UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Gordon Institute of Business Science
University of Pretoria

Environmental turbulence and corporate entrepreneurship: The moderating role of transformational leadership

Student number: 20803029

A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration.

01 November 2022

ABSTRACT

Despite the unwavering research that measures corporate entrepreneurship and its consequences, such as firm performance, strategic management, and market performance, minimal studies have explored the antecedents of corporate entrepreneurship, especially the ones that relate to the environment and other related organisational factors, that will ultimately drive increased positive consequential outcomes. Therefore, this study developed a model that examines the moderating role of transformational leadership (organisational factor) to the relationship between environmental turbulence (antecedent), its subdimensions, and corporate entrepreneurship. The subdimensions of environmental turbulence were argued to be market turbulence, technological turbulence, and competitive intensity. This study operated on a central theory that argued that transformational leadership moderates the positive relationship between environmental turbulence, its subdimensions, and corporate entrepreneurship. It used survey data from a sample of 156 individuals working in organisations within the South African market across different industries for analysis. The bivariate, stepwise hierarchal linear regression analysis found that transformational leadership does indeed significantly moderate the positive relationship between (1) environmental turbulence and corporate entrepreneurship, (2) market turbulence and corporate entrepreneurship, (3) technological turbulence and corporate entrepreneurship, and (4) competitive intensity and corporate entrepreneurship, with varying strengths.

Keywords: *Environmental turbulence, market turbulence, technological turbulence, competitive intensity, corporate entrepreneurship, transformational leadership.*

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

DECLARATION

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

_____

Siyabonga Nxumalo

01 November 2022

CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION TO RESEARCH PROBLEM

1.1 Introduction

This study aims to understand the moderating role of transformational leadership in the relationship between environmental turbulence and corporate entrepreneurship. This section will present the research background, intending to provide the history and developments on the constructs and proposed relationships. It will then discuss the research problem in detail, emphasising its academic and business relevance. The section will conclude by outlining the purpose of this study and, finally, the general conclusion of the chapter, providing a summary of what was covered.

1.2 Background to the research

Corporate entrepreneurship is defined as the means through which organisations form new businesses, find methods of generating revenue streams and innovate in the markets they serve (Urbano et al., 2022). Corporate entrepreneurship is perceived to be a significant form of innovation (Guth & Ginsberg, 1990; Zahra, 1993), as it facilitates organisational efforts towards innovativeness, improved profitability, competitiveness (Yunis et al., 2018), and continuous innovation (Kuratko et al., 2014). It plays a central role towards economic growth (Bellstam et al., 2021) and is expected to benefit overall organisational innovativeness (Boone et al., 2019).

Furthermore, this phenomenon is argued to foster a competitive advantage that leads to the organisation's survival, sustainable performance, and growth (Miller, 1983; Covin & Slevin, 1989; Zahra, 1993). It is also theorised to be a product of turbulent environments (Calantone et al., 2003; Bodlaj & Čater, 2019; Lee & Trimi, 2021). Similarly, other scholars have supported and expanded on this view, arguing that the organisation's drive towards innovation and renewal, the theorised dimensions of corporate entrepreneurship, is pivotal for its survival during competitiveness, market turbulence, and technological turbulence, the three dimensions of environmental turbulence (Boone et al., 2019).

Therefore, based on the above arguments, this study identifies environmental turbulence as one of the antecedents of corporate entrepreneurship and argues that it is critical for the firm's entrepreneurial advancements. Although scholars have in the past argued the relationship between environmental turbulence and corporate

entrepreneurship; however, there have been limited studies, in general, that have concentrated on the antecedents of corporate entrepreneurship (Wang et al., 2021; Urbano et al., 2022). More focus in the literature has been on its consequences rather than antecedents (Urbano et al., 2022). This gap in the literature identifies the first motivation for this study, which aims to study the antecedent role of environmental turbulence on corporate entrepreneurship. Therefore, this study raises its first question. What do we know about environmental turbulence and its role towards corporate entrepreneurship?

