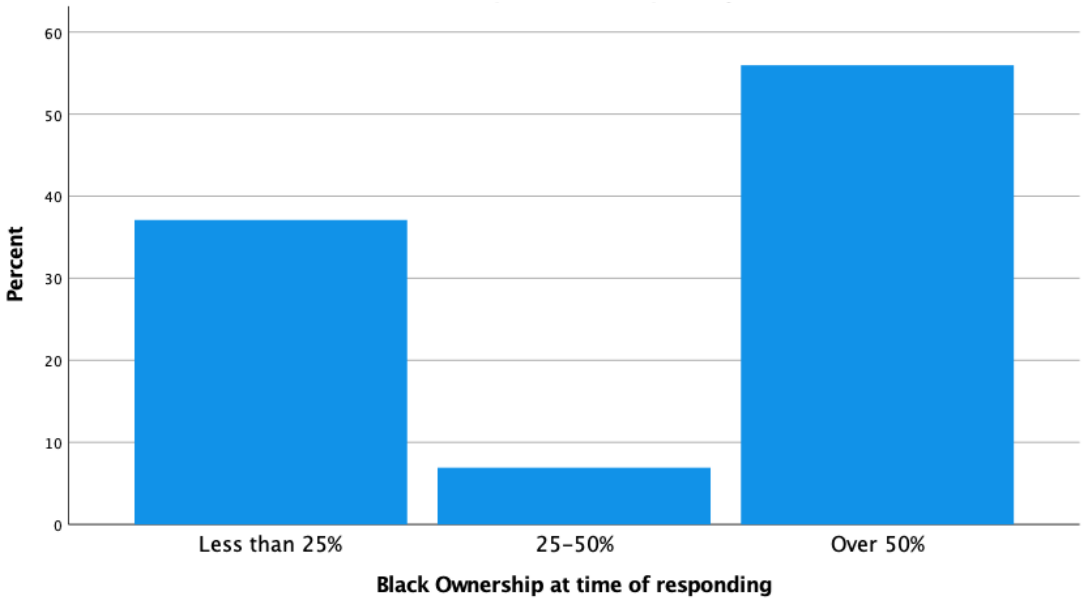

Figure 4.3: Black ownership at time of responding to questionnaire

When considering the status of black ownership at the time of responding to the questionnaire, the highest representation was found among businesses with over 50 per cent black ownership, with 89 respondents (56 per cent) falling into this category. Following this, 59 respondents (37.1 per cent) reported less than 25 per cent black ownership. The combined effect of those with less than 50 per cent black ownership amounted to 70 respondents (44 per cent). These findings are summarised in Tables 4.2 and 4.3 and visually represented in Figures 4.2 and 4.3, representing the status of black ownership at the launch of the business and the black ownership at the time of responding to the questionnaire, respectively.

These findings shed light on the status of black ownership in the sampled businesses at the start and at the time of data collection. The results indicated a significant presence of black ownership in South African businesses, although many businesses still fall below the 50 per cent ownership threshold. These insights contribute to the understanding of the progress and distribution of black ownership in the business landscape, as mandated by the B-BEEE Act (RSA, 2003).

4.2.3 Age of founders

In this study, the age of the respondents was categorised into six age groups, ranging from under 20 to over 65 years of age. The analysis examined the age distribution of founders both at the launch of their businesses and when responding to the questionnaire. It is important to note that none of the respondents reported having founders or co-founders under 20 or over 60 years of age, resulting in the presentation of only four of the six age categories in the age distribution at the time of business launch.

Table 4.4: Age of founders at launch of business

AGE	N	PERCENTAGE
20-29 years	33	20.8%
30-39 years	69	43.4%
40-49 years	41	25.8%
50-59 years	16	10.1%

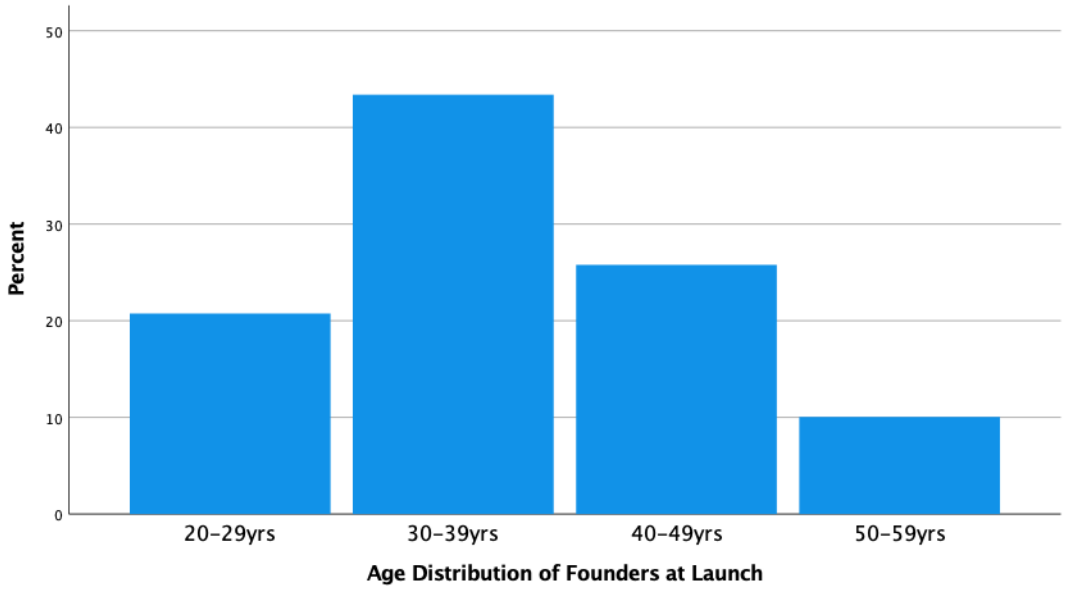

Figure 4.4: Age of founders at launch of business

The findings indicated that the largest proportion of founders, 69 individuals (43.4 per cent), fell into the age group of 30 to 39 years at the time of business launch. In contrast, the category with the least representation was 50 to 59 years of age, with only 16 individuals (10.1 per cent). These results highlight the concentration of founders within the middle age range, reflecting the active entrepreneurial phase of their careers.

When examining the age distribution at the time of responding to the questionnaire, six age categories were represented. The category with the lowest representation was over 65 years of age, with only two individuals (1.3 per cent) falling into this group. The category with the highest representation at 60 individuals and 37.7 per cent was the 40 to 49 year age group.

Tables 4.4 and 4.5 summarise the respondents' age profiles at the launch of their businesses and at the time of responding to the survey, respectively. Furthermore, Figures 4.4 and 4.5 visually depict the age distribution of founders at the business launch and at the time of questionnaire response, respectively.

Table 4.5: Age of founders at time of responding to questionnaire

RANGE	N	PERCENTAGE
20-29 years	9	5.7%
30-39 years	43	27.0%
40-49 years	60	37.7%
50-59 years	33	20.8%
60-65 years	12	7.5%
Over 65 years	2	1.3%

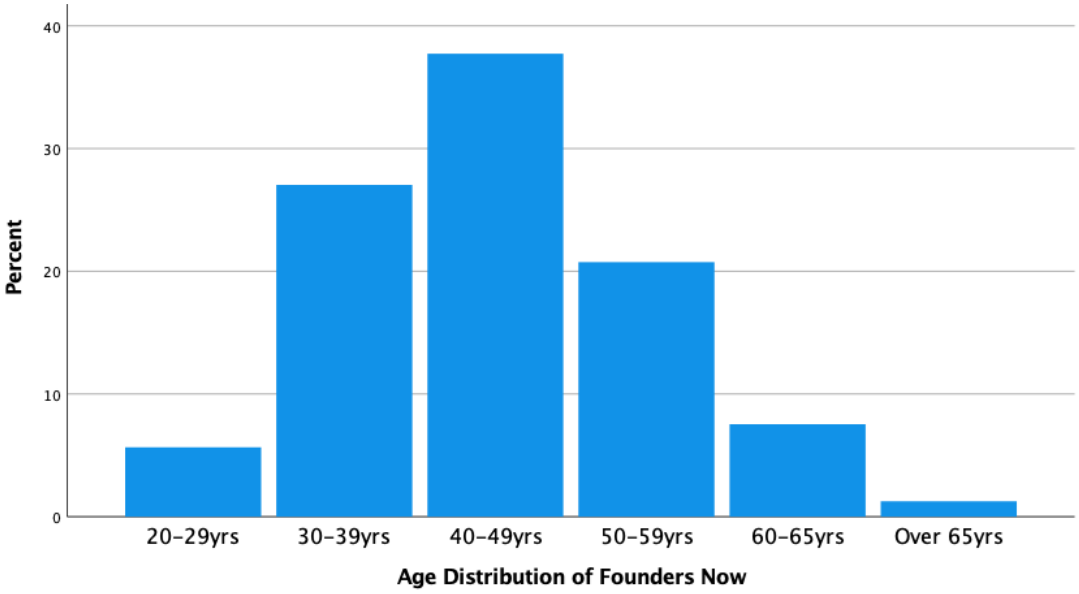

Figure 4.5: Age of founders at time of responding to questionnaire

These findings provided insights into the age groups of South African founders that are actively involved in the technology ecosystem. Understanding the age demographics of these founders contributed to the broader understanding of entrepreneurship and the potential influence of age on founder resources and business success.

4.2.4 Level of education

To examine the educational background of the founders, respondents were asked to indicate the highest level of education attained by their founders. They were provided with eight categories, ranging from less than high school to doctorate level.

In the analysis, this was organised into bands, in line with the South African Qualifications Authority, where:

- Band 1 covers high school Grade 9 to 12 or vocations training;
- Band 2 covers college diplomas and technical qualifications; and
- Band 3 covers the full spectrum of advanced diplomas, junior degrees right up to doctor's degree.

The findings revealed that the highest representation among the respondents was observed in one category. This category was Band 3 (n=140, 88.1 per cent). This suggested a significant proportion of founders with advanced educational qualifications.

Conversely, the category with the least representation was Band 1 (n=9, 5.7 per cent). This indicated a relatively small proportion of founders with limited formal education in the surveyed businesses.

Table 4.6 presents a summary of the level of education through the education bands. Furthermore, Figure 4.6 visually represents the distribution of educational attainment among founders in the South African technology landscape.

These findings shed light on the educational qualifications of founders in South African businesses. The majority of founders demonstrated a higher level of education.

Table 4.6: Qualification level of founders

BAND	N	PERCENTAGE
Band 1	9	5.7%
Band 2	10	6.3%
Band 3	140	88.1%

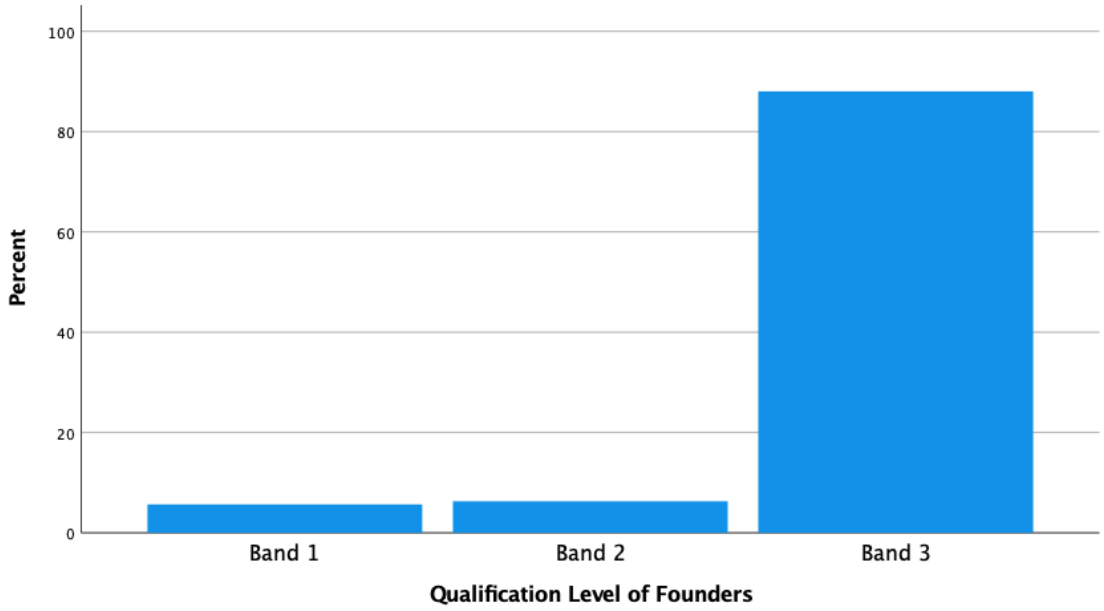

Figure 4.6: Qualification level of founders

4.2.5 Number of founders

The data collected in this study provided the number of founders involved in South African technology businesses. Respondents were asked to indicate the number of founders associated with their businesses, and they were given three options to choose from: sole founder, two to five founders, and more than five founders.

The findings revealed that most businesses had between two and five founders, with 87 respondents (54.7 per cent) falling into this category. The second most common scenario was businesses with sole founders, comprising 70 respondents (44.0 per cent).

The category with the least representation was businesses with more than five founders, accounting for only two respondents (1.3 per cent).

These results indicated that a significant proportion of businesses in South Africa operate with a small team of founders, typically ranging from two to five individuals. This might suggest that collaborative efforts and shared responsibilities among a limited number of founders were prevalent in the entrepreneurial landscape. Additionally, the presence of a substantial number of businesses with sole founders highlighted the significance of individual entrepreneurship in the country. Table 4.7 summarises the constitution of founders in South African technology businesses, while Figure 4.7 visually represents the same.

Table 4.7: Constitution of founders

RANGE	N	PERCENTAGE
1	70	44.0%
2-5	87	54.7%
Over 5	2	1.3%

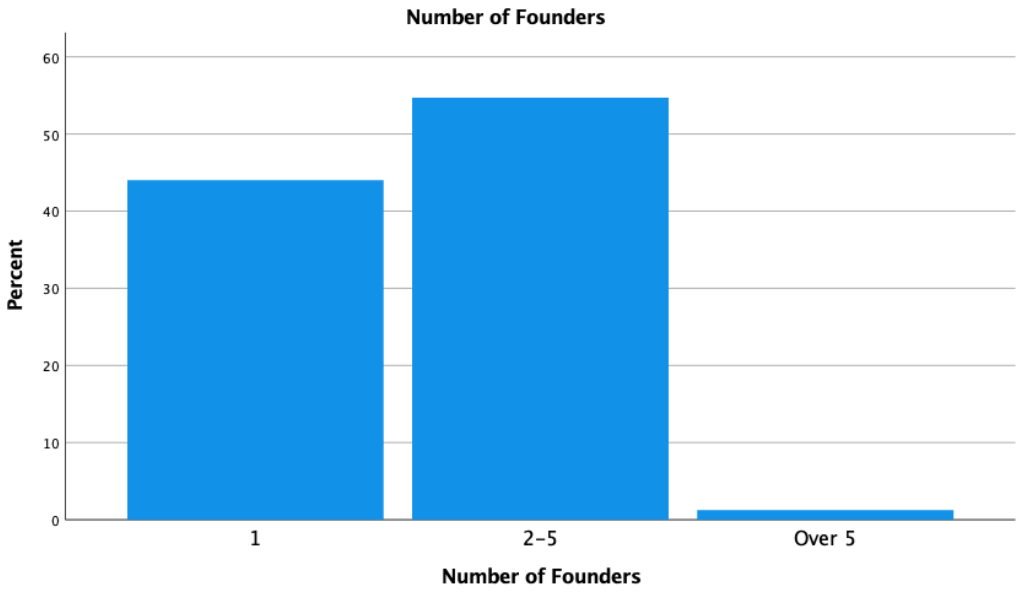

Figure 4.7: Constitution of founders

These findings shed light on the composition of founding teams in South African technology businesses, highlighting the prevalence of small teams with two to five founders and the significant presence of businesses led by sole founders. The limited representation of businesses with more than five founders suggested that the larger founding teams were less common in the entrepreneurial landscape.

4.2.6 Age of business

The duration of time that businesses have been operating is an important factor to consider in understanding their stability and longevity. In this study, respondents were asked to disclose the number of years that their businesses had been in operation. The findings indicated that the number of years in business could be categorised into four groups: three to five years, six to 10 years, 11 to 20 years, and over 20 years.

Table 4.8: Age of business

RANGE	N	PERCENTAGE
3-5 years	60	37.7%
6-10 years	49	30.8%
11-20 years	37	23.3%
Over 20 years	13	8.2%

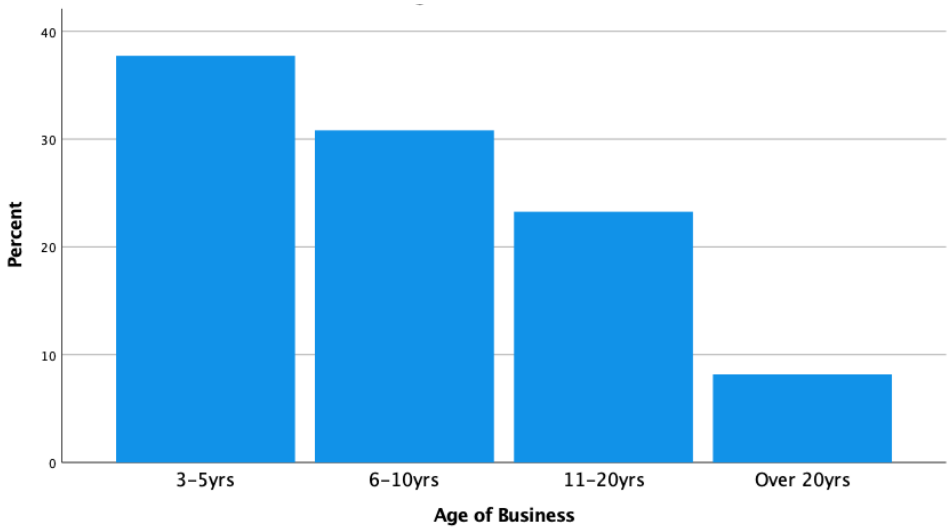

Figure 4.8: Age of business

It is worth noting that none of the respondents fell into the category of being in business for less than three years. This was because the selection criteria for participant businesses required a minimum operational period of three years. Consequently, the analysis focused on the duration of business operations beyond this minimum threshold.

Among the respondents, the majority reported being in business for between three and five years, with 60 individuals (37.7 per cent) falling into this category. This suggests a significant presence of relatively new businesses in the entrepreneurial landscape. The second most common duration was six to 10 years, with 49 respondents (30.8 per cent) having businesses operating within this range. The category of 11 to 20 years had 37 respondents (23.3 per cent), indicating businesses with a more established presence. The least represented category was businesses operating for over 20 years, with 13 respondents (8.2 per cent). Table 4.8 summarises the distribution of business age among the respondents, while Figure 4.8 visually represents the prevalence of different business durations.

These findings provided valuable insights into the longevity and sustainability of businesses in South Africa. The large presence of businesses in the three to five year range suggested a vibrant entrepreneurial ecosystem that allows new entrants. The predominance of businesses operating for six years and above (62.3 per cent) indicated a level of durability and success in maintaining operations over an extended period, signalling a need for further exploration into long-term business sustainability.

4.2.7 Sub-sectors

The diverse range of sub-sectors in which businesses operate provides insights into the industry landscape and the areas of specialisation within the entrepreneurial ecosystem. In this study, respondents were asked to indicate the sub-sectors in which their businesses operate, choosing from a list of 36 predefined options. They were also given the freedom to specify any additional sub-sectors not covered by the provided list.

The analysis of the data revealed that the majority of firms represented in the sample were involved in information and communication technology, with 46 respondents (32.62 per cent). Cloud computing also emerged as a significant area of operation, with an equal number of respondents (46, 32.62 per cent) reporting involvement in this domain. The sub-sector with the next highest representation was the Internet of Things (IoT), with 38 respondents (26.95 per cent) identifying their participation in this field.

It is important to note that the respondents had the option to select multiple applicable sub-sectors from the list and add any additional sub-sectors relevant to their companies. This flexibility allowed for a comprehensive understanding of the breadth and diversity of entrepreneurial activities in South Africa. Table 4.9 presents a summary of the frequency of each sub-sector among the respondents, while Figure 4.9 visually represents the prevalence of different sub-sectors.

Table 4.9: Technology sub-sector representation

SUB-SECTOR	FREQUENCY	PERCENTAGE
Internet of Things (IoT)	38	26,95
Big Data (data mining, data analytics and advanced algorithms)	31	21,99
Additive Manufacturing (3D printing, 3D scanning)	4	2,84
Cloud Computing	46	32,62
Autonomous Robots	2	1,42
Virtual Reality (VR)	7	4,96
Augmented Reality (AR)	8	5,67
Cyber-Physical Systems (CPS)	6	4,26
Artificial Intelligence (AI) and Machine Learning	33	23,40
Smart Sensors (smart actuators, smart objects, and smart dust)	11	7,80
Advanced Simulation (3D modelling and 3D visualisation)	8	5,67
Nanotechnology (advanced materials, nanomaterials, nanobots)	4	2,84
Drones, UAV, UAS & RPA	12	8,51
Biotechnology (synthetic biology, molecular biology)	9	6,38
Blockchain (Bitcoin, cryptocurrency, digital currency)	6	4,26
Flexible Production System (FMS) and cluster concept	1	0,71
Material Science	4	2,84
Internet of Data (IoD)	11	7,80
Location Detection (digital traceability and GPS)	13	9,22
Cybersecurity	23	16,31
Internet of Energy (IoE) (smart grid)	5	3,55
Advanced Human to Machine Interface (HMI)	1	0,71
Industrial Internet of Things (IIoT) or industrial internet	9	6,38
Predictive Maintenance	7	4,96
Neurotech	0	0,00
Manufacturing Execution Systems (MES) and SCADA	3	2,13
Mobile Devices	17	12,06

SUB-SECTOR	FREQUENCY	PERCENTAGE
Quantum Computing	1	0,71
Information and Communication Technology (ICT)	46	32,62
Advanced Network Technology	9	6,38
Machine to Machine Communication	7	4,96
Renewable Energy and Advanced Energy Storage	12	8,51
Vertical and Horizontal (V&H) System Integration	3	2,13
Internet of Services	15	10,64
Smart Factory and Intelligent Factory	5	3,55
Digital Twin	11	7,80
Fintech	4	2,84
Website Development & Digital Business	2	1,42
Software Development	3	2,13
Medical devices	3	2,13
Healthtech	1	0,71
Satellite Imaging	2	1,42
Online Marketing	1	0,71
Edutech	4	2,84
Network Infrastructure	1	0,71
SaaS	2	1,42
InsureTech	2	1,42
Assistive Tech	1	0,71

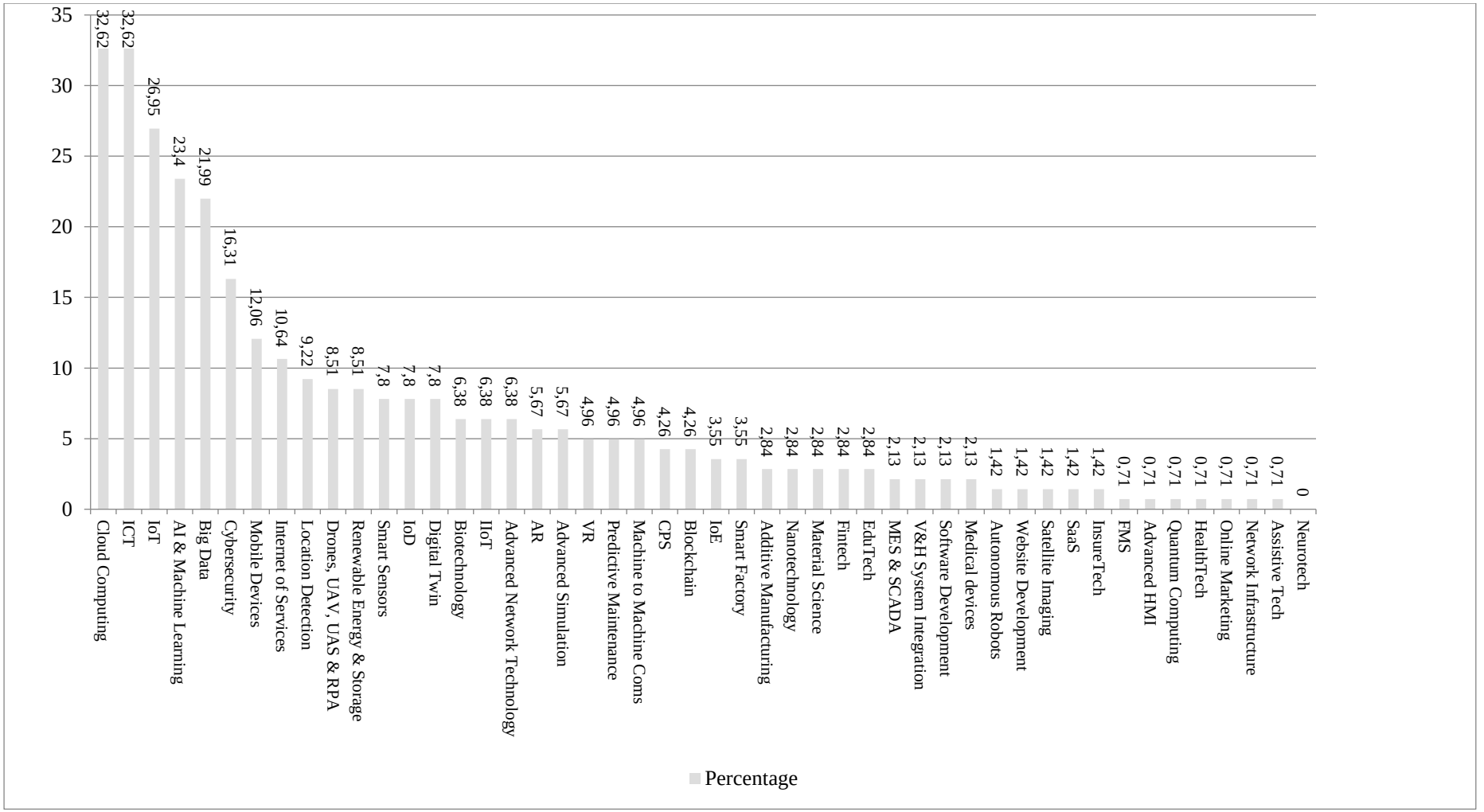

Figure 4.9: Technology sub-sector representation

These findings highlighted the dominance of information and communications technology and cloud computing as key sub-sectors in the technology entrepreneurial landscape of South Africa. The significant representation of these sub-sectors reflected the growing importance of technology-driven solutions and digital transformation in various industries. The presence of businesses operating on the Internet of Things sub-sector emphasised the integration of smart technologies and connectivity in the business landscape. By identifying the prominent sub-sectors, policymakers and stakeholders can gain valuable insights into the trends and opportunities within the entrepreneurial technology ecosystem, fostering targeted support and development initiatives.

4.3 Custom Tables

This section presents the custom tables results of the study, starting with firm performance and its four factors, GIB and founder income level, growth in profitability, growth in the number of employees and the ability to retain key employees; as well as the growth in turnover. This is followed by the respondent's perceptions of effectual entrepreneur behaviour, ESE, HC and SC.

The research instrument was in the form of a seven-point Likert scale, for purposes of the custom tables, these were coded as follows:

- *Tables 4.10 to 4.13*: Highly disagree and disagree to general disagreement; highly agree and agree to general agreement; and neither disagree nor agree was maintained as it was.
- *Table 4.14*: Highly disagree and disagree to low effectuation; highly agree and agree to high effectuation; and neither disagree nor agree to medium effectuation.
- *Table 4.15*: Highly disagree and disagree to low ESE; highly agree and agree to high ESE; and neither disagree nor agree to medium ESE.

- *Table 4.16*: Highly disagree and disagree to low HC; highly agree and agree to high HC; and neither disagree nor agree to medium HC.
- *Table 4.17*: Highly disagree and disagree to low SC; highly agree and agree to high SC; and Neither Disagree nor Agree to Medium SC.

4.3.1 Firm performance: Growth in business & founder income level

Table 4.10 illustrates the respondents' perceptions the overall business growth and income level of founders. The majority of the respondents (67.3 per cent) expressed general agreement regarding satisfaction in business growth. Similarly, over half of the respondents (52.2 per cent) agreed that their business goals were achieved. However, improvement in the life standards of founders and growth in personal income level received relatively lower agreement scores, with 44.7 per cent and 49.1 per cent agreement respectively. These findings suggested that while there is general agreement regarding overall business growth and goal achievement, there might be room for improvement in terms of the personal financial benefits to the founders.

Table 4.10: Growth in business & founder income level

GROWTH IN BUSINESS & FOUNDER INCOME LEVEL		GENERAL DIS-AGREEMENT	NEITHER AGREE NOR DISAGREE	GENERAL AGREEMENT	MEAN	STD
Satisfaction in business growth	Count	47	5	107	4.75	1.768
	Row N %	29,6%	3,1%	67,3%		
Achievement of business goals	Count	55	21	83	4.26	1.808
	Row N %	34,6%	13,2%	52,2%		
Improvement in life standard of founders	Count	77	11	71	3.82	2.104
	Row N %	48,4%	6,9%	44,7%		
Growth in personal income level of founders	Count	63	18	78	4.09	1.992
	Row N %	39,6%	11,3%	49,1%		

4.3.2 Firm performance: Growth in profitability

Table 4.11 represents the respondents' perceptions of growth in profitability. The findings indicated a relatively balanced view across the different indicators. Respondents expressed a moderate level of agreement regarding business savings and growth in net profit, with 45.9 per cent and 47.8 per cent agreement respectively. On the other hand, improvement in return on investment and return on assets received higher agreement scores, with 50.3 per cent and 46.5 per cent agreement respectively. These results suggested that while profitability growth is perceived positively, there was greater consensus regarding the improvement in returns metrics.

Table 4.11: Growth in profitability

GROWTH IN PROFITABILITY ITEMS		GENERAL DIS-AGREEMENT	NEITHER AGREE NOR DISAGREE	GENERAL AGREEMENT	MEAN	STD
Business Savings	Count	62	24	73	4.01	1.987
	Row N %	39,0%	15,1%	45,9%		
Growth in net profit	Count	63	20	76	4.11	1.970
	Row N %	39,6%	12,6%	47,8%		
Improvement in Return on Investment	Count	57	22	80	4.34	1.905
	Row N %	35,8%	13,8%	50,3%		
Improvement in Return on Assets	Count	50	35	74	4.28	1.789
	Row N %	31,4%	22,0%	46,5%		

4.3.3 Firm performance: Growth in number of employees & retaining key employees

Table 4.12 examines the growth in the number of employees and the company's ability to retain key employees. The majority of the respondents (76.7 per cent) agreed that there has been an increase in the number of employees, indicating growth in this aspect. Similarly, a significant proportion (71.1 per cent) agreed that they were able to keep the best and most talented employees. These findings highlighted the successful expansion of the workforce and the ability to retain key talent, which were essential for sustainable growth.

Table 4.12: Growth in number of employees & retaining key employees

GROWTH IN NUMBER OF EMPLOYEES & RETAINING KEY EMPLOYEES		GENERAL DIS-AGREEMENT	NEITHER AGREE NOR DISAGREE	GENERAL AGREEMENT	MEAN	STD
Increase in number of employees	Count	29	8	122	5.25	1.838
	Row N %	18,2%	5,0%	76,7%		
Ability to keep best and most talented employees	Count	24	22	113	5.12	1.678
	Row N %	15,1%	13,8%	71,1%		

4.3.4 Firm performance: Growth in turnover

Table 4.13 explores the growth in turnover, focusing on sales growth and growth compared to competitors. The findings revealed a high level of agreement regarding both indicators. The majority of respondents (76.1 per cent) agreed that there has been growth in sales, indicating a positive trend in generating revenue. Additionally, 45.3 per cent of respondents agreed that their business has achieved growth compared to competitors. These results suggested a competitive position in the market and overall positive performance in terms of turnover growth.

Table 4.13: Growth in turnover

GROWTH IN TURNOVER		GENERAL DIS-AGREEMENT	NEITHER AGREE NOR DISAGREE	GENERAL AGREEMENT	MEAN	STD
Growth in Sales	Count	27	11	121	5.25	1.665
	Row N %	17,0%	6,9%	76,1%		
Growth compared to competitors	Count	37	50	72	4.42	1.651
	Row N %	23,3%	31,4%	45,3%		

4.3.5 Effectual entrepreneur behaviour

Table 4.14 represents the respondents' level of effectual entrepreneur behaviour (EEB). The analysis revealed a varied distribution across different characteristics of effectual behaviour. High levels of effectuation were observed through the unclear end goal, business evolution, employment of the resources at hand concept, experimentation, and flexibility, with 93.7 per cent, 86.2 per cent, 81.8 per cent, 86.2 per cent, and 61.6 per cent agreement respectively. The behaviour with the highest level of agreement was business evolution, with a mean value of 6.03. Conversely, the difference of idea to actual business and the employment of the how much an individual can afford to lose concept received lower agreement scores, with 47.2 per cent and 59.1 per cent agreement respectively. Unclear end goal received a relatively lower mean value of 4.67. The standard deviations indicated some variability in responses, with business evolution showing the lowest dispersion among the items (1.153). These findings suggested that technology founders demonstrated a considerable level of EEB in most aspects.

Table 4.14: Effectual entrepreneur behaviour

EEB		LOW EFFECTUA-TION	MEDIUM EFFECTUA-TION	HIGH EFFECTUA-TION	MEAN	STD
Difference of original idea to final product	Count	75	7	77	3.91	2.039
	Row N %	47,2%	4,4%	48,4%		
Unclear end goal	Count	46	13	100	4.67	1.844
	Row N %	28,9%	8,2%	62,9%		
Business evolution	Count	7	3	149	6.03	1.153
	Row N %	4,4%	1,9%	93,7%		
Driven by resources at hand	Count	12	10	137	5.60	1.317
	Row N %	7,5%	6,3%	86,2%		

EEB		LOW EFFECTUA-TION	MEDIUM EFFECTUA-TION	HIGH EFFECTUA-TION	MEAN	STD
Experimentation	Count	18	11	130	5.49	1.354
	Row N %	11,3%	6,9%	81,8%		
Flexibility	Count	10	12	137	5.73	1.330
	Row N %	6,3%	7,5%	86,2%		
Pre-commitments	Count	41	20	98	4.64	1.787
	Row N %	25,8%	12,6%	61,6%		
How much can one afford to lose	Count	43	22	94	4.68	1.877
	Row N %	27,0%	13,8%	59,1%		

4.3.6 Entrepreneurial self-efficacy

Table 4.15 examines the respondents' level of entrepreneurial self-efficacy (ESE). The analysis indicated a high level of self-efficacy across all ESE items. The majority of respondents (92.5 per cent to 96.2 per cent) demonstrated a strong belief in their ability to execute entrepreneurial tasks, as indicated by high agreement scores. The mean values ranged from 6.24 to 6.42, indicating strong agreement in self-efficacy. The item with the highest level of agreement was skills and capabilities, with a mean value of 6.42. The standard deviations suggested a relatively low variability in responses, with self-confidence showing the lowest dispersion among the items (1.111). These findings suggested that technology founders perceived themselves as capable and confident in their entrepreneurial abilities.

Table 4.15: Entrepreneurial self-efficacy

ENTREPRENEURIAL SELF-EFFICACY		LOW ESE	MEDIUM ESE	HIGH ESE	MEAN	STD
Skill and capabilities	Count	3	3	153	6.42	.944
	Row N %	1,9%	1,9%	96,2%		
Past work experience	Count	6	6	147	6.24	1.209
	Row N %	3,8%	3,8%	92,5%		
Self-confidence	Count	7	2	150	6.24	1.111
	Row N %	4,4%	1,3%	94,3%		

4.3.7 Human capital

Table 4.16 investigates the respondents' human capital (HC) levels. The findings suggested a positive trend in HC development. High agreement scores were observed for levels of education, industry experience, and managerial experience, indicating that the majority of the respondents perceived their HC to be at a medium to high level. The item with the highest mean value was level of education, at 5.65, indicating that technology founders were mostly highly educated. Conversely, business experience received a lower agreement score, suggesting this could be a first business for most of the founders. The standard deviations suggested some variability in responses, with business experience showing the highest dispersion among the items (2.363).

Table 4.16: Human capital

HUMAN CAPITAL		LOW HC	MEDIUM HC	HIGH HC	MEAN	STD
Business experience	Count	62	8	89	4.36	2.363
	Row N %	39,0%	5,0%	56,0%		
Level of education	Count	19	11	129	5.65	1.630
	Row N %	11,9%	6,9%	81,1%		

HUMAN CAPITAL		LOW HC	MEDIUM HC	HIGH HC	MEAN	STD
Industry experience	Count	26	4	129	5.52	1.852
	Row N %	16,4%	2,5%	81,1%		
Managerial experience	Count	29	6	124	5.42	1.794
	Row N %	18,2%	3,8%	78,0%		

4.3.8 Social capital

Table 4.17 explores the respondents' social capital (SC) levels. The findings indicated varying levels of SC across different dimensions. Respondents demonstrated relatively low agreement scores for parents in business, siblings in business, encouragement from neighbours, neighbours in business, and spousal support, indicating low levels of SC in these aspects. The items parents in business and siblings in business received lower means values of 2.69 and 2.51, respectively. Conversely, encouragement from friends, encouragement from family, friends in business, and family in business received higher agreement scores, suggesting stronger SC in these dimensions. The items with the highest mean values were encouragement from family and friends in business, with mean values of 4.16 and 4.42, respectively. The standard deviations suggested variability in responses, with encouragement from family showing the highest dispersion among the items (2.077). These results suggested that while certain aspects of SC were strong, others might not be well developed.

Table 4.17: Social capital

VARIABLE		LOW SC	MEDIUM SC	HIGH SC	MEAN	STD
Parents in business	Count	115	10	34	2.69	2.028
	Row N %	72,3%	6,3%	21,4%		
Siblings in business	Count	118	8	33	2.51	1.939
	Row N %	74,2%	5,0%	20,8%		

VARIABLE		LOW SC	MEDIUM SC	HIGH SC	MEAN	STD
Encouragement from friends	Count	63	20	76	4.06	2.094
	Row N %	39,6%	12,6%	47,8%		
Encouragement from family	Count	59	18	82	4.16	2.077
	Row N %	37,1%	11,3%	51,6%		
Encouragement from neighbours	Count	102	37	20	2.69	1.717
	Row N %	64,2%	23,3%	12,6%		
Friends in business	Count	47	18	94	4.42	1.953
	Row N %	29,6%	11,3%	59,1%		
Family in business	Count	84	17	58	3.47	2.101
	Row N %	52,8%	10,7%	36,5%		
Neighbours in business	Count	101	28	30	2.79	1.828
	Row N %	63,5%	17,6%	18,9%		
Spousal support	Count	59	14	86	4.24	2.334
	Row N %	37,1%	8,8%	54,1%		

Overall, the results indicated high levels of agreement in various aspects, such as business satisfaction, goal achievement, profitability, growth in number of employees and turnover. In addition, there was demonstration of high EEB levels, ESE, HC, and SC. However, certain areas, such as founder income levels, certain dimensions of EEB, HC development, and SC in specific aspects did not demonstrate high levels.

4.4 Confirmatory Factor Analysis and Exploratory Factor Analysis

Since PLS-SEM employed in this study did not rely on the assumption of multivariate normality or on making strong distributional assumptions, the confirmatory factor analysis (CFA) and exploratory factor analysis (EFA) were not mandatory steps. Nonetheless, a two-step approach for a comprehensive assessment of the measurement

model was employed, starting with CFA and EFA on SPSS Amos to assess the initial validity and reliability of the measurement model, and subsequently using measurement validation on PLS-SEM.

CFA was utilised for constructs where the relationships between latent variables and indicators were well defined and validated scales were available, such as in the case of firm performance and EEB. However, for entrepreneur means, EFA was employed. This choice was based on the need to explore the relationship between the validated scales used to measure ESE, HC, and SC as independent constructs, and their collective contribution to the entrepreneur means construct. Although the scales themselves had previously undergone validation, the combined relationship between these constructs had not been tested. Thus, EFA was deemed necessary to develop a measurement model for entrepreneur means and explore the interconnections between its constituent components.

4.4.1 CFA: Growth in business

The growth in business (GIB) model as depicted in Figure 4.10 consisted of four observed variables and one unobserved variable. The observed variables included business growth (FP1), founder standard of living (FP2), founder personal income level at the start of the business (FP3), and founder personal income level at present (FP4). These variables were examined to understand their collective influence on an unobserved variable referred to as GIB.

The model estimated four regression weights, six covariance parameters, and four variance parameters. No means or intercepts were included in the model, ensuring a more focused exploration of the relationship between the observed and unobserved variables.

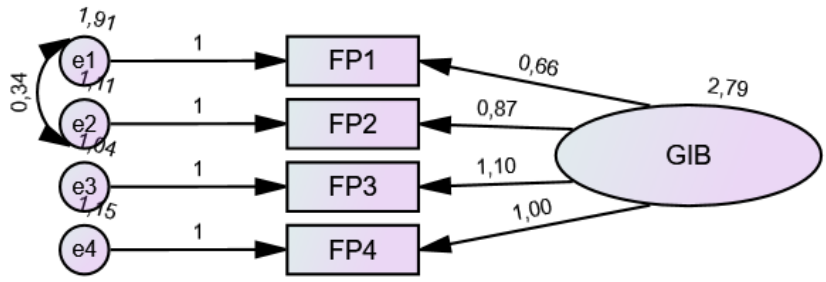

Figure 4.10: Growth in business model

The sample covariances between the observed variables, as shown in Table 4.18 played a crucial role in understanding the interconnectedness among the observed variables. These covariances were instrumental in identifying how the observed variables jointly contributed to the unobserved variable, GIB.

Table 4.18:Growth in business sample covariances

VARIABLE	FP1	FP2	FP3	FP4
FP1- Business Growth	3,107			
FP2- Founder standard of living	1,939	3,248		
FP3- Founder personal income level	2,074	2,663	4,401	
FP4- Founder's personal income level at time of responding	1,752	2,468	3,066	3,942

Condition number = 11,039 Eigenvalues 10,823 1,798 1,096 ,980 Determinant of sample covariance matrix = 20,902

Table 4.19: Growth in business sample correlations

VARIABLE	FP1	FP2	FP3	FP4
FP1- Business Growth	1,000			
FP2- Founder standard of living	,610	1,000		
FP3- Founder personal income level	,561	,704	1,000	
FP4- Founder's personal income level at time of responding	,501	,690	,736	1,000

Condition number = 11,248 Eigenvalues 2,909 ,537 ,296 ,259

The regression weights as presented in Table 4.19 illustrate the relationships between the unobserved variable (GIB) and the observed variables (business growth, founder standard of living, founder personal income level at the start of the business, and the founder personal income level at present). The standardised regression weights, as shown in Table 4.20, present these relationships in a standardised form, facilitating a comparison of their relative strengths.

From the regression weights presented in Tables 4.20 and 4.21, it was evident that founder's personal income level at time of responding (FP4) displayed the highest positive relationship with GIB, with an estimated weight of 1.000. This indicated that the founder's current personal income level was strongly associated with the overall growth of the business. Entrepreneurs who had businesses that exhibit notable growth tended to experience an increase in personal income of its founders. Similarly, founder personal income level (FP3) and founder standard of living (FP2) demonstrated positive relationships with GIB, with standardised regression weights of 0.874 and 0.811, respectively. This suggested that business growth played significant roles in both the founder's personal income level and their standard of living. Entrepreneurs who enjoyed a higher personal income level and a comfortable standard of living tended to lead businesses that have experienced growth. Business growth (FP1) also exhibited a positive relationship with GIB, with a standardised regression weight of 0.621.

Table 4.20: Growth in business regression weights

VARIABLE			ESTIMATE	S.E.	C.R.	P
FP4- Founder's personal income level at time of responding	<---	GIB	1,000			
FP3- Founder personal income level	<---	GIB	1,097	,090	12,262	***
FP2- Founder standard of living	<---	GIB	,875	,077	11,435	***
FP1- Business Growth	<---	GIB	,655	,082	8,000	***

Table 4.21: Growth in business standardised regression weights

VARIABLE			ESTIMATE
FP4- Founder's personal income level at time of responding	<---	GIB	,842
FP3- Founder personal income level	<---	GIB	,874
FP2- Founder standard of living	<---	GIB	,811
FP1- Business Growth	<---	GIB	,621

Overall, the GIB model provided valuable insights into the factors influencing business growth and the interplay between the founder's personal financial well-being and business success. Understanding these relationships can empower entrepreneurs to make informed decisions and implement strategies to foster business growth while improving their personal financial standing. By recognising the importance of the founder's personal income level and standard of living, entrepreneurs can develop holistic approaches to enhance business performance and ensure personal prosperity. This comprehensive understanding of the connections between personal and business growth can contribute to the long-term sustainability and success of the business venture.

4.4.2 CFA: Growth in profitability

The growth in profitability (GIP) model as shown in Figure 4.11 consisted of four observed variables and one unobserved variable. The observed variables included business savings (FP5), business net profit (FP6), business return on investment (FP7), and business return on assets (FP8). The model estimated four regression weights, six covariance parameters and four variance parameters. No means or intercepts were included in the model.

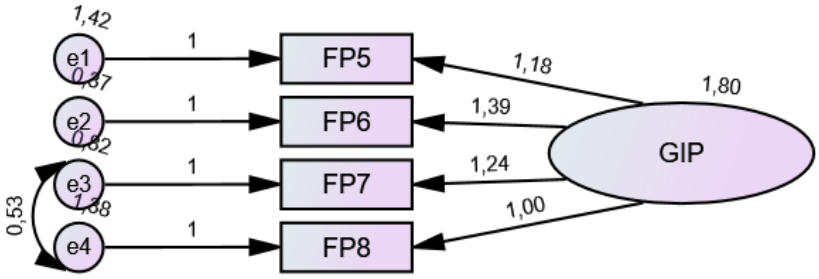

Figure 4.11: Growth in profitability model

The sample covariances between the observed variables are as per Table 4.22, and sample correlations between the observed variables are as per Table 4.23.

Table 4.22: Growth in profitability sample covariances

VARIABLE	FP5	FP6	FP7	FP8
FP5: Business Savings	3,924			
FP6: Business Net Profit	2,955	3,856		
FP7: Business Return on Investment	2,650	3,115	3,608	
FP8: Business Return on Assets	2,078	2,518	2,774	3,181

Condition number = 24,214 Eigenvalues 11,735 1,571 ,780 ,485 Determinant of sample covariance matrix = 6,965

Table 4.23: Growth in profitability sample correlations

VARIABLE	FP5	FP6	FP7	FP8
FP5: Business Savings	1,000			
FP6: Business Net Profit	,759	1,000		
FP7: Business Return on Investment	,704	,835	1,000	
FP8: Business Return on Assets	,588	,719	,819	1,000

Condition number = 23,807 Eigenvalues 3,218 ,436 ,212 ,135

The regression weights as presented in Table 4.24 indicate the relationships between the unobserved variable (GIP) and the observed variables (business savings, business net profit, business return on investment and business return on assets). The standardised regression weights presented in Table 4.25 represent the standardised relationships.

Table 4.24: Growth in profitability regression weights

VARIABLE			ESTIMATE	S.E.	C.R.	P
FP8: Business Return on Assets	<---	GIP	1,000			
FP7: Business Return on Investment	<---	GIP	1,243	,079	15,758	***
FP6: Business Net Profit	<---	GIP	1,389	,118	11,787	***
FP5: Business Savings	<---	GIP	1,179	,113	10,391	***

Table 4.25: Growth in profitability standardised regression weights

VARIABLE			ESTIMATE
FP8: Business Return on Assets	<---	GIP	,753
FP7: Business Return on Investment	<---	GIP	,879
FP6: Business Net Profit	<---	GIP	,950
FP5: Business Savings	<---	GIP	,799

Overall, based on the regression weights, it was found that business return on assets (FP8) had the highest positive relationship with GIP, with an estimate of 1.000. This indicated that an increase in business return on assets is associated with a proportional increase in GIP. Similarly, business return on investment (FP7) and business net profit (FP6) also showed positive relationships with GIP, with standardised regression weights of 0.897 and 0.950, respectively. This suggested that improvements in both return on investment and net profit contributed positively to the GIP. Business savings (FP5) displayed the lowest but still positive relationship with GIP, with a standardised regression weight of 0.799. This indicated that while business savings played a role in driving GIP, its impact is relatively less pronounced compared to the other observed variables. The findings highlighted the significance of business return on assets, business return on investment, business net profit, and business savings in driving overall GIP.

4.4.3 CFA: Growth in turnover_retaining key employees

The growth in turnover_retaining key employees (GIT_RKE) model as shown in Figure 4.12 consisted of four observed variables and one unobserved variable. The observed variables included turnover growth (FP9), turnover growth compared to competitors (FP10), growth in number of employees (FP11), and talent retention (FP12). These variables were measured to understand their collective impact on an unobserved variable, GIT_RKE. The model estimated four regression weights, six covariance parameters and four variance parameters. No means or intercepts were included in the model, allowing for a more focused examination of the relationships between the observed and unobserved variables.

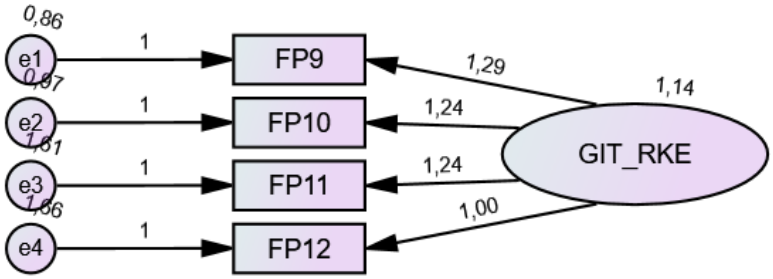

Figure 4.12: Growth in turnover_retaining key employees model

The sample covariances between the observed variables, as shown in Table 4.26, were essential in determining the interconnections among the variables. These covariances helped identify how the observed variables jointly contributed to the unobserved variable GIT_RKE. The covariance between turnover growth (FP 9) and turnover growth compared to competitors (FP 10) is 1,870, suggested a particular relationship between these variables.