For the purposes of this study, environmental turbulence is defined as those erratic environments that cannot be planned but can threaten the organisation's existence, requiring swift action to minimize its impact (Bonn & Rundle-Thiele, 2007). Environmental turbulence has been a study of interest dating back to the 1960s, with Emery & Trist (1965) argued to have been among the seminal writers in this field (Buganza et al., 2009). The increased interest in this domain has been a result of the unexpected changes in the market, technology and competitiveness in the industry environment (Bodlaj & Čater, 2019; Wang et al., 2021), three domains argued to be embodied in the multidimensional, environmental turbulence phenomenon (Jaworski & Kohli, 1993; Arshad & Arshad, 2018; Zhou et al., 2019a).

Environmental turbulence is introduced in this study as a variable that can be explored because of prior research that has linked it to corporate entrepreneurship. For example, there is an existing body of knowledge that argues a positive relationship between environmental turbulence and corporate entrepreneurship (Zahra, 1991; Bodlaj & Čater, 2019; Wang et al., 2021). These studies have argued how turbulence in the environment assists organisations in adopting an entrepreneurial mindset, leading to corporate entrepreneurship. However, contrasting views exist and should not be ignored, as scholars such as Turulja & Bajgoric (2018) and McCarthy et al. (2018) have argued differently.

Therefore, this study will consider these arguments in the literature in order to fulfil its first identified gap, which is to test the antecedent role of environmental turbulence on corporate entrepreneurship.

Secondly, further research in this field has argued an existing gap in the literature

that measures the internal organisational structures, which strengthens the relationship between environmental turbulence and corporate entrepreneurship (Gemici & Zehir, 2021; Wang et al., 2021). There are multiple dimensions of internal organisational structures one could consider. This study proposes leadership, as it remains among the critical tools for organisations to continuously reinvent themselves and remain competitive in their markets. Therefore, this study suggests that strong, strategic, and capable leadership can help drive organisations through multifaced situations and help bridge the gap between environmental turbulence and corporate entrepreneurship.

There are multiple leadership styles in the leadership paradigm. This study argues transformational leadership as a leadership style with strategic leadership capabilities to respond to this gap. Transformational leaders are visionaries, and they can lead organisations through turbulent times by fostering both team and corporate entrepreneurship (Gumusluoğlu & Ilsev, 2009a; Gumusluoğlu & Ilsev, 2009b; García-Morales et al., 2012; Al-Husseini & Elbeltagi, 2016). Transformational leadership is defined as the style of leadership where a "leader's support and encouragement raise the level of their morals, motivation, beliefs, perceptions, and association with the objectives of the organization" (Reza, 2019, p. 120).

Consequently, this study will consider these arguments in the literature to fulfil its second identified gap, to test the role of transformational leadership in strengthening the relationship between environmental turbulence and corporate entrepreneurship, responding to the gap identified by Gemici & Zehir (2021) and Wang et al. (2021).

1.3 Research problem

1.3.1 Academic rationale for the study

Corporate entrepreneurship is a well-researched phenomenon, with some inspiring seminal work from scholars such as Miller (1983), Covin & Slevin (1989), Zahra (1993) and Lumpkin & Dess (1996), and developments and latest work in this literature from scholars such as Simba & Thai (2019), Kreiser et al. (2021), and Minola et al. (2021). The literature in this field has tested multiple relationships, including corporate entrepreneurship's antecedents, dimensions, and its consequences (Urbano et al., 2022).

For example, there is unwavering research that has studied the consequences of corporate entrepreneurship, with the more common research focusing on its relationship with firm/organisational performance. These studies have argued corporate entrepreneurship to be the predictor of the firm or organisational performance. Examples of such work are from scholars such as Zahra (1993), Zahra & Covin (1995) and Lee et al. (2019). Additionally, others have looked at corporate entrepreneurship, and strategic management (Barringer & Bluedorn, 1999), whilst others have studied corporate entrepreneurship and market performance (Yang et al., 2007), to name just a few.