In Table 4.27, the correlation matrix for the same set of variables is provided. These values ranged between -1 and 1, representing the strength and direction of the linear relationships between the variables. The correlation of 0,685 between turnover growth (FP9) and turnover growth compared to competitors (FP 10), highlighted the extent of linear association between those specific variables.

Table 4.26: Growth in turnover_retaining key employees covariance

VARIABLE	FP9	FP10	FP11	FP12
FP9: Turnover growth	2,754			
FP10: Turnover growth compared to competitors	1,870	2,708		
FP11: Growth in number of employees	1,792	1,669	3,358	
FP12: Talent retention	1,385	1,359	1,643	2,797

Condition number = 9,127 Eigenvalues 7,797 1,578 1,388 ,854 Determinant of sample covariance matrix = 14,591

Table 4.27: Growth in turnover_retaining key employees correlations

VARIABLE	FP9	FP10	FP11	FP12
FP9: Turnover growth	1,000			
FP10: Turnover growth compared to competitors	,685	1,000		
FP11: Growth in number of employees	,589	,553	1,000	
FP12: Talent retention	,499	,494	,536	1,000

Condition number = 8,606 Eigenvalues 2,682 ,566 ,440 ,312

The regression weights as presented in Table 4.28 illustrate the relationships between the unobserved variable (GIT_RKE) and the observed variables (turnover growth, turnover growth compared to competitors, growth in number of employees, and talent retention). The standardised regression weights, as shown in Table 4.29, present these relationships in a standardised form, allowing for a comparison of their relative strengths. From the regression weights, it was observed that talent retention (FP 12) displayed the highest positive relationship with GIT_RKE, with an estimated weight of 1.000. This indicated that a strong focus on retaining talented employees was associated with a significant improvement in overall turnover growth. Similarly, growth in number of employees (FP11) and turnover growth compared to competitors (FP10) exhibited positive relationships with GIT_RKE, with standardised regression weights of 0.7222 and 0.801,

respectively. These results implied that both an increase in the number of employees and outperforming competitors in terms of turnover growth could positively influence the overall retention of key employees. Turnover growth (FP9) also demonstrated a positive relationship with GIT_RKE, with a standardised regression weight of 0.829. This suggested that enhancing turnover growth could contribute to the organisation's ability to retain its key talent.

Table 4.28: Growth in turnover_retaining key employees regression weights

VARIABLE			ESTIMATE	S.E.	C.R.	P
FP12: Talent retention	<---	GIT_RKE	1,000			
FP11: Growth in number of employees	<---	GIT_RKE	1,242	,170	7,296	***
FP10: Turnover growth compared to competitors	<---	GIT_RKE	1,237	,159	7,799	***
FP9: Turnover growth	<---	GIT_RKE	1,292	,163	7,922	***

Table 4.29: Growth in turnover_retaining key employees standardised regression weights

VARIABLE			ESTIMATE
FP12: Talent retention	<---	GIT_RKE	,637
FP11: Growth in number of employees	<---	GIT_RKE	,722
FP10: Turnover growth compared to competitors	<---	GIT_RKE	,801
FP9: Turnover growth	<---	GIT_RKE	,829

In conclusion, the GIT_RKE model provided valuable insights into the factors influencing both turnover growth and talent retention within an organisation. Understanding these relationships could empower organisations to develop effective strategies for achieving sustainable growth and maintaining a motivated and engaged workforce. By prioritising talent retention, fostering turnover growth, and proactively

managing the number of employees, organisations could create an environment that nurtures and retains key employees, ultimately leading to long-term success and competitiveness in the market.

4.4.4 CFA: Effectual entrepreneur behaviour

The effectual entrepreneur behaviour (EEB) model initially aimed to explore the relationships between eight observed variables and one unobserved variable. However, two observed variables, EEB1 similarity of original idea to actual product, and EEB7 pre-commitments, were excluded from the final model because their relationships with other observed variables were not strong enough to be reliably estimated in the model. Figure 4.13 shows the following observed variables, EEB2 unclear end goal, EEB3 business evolution, EEB4 driven by resources at hand, EEB5 experimentation, EEB6 flexibility, and EEB8 how much individuals can afford to lose. Each of these variables represents distinct aspects of an entrepreneur's behavioural choices. The model estimated six regression weights, 15 covariance parameters, and six variance parameters. No means or intercepts were included in the model, allowing a more focused examination of the relationships between the observed and unobserved variables.

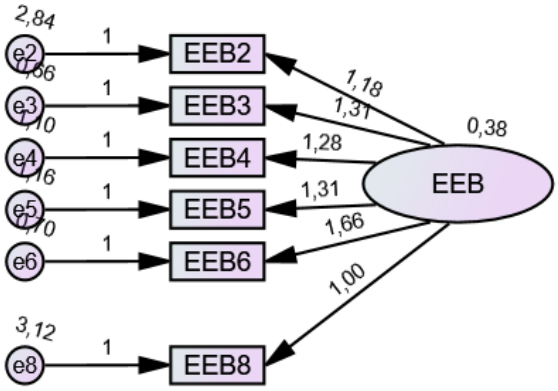

Figure 4.13: Effectuation model

The sample covariances between the observed variables, as shown in Table 4.30, provided insights into the interrelationships among the observed variables. These covariances were essential for understanding how the observed variables jointly influenced the unobserved variable EEB. Following this, Table 4.31 elucidates the correlations between these observed variables, further enhancing the understanding of their relationships.

Table 4.30: Effectual entrepreneur behaviour sample covariances

VARIABLE	EEB2	EEB3	EEB4	EEB5	EEB6	EEB8
EEB2: Unclear end goal	3,377					
EEB3: Business evolution	,606	1,320				
EEB4: Driven by resources at hand	,390	,645	1,725			
EEB5: Experimentation	,569	,642	,663	1,822		
EEB6: Flexibility	,824	,856	,778	,831	1,757	
EEB8: How much an individual can afford to lose	,612	,341	,890	,560	,517	3,501

Condition number = 8,683 Eigenvalues 5,643 2,943 2,292 1,093 ,882 ,650 Determinant of sample covariance matrix = 23,842

Table 4.31: Effectual entrepreneur behaviour sample correlations

VARIABLE	EEB2	EEB3	EEB4	EEB5	EEB6	EEB8
EEB2: Unclear end goal	1,000					
EEB3: Business evolution	,287	1,000				
EEB4: Driven by resources at hand	,162	,428	1,000			
EEB5: Experimentation	,229	,414	,374	1,000		
EEB6: Flexibility	,338	,562	,447	,464	1,000	
EEB8: How much an individual can afford to lose	,178	,159	,362	,222	,208	1,000

Condition number = 6,250 Eigenvalues 2,674 ,943 ,848 ,618 ,489 ,428

The regression weights, as presented in Table 4.32, indicated the relationships between the unobserved variable EEB and the various observed variables. The standardised regression weights, as shown in Table 4.33, represented these relationships in a standardised form, allowing for a comparison of their relative strengths.

From the regression weights, it was observed that EEB8, how much an individual can afford to lose, displayed the highest positive relationship with EEB, with an estimated weight of 1.000. This suggested that the entrepreneur's risk appetite, or the willingness to take calculated risks based on their financial capacity, played a critical role in shaping their overall entrepreneur behaviour. Similarly, EEB6 flexibility, and EEB5 experimentation, exhibited positive relationships with EEB, with standardised regression weights of 0.774 and 0.601, respectively. This implied that entrepreneurs who exhibit EEB are more likely to demonstrate flexibility in adapting to changing circumstances and actively experiment with different approaches and ideas. The observed variable EEB4, driven by resources at hand, also demonstrated a positive relationship with EEB, with a standardised regression weight of 0.705. This suggested that entrepreneurs who adopt effectual behaviour focus on leveraging their available resources to pursue opportunities. EEB3 business evolution also showed a positive relationship with EEB, with a standardised regression weight of 0.705. This indicated that entrepreneurs who display effectual behaviour are more likely to be responsive to the evolving nature of their business environments and to adopt their strategies accordingly. In addition, EEB2 unclear end goal exhibited a positive relationship with EEB, but with a lower standardised regression weight of 0.398. This suggested that entrepreneurs who adopt effectual behaviour maintained some degree of ambiguity or uncertainty about their ultimate end goal.

Table 4.32: Effectual entrepreneur behaviour regression weights

VARIABLE			ESTIMATE	S.E.	C.R.	P
EEB8: How much an individual can afford to lose	<---	EEB	1,000			
EEB6: Flexibility	<---	EEB	1,655	,447	3,702	**
EEB5: Experimentation	<---	EEB	1,309	,371	3,524	***
EEB4: Driven by resources at hand	<---	EEB	1,278	,362	3,527	***
EEB3: Business evolution	<---	EEB	1,307	,358	3,654	***
EEB2: Unclear end goal	<---	EEB	1,181	,389	3,038	,002

Table 4.33: Effectual entrepreneur behaviour standardised regression weights

VARIABLE			ESTIMATE
EEB8: How much an individual can afford to lose	<---	EEB	,331
EEB6: Flexibility	<---	EEB	,774
EEB5: Experimentation	<---	EEB	,601
EEB4: Driven by resources at hand	<---	EEB	,603
EEB3: Business evolution	<---	EEB	,705
EEB2: Unclear end goal	<---	EEB	,398

In conclusion, the EEB model provided valuable insights into the factors that influence entrepreneurial decision-making and behaviour. Entrepreneurs who demonstrated a hedged risk tolerance, flexibility, a willingness to experiment, and an ability to adapt to changing circumstances were associated with effectual behaviour. Additionally, leveraging available resources and being responsive to the evolving business landscape were also vital to EEB. By understanding the determinants of EEB, policymakers, educators, and aspiring entrepreneurs can foster an entrepreneurial ecosystem that encourages innovative and effectual approaches to venture creation and management. Effectual behaviours are associated with adaptive and agile decision-making,

which could enhance an entrepreneur's ability to identity and seize opportunities, leading to greater chances of entrepreneurial success and growth in various industries, including the technology sector.

4.4.5 Exploratory factor analysis

Table 4.34, demonstrates the following: ESE was positively correlated with HC and SC, with correlation coefficients ranging from 0.477 to 0.532. The same applied to HC variables, which were positively correlated with each other, with correlation coefficients ranging from 0.293 to 0.476. SC variables were also positively correlated with each other, with correlation coefficients ranging from 0.392 to 0.716.

Table 4.34: Correlation matrix

	SKILLS AND COMPETENCIES	PAST WORK EXPERIENCE	SELF CONFIDENCE	BUSINESS EXPERIENCE	INDUSTRY EXPERIENCE	MANAGERIAL EXPERIENCE	PARENTS IN BUSINESS	SIBLINGS IN BUSINESS	ENCOURAGEMENT FROM FRIENDS	ENCOURAGEMENT FROM FAMILY	ENCOURAGEMENT FROM NEIGHBOURS	FAMILY IN BUSINESS	NEIGHBOURS IN BUSINESS	INITIAL	EXTRACT
Skills and Competencies	1,000	0,532	0,477	0,145	0,277	0,161	0,032	0,031	0,138	0,162	0,057	0,020	0,095	1,000	0,735
Past Work Experience	0,532	1,000	0,419	0,264	0,485	0,357	0,061	0,088	0,052	0,138	0,042	0,075	0,100	1,000	0,666
Self Confidence	0,477	0,419	1,000	0,261	0,124	0,220	-0,063	-0,051	0,002	0,005	-0,047	-0,016	-0,022	1,000	0,567
Business Experience	0,145	0,264	0,261	1,000	0,293	0,435	-0,051	0,116	0,000	-0,020	-0,019	0,061	0,161	1,000	0,510
Industry Experience	0,277	0,485	0,124	0,293	1,000	0,476	-0,008	0,110	0,066	0,147	0,068	0,139	0,144	1,000	0,524
Managerial Experience	0,161	0,357	0,220	0,435	0,476	1,000	0,001	0,159	-0,070	0,019	-0,094	0,149	0,117	1,000	0,722
Parents in Business	0,032	0,061	-0,063	-0,051	-0,008	0,001	1,000	0,716	0,465	0,392	0,376	0,636	0,396	1,000	0,558
Siblings in Business	0,031	0,088	-0,051	0,116	0,110	0,159	0,716	1,000	0,554	0,498	0,405	0,654	0,464	1,000	0,684
Encouragement from Friends	0,138	0,052	0,002	0,000	0,066	-0,070	0,465	0,554	1,000	0,714	0,626	0,567	0,416	1,000	0,714
Encouragement from Family	0,162	0,138	0,005	-0,020	0,147	0,019	0,392	0,498	0,714	1,000	0,488	0,543	0,389	1,000	0,609

	SKILLS AND COMPETENCIES	PAST WORK EXPERIENCE	SELF CONFIDENCE	BUSINESS EXPERIENCE	INDUSTRY EXPERIENCE	MANAGERIAL EXPERIENCE	PARENTS IN BUSINESS	SIBLINGS IN BUSINESS	ENCOURAGEMENT FROM FRIENDS	ENCOURAGEMENT FROM FAMILY	ENCOURAGEMENT FROM NEIGHBOURS	FAMILY IN BUSINESS	NEIGHBOURS IN BUSINESS	INITIAL	EXTRACT
Encouragement from Neighbours	0,057	0,042	-0,047	-0,019	0,068	-0,094	0,376	0,405	0,626	0,488	1,000	0,460	0,691	1,000	0,587
Family in Business	0,020	0,075	-0,016	0,061	0,139	0,149	0,636	0,654	0,567	0,543	0,460	1,000	0,599	1,000	0,719
Neighbours in Business	0,095	0,100	-0,022	0,161	0,144	0,117	0,396	0,464	0,416	0,389	0,691	0,599	1,000	1,000	0,550

The component transformation matrix presented on Table 4.35 shows the loadings of each variable on the extracted components. Component 1 had high loadings for all variables except for parents in business, siblings in business, and encouragement from friends. This component seemed to represent a combination of ESE and HC variables. On the other hand, Component 2 appeared to represent SC variables only, with high loadings for parents in business, siblings in business, and encouragement from friends, encouragement from family, encouragement from neighbours, family in business, and neighbours in business. Component 3 had high loadings for industry experience, managerial experience, parents in business, siblings in business, and encouragement from friends. This component appeared to represent a combination of HC and SC variables.

Table 4.35: Component transformation matrix

COMPONENT	1	2	3
1	,976	,168	,137
2	-,216	,694	,687
3	,020	-,701	,713

Overall, the results of the exploratory factor analysis provided initial evidence for the validity of the measurement model. The variables seem to load on the expected components, indicating that they are capturing the intended constructs.

4.5 One-way ANOVA

Prior to moving to PLS-SEM, a one-way ANOVA was conducted to analyse the differences in demographic groups (intersecting moderator) in relation to firm performance EEB. These demographic groups included Asian and coloured, black African, white and multiracial, categorised by age groups at the start of the business (20 to 29 years, 30 to 39

years, 40 to 49 years, 50 to 59 years, 60 to 65 years, and over 65 years). The latter two age categories were not observed for this analysis.

4.5.1 Firm performance

Descriptive statistics were conducted, and the mean, standard deviation, standard error, and 95 per cent confidence intervals for the mean were calculated for each group. Additionally, the minimum and maximum values for each group were determined. The results in Table 4.36 indicate that the mean firm performance varied across the different demographic groups and age categories. The Asian and coloured group had its highest mean firm performance in the 40 to 49 year age group (M=5.7500, SD = 0.00000). For individuals aged 30 to 39 years, the mean firm performance was 4.5417 (SD=1.83390), indicating a slightly lower performance compared to the 40 to 49 year age group.

Regarding the black African group, the highest mean firm performance was found in the 50 to 59 year age group (M = 5.0139, SD = 2.07861), followed by the 40 to 49 year age group (M = 4.3611, SD = 1.42771). The lowest mean firm performance for the black African group was observed in the 30 to 39 year age group (M = 3.9205, SD = 1.34555).

White individuals exhibited relatively consistent firm performance across the different age groups, with mean scores ranging from 4.2143 (SD = 1.24337) in the 50 to 59 year age group, to 5.0000 (SD = 1.07250) in the 20 to 29 year age group.

Multiracial groups displayed varying levels of firm performance across age groups. The highest mean firm performance was observed in the 20 to 29 year age group (M= 5.8611, SD = 0.17347), while the lowest mean was found in the 50 to 59 year age group (M = 4.5278, SD = 0.39382)

In summary, the results of the One-Way ANOVA indicated that there are differences in firm performance across different demographic groups. Specifically, there were variations in the mean firm performance in the Asian and coloured, black African,

white, and multiracial groups across different age groups. These findings highlighted the importance of considering demographic factors, particularly the intersections of race and age, when examining firm performance, within the context of an unequal environment.

Table 4.36: Firm performance descriptives

VARIABLE	N	MEAN	STD. DEVIATION	STD. ERROR	95% CONFIDENCE INTERVAL FOR MEAN		MINIMUM	MAXIMUM
					LOWER BOUND	UPPER BOUND		
Asian & Coloured 30-39 years	6	4.5417	1.83390	.74869	2.6171	6.4662	1.75	6.50
Asian & Coloured 40-49 years	2	5.7500	.00000	.00000	5.7500	5.7500	5.75	5.75
Black African 20-29 years	18	4.2222	1.70639	.40220	3.3737	5.0708	1.67	6.83
Black African 30-39 years	22	3.9205	1.34555	.28687	3.3239	4.5170	1.00	6.50
Black African 40-49 years	15	4.3611	1.42771	.36863	3.5705	5.1518	1.17	6.08
Black African 50-59 years	6	5.0139	2.07861	.84859	2.8325	7.1953	2.08	7.00
White 20-29 years	12	5.0000	1.07250	.30960	4.3186	5.6814	3.50	6.83
White 30-39 years	32	4.4635	1.20890	.21371	4.0277	4.8994	1.08	6.33
White 40-49 years	17	4.3382	1.35448	.32851	3.6418	5.0346	2.58	6.25
White 50-59 years	7	4.2143	1.24337	.46995	3.0644	5.3642	3.00	6.17
Multiracial 20-29 years	3	5.8611	.17347	.10015	5.4302	6.2920	5.67	6.00
Multiracial 30-39 years	9	5.1019	1.42752	.47584	4.0046	6.1991	2.33	6.50
Multiracial 40-49 years	7	4.5238	1.58605	.59947	3.0570	5.9907	2.83	7.00
Multiracial 50-59 years	3	4.5278	.39382	.22737	3.5495	5.5061	4.08	4.83

Total	159	4.4738	1.39935	.11098	4.2546	4.6930	1.00	7.00

The tests of homogeneity of variances provided in Table 4.37 used a Levene statistic to assess whether the variances of different groups for firm performance are equal or not. When the significance value (Sig.) is less than 0.05, it indicated that the assumption of equal variances was violated, and the groups' variances were significantly different. The 'based on mean' and 'based on trimmed mean' tests had p-values of 0.007 and 0.009, respectively, which were less than 0.05. Thus, it can be concluded that the variances in these cases are significantly different between groups. On the other hand, the 'based on median' and the 'based on median with adjusted df' tests had p-values of 0.223 and 0.227, respectively, which are greater than 0.05. Therefore, the hypothesis of equal variances for these tests, indicating that the variances are not significantly different between groups, was accepted.

Table 4.37: Firm performance test of homogeneity of variances

VARIABLE	LEVENE STATISTIC	DF1	DF2	SIG.
Based on Mean	2.363	13	145	.007
Based on Median	1.293	13	145	.223
Based on Median and with adjusted df	1.293	13	116.784	.227
Based on trimmed mean	2.276	13	145	.009

The ANOVA for firm performance is presented in Table 4.38. This was to assess whether there were statistically significant differences in the means of firm performance across different demographic groups. The p-value (Sig.) of 0.410 was greater than 0.05, indicating that there was no statistically significant difference between the means of firm performance across different demographic groups. Therefore, based on these results, there was not sufficient evidence to reject the null hypothesis, thus it was concluded that there were no significant differences in the means of firm performance across the groups.

Table 4.38: Firm Performance ANOVA

VARIABLE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.
Between Groups	26.561	13	2.043	1.047	.410
Within Groups	282.830	145	1.951		
Total	309.391	158			

In Table 4.39, the Eta-squared value of 0.086 indicates that approximately 8.6 per cent of the total variance in firm performance could be explained by the group variable. Omega-squared values were very small, indicating that the independent variable has a minimal effect on the variance of the dependent variable, and very little of the variance was explained by the group demographics.

Table 4.39: Firm performance ANOVA effect sizes[a,b]

VARIABLE	POINT ESTIMATE	95% CONFIDENCE INTERVAL	
		LOWER	UPPER
Eta-squared	.086	.000	.099
Epsilon-squared	.004	-.090	.018
Omega-squared Fixed-effect	.004	-.089	.018
Omega-squared Random-effect	.000	-.006	.001

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.
b. Negative but less biased estimates are retained, not rounded to zero

4.5.2 Post hoc tests

The post hoc tests results in Appendix C showed the mean differences between different groups and their confidence intervals for the dependent variable firm performance across various categories of the variable, intersection of race and age (RaceAge). The ‘Sig.’ column indicates the p-vales for each comparison, thus helping to determine if the mean differences are statistically significant. Using a commonly used significance level of

0.05, most of the comparisons did not show significant differences in firm performance between the different groups.

4.5.3 Homogeneous subsets

Table 4.40 presents the homogeneous subsets analysis using the Tukey's honestly significant difference (HSD) which was conducted to explore significant differences in firm performance based on the RaceAge categories. Each subset represented a group of individuals with similar mean firm performance scores, and these subsets were arranged in ascending order of their mean scores. The results show individuals belonging to the black African 30 to 39 year subset had the lowest mean firm performance score (3.9205) among all subsets. On the other hand, individuals in the multiracial 20 to 29 year subset had the highest mean firm performance score (5.8611).

The p-value associated with the homogeneous subsets analysis was 0.445. This p-value was used to determine the significance of the differences between the mean firm performance scores of the subsets. The homogeneous subsets analysis using Tukey's HSD indicated that there were no statistically significant differences in firm performance across the RaceAge categories at the alpha of 0.05. However, it is important to consider that the group sizes under analysis are unequal, thus a harmonic mean sample size of 6.256 was used to address this imbalance.

Table 4.40: Firm performance Tukey's HSD

RACEAGE	N	SUBSET FOR ALPHA = 0.05
		1
Black African 30-39 years	22	3.9205
White 50-59 years	7	4.2143
Black African 20-29 years	18	4.2222

RACEAGE	N	SUBSET FOR ALPHA = 0.05
		1
White 40-49 years	17	4.3382
Black African 40-49 years	15	4.3611
White 30-39 years	32	4.4635
Multiracial 40-49 years	7	4.5238
Multiracial 50-59 years	3	4.5278
Asian & Coloured 30-39 years	6	4.5417
White 20-29 years	12	5.0000
Black African 50-59 years	6	5.0139
Multiracial 30-39 years	9	5.1019
Asian & Coloured 40-49 years	2	5.7500
Multiracial 20-29 years	3	5.8611
Sig.		.445

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 6.256.
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

4.5.4 One-way ANOVA effectuation

The one-way ANOVA in Table 4.41 presents the effectuation scores of different demographics, grouped according to race and age. The table provides descriptive statistics including the mean, standard deviation, standard error, and 95 per cent confidence intervals for each group. The mean effectuation score for the entire sample of 159 was approximately 5.3658, with a standard deviation of approximately 0.95972. The standard error of the mean was approximately 0.07611. The 95 per cent confidence interval for the mean effectuation score ranged from approximately 5.2155 to 5.5158. The results indicate that there were differences in effectuation scores across the different demographics; this might indicate varying levels of effectual thinking and decision-making. Of note, the white

20 to 29 year group (n=12) had the highest mean effectuation score of 5.8472, suggesting a relatively higher tendency for effectual behaviour within this subset. On the other hand, the Asian and coloured 40 to 49 year group (n=2) had the lowest mean effectuation score of 4.9167, indicating a lower tendency for effectual thinking in this specific group. The standard deviations and standard errors of the mean provided insights into the dispersion of effectuation scores within each group and the precision of the mean estimate, respectively. However, it is important to consider that smaller group sizes, for example n=2, might lead to greater variability in the mean estimates, as seen in the wider confidence intervals for the Asian and coloured 40 to 49 year group (-6,7307 - 16,5640).

Table 4.41: Effectuation descriptives

VARIABLE	N	MEAN	STD. DEVIATION	STD. ERROR	95% CONFIDENCE INTERVAL FOR MEAN		MINIMUM	MAXIMUM
					LOWER BOUND	UPPER BOUND		
Asian & Coloured 30-39 years	6	5,6667	,82999	,33884	,7956	.5377	4,83	7,00
Asian & Coloured 40-49 years	2	4,9167	1,29636	,91667	6,7307	6,5640	4,00	5,83
Black African 20-29 years	18	5,6296	,88479	,20855	,1896	,0696	3,33	7,00
Black African 30-39 years	22	4,9697	1,29778	,27669	,3943	,5451	1,50	6,50
Black African 40-49 years	15	5,2889	,47336	,12222	,0267	,5510	4,33	6,00
Black African 50-59 years	6	5,3889	,94084	,38410	,4015	,3762	3,50	6,00
White 20-29 years	12	5,8472	,77998	,22516	,3516	,3428	4,67	7,00
White 30-39 years	32	5,3021	,80482	,14227	,0119	,5923	3,17	6,50
White 40-49 years	17	5,1275	1,34181	,32544	4,4376	,8173	1,00	6,67
White 50-59 years	7	5,7381	,82696	,31256	,9733	,5029	4,67	6,83
Multiracial 20-29 years	3	4,5000	,44096	,25459	,4046	,5954	4,17	5,00
Multiracial 30-39 years	**9**	5,3704	,71578	,23859	,8202	,9206	4,17	6,33
Multiracial 40-49 years	**7**	5,7857	,90120	,34062	,9522	,6192	4,50	7,00
Multiracial 50-59 years	3	5,8333	,44096	,25459	,7379	,9287	5,50	6,33
Total	159	5,3658	,95972	,07611	,2155	,5162	1,00	7,00

Table 4.42 shows the tests of homogeneity of variance. The Levene statistic was used to assess whether the variance of effectuation scores was homogenous across different groups. Four tests were conducted based on different metrics (mean, median, median with adjusted degrees of freedom, and trimmed mean). In all four tests, the p-values (significance) were greater than 0.05, indicating that there was no significant difference among groups. Therefore, the assumption of homogeneity of variances was met for the ANOVA analysis.

Table 4.42: Effectuation test of homogeneity

VARIABLE	LEVENE STATISTIC	DF1	DF2	SIG.
Based on Mean	1,190	13	145	,292
Based on Median	,910	13	145	,544
Based on Median and with adjusted df	,910	13	93,202	,546
Based on trimmed mean	1,015	13	145	,440

Table 4.43 shows the ANOVA, which tested the null hypothesis that there were no differences in the mean effectuation scores among the groups. The F-ratio (1.256) compared the variability between groups (between group mean square) to the variability within the groups (within groups mean square). The p-value (0.246) associated with the F-ratio was greater than 0.05, indicating that there was no significant difference in effectuation scores among groups.

Table 4.43: Effectuation ANOVA

VARIABLE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.
Between Groups	14,729	13	1,133	1,256	,246
Within Groups	130,797	145	,902		
Total	145,527	158			

The ANOVA effect sizes, in Table 4.44, provide information about the magnitude of the differences among the groups. The results suggested that there was a small, but not statistically significant difference in effectuation scores among the groups.

Table 4.44: Effectuation ANOVA effect sizes[ab]

VARIABLE	POINT ESTIMATE	95% CONFIDENCE INTERVAL	
		LOWER	UPPER
Eta-squared	,101	,000	,121
Epsilon-squared	,021	-,090	,042
Omega-squared Fixed-effect	,021	-,089	,042
Omega-squared Random-effect	,002	-,006	,003

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.
b. Negative but less biased estimates are retained, not rounded to zero.

The multiple comparisons (Tukey HSD) for effectuation are shown in Appendix D, revealing specific comparisons between pairs of groups, and shedding light on potential subtle differences among certain subgroups. The reporting was done with caution since some comparisons were not statistically significant and the confidence intervals for the mean differences were too wide. For example, the mean difference between the Asian and coloured 40 to 49 year group and the black African 30 to 39-year group on the variable effectuation was -0.05303. The negative sign indicates that the Asian and coloured 40 to 49 year group had on average, a slightly lower effectuation score compared to the black African 30 to 39 year group. However, the difference was not statistically significant (Sig = 1.000). The 95 per cent confidence interval suggests that the true population mean difference lay within the range of -2.3400 to 2.4460. On the other hand, the mean difference between the Asian and coloured 40 to 49 year group and the black African 40 to 49 year group was 0.37222. This indicates that the Asian and coloured 40 to 49 year group

had, on average, a slightly higher effectuation score compared to the black African group of the same age. However, the difference was not statistically significant (Sig. =1.000). The 95 per cent confidence interval suggested that the true population mean difference lay within the range of -2.0669 to 2.8113.

When comparing the mean difference between black African groups and white groups of similar age categories, the statistical analysis did not find any significant differences in effectuation scores within each age category. These results suggested that race was not a significant factor influencing the EEB among individuals within the same age groups.

4.6 Structural Equation Modelling

Structural equation modelling (SEM) analysis was conducted to examine the proposed model, encompassing two main sections: the evaluation of the measurement model and the analysis of the structural model. The measurement model assessment aimed to establish the quality criteria of the constructs in the study, while the structural model analysis substantiated the proposed hypotheses by examining the relationships between the constructs/latent variables (Hair et al., 2021b).

4.6.1 Assessment of the measurement model

In this study, assessing the measurement model involved evaluating the reliability and validity of the constructs used. This assessment was crucial for justifying the inclusion of the constructs in the path model and ensuring the quality of the measurement instrument (Hair et al., 2021b; Tavakol & Dennick, 2011). To establish the reliability of the measurement instrument, internal consistency reliability was assessed (Hair et al., 2021b; Henseler et al., 2009). This reflects the degree to which all the items in an instrument measure the same concept or construct.

Two commonly used measures are Cronbach's alpha and internal consistency. Cronbach's alpha calculates the indicator intercorrelations and is often combined with composite reliability for a more comprehensive assessment (Henseler et al., 2009). The study noted that Cronbach's alpha tends to be conservative in estimating internal consistency (Hair et al., 2021b; Henseler et al., 2009), while composite reliability is considered more liberal (Hair et al., 2021b). The true reliability typically falls within the range between these two measures. The coefficient rho_a can serve as a potential mediator between Cronbach alpha and composite reliability rho_c (Dijkstra, 2014; Dijkstra & Henseler, 2015).

4.6.1.1 Indicator reliability / Factor loadings

Indicator reliability, also known as factor loadings, explains the correlations between observed variables and latent factors (Hair et al., 2021b). One such measure is Cronbach's alpha, proposed by Lee Cronbach as early as 1951 (Cronbach, 1951). It is expressed as a value between zero and one, reflecting internal consistency. Higher values indicate better internal consistency. In this study, all items exhibited factor loadings above 0.40. While Hair et al. (2014) noted that the recommended factor loading is 0.70; an item with loading between 0.40 and 0.70 should only be removed if it cannot enhance construct reliability and convergent validity. Consequently, in this study, two items from the effectual entrepreneur behaviour construct (EEB1 similarity of the original idea to actual business, and EEB2 unclear end goal) and one item from the HC construct (HC2 level of education) were deleted. The items for each construct and their factor loadings are presented in Table 4.45.

4.6.1.2 Internal consistency reliability / Construct reliability

The second step in the reflective measurement model assessment involved examining internal consistency reliability, which reflects the association between

indicators measuring the same construct. Reliability indicates consistent measurement of the construct across uses. Cronbach alpha and composite reliability are two prominent measures of construct reliability, sharing a similar assessment threshold. Higher values signify higher levels of reliability. For instance, reliability values between 0.60 and 0.70 are considered acceptable in exploratory research, whereas values between 0.70 and 0.90 are deemed satisfactory to good (Diamantopoulos et al., 2012). However, values above 0.90, particularly above 0.95 do not necessarily indicate improvement, as they suggest redundancy of indicators and questionable construct validity (Diamantopoulos et al., 2012).

Cronbach's alpha assumes that all indicator loadings are the same in the population (tau-equivalence). Deviations from this assumption result in lower reliability values than those produced by Spearman's rank correlation coefficient ($rho_{c)}$. Consequently, a more contemporary approach to measuring construct reliability involves replacing Cronbach's alpha with composite reliability. In the present study, Cronbach's alpha values ranged from 0.668 for HC to 0.918 for growth in profit. The composite reliability (rho_c) values ranged from 0.802 for EEB to 0.943 for growth in profit. Thus, all constructs exhibited acceptable reliability based on the composite reliability criteria. Although the alpha value for HC falls slightly below the recommended threshold of 0.70, it is very close, and the result was affirmed by the composite reliability (rho_a and rho_c) which was deemed acceptable at 0.705 and 0.815, respectively.

Additionally, the composite reliability value of GIB and growth in profit, although below 0.95, were slightly concerning at 0.913 and 0.943 respectively, surpassing the threshold suggested by Diamantopoulos et al. (2012). Table 4.45 presents the results of Cronbach's alpha and composite reliability rho_c, while composite reliability rho_a is also

included to demonstrate its position between the two measures (Dijkstra, 2014 Dijkstra & Henseler, 2015).

Table 4.45: Internal consistency measures

FACTORS	CRONBACH'S ALPHA	COMPOSITE RELIABILITY (RHO_A)	COMPOSITE RELIABILITY (RHO_C)	AVERAGE VARIANCE EXTRACTED (AVE)
Effectual Entrepreneur Behaviour	0,746	0,744	0,802	0,407
Entrepreneurial Self-Efficacy	0,732	0,844	0,838	0,637
Growth in Business	0,874	0,922	0,913	0,725
Growth in Profit	0,918	0,918	0,943	0,804
Growth in Turnover_Retaining Key Employees	0,835	0,863	0,889	0,668
Human Capital	0,668	0,705	0,815	0,597
Social Capital	0,873	0,887	0,892	0,483

4.6.1.3 Convergent validity

Convergent validity, a form of construct validity, assesses the extent to which a test is related to other tests measuring the same or similar constructs (Hair et al., 2021b; Nikolopoulou, 2022). It examines the similarity or relatedness between the test and others measuring the same construct (Nikolopoulou, 2022). Average variance extracted (AVE) is used to assess convergent validity, with a value above 0.50 indicating sufficient convergent validity. The results revealed AVE values ranging between 0.407 for EEB to 0.804 for growth in profit.

Although the AVE values for EEB and SC fell below the recommended threshold, as stated by Hair et al. (2014), convergent validity is established if the AVE values are over 0.40 and composite reliability is above 0.70. Given that the present study's composite

reliability values for the constructs surpassed 0.70, it could be concluded that convergent validity was established. Refer to Table 4.46 showing EEB AVE of 0.407 and Cronbach alpha of 0.746, and for SC, an AVE score of 0.483 and Cronbach alpha of 0.873:

Table 4.46: Convergent validity using average variance extracted

FACTORS	CRONBACH'S ALPHA	AVERAGE VARIANCE EXTRACTED (AVE)
Effectual Entrepreneur Behaviour	0,746	0,407
Entrepreneurial Self-Efficacy	0,732	0,637
Growth in Business	0,874	0,725
Growth in Profit	0,918	0,804
Growth in Turnover_Retaining Key Employees	0,835	0,668
Human Capital	0,668	0,597
Social Capital	0,873	0,483

4.6.1.4 Discriminant validity

Discriminant validity is an important aspect of construct validity that aims to establish the distinctiveness of different constructs. (Hair et al., 2021b; Nikolopoulou, 2022). This study assessed discriminant validity using three techniques: the Fornell and Larcker criterion, the heterotrait-monotrait (HTMT) ratio, and cross-loadings.

- *Fornell-Larcker*: The Fornell-Larcker criterion, (Fornell & Larcker, 1981) compares the AVE of each construct with the squared inter-construct correlations of that same construct and all other reflectively measured constructs in the structural model. Each diagonal value should be greater than its respective column and row values for discriminant validity to be established, as was the case in this study (see Table 4.47). This criterion has been widely used to assess discriminant validity; however, the Fornell-Larcker criterion has received criticism in recent studies,

particularly when indicator loadings on a construct have minimal differences. As a result, the use of HTMT in correlations has gained popularity (Hair et al., 2021b).

Table 4.47: Discriminant validity using Fornell-Larcker criterion

VARIABLE	EFFECTUAL ENTREPRENEUR BEHAVIOUR	ENTREPRENEURIAL SELF-EFFICACY	GROWTH IN BUSINESS	GROWTH IN PROFIT	GROWTH IN TURNOVER_ RETAINING KEY EMPLOYEES	HUMAN CAPITAL	SOCIAL CAPITAL
Effectual Entrepreneur Behaviour	0,638						
Entrepreneurial Self-Efficacy	0,379	0,798					
Growth in Business	0,194	0,166	0,851				
Growth in Profit	0,275	0,063	0,757	0,897			
Growth in Turnover_Retaining Key Employees	0,275	0,138	0,613	0,615	0,818		
Human Capital	0,069	0,416	0,143	0,031	0,036	0,772	
Social Capital	0,142	0,152	0,156	0,150	0,207	0,211	0,695

- *Heterotrait-monotrait ratio:* The Heterotrait-monotrait (HTMT) ratio is a relatively new criterion for assessing discriminant validity, and is defined as the mean value of the indicator correlations across constructs relative to the geometric mean of the average correlations for the indicators measuring the same construct as seen in Figure 4.14 (Hair et al., 2021b; Henseler et al., 2015).

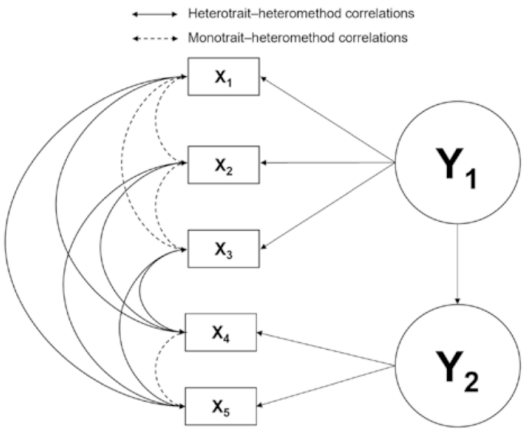

Figure 4.14: Discriminant validity assessment using HTMT

Sourced from Hair et al. (2021)

Hair et al. (2021b) advocated for the use of HTMT and provided a functional framework for its assessment. Ideally, the HTMT values should be below 0.85 for discriminant validity, most of the constructs in this study complied. A value higher than 0.90 in HTMT suggests a lack of discriminant validity, especially for similar concepts. However, for distinct concepts, a threshold of 0.85 is suggested (Hair et al., 2021b; Henseler et al., 2015). Bootstrapping is recommended to assess whether HTMT values fall within the specified threshold. In this study, HTMT values showed satisfactory discriminant validity except for the correlation between GIP -> GIB, which was 0.856. Although this value falls below 0.90, it can still be a cause for concern since both belong to the firm performance construct (Table 4.48).

Table 5.48: Discriminant validity on the heterotrait-monotrait ratio matrix

VARIABLE	EFFECTUAL ENTREPRENEUR BEHAVIOUR	ENTREPRENEURIAL SELF-EFFICACY	GROWTH IN BUSINESS	GROWTH IN PROFIT	GROWTH IN TURNOVER_ RETAINING KEY EMPLOYEES	HUMAN CAPITAL	SOCIAL CAPITAL
Effectual Entrepreneur behaviour							
Entrepreneurial Self-Efficacy	0,525						
Growth in Business	0,190	0,179					
Growth in Profit	0,258	0,077	0,856				
Growth in Turnover_Retaining Key Employees	0,274	0,164	0,736	0,697			
Human Capital	0,174	0,583	0,171	0,058	0,136		
Social Capital	0,210	0,164	0,137	0,129	0,205	0,258	

- *Cross-loadings:* Cross-loadings represent an additional method employed to evaluate discriminant validity, allowing the assessment of both the magnitude and uniqueness of indicator loadings. This process involves scrutinising the loadings of different items on their respective constructs, aiming to identify any items that might exhibit substantial loadings on more than one construct (Henseler et al., 2015; Sarstedt et al., 2021). In cross-loadings, the expectation is that each indicator should exhibit higher loadings on its designated construct compared to other constructs (Henseler et al., 2015; Sarstedt et al., 2021). This study largely confirmed this expectation, as evidenced in Table 4.49.

Table 4.49: Discriminant validity using cross-loadings

VARIABLE	EFFECTUAL ENTREPRENEUR BEHAVIOUR	ENTREPRENEURIAL SELF-EFFICACY	GROWTH IN BUSINESS	GROWTH IN PROFIT	GROWTH IN TURNOVER_ RETAINING KEY EMPLOYEES	HUMAN CAPITAL	SOCIAL CAPITAL
EEB3	0,619	0,300	0,027	0,091	0,164	0,039	-0,035
EEB4	0,680	0,218	0,056	0,133	0,211	-0,029	0,149
EEB5	0,503	0,260	-0,017	0,014	-0,015	0,125	-0,037
EEB6	0,712	0,280	0,114	0,170	0,175	0,117	0,153
EEB7	0,743	0,257	0,232	0,283	0,246	0,051	0,093
EEB8	0,534	0,248	0,117	0,137	0,030	0,048	0,070
ESE1	0,353	0,819	0,102	0,040	0,124	0,231	0,144
ESE2	0,317	0,891	0,183	0,077	0,132	0,448	0,165
ESE3	0,233	0,668	0,084	0,010	0,052	0,272	-0,004
FP1	0,083	0,143	0,748	0,597	0,624	0,095	0,082
FP10	0,180	0,117	0,512	0,516	0,821	0,091	0,117
FP11	0,259	0,123	0,431	0,399	0,834	-0,054	0,186
FP12	0,100	0,119	0,485	0,441	0,738	0,093	0,195
FP2	0,202	0,162	0,895	0,688	0,527	0,136	0,132

VARIABLE	EFFECTUAL ENTREPRENEUR BEHAVIOUR	ENTREPRENEURIAL SELF-EFFICACY	GROWTH IN BUSINESS	GROWTH IN PROFIT	GROWTH IN TURNOVER_ RETAINING KEY EMPLOYEES	HUMAN CAPITAL	SOCIAL CAPITAL
FP3	0,181	0,191	0,904	0,609	0,497	0,175	0,153
FP4	0,174	0,040	0,849	0,720	0,492	0,046	0,158
FP5	0,252	0,101	0,728	0,853	0,438	0,063	0,106
FP6	0,268	0,038	0,673	0,925	0,538	-0,008	0,120
FP7	0,237	0,058	0,682	0,935	0,601	0,029	0,129
FP8	0,229	0,028	0,629	0,872	0,629	0,027	0,184
FP9	0,310	0,099	0,582	0,642	0,872	0,022	0,177
HC1	0,045	0,272	0,116	0,011	0,050	0,778	0,129
HC3	0,061	0,421	0,094	0,013	-0,066	0,672	0,228
HC4	0,059	0,323	0,119	0,042	0,060	0,856	0,164
SC1	0,167	0,034	-0,007	-0,010	0,088	-0,026	0,611
SC2	0,177	0,051	0,024	0,019	0,094	0,168	0,697
SC3	0,108	0,086	0,000	0,043	0,105	-0,017	0,690
SC4	0,178	0,146	0,116	0,156	0,059	0,043	0,712
SC5	0,079	0,036	-0,009	0,011	0,015	-0,038	0,659

VARIABLE	EFFECTUAL ENTREPRENEUR BEHAVIOUR	ENTREPRENEURIAL SELF-EFFICACY	GROWTH IN BUSINESS	GROWTH IN PROFIT	GROWTH IN TURNOVER_ RETAINING KEY EMPLOYEES	HUMAN CAPITAL	SOCIAL CAPITAL
SC6	0,123	0,177	0,084	0,119	0,146	0,363	0,692
SC7	0,076	0,048	0,131	0,107	0,172	0,146	0,840
SC8	0,110	0,091	0,215	0,137	0,202	0,177	0,799
SC9	-0,020	0,163	0,074	0,105	0,173	0,117	0,494

4.6.1.5 R-square

R-square values, also known as the coefficient of determination, provide valuable insights into the extent to which the variance in the dependent variables can be accounted for or explained by the independent variables (Hair et al., 2021b). In the context of this study, as demonstrated in Table 4.50, the R-square values for GIB, GIP, and GIT_RKE appeared to be relatively low. This implied that the predictors considered in this study had limited explanatory power in predicting changes or variables in these specific dependent variables. When R-square values are low, it suggests that there are other factors not accounted for by the selected independent variables that significantly influence the outcomes of interest. Having said that, low R-square values do not necessarily imply that the chosen predictors are entirely irrelevant or insignificant, it merely indicates that they might not be the dominant or primary drivers of the variations observed in the dependent variables under examination. Although not part of the scope of this study, this would necessitate the exploration of additional variables or factors that might contribute to a more comprehensive understanding of the observed outcomes.

Table 4.50: R-square

VARIABLE	R-SQUARE	R-SQUARE ADJUSTED
Growth in Business	0,068	0,044
Growth in Profit	0,092	0,068
Growth in Turnover_Retaining Key Employees	0,105	0,082

The relatively low R-square values for the dependent variables suggested that there might be other significant predictors not included in the model, and other researchers might need to consider a broader set of predictors or delve deeper into the complexities of firm performance to gain a more accurate and comprehensive understanding of the

relationships involved. In conclusion, the model, as shown in Figure 4.15, had good construct reliability, but there were issues with the model fit and potential discriminant validity concerns for certain pairs of constructs.

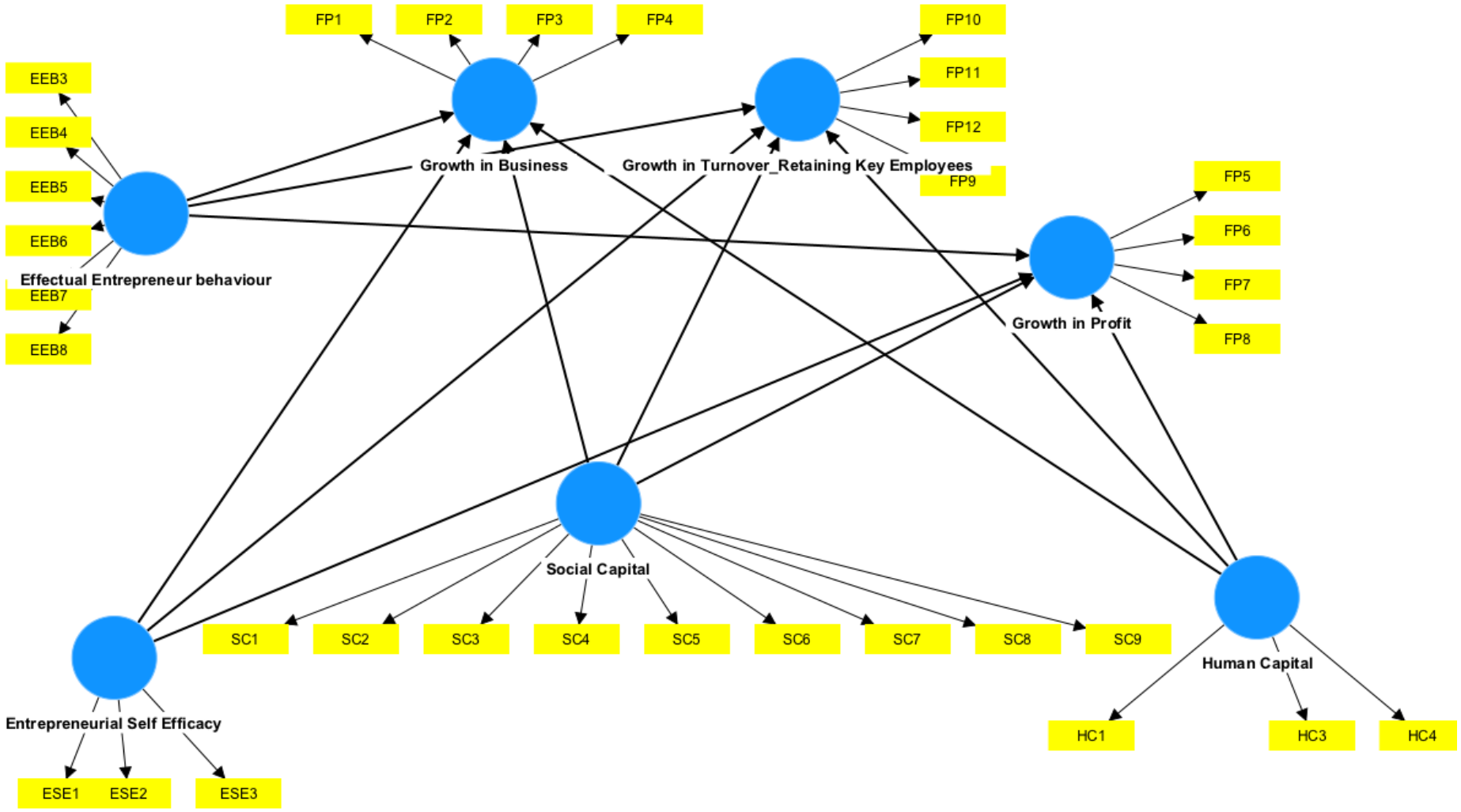

Figure 4.15: Suggested measurement model

4.6.2 Evaluating the structural model

In this study, the structural model incorporates the proposed relationships outlined in the research framework. To assess the results of this model, a systematic four-step procedure was employed. First, the collinearity issues within the structural model were identified and addressed. Second, the focus shifted towards examining the path coefficients present in the structural model. Third, the explanatory capability of the model was assessed using the R^2 value, particularly concerning the endogenous latent variables: entrepreneur means and firm performance. Finally, the analysis included an investigation of the moderated mediation effect.