In contrast, some studies have focused on the antecedents of corporate entrepreneurship. For example, the scholarly work by Guth & Ginsberg (1990) argued the importance of leadership and the importance of the environment. Zahra (1993) studied environmental factors and how they influence corporate entrepreneurship. Martín-Rojas et al. (2017) evaluated the influence of distinctive technological competencies on corporate entrepreneurship, and Wang et al. (2021) studied the effect of environmental turbulence on the entrepreneurial orientation of a firm, a study closely aligned with this study.

However, although there is evidence of scholarly work on the antecedents of corporate entrepreneurship, it is also argued that research on this field has received limited to no attention in the literature (Urbano et al., 2022; Wang et al., 2021), especially the ones focusing on the environmental level of analysis (Urbano et al., 2022). Therefore, the interest in understanding the antecedent role of environmental turbulence, and its dimensions, is argued as the need for this study.

Literature argues environmental turbulence as a multidimensional construct which includes the unprecedented nature of customer demands (market turbulence), technological advancements (technological turbulence), and industry rivalry (competitive intensity) (Jaworski & Kohli, 1993). The literature further argues that positive strategic outcomes and corporate entrepreneurship can be enhanced through environmental turbulence (Zahra, 1991; Barringer & Bluedorn, 1999; McCarthy et al., 2018; Ojha et al., 2020). These scholars arguing that organisations become innovative during these unprecedented times.

Although this notion is supported, some views argue differently, suggesting that little attention has been afforded to this domain (Urbano et al., 2022; Wang et al., 2021), hence the argument by this study to explore and expand in it, contributing to both literature and business. In doing so, contrasting views (e.g., Cano et al., 2004; Kirca et al., 2005) must not be ignored but should be considered in research (Ho & Plewa, 2020).

Furthermore, the constant need to thrive during turbulent environments and for organisations to create corporate entrepreneurship require unique leadership capabilities that can assist manage uncertainty and risk (Dost et al., 2019). It is not easy to talk about organisational growth and performance without touching on the leadership that helps drive it. This study argues transformational leadership to be the preferred style of leadership as it has long been argued to play a pivotal role required for effective management outputs (Buil et al., 2019). This is due to its ability to create and drive the organisation's vision for the future and further empower human capital to take ownership of this vision (Bass, 1999). Argued differently, transformational leaders are theorised to be visionaries and can lead organisations towards greater heights, even during uncertain turbulent times (Buil et al., 2019).

In summary, researchers have in the past conducted studies demonstrating the relationships between leadership styles and corporate entrepreneurship (Gumusluoğlu & Ilsev, 2009a; Gumusluoğlu & Ilsev, 2009b; García-Morales et al., 2012; Al-Husseini & Elbeltagi, 2016; Zhu & Chen, 2016). However, to our knowledge, the link to environmental turbulence, and its relationship to corporate entrepreneurship, has received little or no attention. Therefore, this is another motivation for this research.

1.3.2 The business rationale for the study

The current digital era requires sustainable corporate entrepreneurship for organisations to endure market turbulence, especially in ever-erratic environments such as the COVID-19 pandemic (Lee & Trimi, 2021). In this era, corporate environments constantly change at extraordinary heights and unimaginable speeds (Brosseau et al., 2019). Therefore this results in complex market environments developing at an unprecedented pace, increasing uncertainty in the marketplace (Lee & Trimi, 2021).

As such, these unprecedented times require organisations to respond swiftly to threatening environmental conditions that continue to challenge how they operate. Therefore, this calls for urgent, impactful corporate entrepreneurship that will assist organisations in maintaining a competitive advantage in their markets (Bello et al., 2020). The need for resilience and increased speed to deploy innovative solutions is essential for organisations operating under unstable and complex environments (Aghina et al., 2018). This applies to all types of sectors, be it private, public, or not-for-profit organisations (Veronica et al., 2020).

As it is commonly known, the COVID-19 pandemic has caused massive environmental shifts globally. However, organisations that managed to use this opportunity to be corporate entrepreneurial have emerged more robust and capable than before the pandemic (Kane et al., 2021). Kane et al. (2021) further state that organisations that remain resilient during turbulent times are those that continuously scan the environment, finding adaptive ways to move forward, which requires both technological tools and impactful organisational capabilities to prosper. The authors further state that organisational success, through corporate entrepreneurship, can be achieved with the presence of innovative-minded leadership, leadership that seeks to create a supportive environment for individuals and teams within the organisational context.