4.6.2.1 Multicollinearity

The Variance Inflation Factor (VIF) is a statistical measure used to assess multicollinearity in a regression analysis (Vanhove, 2021). It quantifies how much the variance of an estimated regression coefficient increases due to collinearity among the predictor variables. VIF values greater than one indicate the presence of some multicollinearity, and generally, VIF values above five are considered problematic, suggesting severe multicollinearity (Hair et al., 2021a).

In this study, the VIF values for the inner model and outer model were examined. The inner model investigated the relationships between various independent variables (EEB, ESE, HC, and SC) and their effects on three dependent variables (GIB, GIP, and GIT_RKE). The outer model examined the VIF values for each specific relationship between the independent variables and dependent variables.

The VIF values for the inner model as demonstrated in Table 4.51 were all below five, indicating that there is no severe multicollinearity among the independent variables. The highest VIF value observed was 1.422 for both EEB and ESE in relation to GIB, GIP, and GIT_RKE. Since all VIF values were below five, it suggested that the independent

variables were not highly correlated with each other and could be included in the model without concern for multicollinearity.

Table 4.51: Inner model VIF scores

VARIABLE	INNER MODEL VIF
Effectual Entrepreneur behaviour -> Growth in Business	1.196
Effectual Entrepreneur behaviour -> Growth in Profitability	1.196
Effectual Entrepreneur behaviour -> Growth in Turnover_Retaining Key Employees	1.196
Entrepreneurial Self-Efficacy -> Growth in Business	1.422
Entrepreneurial Self-Efficacy -> Growth in Profitability	1.422
Entrepreneurial Self-Efficacy -> Growth in Turnover_Retaining Key Employees	1.422
Human Capital -> Growth in Business	1.261
Human Capital -> Growth in Profitability	1.261
Human Capital -> Growth in Turnover_Retaining Key Employees	1.261
Social Capital -> Growth in Business	1.065
Social Capital -> Growth in Profitability	1.065
Social Capital -> Growth in Turnover_Retaining Key Employees	1.065

The outer model in Table 4.52 focuses on the specific items or measures that represent each construct. Here, the VIF values were calculated for each item's relationship with the respective construct. The VIF values for most of the items in the outer model were below two, indicating low levels of multicollinearity between the items within each construct. However, there were a few items with higher VIF values, such as FP 6 (VIF=4.141) and FP2 (VIF=2.564), and FP3 (VIF = 2.701). These higher VIF values might suggest some degree of multicollinearity among the items in these constructs. Additionally, the items SC3 has a VIF value of 3.057, which also indicated a potential issue with multicollinearity among the items in the SC construct.

Table 4.52: Outer model VIF scores

VARIABLE	VIF
EEB3	1,597
EEB4	1,488
EEB5	1,413
EEB6	1,714
EEB7	1,191
EEB8	1,235
ESE1	1,566
ESE2	1,468
ESE3	1,361
FP1	1,687
FP10	2,073
FP11	1,804
FP12	1,556
FP2	2,564
FP3	2,701
FP4	2,503
FP5	2,458
FP6	4,141
FP7	5,057
FP8	3,073
FP9	2,187
HC1	1,248
HC3	1,309
HC4	1,475
SC1	2,347
SC2	2,621
SC3	3,057

VARIABLE	VIF
SC4	2,408
SC5	2,754
SC6	1,572
SC7	2,911
SC8	2,740
SC9	1,193

In conclusion, the inner model appeared well structured with no significant multicollinearity among the main constructs and their relationships with growth aspects. However, the outer model showed some potential issues with multicollinearity for certain items within the constructs of EEB, ESE, and SC. Overall, the VIF analysis provided valuable insights into the collinearity of the model's variables and helped to ensure the reliability and validity of the regression results.

4.6.2.2 Statistical significance of path coefficients

Conversely, the significance of path coefficients served to determine the nature of relationships between variables, whether positive or negative. Specifically, this assessment sought to ascertain whether an increase in the value of the independent variable corresponded with an increase or decrease in the value of the dependent variable. To accomplish this, a bootstrapping exercise was conducted. Significance was established at a 95 per cent confidence level when the p-value was below 0.5 and t-values above 1.960. Table 4.53 displays the following findings:

- A significant positive relationship on the EEB -> firm performance relationship ((*β = 0.256. p=0.035),* indicated that as EEB increased, firm performance also improved. This validated H_1.

- A positive relationship on the EEB -> entrepreneur means relationship (*β = 0.206. p=0.036),* which suggested that as EEB increased, the reliance on entrepreneur means also increased. This supported H_4.
- A very strong positive relationship on entrepreneur means firm -> performance (*β = 0.801. p=0.008).* This signified the importance of intangible resources in driving firm performance.
- An insignificant relationship on RaceAge -> entrepreneur means (*β* =0.011, p = 0.250), suggested that race and age, combined, did not directly influence the reliance on entrepreneur means.
- A significant positive relationship on RaceAge -> firm performance relationship (*β* =0.251, p = 0.014), indicated that race and age combined did have a significant influence on firm performance.
- A negative relationship between RaceAge x entrepreneur means -> firm performance (*β* =-0.052, p = 0.026) as depicted in Figure 4.16 indicated that there might be instances where the interaction of race and age with entrepreneur means could reduce firm performance.

Table 4.53: Path coefficients

VARIABLE	ORIGINAL SAMPLE (O)	SAMPLE MEAN (M)	STANDARD DEVIATION (STDEV)	T STATISTICS (|O/STDEV|)	P VALUES
Effectual Entrepreneur Behaviour -> Entrepreneur Means	0,206	0,209	0,114	1,802	0,036
Effectual Entrepreneur Behaviour -> Firm Performance	0,256	0,257	0,141	1,811	0,035
Entrepreneur Means -> Firm Performance	0,801	0,819	0,330	2,426	0,008
RaceAge -> Entrepreneur Means	0,011	0,011	0,016	0,675	0,250

VARIABLE	ORIGINAL SAMPLE (O)	SAMPLE MEAN (M)	STANDARD DEVIATION (STDEV)	T STATISTICS (|O/STDEV|)	P VALUES
RaceAge -> Firm Performance	0,251	0,261	0,114	2,208	0,014
RaceAge x Entrepreneur Means -> Firm Performance	-0,052	-0,055	0,027	1,942	0,026

4.6.2.3 Explanatory power: Coefficients of determination (R^2)

The coefficients of determination (R^2) of the identified endogenous latent variables within the model were examined. These variables were identifiable by arrows pointing to them. As seen in Table 4.54, for entrepreneur means, the R^2 value of 0.042 indicated that about 4.2 per cent of the variability in entrepreneur means could be explained by the predictors. This value was not significant (p=0.174), implying that other unexamined variables might be contributing. For firm performance, the model explained about 10.1 per cent of the variance; this value was significant (p=0.022).

Table 4.54: R-Square values

VARIABLES	ORIGINAL SAMPLE (O)	SAMPLE MEAN (M)	STANDARD DEVIATION (STDEV)	T STATISTICS (|O/STDEV|)	P VALUES
Entrepreneur Means	0,042	0,057	0,045	0,940	0,174
Firm Performance	0,101	0,127	0,050	2,011	0,022

4.6.2.4 Moderated mediation analysis: Examining indirect effects

The analysis further incorporated the notion of moderated mediation, where a moderator interacts with one or more paths of the mediated effect, leading to variations in the mediated effect's value on the moderator's value (Hair et al., 2021b). The EEB -> entrepreneur means -> firm performance relationship was positive (β = 0.165) but not significant (p=0.081), suggesting that while EEB did influence firm performance through

entrepreneur means, this mediation was not very strong. This provided partial support for H_2. For the RaceAge -> entrepreneur means -> firm performance, the indirect relationship was also not significant (p=0.266) suggesting that race and age did not significantly mediate the relationship between entrepreneur means and firm performance through the pathway shown in Figure 4.16.

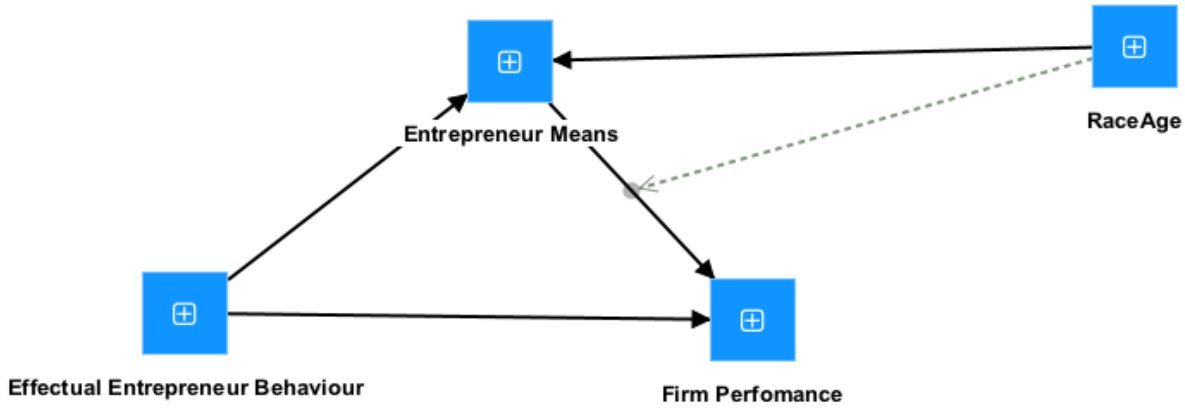

Figure 4.16: Moderated mediation

4.6.2.5 Assessing indirect relationships confidence

Table 4.55 shows confidence intervals for the specific indirect relationships. For the indirect relationship EEB -> entrepreneur means -> firm performance, the confidence interval ranged from 0.012 to 0.391. As this did not cross zero, the effect was considered significant. For the RaceAge -> entrepreneur means -> firm performance, the confidence interval crossed zero (-0.014 to 0.031), making the effect non-significant.

Table 4.55: Confidence intervals

VARIABLE	ORIGINAL SAMPLE (O)	SAMPLE MEAN (M)	5.0%	95.0%
Effectual Entrepreneur Behaviour -> Entrepreneur Means -> Firm Performance	0,165	0,169	0,012	0,391
RaceAge -> Entrepreneur Means -> Firm Performance	0,009	0,008	-0,014	0,031

4.6.2.6 Assessing conditional indirect effects: Race/age variations

The conditional indirect effects at different values of RaceAge (at =1 SD, -1 SD, and Mean) were examined. As seen in Table 4.56, none of these effects were statistically significant as all p-vales were greater than 0.05. This implied that the conditional mediation of the entrepreneur means between EEB and firm performance was not influenced significantly by race and age, providing little support for H_3.

Table 4.56: Conditional indirect effect

VARIABLE	ORIGINAL SAMPLE (O)	SAMPLE MEAN (M)	STANDARD DEVIATION (STDEV)	T STATISTICS (|O/STDEV|)	P VALUES
Effectual Entrepreneur Behaviour -> Entrepreneur Means -> Firm Performance conditional on RaceAge at +1 SD	-0,017	-0,021	0,044	0,379	0,352
RaceAge -> Entrepreneur Means -> Firm Performance conditional on RaceAge at +1 SD	-0,001	0,000	0,004	0,243	0,404
Effectual Entrepreneur Behaviour -> Entrepreneur Means -> Firm Performance conditional on RaceAge at -1 SD	0,087	0,087	0,060	1,438	0,075
RaceAge -> Entrepreneur Means -> Firm Performance conditional on RaceAge at -1 SD	0,005	0,004	0,007	0,632	0,264
Effectual Entrepreneur Behaviour -> Entrepreneur Means -> Firm Performance conditional on RaceAge at Mean	0,035	0,033	0,033	1,058	0,145
RaceAge -> Entrepreneur Means -> Firm Performance conditional on RaceAge at Mean	0,002	0,002	0,004	0,521	0,301

4.7 Chapter Conclusion

In conclusion, the findings of this study suggested that while intangible resources and EEB are vital for technology founders, other unexamined variables might be playing crucial roles in firm performance. Moreover, while race and age did have an impact on firm performance, their combined influence with entrepreneur means was not as pronounced in the current dataset. Whilst the emphasis of this chapter was the presentation of the findings, Chapter 5 engages in an in-depth discussion, analysis and interpretation of these findings.

CHAPTER 5: DISCUSSION

5.1 Introduction

This chapter engages in a comprehensive discussion of the research findings presented in Chapter 4, aiming to interpret and analyse these findings in relation to the study objectives, research questions, and hypotheses. It builds upon the premise that potential statistical factors that could affect the results have been carefully considered and eliminated, including in instrument design, statistical tests, sample size, and measurement error.

The study addressed a critical gap in understanding the performance disparities among entrepreneurs with similar dispositions but different demographics. Specifically, it argued that the interplay of personal attributes, such as race and age, within a racially imbalanced environment, characterised by economic power, might influence entrepreneurs in the same field to exhibit distinct entrepreneurial behaviours, thereby affecting their business performance outcomes. This study focused on the South African context, where historically privileged groups, such as white individuals, who had greater access to economic resources, were anticipated to rely less on intangible means. Conversely, individuals from historically disadvantaged racial groups who lacked financial and physical resources were expected to demonstrate EEB, emphasising the utilisation of intangible resources, including ESE, SC and HC.

In light of these considerations, this study examined the overall impact of EEB on firm performance through entrepreneur means, while also investigating how the intersections of race and age moderated these relationships. By shedding light on these dynamics, this study made a significant contribution to intersectionality discussions within entrepreneurship.

The discussion proceeds by interpreting and discussing the key findings in relation to the study's objectives, research questions, and hypotheses (see Table 5.1).

Table 5.1: Summary of research objectives, research questions, hypotheses & results

RESEARCH OBJECTIVE	RESEARCH QUESTION	HYPOTHESIS	RESULT
Investigate the relationship between effectual entrepreneur behaviour and firm performance among technology founders.	What is the relationship between effectual entrepreneur behaviour and firm performance among technology founders?	H_1: EEB -> FP There is a significant positive relationship between effectual entrepreneur behaviour and firm performance.	A significant positive relationship on the Effectual Entrepreneur Behaviour -> Firm Performance relationship (($\beta = 0.256$. $p=0.035$). This indicated that as effectual entrepreneur behaviour increased, firm performance also improved. This validated H_1.
Examine the relationship between effectual entrepreneur behaviour and firm performance through entrepreneur means (intangible resources).	To what extent does the utilisation of entrepreneur means mediate the relationship between effectual entrepreneur behaviour and firm performance?	H_2: EEB -> Entrepreneur Means -> FP The relationship between effectual entrepreneur behaviour and firm performance is mediated by entrepreneur means, indicating that effectual entrepreneurs' utilisation of intangible resources influences their firm's performance.	The Effectual Entrepreneur Behaviour -> Entrepreneur Means -> Firm Performance relationship is positive ($\beta = 0.165$) but not significant ($p=0.081$). This suggested that while effectual entrepreneur behaviour does influence firm performance through entrepreneur means, this mediation was not very strong. This provided partial support for H_2.
Examine the mediating effect of entrepreneur means in the relationship between effectual entrepreneur behaviour and firm performance, with a specific focus on how this mediating effect might be moderated by race and age.	To what extent does the mediating effect of entrepreneur means impact the relationship between effectual entrepreneur behaviour and firm performance, and how is this mediating effect further influenced by the moderating factors of race and age?	H_3: AR x EEB -> Entrepreneur Means -> FP The mediating effect of entrepreneur means in the relationship between effectual entrepreneur behaviour and firm performance is significantly moderated by the intersection of race and age, implying that the impact of effectual behaviour on firm performance varies based on the combined influence of race and age.	For the RaceAge -> Entrepreneur Means -> Firm Performance, the confidence interval cross zero *(-0.014 to 0.031).* This made the effect non-significant. For the conditional indirect effects at different values of RaceAge (at =1 SD, -1 SD, and mean). None of the effects were statistically significant as all p-vales were greater than 0.05. This implied that the conditional mediation of the entrepreneur means between effectual entrepreneur behaviour and firm performance was not influenced significantly by race and age. This provided little support for H_3.

RESEARCH OBJECTIVE	RESEARCH QUESTION	HYPOTHESIS	RESULT
Establish and validate a measurement model for entrepreneur means (intangible resources).	To what extent do technology founders rely on intangible means to achieve firm performance?	H_4 Entrepreneur Means -> FP Technology founders often rely on entrepreneur means (intangible resources) to achieve performance.	A very strong positive relationship on Entrepreneur Means ->Firm Performance ($\beta = 0.801$. $p=0.008$). This signified the importance of intangible resources in driving firm performance. This supported H_4.

5.2 Demographic Profile of Respondents

For this discussion, the study adopted and adapted Cole's (2009) suggested questions for dealing with intersectionality studies (see Figure 5.1): Who is included in this study? What role does inequality play? Where are the similarities?

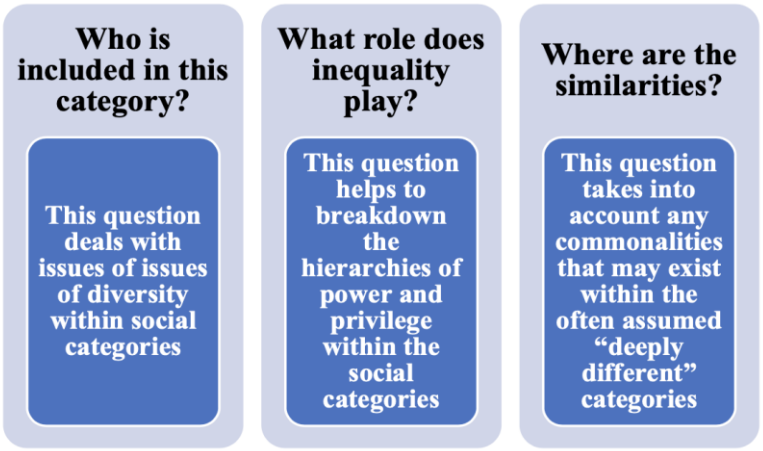

Figure 5.1: Key questions for intersectionality studies

(Cole, 2009, p. 172)

5.2.1 Who is included in this study?

As already stated in previous chapters, the respondents were founders of technology firms running their businesses in South Africa for at least three years. According to 2022 mid-year population estimates (Statistics South Africa, 2022), the demographics of the country comprised black (81 per cent), coloured (8.8 per cent), white (7.7 per cent) and Asian (2.6 per cent) racial groups. Further, Sulla et al. (2022) stated that 70 per cent of the economic power in South Africa is held by 10 per cent of the population, which is disproportionally white, while the bottom 60 per cent of the population (mostly black) holds just seven per cent of the wealth. That disparity was evident in the representation of respondents in the study. Despite all efforts to cast the net as wide as possible when curating the sampling frame, unsurprisingly, it still demonstrated the close

to 35 per cent over-representation of white individuals in this lucrative and fast-growing technology sector, compared to the country statistics. Considering the research objectives where race is a moderating variable, the over-representation of white individuals in this study might skew the research outcomes.

Further, regarding the founder's age, data shows that the bulk (43.4 per cent) of the founders fell into the 30 to 39 year category, only 20.8 per cent in the 20 to 29 year category and none in the under 20 year category, at the start of their business. This contradicted the popular belief that technology founders established their businesses in their early twenties; this belief is perpetuated by the outliers, like Bill Gates, Steve Jobs, and Mark Zuckerberg, who have built successful companies (Azoulay et al., 2018). The results also contradicted the findings of Azoulay et al. (2018, 2020) that the average age of founders when they start their businesses is 42 years. Certainly, these are global patterns, and the situation in South Africa might deviate due to various factors. Among them is the government’s policy structure that focuses on endorsing and aiding individuals below the age of 35 years, combined with the comfort of having accumulated a good level of entrepreneur means and financial capital by that age.

Citing data from the University of Cape Town, Adonis (2023) argued that 75 to 80 per cent of small businesses in South Africa fail within the first five years; a higher failure rate than anywhere else. Those who have exceeded this threshold have stood the test of time and are expected to have a better survival rate. As might be expected, all businesses surveyed here had been in operation for at least three years simply because this was one of the key filters used when seeking respondents. Interestingly, 37.7 per cent of the businesses surveyed fell into the three to five year category, but a total of 62.3 per cent had been in operation for six years. In short, 62.3 per cent of the businesses had exceeded the failure threshold, and it could even be argued that their concerns and entrepreneur

behaviours differed from those still battling to survive. Although this did not take away from the value of the study, it might make the findings less generalisable to emerging technology companies. In addition, the study did not factor in those who might have shut down their businesses or moved to other sectors.

5.2.2 What role does inequality play?

Despite policy efforts to bridge apartheid-induced inequality and increase black representation in formal businesses, significant economic disparities exist among South Africa's racial groups. Black individuals dominate informal and survivalist businesses, but there is still a lack of representation in highly skilled and capital-intensive businesses. Sulla et al. (2022) argued that there was high inequality of opportunity, which was determined by factors such as race and SC. The demographic data highlights significant inequalities in the representation of racial groups within the technology sector. The overrepresentation of white individuals compared to their population percentage and the underrepresentation of black African individuals raised concerns about persistent disparities resulting from historical and systemic factors, including the legacy of apartheid. These disparities in representation indicated the existence of unequal access to resources, opportunities, and networks within the technology industry, potentially limiting the participation and success of certain racial groups in key sectors. Researchers of niche sectors, like the technology sector, might find it imperative to use purposive sampling to achieve a balanced and representative perspective of the phenomenon they are studying. For instance, Heydenrych (2013) employed non-random judgmental sampling in their study of South Africa's technology sector, possibly for this reason. Although this technique was not used in this study, future researchers studying niche sectors could consider using purposive sampling focusing on inclusivity and representation.

5.2.3 Where are the similarities in the demographics?

Amidst the demographic differences among founders of technology businesses, some similarities emerged. The study included only respondents that were founders or co-founders of technology businesses, meaning a diversity of ownership in the sector, in spite of disparities. Furthermore, the data revealed a high level of educational attainment among the founders, with 88.1 per cent falling within Band 3, which includes advanced diplomas up to PhD level. This suggested that the technology sector commands a high level of HC, particularly in terms of education. Additionally, the study showed that businesses operated with either sole founders (44.0 per cent) or small founder teams of two to five individuals (54.7 per cent), highlighting the prevalence of collaborative efforts in entrepreneurship. Further, the top five sub-sectors of the technology industry that respondents dominated were Internet of Things, big data, cloud computing, artificial intelligence and machining, as well as information and communications technology. Given these sub-sectors, the intricate nature and complexity of the sector, and the level of expertise it requires, it was unsurprising that these founders would exhibit high levels of education. These results provided tentative evidence that the sector commands a high level of HC, albeit on the 'education level' dimension. In addition, they all function under a B-BBEE policy framework that necessitates a specific degree of black involvement in each enterprise to interact effectively with all government levels and the overall business ecosystem. This background might shed light on ownership percentages. Even though the bulk of the businesses (49.7 per cent) had less than 25 per cent black ownership at the launch of the business, there was a shift as businesses grew to increase representation. At the time of the study, 56 per cent of businesses had over 50 per cent black ownership. This and other factors help to explain why at least 13.8 per cent of the co-founder teams were multiracial. Besides the quest to comply with or manoeuvre the policy environment, other possible

explanations were to complement their human, social, and financial capital needs (Gray et al., 2021) through the ‘strength in numbers’ principle (Asset, 2019; Konstantinova, 2019).

In summary, applying an intersectionality lens to the demographic profile of technology firm founders in South Africa sheds light on the complexities of social identities and their impact on opportunities and representation within the technology ecosystem. This study highlighted racial disparities, age-related patterns, educational achievements, business ownership, and collaboration among founders. These findings underscored the need for targeted strategies to promote diversity, inclusivity, and equitable access to opportunities within the technology sector in South Africa, addressing historical inequalities and systematic barriers.

5.3 Custom Tables

The custom tables presented in Chapter 4 provided insights into the respondents’ perceptions of various factors related to firm performance, effectual entrepreneur behaviour, and the three dimensions of entrepreneur means (ESE, HC and SC).

5.3.1 Firm performance and effectual entrepreneur behaviour

The findings on firm performance indicated high levels of agreement in multiple aspects, such as business growth, growth in sales, employee growth, and retaining key employees. These results suggested overall positive performance and successful expansion for the firms surveyed, aligning with the literature’s emphasis on firm performance in uncertain environments for companies adopting effectual entrepreneur behaviour (EEB) (Barringer et al., 2005).

The findings regarding the growth in the number of employees and the ability to retain key employees were supported by the literature, which highlights the effectuation’s potential value for successful expansion and talent retention (Heydenrych, 2013).

Additionally, the findings regarding the sales growth and growth compared to competitors, also aligned with the literature's emphasis on effectuation's effectiveness in dynamic and competitive environments, as supported by Zhang et al. (2023).

However, literature also emphasised the role of both individual and contextual factors in shaping the relationship between entrepreneur behaviour and firm performance. Factors such as demographics, industry characteristics, local contextual factors, and environmental uncertainty could influence the effectiveness of effectuation. Therefore, while the custom tables demonstrated a high level of agreement, it was essential to consider the specific context of the surveyed firms to understand the implications of the results fully.

In terms of the level of EEB among technology founders, the findings revealed a varied distribution across the different characteristics of effectual behaviour. High levels of agreement were observed in aspects such as unclear end goals, business evolution, employment of resources at hand, experimentation, and flexibility, aligning with literature that highlights high levels of effectuation among companies in the technology sector (Chidakwa, 2015; Mthanti, 2012; Sarasvathy, 2001; Urban & Heydenrych, 2015). These findings also indicated a willingness among technology founders to experiment with MVPs and flexibly adjust their offerings based on feedback and market dynamics (Fisher, 2012; Liu & Siu, 2019; Mthanti & Urban, 2014; Woetmann, 2014). However, there was a contradiction between these findings and Eyana's (2017) findings regarding the flexibility dimension of effectuation. While the results showed high agreement with flexibility, indicating that technology founders were adaptive and open to changes in their business approaches, Eyana (2017) suggested that its relevance might be limited in resource-constrained environments, where entrepreneurs rarely rely on their own financial and physical resources. In addition, the respondents showed low scores in affordable loss, but

very high scores in being driven by resources-at-hand. This demonstrated the technology entrepreneurs' propensity for leveraging their resources, rather than the extent to which they were prepared to expend those resources.

In conclusion, the custom tables largely supported the principles of effectuation identified in the literature review, indicating a considerable level of EEB among technology founders. However, the contradiction from Eyena's (2017) research highlights the significance of context in understanding and applying effectuation principles. It might also suggest that technology entrepreneurs largely employ effectual principles, not solely due to resource constraints, but also for the flexibility and experimentation, it offers, hedging against uncertainty. While the custom tables themselves did not directly establish a relationship between firm performance and EEB, the data suggested a potential connection through the alignment of the outcomes of effectual behaviour indicators with firm performance indicators.

5.3.2 Entrepreneurial self-efficacy, human capital, and social capital

The custom tables on entrepreneurial self-efficacy (ESE) showed that the majority of technology founders demonstrated a strong belief in their ability to execute entrepreneurial tasks. These findings aligned with literature, which emphasises the significance of ESE as a critical resource in entrepreneurial performance (Chen et al., 1998; McGee et al., 2009; Renko et al., 2021; Yang et al., 2020). High levels of ESE are associated with increased entrepreneurial intentions and behaviour (Newman et al., 2019). Furthermore, Hmieleski and Baron (2008) found that ESE is a strong predictor of firm performance. Therefore, the high level of ESE among technology founders suggested that they perceived themselves as capable and confident, which might contribute to entrepreneurial success.

HC results revealed that technology founders generally possess medium to high levels of education, industry experience, and managerial experience. These findings were in line with the literature, which recognises HC as an essential factor in determining the success or failure of entrepreneurial ventures (Solesvik, 2017). Hsiao et al. (2016) found that HC mediates the relationship between an individual's internal locus of control and entrepreneurship. The findings also supported Aboobaker and Renjini (2020), who demonstrated that entrepreneurial training and education effectively elicit entrepreneurial intention and that HC mediates this relationship. The combination of tacit and explicit knowledge enhances HC and improves decision-making in entrepreneurial endeavours (Davidsson & Honig, 2003). Therefore, the medium to high levels of HC among technology founders might contribute to their ability and act on entrepreneurial opportunities.

On the other hand, the custom tables on SC indicated varying levels of SC among technology founders across different dimensions. Some aspects, such as encouragement from family and friends in business, showed higher agreement scores, suggesting that the respondents perceived to have received strong support and encouragement from their family and friends who are in business. In contrast, aspects like parents and siblings in business demonstrated lower agreement scores, indicating lower levels of SC. These findings were consistent with the literature, which recognises SC as a vital source for entrepreneurs (Portes & Rumbaut, 2006). Davidsson and Honing (2003) found that bonding and bridging capital play different roles in the entrepreneurial journey. Strong bonding capital, such as family and close friends, provides consistent support and access to resources, while bridging capital, such as professional networks, offers access to information and networking opportunities. The findings suggested that technology

founders might rely more on their immediate family and close friends for support and resources rather than professional networks.

Overall, the custom tables, together with the literature, provided valuable insights into the role of entrepreneur means (ESE, HC, and SC) in the entrepreneurial journey.

5.4 Confirmatory Factor Analysis

The confirmatory factor analysis (CFA) conducted in this study was used as a first layer of assessing the measurement model's validity and reliability for three different constructs related to firm performance (GIB, GIP and GIT_RKE). Effectuation started out with eight variables; however, the final model had six variables after the elimination of two that did not fit the model.

The CFA results for GIB revealed interesting insights into the relationships between observed variables and the unobserved variable. The standardised regression weights demonstrated that founder's personal income level at time of responding (FP4) had the highest positive relationship to GIB, with an estimated weight of 1.000. This finding was statistically significant and indicated a strong association between the founder's current personal income level and the overall growth of the business. Entrepreneurs with businesses experiencing notable growth were more likely to witness an increase in their personal income. Furthermore, founder personal income (FP3) and founder standard of living (FP2) demonstrated positive relationships with GIB; noted through standardised regression. These findings highlighted that personal financial well-being and standard of living of founders were positively associated with the growth of their businesses. This could be attributed to the fact that financially stable and experienced founders were more likely to make sound strategic decisions and invest in the growth of their business, resulting in improved overall performance. This supported the insights of

Barringer et al. (2005) on the significance of founder characteristics in firm success. In the South African context, the positive relationships between founder characteristics and firm performance in the CFA results had particular significance. As a country with economic disparities and a diverse entrepreneurial landscape, understanding the role of founder characteristics in driving business success could have policy implications. Supporting and empowering entrepreneurs with strong HC (education and experience) and solid financial acumen can potentially foster the growth of successful businesses and contribute to addressing economic inequality.

The positive relationship between business growth (FP1) and GIB was noteworthy. This suggested that businesses experiencing growth are likely to exhibit improved overall performance. This finding was in line with the conventional understanding that overall growth is an essential indicator of a firm's success (Barringer et al., 2005). In the context of South Africa, where fostering business growth is crucial for economic development and addressing socio-economic challenges, these results underscored the importance of nurturing and supporting high-growth firms.

The CFA results for GIP revealed that business return on assets (FP8) had the highest positive relationship with GIP. This result indicated that firms with better returns on their assets tended to experience improved profitability. A higher return on assets suggested efficient resource utilisation, which aligned with traditional financial perspectives of firm profitability. A higher return on assets suggested efficient resource utilisation, which aligned with traditional financial perspectives on firm profitability. This finding was consistent with prior research emphasising the importance of financial indicators in assessing firm performance (Barringer et al., 2005). Similarly, business return on investment (FP7) and business net profit (FP6) demonstrated positive relationships with GIP. These results further emphasised the significance of financial management and

profitability in driving overall firm performance. Organisations with higher returns on their investments and net profits were likely to experience improved profitability and sustainable growth. The relatively lower positive relationship between business savings (FP5) and GIP, suggested that while savings might contribute positively to profitability, its impact might be less pronounced compared to other financial indicators. This finding was intriguing and could be due to various factors, such as the need for businesses to allocate what could have gone to savings towards growth opportunities or the influence of external market conditions on overall profitability. These results highlighted the significance of financial indicators in assessing firm performance. Emphasising financial management and resource utilisation could be essential for businesses seeking to improve profitability and contribute to the nation's economic growth.

In terms of GIT_RKE, the CFA results provided insights into factors influencing turnover growth and talent retention within organisation. Talent retention (FP12) exhibited the highest positive relationship with GIT_RKE. This implied that organisations that prioritise talent retention are more likely to experience overall turnover growth while retaining key employees. This finding aligned with contemporary organisational literature, which underscored the importance of HC and talent management in driving performance. Growth in number of employees (FP11) and turnover growth compared to competitors (FP10) demonstrated positive relationships with GIT_RKE. These results suggested that firms with increasing numbers of employees and competitive turnover growth tended to retain their key talent better. This supported the notion that attracting and retaining skilled employees contributed to a company's competitive advantage and long-term success. However, the relatively lower positive relationship between turnover growth (FP9) and GIT_RKE, suggested that while turnover growth might have some impact on talent retention, its influence might be less significant compared to other factors like talent

management practices. This finding highlighted the importance of not only focusing on turnover growth but also implementing effective talent retention strategies to harness the full potential of key employees. In any economy, skilled labour is a valuable resource, the CFA results emphasised the significance of talent management and retention practices in driving firm performance. Prioritising talent retention could create a motivated and engaged workforce, leading to increased productivity, innovation, and overall business success. Organisations that actively invest in people could contribute to addressing skills shortages and economic disparities in the country.

The CFA results for the three firm performance constructs provided valuable insights that aligned with existing literature on firm performance. The findings underscored the importance of founder characteristics, financial indicators, and talent management practices in driving business success (Barringer et al., 2005; Del Bosco et al., 2021). The positive relationships observed in the CFA model results validated and reinforced the significance of these factors in the context of South Africa, a country with unique economic dynamics and social challenges.

The alignment between the CFA results and prior research on firm performance offered support for the robustness and validity of the study's measurement model. However, it is essential to acknowledge that firm performance is a complex and multi-faceted construct influenced by various internal and external factors. Furthermore, it is important to note that although these results provided valuable insights, they are only a snapshot of the relationships within the measurement model. Further, it is necessary to explore the contingencies and dynamics of these relationships in different contexts and industries within South Africa, since the country's diverse entrepreneurial landscape, economic challenges, and social inequalities demand a nuanced understanding of the drivers of firm performance. Complementary methodologies, such as qualitative research

and longitudinal studies, could provide deeper insights into the causal relationships between the identified factors and firm performance outcomes.

The CFA results for the EEB model aimed to explore the relationships between observed variables and unobserved variable representing EEB. How much an individual can afford to lose (EEB8) displayed the highest positive relationship with EEB. This finding aligned with existing literature on effectuation, which emphasises the significance of hedged risk-taking and the entrepreneur's decision regarding the extent to which they can tolerate losses (Sarasvathy, 2001). In the context of South Africa, where entrepreneurship can be inherently risky, this finding suggested that effectual entrepreneurs might be more inclined to take calculated risks, making them better equipped to handle the uncertainties prevalent in the technology sector (Mthanti, 2012; Urban & Heydenrych, 2015). Flexibility (EEB6) and experimentation (EEB5) also exhibited positive relationships with EEB. These results were in line with the literature, which highlights the importance of flexibility and experimentation in effectual decision-making (Chandler et al., 2011; Sarasvathy, 2001). In the context of the technology sector, where market conditions are constantly changing, effectual entrepreneurs who embrace adaptability and experimentation are better positioned to identify and exploit new opportunities (Chidakwa, 2015; Mthanti, 2012).

The observed variable driven by resources-at-hand (EEB4) demonstrated a positive relationship with EEB. This finding was consistent with the literature on effectuation, where entrepreneurs leverage their means to create desired ends (Mthanti, 2012; Sarasvathy, 2001; Urban & Heydenrych, 2015). In the context of South Africa, where access to resources can be limited for some entrepreneurs, effectual decision-making that focuses on resourcefulness and creativity might offer a viable approach to venture creation and growth (Mthanti, 2012).

Business evolution (EEB3) also exhibited a positive relationship with EEB, with a standardised regression weight of 0.705. This result suggested that entrepreneurs who adopt effectual behaviour were more likely to be responsive to the evolving nature of their business environments and adapt their strategies accordingly. This aligned with the literature, which emphasises the importance of adaptability and responsiveness in effectual decision-making (Sarasvathy, 2001; Urban & Heydenrych, 2015).

Furthermore, unclear end goal (EEB2) displayed a positive relationship with EEB, but with a lower standardised regression weight. This suggested that entrepreneurs who adopt effectual behaviour might, to a small extent, maintain some degree of ambiguity or uncertainty about their ultimate end goal. This finding confirmed that effectual entrepreneurs embrace uncertainty and ambiguity regarding their goals, to some extent (Heydenrych, 2015; Sarasvathy, 2001).

The EEB model's findings aligned with the literature on effectuation, emphasising the importance of risk-taking, flexibility, experimentation, resource leverage, and responsiveness to business evolution in shaping effectual behaviour (Chidakwa, 2015; Mthanti, 2012; Sarasvathy, 2001; Urban & Heydenrych, 2015). The model's focus on effectual behaviour provides valuable insights for policymakers, educators, and inspiring entrepreneurs in fostering an entrepreneurial ecosystem that encourages innovative, agile, and effectual approaches to venture creation and management, particularly in technology-intensive sectors (Chidakwa, 2015; Mthanti, 2012; Sarasvathy, 2001). Despite the alignment between the model's findings and the literature, the study's limitations should be acknowledged. The use of cross-sectional data limited the ability to infer causality between EEB and its determinants. Longitudinal studies could provide more robust insights into the temporal relationships between the observed variables and effectual decision-making. Additionally, the study's focus on the technology sector in South Africa might limit the

generalisability of the findings to other industries or regions with different socio-economic contexts.

5.5 Exploratory Factor Analysis

The present study conducted an exploratory factor analysis (EFA) to examine the relationships among ESE, HC, and SC as intangible resources used by entrepreneurs to achieve firm performance.

The results from the EFA show that ESE was positively correlated with HC and SC. Similarly, HC variables were positively correlated with each other, confirming the assertion by Davidsson and Honing (2003) that education and industry experience are components of HC, and are important to business success (Fairlie & Rob, 2008; Lerner et al., 1997). In addition, SC variables were positively correlated with each other. These findings are in line with literature that emphasises the significance of these intangible resources in entrepreneurial ventures.

In conclusion, both the results of the EFA and literature supported the suggested link between ESE, HC, and SC as important entrepreneur resources. The results also supported the validity of the measurement model, indicating the relevance of ESE, HC, and SC as intangible resources for entrepreneurs. These intangible resources were interconnected and played a critical role in the entrepreneurial journey. The literature review in Chapter 2 further corroborates the importance of these resources in entrepreneurship and their relationship with entrepreneur behaviour and firm performance. However, given the dynamics of South Africa and its unique context, further research is needed to explore the nuances and contingencies of these relationships in the local entrepreneurial landscape.

5.6 One-Way ANOVA

In order to drill down to the nuances regarding the intersections of race and age, a one-way ANOVA analysis was done for both firm performance and effectuation. Having started with four race categories (Asian/coloured, white, black, and multiracial) and six age categories (20 to 29 years, 30 to 39 years, 40 to 49 years, 50 to 59 years, 60 to 65 years, and over 65 years), the study comprised a total of 24 categories for analysis.

As far as firm performance was concerned, data seemed to suggest performance variations across both race and age categories. While there was a general trend among the Asian/coloured and black African categories for older age groups (40 to 49 years) to have higher firm performances, the white and multiracial individuals either maintained a relative consistency or demonstrated better performance in the 20 to 29 year age group. However, what is striking is that the ANOVA p-value of 0.410 negated the initial inferences drawn from the descriptive statistics. This discrepancy highlights that even if certain demographic groups illustrate differences in mean performance; these differences are not statistically significant (Michaelides, 2020).

From the tests of homogeneity of variances, there was a clear indication that variances between groups were not consistent, especially when ‘based on mean’ and ‘based on trimmed mean’. Unequal variances could affect the validity of the results and might suggest that some groups have more heterogeneity within them compared to others. This was significant because if there were unequal variances, it means that the study might not be a true representation of the groups, and this could affect the generalisation of the results.

The nuanced understanding of the entrepreneur’s journey in South Africa, as presented by Beresford (2021) and Michaelides (2020), revealed a web of disparities, deeply rooted in racial inequality. This was in line with the primary observation from the

ANOVA, emphasising differences in the means across racial categories. While white entrepreneurs often had better resource access, black entrepreneurs might be at a disadvantage, thereby affecting firm performance. The literature also recognises age as a pivotal dimension, interacting with race, to craft a unique entrepreneurial journey for each individual. The differences in experience between a 21 year old black male versus a 40 year old black male entrepreneur, illustrated in the literature review (Acker, 2000; Martinez Dy, 2020), aligned well with the age-based trends discerned from the data. Fairlie and Robb (2008) and Ramana et al. (2009) emphasised the importance of digging into the reasons and nuances for the differences in the performance of business of the previously disadvantaged versus their white counterparts.

The data derived from the one-way ANOVA pointed to several key findings regarding firm performance and the interplay of demographic factors, supporting the assertions of intersectionality theory (Acker, 2000; Martinez Dy, 2020). The significance of accounting for overlapping demographic attributes is highlighted by the differing average performance of firms across various age and racial categories. However, despite these observable variations, it is important to note that the ANOVA results did not reveal any statistical significance in average firm performance across demographic groups. This might suggest that other factors, not considered in this study, could be contributing to the observed variations in performance. To some extent, this aligns with the perspectives of (Fingerman, 2011; Griffin & Jackson, 2009; Jackson et al., 2010) who contended that performance disparities occur at individual, group, and structural levels. Such disparities, although they encompass aspects like race, age, and gender, could include other factors like geography, and even structural power imbalances, leading to differential inter-individual and inter-group outcomes.

While the ANOVA results of this study did not provide definitive evidence of statistically significant differences in firm performance across various demographic groups, they did point towards the importance of an intersectional lens in understanding such outcomes. The findings reaffirmed the complex and interrelated nature of demographic factors as influencers of entrepreneurial success (Lucas, 2017) in an unequal society. The journey of an entrepreneur in South Africa is mired with challenges emanating from a deeply unequal socio-economic tapestry, and while data can provide glimpses into these disparities, a more comprehensive and integrative approach, perhaps even longitudinal, building on the existing literature and beyond, is required to truly appreciate the intricacies at play.

A review of the effectuation scores among different demographic groups revealed some interesting patterns. The average effectuation score across all 159 respondents was 5.3658 (SD = 0.95972). This provided a general understanding of the effectuation mindset across the surveyed population. However, delving deeper, the white individuals aged 20 to 29 years had an elevated mean score, implying a higher inclination towards effectual behaviour. On the contrary, Asian and coloured individuals aged 40 to 49 years exhibited the lowest mean score. However, this observation warrants caution due to the significantly smaller group size of Asian and coloured individuals in this study. The Levene statistic supported the assumption of homogeneity of variances for the ANOVA, since the p-values in all tests were above the conventional 0.05 significance level. This suggested that the variances for the effectuation scores across demographic groups were consistent and reinforced the reliability of the ANOVA results.

However, the ANOVA results presented a quandary in that, although different mean scores across demographic groups were observed, the F-ratio of 1.256 yielded a p-value of 0.246. This indicated that these observed differences might not be statistically significant,

could potentially have occurred by chance, and were not robust enough to generalise. Supporting this, the effect sizes were small, suggesting that the practical significance of these differences was minimal. Delving into pairwise comparisons via the Tukey HSD, non-significant differences even among specific group pairs were noticed. For instance, the mean difference in effectuation scores between the Asian/coloured individuals aged 40 to 49 years and black African individuals aged 30 to 39 years was just -0.05303, a difference that is negligible. Such pairwise comparisons further underline the notion that, while observable differences exist, they are not statistically significant.

When juxtaposed with the literature, some interesting dynamics emerge. Beresford (2021) and Michaelides (2020) highlighted the difference in resource distribution and access among white and black entrepreneurs in South Africa. These suggest potential disparities in entrepreneur means based on racial and socio-economic factors. While this study's ANOVA results showed no significant difference in effectuation scores between different demographics, the literature does indicate that underlying socio-economic factors, resource distribution, and access to means can influence entrepreneurial decisions and behaviours. Liang et al. (2018) proposed that the link between age and entrepreneurial capability offers an insightful lens. If younger individuals tend to be more innovative and older individuals accumulate business acumen, then it could be hypothesised that effectuation might manifest differently across age groups. However, the ANOVA results detailed in this study did not statistically support this, suggesting that while age might influence innovation and business acumen, it did not necessarily dictate an individual's effectual thinking. The works of Sarasvathy and Dew (2008), Woetmann (2014), and Sarasvathy (2001) provided an interesting perspective on the distinction in decision-making between novice and expert entrepreneurs. They posited that effectuation is more prevalent in established entrepreneurs. Aligning this with this study's data, it raised the

question: could factors like entrepreneurial experience and exposure be more influential than mere age or race? However, even this logic is quickly dispelled by the high effectuation mean score of the white 20 to 29 year old category; it can be assumed that these individuals did not possess much experience.

In conclusion, this investigation, informed by the ANOVA results, pointed to the complex nature of entrepreneurial mindset. While race, age, and socio-economic background might influence this, it was clear that a combination of factors determined an individual's entrepreneur behaviour.

5.7 Structural Equation Modelling

In this section of the discussion chapter, the outcomes of the measurement model and the structural model are examined. The measurement model explored the incorporation of various indicators and constructs related to the concept of entrepreneur means, EEB, and firm performance. On the other hand, the discussion also includes an analysis of the structural model concerning the hypotheses presented in the study. By examining both models, a deeper understanding of the relationships and implication of the study's variables was sought.

The study employed PLS-SEM to provide an in-depth investigation of the measurement model and the relationships between various independent variables (EEB, ESE, HC, and SC) and their effects on dependent variables reflecting the growth aspects of businesses. This methodology effectively allowed for an analysis of the interplay between these variables in the entrepreneurship context, more specifically in the technology industry.

The measurement model's assessment indicated that most of the constructs used in the study exhibit good construct reliability. However, the model encountered challenges

with potential discriminant validity concerns for some construct pairs and low R-square values, indicating a limited explanatory power of the selected predictors for the dependent variables.

The structural model assessment uncovered various implications. The analysis demonstrated that there was no severe multicollinearity among the independent variables, suggesting that the factors investigated in this study did not correlate or interfere with each other. Furthermore, the positive relationships identified between EEB, entrepreneur means, and firm performance underlined the importance of EEB and the use of intangible resources in achieving firm success. This finding supported the two hypotheses (H_1 and H_4) that suggested a reliance on entrepreneur means and a significant relationship between EEB and firm performance.

The study found an insignificant relationship between the intersection of race and age (RaceAge) and entrepreneur means, but a significant positive relationship between RaceAge and firm performance. This insight provided partial support to H_2, which proposed a mediating effect of entrepreneur means in the relationship between EEB and firm performance. The conditional indirect effect affected the analysis, however, did not provide strong support for H_3, indicating that the intersectionality of race and age did not significantly influence the mediating effect of entrepreneur.

These results provided several interesting implications. The validation of H_1 and H_4 supported the assertion that EEB and the use of intangible resources could significantly influence firm performance. This has practical implications for entrepreneurship educators, coaches, and policy makers, who can direct their efforts towards nurturing effectual entrepreneurial skills and the leveraging of intangible resources. Conversely, the results showed that race and age did not influence entrepreneur means directly but could influence

firm performance. This suggested that intersectionality should be considered when designing and implementing entrepreneurial policies and practices.

The findings of this study added value to the existing body of knowledge and contributed to a better understanding of the complex dynamics that influence entrepreneurship. The significant relationships identified between EEB, entrepreneur means, and firm performance suggested that effectuation might be more impactful in the context of technology entrepreneurs. These findings were consistent with most literature (Laskovaia et al., 2022; Yu et al., 2018; Zhang et al., 2023), indicating a relationship between the EEB and firm performance in several sectors, including the technology sector (Chen et al., 2021; Chidakwa, 2015; Heydenrych, 2013; Urban & Heydenrych, 2015; Yu et al., 2018).

On the issue of intersectionality, the findings brought a novel perspective to the discourse. Contrary to studies that found a significant influence of demographic factors on the use of entrepreneur means (Greve & Salaff, 2003; Liang et al, 2018; Pidduck & Clark, 2021), this study suggested that race and age, combined, did not significantly affect the use of entrepreneur means. However, these intersectional variables did influence firm performance, highlighting a complex relationship that merits further exploration.

5.8 Significance of Findings

The findings of this research contributed to a nuanced understanding of the role of EEB and the use of intangible resources in firm performance. It highlighted the potential of these factors as key drivers of success in the technology entrepreneurship domain, thereby adding to the existing body of literature in entrepreneurship, intersectionality, disadvantage entrepreneurship, and firm performance. The insights obtained also shed light on the interplay of intersectionality variables (race and age) with firm performance and

entrepreneur means. This provided new directions for research and policy-making to take into account the importance of race and age in influencing entrepreneurial outcomes.

5.9 Chapter Conclusion

In conclusion, Chapter 5 has engaged in a comprehensive discussion of the research findings presented in Chapter 4, interpreting and analyzing these findings in relation to the study objectives, research questions, and hypotheses. The chapter highlighted the gap in understanding the performance disparities among entrepreneurs with similar dispositions but different demographics, focusing on the South African context. The discussion provided valuable insights into the dynamics of entrepreneur behaviour, the role of intangible resources, and the moderating effects of race and age on form performance. The final chapter, Chapter 6, synthesizes the key findings from this research, drawings meaningful conclusions and offering actionable recommendations. It also discusses the broader policy implications of the study, providing insights for policymakers, educators, and practitioners.

CHAPTER 6: CONCLUSIONS, RECOMMENDATIONS AND POLICY IMPLICATIONS

6.1 Introduction

In the pursuit of understanding the intricate dynamics that influence entrepreneurship in South Africa, this study delved into the impact of race and age on the utilisation of entrepreneur means and behaviour among technology firm founders. The backdrop of South Africa's historical apartheid legacy, which has perpetuated high levels of inequality, makes it crucial to explore how these factors shape entrepreneurial success. The study employed an intersectionality lens to shed light on the complex interplay between race, age, and entrepreneur means in the context of effectual behaviour and its relationship with firm performance.