Therefore, the proposed study seeks to provide literature-driven insights, backed by research, to test the views suggested in the business context. Through this study, the role that leadership plays in the relationships between disruptive, turbulent environments and corporate entrepreneurship can therefore be established.

1.4 Research purpose

The recent global shock events, such as the global economic crisis around 2008, the 2015/16 stock market selloff, and more recently, the COVID-19 pandemic, have raised the importance for firms to react quicky towards turbulence if they ought to be competitive or at the very least, remain in business within their markets. In addition, continuously disruptive environments, such as the cliché technological disruption concept, also require organisations to continually assess their operating environment to serve the need of their existence. Unfortunately for today's businesses, markets are no longer as stable as they were decades ago, as firms undergo ever-changing

environmental conditions, requiring immediate intervention for survival.

Therefore, as internal and external factors constantly challenge the firm's existence, causing organisational turbulence, this study aims to understand what influence these events have towards corporate entrepreneurship and whether the presence of transformational leadership has any impact on this relationship.

This study, therefore, proposes the following research question to address its purpose:

- What influence does transformational leadership have on the relationship between environmental turbulence and corporate entrepreneurship?

Therefore, the significance of this study lies close to this research question. This study argues that the ability for organisations to become entrepreneurial during turbulent times is critical in maintaining and developing a competitive advantage within their markets. Therefore this study will be successful if it provides evidence that environmental turbulence is indeed a predictor of corporate entrepreneurship and whether transformational leadership can indeed help strengthen this relationship, leading to improved corporate entrepreneurship, which is known to have more significant consequential outcomes.

1.5 Conclusion

The research background, research problem and the purpose of the study were discussed in this section. Theory on the constructs was discussed, together with this study's relevance in the academic and business domains. The main research question was then outlined, following an argument related to the purpose of this study.

The rest of this study is structured as follows:

- Chapter two covers the literature review, introducing the three constructs and their relationships and then providing arguments highlighting the need for the study and hypotheses development.
- Chapter three crystalises the hypothesis, providing a conceptual model for this study.

- Chapter four describes the data and its origin and defends the chosen methodology through the literature developed in chapter two.
- Chapter five outlines the results obtained after running the necessary tests.
- Chapter six discusses the results, referring to the literature as outlined in chapter two.
- Chapter seven concludes the study, highlighting the general conclusion, academic and managerial implications, study limitations, and recommendations for future research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This study aims to understand the moderating role of transformational leadership in the relationship between environmental turbulence and corporate entrepreneurship. This chapter thus provides an overview of the academic literature that supported the research need and the development of a conceptual model and hypotheses. Therefore, this chapter will begin by providing a section highlighting the need for the study. Then a thorough review of the literature surrounding the constructs outlined in the study: corporate entrepreneurship, environmental turbulence, and transformational leadership. Furthermore, the literature surrounding the relationships between the constructs, and their subconstructs, will be explored in detail. Moreover, the moderating role of transformational leadership on the identified relationships will also be discussed, and then the chapter will be concluded with a general conclusion summarising the different sections.

2.2 Developments leading to the study

Corporate entrepreneurship is a well-researched phenomenon, with some pioneering works from scholars such as Miller (1983) and Covin & Slevin (1989). Most research in the literature has focused on the consequences of corporate entrepreneurship (Urbano et al., 2022), the dominant ones measuring its relationship to the firm performance (Zahra, 1993; Lee et al., 2019; Urbano et al., 2022). These are not the only studies available, as some other scholars have explored the relationship between corporate entrepreneurship and strategic management (Barringer & Bluedorn, 1999). Others have also explored the relationship between corporate entrepreneurship and market performance (Yang et el., 2007).