The aim of this chapter is to provide a succinct, yet comprehensive overview of the study's key findings and the resulting conclusions drawn from them. In the preceding chapters, the intricacies of the proposed measurement model, which involved loading various indicators and constructs pertaining to the concept of entrepreneur means (which itself is derived from Sarasvathy's (2001) concept of means-at-hand) were explored. Additionally, the structural model was delved into, examining its alignment with the presented hypotheses. This chapter synthesises these findings and makes conclusive insights. Beyond the conclusions, this chapter also offers valuable recommendations, based on the study's outcomes, to guide future research and practical applications in the relevant fields.

The investigation began by addressing several research questions, aiming to explore the extent of reliance on intangible resources for achieving firm performance, the relationship between entrepreneur behaviour and firm performance, and the mediating role

of entrepreneur means on intangible means in the relationship. Additionally, the study sought to understand whether the intersectionality of race and age moderated the effect of EEB on firm performance, through entrepreneur means. To assess these research questions, the study proposed a set of hypotheses:

- *Hypothesis $_1$:* There is a significant positive relationship between effectual entrepreneur behaviour and firm performance.
- *Hypothesis $_2$:* The relationship between effectual entrepreneur behaviour and firm performance is mediated by entrepreneur means.
- *Hypothesis $_3$:* The mediating effect of entrepreneur means in the relationship between effectual entrepreneur behaviour and firm performance is significantly moderated by the intersection of race and age.
- *Hypothesis $_4$:* Technology founders often rely on entrepreneur means (intangible resources) to achieve performance.

The research design involved a survey of 159 technology firm founders operating for at least three years, using self-administered online structured questionnaires. The data analysis utilised PLS 4 statistical computing software, substituted with the SPSS Amos for processing demographic data.

6.2 Contributions of the Study

The study's contributions were multi-faceted, enriching theory, and policy considerations in the field of entrepreneurship. Methodologically, the study proposed a novel measurement model for entrepreneur means (intangible resources), advancing the understanding of effectuation theory and the means-at-hand concept. Theoretically, the research bridged the gap between theory and methodology, offering insights into how entrepreneurs navigate resource-constrained environments and the role of intangible

resources in facilitating entrepreneurial success. Moreover, the study expanded existing literature by specifically examining the impact of race and age on entrepreneur means and behaviour in the technology sector of a developing country, filling an important gap in the literature.

From a policy perspective, the research provided practical implications for policymakers, educators, and practitioners. Policymakers could use the insights to develop and support effectual behaviour among entrepreneurs, considering the unique challenges and opportunities faced by individuals from diverse demographic backgrounds. Fostering inclusivity, reducing disparities, and promoting equitable access to entrepreneurship can lead to a thriving entrepreneurial ecosystem in resource-constrained societies.

6.3 Limitations of the Study

Despite its contributions, this research was not without its limitations. First, the study only explained about 4.2 per cent and 10.1 per cent of the variability in entrepreneur means and firm performance, respectively, suggesting that other unexamined variables might be contributing factors. Second, the study used cross-sectional data, limiting the scope to make causal inferences. Future research could use longitudinal data to capture dynamic changes and causality. In addition, future studies could explore other variables that might influence entrepreneur means and firm performance. For example, considering cultural or location advantages, industry characteristics, or even other individual factors such as personality traits could shed light on the unexplained variance.

Additionally, the study's focus was on technology founders, which might limit the generalisability of findings to founders in other sectors. Future research could compare these results with other sectors to understand if the relationships hold across different industries.

Finally, the study's finding that the intersectionality of race and age did not significantly influence entrepreneur means but did impact firm performance suggested a nuanced interplay of these variables. Future research could dig deeper into these relationships, possibly incorporating qualitative methods to understand the underlying mechanisms.

6.4 Recommendations for Future Research, Refinement and Enrichment

Despite some limitations, the study has made significant progress in developing a measurement model for entrepreneur means. However, it is important to recognise that it is not yet a definitive or exhaustive model. With further refinement, especially in addressing overlaps and expanding the scope of the constructs, it has the potential to become a robust tool for gauging entrepreneur means.

While the current model includes several variables, it is crucial to assess whether these constructs encompass all the relevant aspects of entrepreneur means. Therefore, before conducting the EFA, a process of validation with entrepreneurship experts and practitioners could have been undertaken. Although outside of the scope and resources of this study, this validation could have been achieved through qualitative methods like focus group discussions or other similar approaches. By incorporating qualitative insights, the measurement model development process would have been enriched, as it is important not to rely solely on statistics. An overemphasis on statistics can lead to a loss of depth, nuance, and context in understanding the constructs.

In the future, researchers should consider mixed methods, incorporating a qualitative analysis to uncover latent aspects of entrepreneur means that might not have been captured quantitatively. By doing so, a more comprehensive understanding of the subject can be achieved. Additionally, researchers should explore other constructs beyond

ESE, HC, and SC. Some potential constructs to investigate could include professional networks, risk tolerance, entrepreneurial motivation, beliefs, attitudes, and other relevant factors.

In addition, to gain a comprehensive understanding of the behaviour of technology entrepreneurs, future research should include entrepreneurs who have experienced failure in their ventures, not just those with successful businesses. Additionally, the study's focus on technology founders might limit the generalisability of the results to other sectors. Comparative studies across different industries and countries would provide further insights into the relationships explored in this research.

The study acknowledged certain limitations, such as potential biases and constraints that might have influenced the results. For instance, the model fit for certain constructs raised concerns about the model's overall fit. Future research could focus on refining the model, addressing potential issues with model fit, and exploring additional predictors to improve the explanatory power of the model.

In summary, while the current study has laid the groundwork for a measurement model of entrepreneur means, it should be regarded as a starting point rather than a conclusion. Through further refinement, validation with experts, and exploration of additional constructs, a more comprehensive and robust understanding of entrepreneur means can be developed.

6.5 Study Conclusion

In conclusion, this study has advanced the understanding of effectual entrepreneurship in South Africa by examining the complex interplay between race, age, and entrepreneur means. While some hypotheses were supported, others were only partially supported, or not supported at all, indicating the complexity of interactions. The

study's insights have practical implications for policy development and contribute to a more comprehensive understanding of entrepreneurship in an unequal society. Moving forward, continuous research and exploration of the dynamics at play would be vital to unlock the full potential of entrepreneurship and drive positive change in resource-constrained environments.

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APPENDIX A: Ethics Clearance

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Ngcobo

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H21/10/34**
PROJECT TITLE	The ripple effect of demographics on the entrepreneurial behaviour-performance relationship in the South African tech sector
INVESTIGATOR(S)	Ms M Ngcobo
SCHOOL/DEPARTMENT	Wits Business School/
DATE CONSIDERED	22 October 2021
DECISION OF THE COMMITTEE	Approved Risk Level: Minimal
EXPIRY DATE	30 November 2024

DATE 01 December 2021 **CHAIRPERSON** _____
(Professor J Knight)

cc: Supervisor : Dr M Murimbika

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to submit an amendment of the protocol to the Committee. **I agree to completion of a regular progress report. For Minimal and Low studies, this is due annually on 31 December. For Medium and High Risk studies, this is due twice annually on 30 June and 31 December.**

_____ _____/_____/_____
Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

APPENDIX B: Research Instrument

Entrepreneurial behaviour questionnaire

Survey Flow

Standard: CSAT (18 Questions)
Standard: FIRM PERFOMANCE (1 Question)
Standard: ENTREPRENEURIAL BEHAVIOUR (2 Questions)
Standard: ENTREPRENEUR MEANS (3 Questions)

Page Break

CSAT

WITS BUSINESS SCHOOL Welcome to the survey!

Dear Entrepreneur

I am a PhD candidate at the Wits Business School, and in fulfilment of my degree requirements I am conducting a study on factors that might affect the behaviour and decision-making of entrepreneurs operating in the tech sector in South Africa.

Kindly spare me about 10-12min of your time to complete the questionnaire which has 3 main sections. Whilst we request your demographic details which are important for analysis, we will not ask for any information that has your person identifiers (ID, name, contact details etc) and should we for any reason have this information at our disposal, please note that it will not form part of our analysis, thus you are assured of full confidentiality and anonymity.

Whilst we will really appreciate a complete questionnaire, please be assured that participation is completely voluntary and you are free to exit at any point during the study, without any prejudice.

Do you understand that participation is voluntary and do you consent to participate?

I consent, begin the study
I do not consent, I do no wish to participate

Are you an individual who is currently (1) an owner-manager of a South African-based technology business that has at least (2) launched a Minimum Viable Product (MVP) to the market and (3) has been running for 3yrs or more?

Yes, let's continue!
No. If not, we thank you for reading this far and wish you well for the future.

Q1.3 In which area/s of tech do you operate in? Please choose whichever is applicable from the drop-down menu or type applicable answer if no category is applicable.

- [ ] Internet of Things (IoT) (1)
- [ ] Big Data (data mining, data analytics & advanced algorithms) (2)
- [ ] Additive Manufacturing (3D printing, 3D scanning) (3)
- [ ] Cloud computing (4)
- [ ] Autonomous robots (industrial robots, robot arms) (5)
- [ ] Virtual reality (VR) (6)
- [ ] Augmented reality (AR) (7)
- [ ] Cyber-physical systems (CPS) (8)
- [ ] Artificial intelligence (AI) and machine learning (9)
- [ ] Smart sensors (smart actuators, smart objects, and smart dust) (10)
- [ ] Advanced simulation (3D modelling and 3D visualization) (11)
- [ ] Nanotechnology (advanced materials, nanomaterials, nanobots) (12)
- [ ] Drones, UAV, UASs, and RPA1 (13)
- [ ] Biotechnology (synthetic biology, molecular biology) (14)
- [ ] Block chain (Bitcoin, cryptocurrency, digital currency) (15)
- [ ] Flexible production system (FMS) and cluster concept (16)

- [ ] Material science (17)
- [ ] Internet of data (IoD) (18)
- [ ] Location detection (digital traceability and GPS) (19)
- [ ] Cybersecurity (20)
- [ ] Material science (21)
- [ ] Internet of energy (IoE) (smart grid) (22)
- [ ] Advanced human to machine interface (HMI) (23)
- [ ] Industrial Internet of Things (IIoT) or industrial internet (24)
- [ ] Predictive maintenance (25)
- [ ] Neurotechnology (26)
- [ ] Manufacturing execution system (MES) and SCADA (27)
- [ ] Mobile devices (smartphones, smart cameras) (28)
- [ ] Quantum computing (29)
- [ ] Information and communication technology (ICT) (30)
- [ ] 5G network (advanced network technology) (31)
- [ ] Machine-to-machine communication (M2M) (32)

- [ ] Renewable energy and advanced energy storage (33)
- [ ] Vertical and horizontal (V&H) system integrations (34)
- [ ] Internet of services (IoS) (35)
- [ ] Smart factory and intelligent factory (36)
- [ ] Digital twin (37)
- [ ] Other, please specify (38) _____

Q1.4 What is your business footprint?

- [ ] Provincial (1)
- [ ] National (2)
- [ ] South Africa & internationally (3)

Q1.5 How long has it been since you launched your business?

- 3 - 5 yrs (1)
- 6-10 yrs (2)
- 11-20yrs (3)
- Over 20yrs (4)

Q1.6 What was the percentage of black ownership at the start of the business?

- Less than 25% (1)
- 25-50% (2)
- Over 50% (3)

Q1.7 What is the percentage of black ownership in the business now?

- Less than 25% (1)
- 25-50% (2)
- Over 50% (3)

Q1.8 How many founders does the business have?

- ○ Only 1 (1)
- ○ 2-5 (2)
- ○ Over 5 (3)

Display This Question:

If How many founders does the business have? = Only 1

Q1.9 What is your gender?

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary / third gender (3)
- ○ Prefer not to say (4)

Display This Question:

If How many founders does the business have? != Only 1

Q1.10 What is the gender distribution of the founders? (please select all applicable, you are not limited to one)

- ☐ Male (1)
- ☐ Female (2)
- ☐ Non-binary / third gender (3)
- ☐ Prefer not to say (4)

Display This Question:
If How many founders does the business have? = Only 1

Q1.11 What was your age at start of the business?

- under 20 (1)
- 20-29 (2)
- 30-39 (3)
- 40-49 (4)
- 50-59 (5)
- 60-64 (6)
- Over 65 (7)

Display This Question:
If How many founders does the business have? = Only 1

Q1.12 What is your age now?

- under 20 (1)
- 20-29 (2)
- 30-39 (3)
- 40-49 (4)
- 50-59 (5)
- 60-64 (6)
- Over 65 (7)

Display This Question:

If How many founders does the business have? != Only 1

Q1.13 What was the average age of the founders at start of the business?

- Under 20 (1)
- 20-29 (2)
- 30-39 (3)
- 40-49 (4)
- 50-59 (5)
- 60-64 (6)
- Over 65 (7)

Display This Question:

If How many founders does the business have? != Only 1

Q1.14 What is the average age of all the founders currently?

- Under 20 (1)
- 20-24 (2)
- 25-29 (3)
- 30-34 (4)
- 35-39 (5)
- 40-44 (6)
- 45-49 (7)
- 50-54 (8)
- 55-59 (9)
- 60-64 (10)
- Over 65 (11)

Display This Question:

If How many founders does the business have? = Only 1

Q1.15 Which racial group do you belong to?

- Asian / Indian (1)
- Black African (2)
- Colored (3)
- White (4)

Display This Question:

If How many founders does the business have? != Only 1

Q1.16 Which racial group categories do the different founders belong to? (please select all applicable, you are not limited to just one)

- [ ] Asian / Indian (1)
- [ ] Black African (2)
- [ ] Colored (3)
- [ ] White (4)

Display This Question:

If How many founders does the business have? = Only 1

Q1.17 What was your level of education at start of business?

- ○ Less than high school (1)
- ○ Matric (2)
- ○ Some college or trade certificate (3)
- ○ 3 year diploma/degree (4)
- ○ Honours degree (5)
- ○ Professional degree (6)
- ○ Masters (7)
- ○ Doctorate (8)

Display This Question:

If How many founders does the business have? != Only 1

Q1.18 Which categories of level of education did the different founders fall under at the start of business? (please select all applicable, you are not limited to just one)

- [ ] Less than high school (1)
- [ ] Matric (2)
- [ ] Some college or trade certificate (3)
- [ ] 3 year diploma/degree (4)
- [ ] Honours degree (5)
- [ ] Professional degree (6)
- [ ] Masters (7)
- [ ] Doctorate (8)

End of Block: CSAT

Start of Block: FIRM PERFOMANCE

Q2.1 Please select your level of agreement with the following statements regarding your business growth in the first three years of the business

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
There was satisfaction in business growth including achievement of business goals (1)	○	○	○	○	○	○	○
There was improvement in standard of life of founder/s (4)	○	○	○	○	○	○	○
There was growth in personal income of founder/s from the beginning of the business (5)	○	○	○	○	○	○	○
There was improvement in income level of founder/s when comparing before and after the business (6)	○	○	○	○	○	○	○
There was improvement in saving capacity and accumulation of resources from the business (7)	○	○	○	○	○	○	○

There was growth on net profit earnings from the business (2)	○	○	○	○	○	○	○
There was improvement in return in investment (ROI) from the business (3)	○	○	○	○	○	○	○
There was improvement in Return on Assets (ROA) from the business (8)	○	○	○	○	○	○	○
There was growth in turnover (9)	○	○	○	○	○	○	○
There was growth in turnover compared to the competitors (10)	○	○	○	○	○	○	○
There was an increase in the number of employees from the beginning of the business (11)	○	○	○	○	○	○	○

The company was able to keep the best and most talented people (12)	○	○	○	○	○	○	○

End of Block: FIRM PERFOMANCE

Start of Block: ENTREPRENEURIAL BEHAVIOUR

Q3.1 Effectuation: Please answer all the questions according to what is most applicable in the first three years of the business

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	agree (6)	Strongly agree (7)
The ultimate product/service that was used to launch this business is quite different from the original concept (10)	○	○	○	○	○	○	○
It was impossible to see from the beginning what the end result would be (20)	○	○	○	○	○	○	○
The business has been allowed to evolve as opportunities have emerged (11)	○	○	○	○	○	○	○
The set of resources and means at my/our disposal determined the business options followed (12)	○	○	○	○	○	○	○
I/We experimented with different products and or business models (13)	○	○	○	○	○	○	○

I/We started out very flexibly and tried to take advantage of unexpected opportunities as they arose (14)	○	○	○	○	○	○	○
I/We used a substantial number of agreements with customers, suppliers, other organizations and people to reduce the amount of uncertainty (15)	○	○	○	○	○	○	○
My/Our decision making has been largely driven by how much we could afford to lose (17)	○	○	○	○	○	○	○

End of Block: ENTREPRENEURIAL BEHAVIOUR

Start of Block: ENTREPRENEUR MEANS

Q4.1 Self-efficacy: Please answer all the questions according to what is most applicable in the first three years of the business

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree or disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Overall, my/our skills and abilities helped in starting the business (1)	○	○	○	○	○	○	○
My/our past experience was very valuable in starting a business (2)	○	○	○	○	○	○	○
There was always confidence that it was possible to put the effort needed to start a business (3)	○	○	○	○	○	○	○

Q4.2 Human capital: Please answer all the questions according to what is most applicable in the first three years of the business

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
The founder/s had previous startup experience (1)	○	○	○	○	○	○	○
The founder/s were highly educated (2)	○	○	○	○	○	○	○
The founder/s had industry experience (3)	○	○	○	○	○	○	○
The founder/s had managerial experience (4)	○	○	○	○	○	○	○

Q4.3 Social capital: Please answer all the questions according to what is most applicable in the first three years of the business

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strong agree (7)
I/We had access to parents in business (1)	○	○	○	○	○	○	○
I/We had access to siblings in business (5)	○	○	○	○	○	○	○
I/We had encouragement from friends to start a business (2)	○	○	○	○	○	○	○
I/we had encouragement from family members to start a business (6)	○	○	○	○	○	○	○
I/we had encouragement from neighbours to start a business (7)	○	○	○	○	○	○	○
I/we had access to friends, who were in business (3)	○	○	○	○	○	○	○
I/we had access to family members who were in business (8)	○	○	○	○	○	○	○

I/we had access to neighbours who were in business (9)	○	○	○	○	○	○	○
I/we had access to spousal support (4)	○	○	○	○	○	○	○

End of Block: ENTREPRENEUR MEANS

APPENDIX C: Firm Performance Multiple Comparisons

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
Asian & Coloured 30-39 years	Asian & Coloured 40-49 years	-1.20833	1.14034	.999	-5.0986	2.6820
	Black African 20-29 years	.31944	.65837	1.000	-1.9266	2.5655
	Black African 30-39 years	.62121	.64324	.999	-1.5732	2.8156
	Black African 40-49 years	.18056	.67463	1.000	-2.1210	2.4821
	Black African 50-59 years	-.47222	.80634	1.000	-3.2231	2.2786
	White 20-29 years	-.45833	.69831	1.000	-2.8406	1.9240
	White 30-39 years	.07813	.62133	1.000	-2.0416	2.1978
	White 40-49 years	.20343	.66320	1.000	-2.0591	2.4660
	White 50-59 years	.32738	.77701	1.000	-2.3234	2.9782
	Multiracial 20-29 years	-1.31944	.98756	.987	-4.6885	2.0497
	Multiracial 30-39 years	-.56019	.73608	1.000	-3.0714	1.9510
	Multiracial 40-49 years	.01786	.77701	1.000	-2.6329	2.6686
	Multiracial 50-59 years	.01389	.98756	1.000	-3.3552	3.3830
Asian & Coloured 40-49 years	Asian & Coloured 30-39 years	1.20833	1.14034	.999	-2.6820	5.0986
	Black African 20-29 years	1.52778	1.04098	.971	-2.0236	5.0791
	Black African 30-39 years	1.82955	1.03147	.884	-1.6894	5.3485
	Black African 40-49 years	1.38889	1.05134	.988	-2.1978	4.9756
	Black African 50-59 years	.73611	1.14034	1.000	-3.1542	4.6264
	White 20-29 years	.75000	1.06669	1.000	-2.8890	4.3890
	White 30-39 years	1.28646	1.01795	.992	-2.1863	4.7592
	White 40-49 years	1.41176	1.04404	.986	-2.1500	4.9735
	White 50-59 years	1.53571	1.11979	.984	-2.2845	5.3559
	Multiracial 20-29 years	-.11111	1.27493	1.000	-4.4606	4.2384
	Multiracial 30-39 years	.64815	1.09179	1.000	-3.0765	4.3728
	Multiracial 40-49 years	1.22619	1.11979	.998	-2.5940	5.0464
	Multiracial 50-59 years	1.22222	1.27493	1.000	-3.1273	5.5717
Black African 20-29 years	Asian & Coloured 30-39 years	-.31944	.65837	1.000	-2.5655	1.9266
	Asian & Coloured 40-49 years	-1.52778	1.04098	.971	-5.0791	2.0236

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
	Black African 30-39 years	.30177	.44388	1.000	-1.2125	1.8161
	Black African 40-49 years	-.13889	.48826	1.000	-1.8046	1.5268
	Black African 50-59 years	-.79167	.65837	.995	-3.0377	1.4544
	White 20-29 years	-.77778	.52049	.967	-2.5534	.9979
	White 30-39 years	-.24132	.41148	1.000	-1.6451	1.1625
	White 40-49 years	-.11601	.47234	1.000	-1.7274	1.4954
	White 50-59 years	.00794	.62210	1.000	-2.1144	2.1303
	Multiracial 20-29 years	-1.63889	.87095	.833	-4.6102	1.3324
	Multiracial 30-39 years	-.87963	.57017	.957	-2.8248	1.0655
	Multiracial 40-49 years	-.30159	.6221	1.000	-2.4239	1.8207
	Multiracial 50-59 years	-.30556	.87095	1.000	-3.2768	2.6657
Black African 30-39 years	Asian & Coloured 30-39 years	-.62121	.64324	.999	-2.8156	1.5732
	Asian & Coloured 40-49 years	-1.82955	1.03147	.884	-5.3485	1.6894
	Black African 20-29 years	-.30177	.44388	1.000	-1.8161	1.2125
	Black African 40-49 years	-.44066	.46765	1.000	-2.0361	1.1548
	Black African 50-59 years	-1.09343	.64324	.913	-3.2879	1.1010
	White 20-29 years	-1.07955	.50121	.663	-2.7894	.6303
	White 30-39 years	-.54309	.38680	.980	-1.8627	.7765
	White 40-49 years	-.41778	.45100	1.000	-1.9564	1.1208
	White 50-59 years	-.29383	.60606	1.000	-2.3614	1.7738
	Multiracial 20-29 years	-1.94066	.85956	.588	-4.8731	.9918
	Multiracial 30-39 years	-1.18140	.55262	.674	-3.0667	.7039
	Multiracial 40-49 years	-.60335	.60606	.999	-2.6710	1.4642
	Multiracial 50-59 years	-.60732	.85956	1.000	-3.5397	2.3251
Black African 40-49 years	Asian & Coloured 30-39 years	-.18056	.67463	1.000	-2.4821	2.1210
	Asian & Coloured 40-49 years	-1.38889	1.05134	.988	-4.9756	2.1978
	Black African 20-29 years	.13889	.48826	1.000	-1.5268	1.8046
	Black African 30-39 years	.44066	.46765	1.000	-1.1548	2.0361
	Black African 50-59 years	-.65278	.67463	.999	-2.9543	1.6488
	White 20-29 years	-.63889	.54091	.996	-2.4842	1.2064
	White 30-39 years	-.10243	.43703	1.000	-1.5934	1.3885
	White 40-49 years	.02288	.49475	1.000	-1.6650	1.7107

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
	White 50-59 years	.14683	.63929	1.000	-2.0341	2.3278
	Multiracial 20-29 years	-1.50000	.88330	.913	-4.5134	1.5134
	Multiracial 30-39 years	-.74074	.58887	.993	-2.7497	1.2682
	Multiracial 40-49 years	-.16270	.63929	1.000	-2.3436	2.0182
	Multiracial 50-59 years	-.16667	.88330	1.000	-3.1801	2.8467
Black African 50-59 years	Asian & Coloured 30-39 years	.47222	.80634	1.000	-2.2786	3.2231
	Asian & Coloured 40-49 years	-.73611	1.14034	1.000	-4.6264	3.1542
	Black African 20-29 years	.79167	.65837	.995	-1.4544	3.0377
	Black African 30-39 years	1.09343	.64324	.913	-1.1010	3.2879
	Black African 40-49 years	.65278	.67463	.999	-1.6488	2.9543
	White 20-29 years	.01389	.69831	1.000	-2.3684	2.3962
	White 30-39 years	.55035	.62133	1.000	-1.5693	2.6700
	White 40-49 years	.67565	.66320	.999	-1.5869	2.9382
	White 50-59 years	.79960	.77701	.999	-1.8512	3.4504
	Multiracial 20-29 years	-.84722	.98756	1.000	-4.2163	2.5219
	Multiracial 30-39 years	-.08796	.73608	1.000	-2.5991	2.4232
	Multiracial 40-49 years	.49008	.77701	1.000	-2.1607	3.1409
	Multiracial 50-59 years	.48611	.98756	1.000	-2.8830	3.8552
White 20-29 years	Asian & Coloured 30-39 years	.45833	.69831	1.000	-1.9240	2.8406
	Asian & Coloured 40-49 years	-.75000	1.06669	1.000	-4.3890	2.8890
	Black African 20-29 years	.77778	.52049	.967	-.9979	2.5534
	Black African 30-39 years	1.07955	.50121	.663	-.6303	2.7894
	Black African 40-49 years	.63889	.54091	.996	-1.2064	2.484
	Black African 50-59 years	-.01389	.69831	1.000	-2.3962	2.3684
	White 30-39 years	.53646	.47276	.997	-1.0764	2.1493
	White 40-49 years	.66176	.52658	.993	-1.1347	2.4582
	White 50-59 years	.78571	.66423	.996	-1.4803	3.0517
	Multiracial 20-29 years	-.86111	.90151	1.000	-3.9367	2.2144
	Multiracial 30-39 years	-.10185	.61585	1.000	-2.2029	1.9991
	Multiracial 40-49 years	.47619	.66423	1.000	-1.7898	2.7422
	Multiracial 50-59 years	.47222	.90151	1.000	-2.6033	3.5478
White 30-39 years	Asian & Coloured 30-39 years	-.07812	.62133	1.000	-2.1978	2.0416

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
	Asian & Coloured 40-49 years	-1.28646	1.01795	.992	-4.7592	2.1863
	Black African 20-29 years	.24132	.41148	1.000	-1.1625	1.6451
	Black African 30-39 years	.54309	.38680	.980	-.7765	1.8627
	Black African 40-49 years	.10243	.43703	1.000	-1.3885	1.5934
	Black African 50-59 years	-.55035	.62133	1.000	-2.6700	1.5693
	White 20-29 years	-.53646	.47276	.997	-2.1493	1.0764
	White 40-49 years	.12531	.41916	1.000	-1.3047	1.5553
	White 50-59 years	.24926	.58276	1.000	-1.7388	2.2373
	Multiracial 20-29 years	-1.39757	.84329	.927	-4.2745	1.4793
	Multiracial 30-39 years	-.63831	.52696	.995	-2.4360	1.1594
	Multiracial 40-49 years	-.06027	.58276	1.000	-2.0484	1.9278
	Multiracial 50-59 years	-.06424	.84329	1.000	-2.9411	2.8127
White 40-49 years	Asian & Coloured 30-39 years	-.20343	.66320	1.000	-2.4660	2.0591
	Asian & Coloured 40-49 years	-1.41176	1.04404	.986	-4.9735	2.1500
	Black African 20-29 years	.11601	.47234	1.000	-1.4954	1.7274
	Black African 30-39 years	.41778	.45100	1.000	-1.1208	1.9564
	Black African 40-49 years	-.02288	.49475	1.000	-1.7107	1.6650
	Black African 50-59 years	-.67565	.66320	.999	-2.9382	1.5869
	White 20-29 years	-.66176	.52658	.993	-2.4582	1.1347
	White 30-39 years	-.12531	.41916	1.000	-1.5553	1.3047
	White 50-59 years	.12395	.62721	1.000	-2.0158	2.2637
	Multiracial 20-29 years	-1.52288	.87460	.897	-4.5066	1.4608
	Multiracial 30-39 years	-.76362	.57573	.988	-2.7277	1.2005
	Multiracial 40-49 years	-.18557	.62721	1.000	-2.3253	1.9542
	Multiracial 50-59 years	-.18954	.87460	1.000	-3.1733	2.7942
White 50-59 years	Asian & Coloured 30-39 years	-.32738	.77701	1.000	-2.9782	2.3234
	Asian & Coloured 40-49 years	-1.53571	1.11979	.984	-5.3559	2.2845
	Black African 20-29 years	-.00794	.62210	1.000	-2.1303	2.1144
	Black African 30-39 years	.29383	.60606	1.000	-1.7738	2.3614
	Black African 40-49 years	-.14683	.63929	1.000	-2.3278	2.0341
	Black African 50-59 years	-.79960	.77701	.999	-3.4504	1.8512
	White 20-29 years	-.78571	.66423	.996	-3.0517	1.4803

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
	White 30-39 years	-.24926	.58276	1.000	-2.2373	1.7388
	White 40-49 years	-.12395	.62721	1.000	-2.2637	2.0158
	Multiracial 20-29 years	-1.64683	.96376	.910	-4.9347	1.6411
	Multiracial 30-39 years	-.88757	.70383	.992	-3.2887	1.5136
	Multiracial 40-49 years	-.30952	.74653	1.000	-2.8563	2.2373
	Multiracial 50-59 years	-.31349	.96376	1.000	-3.6014	2.9744
Multiracial 20-29 years	Asian & Coloured 30-39 years	1.31944	.98756	.987	-2.0497	4.6885
	Asian & Coloured 40-49 years	.11111	1.27493	1.000	-4.2384	4.4606
	Black African 20-29 years	1.63889	.87095	.833	-1.3324	4.6102
	Black African 30-39 years	1.94066	.85956	.588	-.9918	4.8731
	Black African 40-49 years	1.50000	.88330	.913	-1.5134	4.5134
	Black African 50-59 years	.84722	.98756	1.000	-2.5219	4.2163
	White 20-29 years	.86111	.90151	1.000	-2.2144	3.9367
	White 30-39 years	1.39757	.84329	.927	-1.4793	4.2745
	White 40-49 years	1.52288	.87460	.897	-1.4608	4.5066
	White 50-59 years	1.64683	.96376	.910	-1.6411	4.9347
	Multiracial 30-39 years	.75926	.93108	1.000	-2.4172	3.9357
	Multiracial 40-49 years	1.33730	.96376	.982	-1.9506	4.6252
	Multiracial 50-59 years	1.33333	1.14034	.996	-2.5570	5.2236
Multiracial 30-39 years	Asian & Coloured 30-39 years	.56019	.73608	1.000	-1.9510	3.0714
	Asian & Coloured 40-49 years	-.64815	1.09179	1.000	-4.3728	3.0765
	Black African 20-29 years	.87963	.57017	.957	-1.0655	2.8248
	Black African 30-39 years	1.18140	.55262	.674	-.7039	3.0667
	Black African 40-49 years	.74074	.58887	.993	-1.2682	2.7497
	Black African 50-59 years	.08796	.73608	1.000	-2.4232	2.5991
	White 20-29 years	.10185	.61585	1.000	-1.9991	2.2029
	White 30-39 years	.63831	.52696	.995	-1.1594	2.4360
	White 40-49 years	.76362	.57573	.988	-1.2005	2.7277
	White 50-59 years	.88757	.70383	.992	-1.5136	3.2887
	Multiracial 20-29 years	-.75926	.93108	1.000	-3.9357	2.4172
	Multiracial 40-49 years	.57804	.70383	1.000	-1.8231	2.9792
	Multiracial 50-59 years	.57407	.93108	1.000	-2.6023	3.7505

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
Multiracial 40-49 years	Asian & Coloured 30-39 years	-.01786	.77701	1.000	-2.6686	2.6329
	Asian & Coloured 40-49 years	-1.22619	1.11979	.998	-5.0464	2.5940
	Black African 20-29 years	.30159	.62210	1.000	-1.8207	2.4239
	Black African 30-39 years	.60335	.60606	.999	-1.4642	2.6710
	Black African 40-49 years	.16270	.63929	1.000	-2.0182	2.3436
	Black African 50-59 years	-.49008	.77701	1.000	-3.1409	2.1607
	White 20-29 years	-.47619	.66423	1.000	-2.7422	1.7898
	White 30-39 years	.06027	.58276	1.000	-1.9278	2.0484
	White 40-49 years	.18557	.62721	1.000	-1.9542	2.3253
	White 50-59 years	.30952	.74653	1.000	-2.2373	2.8563
	Multiracial 20-29 years	-1.33730	.96376	.982	-4.6252	1.9506
	Multiracial 30-39 years	-.57804	.70383	1.000	-2.9792	1.8231
	Multiracial 50-59 years	-.00397	.96376	1.000	-3.2919	3.2839
Multiracial 50-59 years	Asian & Coloured 30-39 years	-.01389	.98756	1.000	-3.3830	3.3552
	Asian & Coloured 40-49 years	-1.22222	1.27493	1.000	-5.5717	3.1273
	Black African 20-29 years	.30556	.87095	1.000	-2.6657	3.2768
	Black African 30-39 years	.60732	.85956	1.000	-2.3251	3.5397
	Black African 40-49 years	.16667	.88330	1.000	-2.8467	3.1801
	Black African 50-59 years	-.48611	.98756	1.000	-3.8552	2.8830
	White 20-29 years	-.47222	.90151	1.000	-3.5478	2.6033
	White 30-39 years	.06424	.84329	1.000	-2.8127	2.9411
	White 40-49 years	.18954	.87460	1.000	-2.7942	3.1733
	White 50-59 years	.31349	.96376	1.000	-2.9744	3.6014
	Multiracial 20-29 years	-1.33333	1.14034	.996	-5.2236	2.5570
	Multiracial 30-39 years	-.57407	.93108	1.000	-3.7505	2.6023
	Multiracial 40-49 years	.00397	.96376	1.000	-3.2839	3.2919

Dependent Variable: Firm_Performance
Tukey HSD

APPENDIX D: Effectuation Multiple Comparisons

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
Asian & Coloured 30-39 years	Asian & Coloured 40-49 years	,75000	,77548	,999	-1,8956	3,3956
	Black African 20-29 years	,03704	,44772	1,000	-1,4904	1,5645
	Black African 30-39 years	,69697	,43743	,945	-,7953	2,1893
	Black African 40-49 years	,37778	,45878	1,000	-1,1874	1,9429
	Black African 50-59 years	,27778	,54835	1,000	-1,5929	2,1485
	White 20-29 years	-,18056	,47488	1,000	-1,8006	1,4395
	White 30-39 years	,36458	,42253	1,000	-1,0769	1,8061
	White 40-49 years	,53922	,45100	,995	-,9994	2,0778
	White 50-59 years	-,07143	,52840	1,000	-1,8741	1,7312
	Multiracial 20-29 years	1,16667	,67158	,899	-1,1245	3,4578
	Multiracial 30-39 years	,29630	,50057	1,000	-1,4114	2,0040
	Multiracial 40-49 years	-,11905	,52840	1,000	-1,9217	1,6836
	Multiracial 50-59 years	-,16667	,67158	1,000	-2,4578	2,1245
Asian & Coloured 40-49 years	Asian & Coloured 30-39 years	-,75000	,77548	,999	-3,3956	1,8956
	Black African 20-29 years	-,71296	,70791	,999	-3,1280	1,7021
	Black African 30-39 years	-,05303	,70145	1,000	-2,4460	2,3400
	Black African 40-49 years	-,37222	,71496	1,000	-2,8113	2,0669
	Black African 50-59 years	-,47222	,77548	1,000	-3,1178	2,1733
	White 20-29 years	-,93056	,72539	,991	-3,4053	1,5441
	White 30-39 years	-,38542	,69225	1,000	-2,7471	1,9762
	White 40-49 years	-,21078	,70999	1,000	-2,6329	2,2114
	White 50-59 years	-,82143	,76150	,998	-3,4193	1,7765
	Multiracial 20-29 years	,41667	,86701	1,000	-2,5412	3,3745
	Multiracial 30-39 years	-,45370	,74246	1,000	-2,9866	2,0792
	Multiracial 40-49 years	-,86905	,76150	,997	-3,4669	1,7289
	Multiracial 50-59 years	-,91667	,86701	,999	-3,8745	2,0412
Black African 20-29 years	Asian & Coloured 30-39 years	-,03704	,44772	1,000	-1,5645	1,4904
	Asian & Coloured 40-49 years	,71296	,70791	,999	-1,7021	3,1280
	Black African 30-39 years	,65993	,30185	,640	-,3699	1,6897
	Black African 40-49 years	,34074	,33204	,999	-,7920	1,4735
	Black African 50-59 years	,24074	,44772	1,000	-1,2867	1,7682

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
	White 20-29 years	-,21759	,35396	1,000	-1,4251	,9899
	White 30-39 years	,32755	,27983	,996	-,6271	1,2822
	White 40-49 years	,50218	,32121	,953	-,5936	1,5980
	White 50-59 years	-,10847	,42306	1,000	-1,5517	1,3348
	Multiracial 20-29 years	1,12963	,59228	,819	-,8910	3,1502
	Multiracial 30-39 years	,25926	,38774	1,000	-1,0635	1,5820
	Multiracial 40-49 years	-,15608	,42306	1,000	-1,5994	1,2872
	Multiracial 50-59 years	-,20370	,59228	1,000	-2,2243	1,8169
Black African 30-39 years	Asian & Coloured 30-39 years	-,69697	,43743	,945	-2,1893	,7953
	Asian & Coloured 40-49 years	,05303	,70145	1,000	-2,3400	2,4460
	Black African 20-29 years	-,65993	,30185	,640	-1,6897	,3699
	Black African 40-49 years	-,31919	,31802	,999	-1,4041	,7658
	Black African 50-59 years	-,41919	,43743	1,000	-1,9115	1,0731
	White 20-29 years	-,87753	,34084	,366	-2,0403	,2853
	White 30-39 years	-,33239	,26304	,992	-1,2298	,5650
	White 40-49 years	-,15775	,30670	1,000	-1,2041	,8886
	White 50-59 years	-,76840	,41215	,842	-2,1745	,6377
	Multiracial 20-29 years	,46970	,58454	1,000	-1,5245	2,4639
	Multiracial 30-39 years	-,40067	,37581	,999	-1,6827	,8814
	Multiracial 40-49 years	-,81602	,41215	,777	-2,2221	,5900
	Multiracial 50-59 years	-,86364	,58454	,970	-2,8578	1,1305
Black African 40-49 years	Asian & Coloured 30-39 years	-,37778	,45878	1,000	-1,9429	1,1874
	Asian & Coloured 40-49 years	,37222	,71496	1,000	-2,0669	2,8113
	Black African 20-29 years	-,34074	,33204	,999	-1,4735	,7920
	Black African 30-39 years	,31919	,31802	,999	-,7658	1,4041
	Black African 50-59 years	-,10000	,4587	1,000	-1,6651	1,4651
	White 20-29 years	-,55833	,36784	,962	-1,8132	,6966
	White 30-39 years	-,01319	,29720	1,000	-1,0271	1,0007
	White 40-49 years	,16144	,33645	1,000	-,9864	1,3092
	White 50-59 years	-,44921	,43474	,999	-1,9323	1,0339
	Multiracial 20-29 years	,78889	,60068	,989	-1,2604	2,8381
	Multiracial 30-39 years	-,08148	,40046	1,000	-1,4476	1,2847
	Multiracial 40-49 years	-,49683	,43474	,997	-1,9800	,9863
	Multiracial 50-59 years	-,54444	,60068	1,000	-2,5937	1,5048
Black African 50-59 years	Asian & Coloured 30-39 years	-,27778	,54835	1,000	-2,1485	1,5929

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
	Asian & Coloured 40-49 years	,47222	,77548	1,000	-2,1733	3,1178
	Black African 20-29 years	-,24074	,44772	1,000	-1,7682	1,2867
	Black African 30-39 years	,41919	,43743	1,000	-1,0731	1,9115
	Black African 40-49 years	,10000	,45878	1,000	-1,4651	1,6651
	White 20-29 years	-,45833	,47488	,999	-2,0784	1,1617
	White 30-39 years	,08681	,42253	1,000	-1,3547	1,5283
	White 40-49 years	,26144	,45100	1,000	-1,2772	1,8000
	White 50-59 years	-,34921	,52840	1,000	-2,1519	1,4534
	Multiracial 20-29 years	,88889	,67158	,988	-1,4022	3,1800
	Multiracial 30-39 years	,01852	,50057	1,000	-1,6892	1,7262
	Multiracial 40-49 years	-,39683	,52840	1,000	-2,1995	1,4058
	Multiracial 50-59 years	-,44444	,67158	1,000	-2,7356	1,8467
White 20-29 years	Asian & Coloured 30-39 years	,18056	,47488	1,000	-1,4395	1,8006
	Asian & Coloured 40-49 years	,93056	,72539	,991	-1,5441	3,4053
	Black African 20-29 years	,21759	,35396	1,000	-,9899	1,4251
	Black African 30-39 years	,87753	,34084	,366	-,2853	2,0403
	Black African 40-49 years	,55833	,36784	,962	-,6966	1,8132
	Black African 50-59 years	,45833	,47488	,999	-1,1617	2,0784
	White 30-39 years	,54514	,32150	,914	-,5517	1,6419
	White 40-49 years	,71977	,35810	,759	-,5019	1,9414
	White 50-59 years	,10913	,45170	1,000	-1,4319	1,6501
	Multiracial 20-29 years	1,34722	,61307	,632	-,7443	3,4387
	Multiracial 30-39 years	,47685	,41881	,997	-,9519	1,9056
	Multiracial 40-49 years	,06151	,45170	1,000	-1,4795	1,6025
	Multiracial 50-59 years	,01389	,61307	1,000	-2,0776	2,1054
White 30-39 years	Asian & Coloured 30-39 years	-,36458	,42253	1,000	-1,8061	1,0769
	Asian & Coloured 40-49 years	,38542	,69225	1,000	-1,9762	2,7471
	Black African 20-29 years	-,32755	,27983	,996	-1,2822	,6271
	Black African 30-39 years	,33239	,26304	,992	-,5650	1,2298
	Black African 40-49 years	,01319	,29720	1,000	-1,0007	1,0271
	Black African 50-59 years	-,08681	,42253	1,000	-1,5283	1,3547
	White 20-29 years	-,54514	,32150	,914	-1,6419	,5517
	White 40-49 years	,17463	,28505	1,000	-,7978	1,1471
	White 50-59 years	-,43601	,39630	,998	-1,7880	,9160
	Multiracial 20-29 years	,80208	,57347	,981	-1,1543	2,7585

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
	Multiracial 30-39 years	-,06829	,35835	1,000	-1,2908	1,1542
	Multiracial 40-49 years	-,48363	,39630	,994	-1,8356	,8684
	Multiracial 50-59 years	-,53125	,57347	1,000	-2,4877	1,4252
White 40-49 years	Asian & Coloured 30-39 years	-,53922	,45100	,995	-2,0778	,9994
	Asian & Coloured 40-49 years	,21078	,70999	1,000	-2,2114	2,6329
	Black African 20-29 years	-,50218	,32121	,953	-1,5980	,5936
	Black African 30-39 years	,15775	,30670	1,000	-,8886	1,2041
	Black African 40-49 years	-,16144	,33645	1,000	-1,3092	,9864
	Black African 50-59 years	-,26144	,45100	1,000	-1,8000	1,2772
	White 20-29 years	-,71977	,35810	,759	-1,9414	,5019
	White 30-39 years	-,17463	,28505	1,000	-1,1471	,7978
	White 50-59 years	-,61064	,42653	,977	-2,0658	,8445
	Multiracial 20-29 years	,62745	,59476	,999	-1,4016	2,6565
	Multiracial 30-39 years	-,24292	,39152	1,000	-1,5786	1,0928
	Multiracial 40-49 years	-,65826	,42653	,957	-2,1134	,7969
	Multiracial 50-59 years	-,70588	,59476	,996	-2,7349	1,3232
White 50-59 years	Asian & Coloured 30-39 years	,07143	,52840	1,000	-1,7312	1,8741
	Asian & Coloured 40-49 years	,82143	,76150	,998	-1,7765	3,4193
	Black African 20-29 years	,10847	,42306	1,000	-1,3348	1,5517
	Black African 30-39 years	,76840	,41215	,842	-,6377	2,1745
	Black African 40-49 years	,44921	,43474	,999	-1,0339	1,9323
	Black African 50-59 years	,34921	,52840	1,000	-1,4534	2,1519
	White 20-29 years	-,10913	,45170	1,000	-1,6501	1,4319
	White 30-39 years	,43601	,39630	,998	-,9160	1,7880
	White 40-49 years	,61064	,42653	,977	-,8445	2,0658
	Multiracial 20-29 years	1,23810	,65540	,829	-,9978	3,4740
	Multiracial 30-39 years	,36772	,47864	1,000	-1,2652	2,0006
	Multiracial 40-49 years	-,04762	,50767	1,000	-1,7796	1,6843
	Multiracial 50-59 years	-,09524	,65540	1,000	-2,3312	2,1407
Multiracial 20-29 years	Asian & Coloured 30-39 years	-1,16667	,67158	,899	-3,4578	1,1245
	Asian & Coloured 40-49 years	-,41667	,86701	1,000	-3,3745	2,5412
	Black African 20-29 years	-1,12963	,59228	,819	-3,1502	,8910
	Black African 30-39 years	-,46970	,58454	1,000	-2,4639	1,5245
	Black African 40-49 years	-,78889	,60068	,989	-2,8381	1,2604
	Black African 50-59 years	-,88889	,67158	,988	-3,1800	1,4022

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
	White 20-29 years	-1,34722	,61307	,632	-3,4387	,7443
	White 30-39 years	-,80208	,57347	,981	-2,7585	1,1543
	White 40-49 years	-,62745	,59476	,999	-2,6565	1,4016
	White 50-59 years	-1,23810	,65540	,829	-3,4740	,9978
	Multiracial 30-39 years	-,87037	,63318	,983	-3,0305	1,2897
	Multiracial 40-49 years	-1,28571	,65540	,788	-3,5216	,9502
	Multiracial 50-59 years	-1,33333	,77548	,906	-3,9789	1,3122
Multiracial 30-39 years	Asian & Coloured 30-39 years	-,29630	,50057	1,000	-2,0040	1,4114
	Asian & Coloured 40-49 years	,45370	,74246	1,000	-2,0792	2,9866
	Black African 20-29 years	-,25926	,38774	1,000	-1,5820	1,0635
	Black African 30-39 years	,40067	,37581	,999	-,8814	1,6827
	Black African 40-49 years	,08148	,40046	1,000	-1,2847	1,4476
	Black African 50-59 years	-,01852	,50057	1,000	-1,7262	1,6892
	White 20-29 years	-,47685	,41881	,997	-1,9056	,9519
	White 30-39 years	,06829	,35835	1,000	-1,1542	1,2908
	White 40-49 years	,24292	,39152	1,000	-1,0928	1,5786
	White 50-59 years	-,36772	,47864	1,000	-2,0006	1,2652
	Multiracial 20-29 years	,87037	,63318	,983	-1,2897	3,0305
	Multiracial 40-49 years	-,41534	,47864	1,000	-2,0482	1,2175
	Multiracial 50-59 years	-,46296	,63318	1,000	-2,6231	1,6971
Multiracial 40-49 years	Asian & Coloured 30-39 years	,11905	,52840	1,000	-1,6836	1,9217
	Asian & Coloured 40-49 years	,86905	,76150	,997	-1,7289	3,4669
	Black African 20-29 years	,15608	,42306	1,000	-1,2872	1,5994
	Black African 30-39 years	,81602	,41215	,777	-,5900	2,2221
	Black African 40-49 years	,49683	,43474	,997	-,9863	1,9800
	Black African 50-59 years	,39683	,52840	1,000	-1,4058	2,1995
	White 20-29 years	-,06151	,45170	1,000	-1,6025	1,4795
	White 30-39 years	,48363	,39630	,994	-,8684	1,8356
	White 40-49 years	,65826	,42653	,957	-,7969	2,1134
	White 50-59 years	,04762	,50767	1,000	-1,6843	1,7796
	Multiracial 20-29 years	1,28571	,65540	,788	-,9502	3,5216
	Multiracial 30-39 years	,41534	,47864	1,000	-1,2175	2,0482
	Multiracial 50-59 years	-,04762	,65540	1,000	-2,2835	2,1883
Multiracial 50-59 years	Asian & Coloured 30-39 years	,16667	,67158	1,000	-2,1245	2,4578
	Asian & Coloured 40-49 years	,91667	,86701	,999	-2,0412	3,8745

(I) RACEAGE	(J) RACEAGE	MEAN DIFFERENCE (I-J)	STD. ERROR	SIG.	95% CONFIDENCE INTERVAL	
					LOWER BOUND	UPPER BOUND
	Black African 20-29 years	,20370	,59228	1,000	-1,8169	2,2243
	Black African 30-39 years	,86364	,58454	,970	-1,1305	2,8578
	Black African 40-49 years	,54444	,60068	1,000	-1,5048	2,5937
	Black African 50-59 years	,44444	,67158	1,000	-1,8467	2,7356
	White 20-29 years	-,01389	,61307	1,000	-2,1054	2,0776
	White 30-39 years	,53125	,57347	1,000	-1,4252	2,4877
	White 40-49 years	,70588	,59476	,996	-1,3232	2,7349
	White 50-59 years	,09524	,65540	1,000	-2,1407	2,3312
	Multiracial 20-29 years	1,33333	,77548	,906	-1,3122	3,9789
	Multiracial 30-39 years	,46296	,63318	1,000	-1,6971	2,6231
	Multiracial 40-49 years	,04762	,65540	1,000	-2,1883	2,2835

Dependent Variable: Effectuation
Tukey HSD