Although there is evidence in the literature that has focused on the antecedents of corporate entrepreneurship, some scholars argue that this has received little attention (Wang et al., 2021; Urbano et al., 2022). Urbano et al. (2022) argue that the limited research has primarily been on the antecedents that focus on environmental factors. This study understood the current COVID-19 pandemic and concentrated on environmental turbulence as a construct related to environmental conditions.

This led to the first requirement for this study, to use developed literature between these two constructs and understand the relationship between environmental turbulence and corporate entrepreneurship. The relationships between environmental turbulence or its dimensions (market turbulence, technological turbulence and competitive intensity) have also been theorised in literature, arguing that there is a positive relationship between constructs (Zhou et al., 2019b; Ch'Ng et al., 2021; Wang et al., 2021). However, these relationships have a contrasting view, which needs to be confirmed (Cano et al., 2004; Kirca et al., 2005; Ho & Plewa, 2020).

Secondly, other scholars have also argued the limited attention given to organisational factors as they aim to strengthen the relationship between environmental turbulence and corporate entrepreneurship (Gemici & Zehir, 2021; Wang et al., 2021). This study has again understood the importance of visionary leadership that has helped organisations survive the current COVID-19 pandemic. Transformational leadership is identified as the most suitable leadership style to manage organisations during turbulent environments (Buil et al., 2019; Singh et al., 2020). This study has argued it as the most suitable construct to strengthen the relationship between environmental turbulence and corporate entrepreneurship.

The second requirement of this study is understanding the role of transformational leadership in the relationship between environmental turbulence and corporate entrepreneurship, which ultimately is the main purpose of this study.

2.3 Corporate entrepreneurship

Corporate entrepreneurship has long gained popularity among scholars, as it is believed to foster a competitive advantage that leads to the firm's survival, sustainable performance, and growth (Miller, 1983; Zahra, 1993). It is strongly associated with organisational renewal (Sathe, 1989) and argued to foster corporate strategy advancements within organisations (Urbano et al., 2022). Moreover, corporate entrepreneurship is said to exploit the organisation's competitive advantage and may lead to new heights and competencies for organisations that adopt this notion (Minola et al., 2021; Urbano et al., 2022).

The development of the construct started from earlier work by Covin & Slevin (1989),

who introduced the phrase entrepreneurial orientation, consistent with the work by Miller (1983). According to the literature, entrepreneurial orientation indicates the organisation's entrepreneurial activity (Covin & Slevin, 1989; Wang et al., 2021). Kreiser et al. (2021) contributed to these arguments, theorising that an organisation can only be considered entrepreneurial if it exhibits elevated levels of entrepreneurial orientation. As the studies in this field evolved, corporate entrepreneurship then became another term used in literature to describe entrepreneurial orientation (Ireland et al., 2009; Kreiser et al., 2021), and for the purposes of this study, literature that describes entrepreneurial orientation will be concluded to refer to corporate entrepreneurship as well.

Since this construct gained popularity in literature, different definitions have emerged (Simba & Thai, 2019). Earlier studies theorised corporate entrepreneurship to comprise of two discrete yet interrelated dimensions, strategic renewal and innovation (Guth & Ginsberg, 1990). Innovation in this context is more concerned with creating new businesses through market advancements, technological innovation, and organisational competitiveness (Zahra, 1993). On the other hand, strategic renewal relates to the organisation's capability to compete and take risks that define its competitive approach in the market (Zahra, 1993).

As the literature further developed, Sharma & Chrisman (1999) went on to define corporate entrepreneurship as "the process whereby an individual or group of individuals, in association with an existing organization, create a new organization or instigate renewal or innovation within that organization" (p. 18). Similarly, other scholars defined it as "the process through which firms innovate, create new businesses, and transform themselves by changing the business domain or key strategic processes" (Heavey & Simsek, 2013, p. 838). In more recent work, it has been defined as the means through which organisations form new businesses, find methods of generating revenue streams and innovate in the markets they serve (Urbano et al., 2022).

Therefore, this study argues that these definitions suggest common themes concerning renewal, growth, and innovativeness. In their study, Chebbi et al. (2020) support this argument. They associate corporate entrepreneurship with organisations geared towards strategic renewal, embracing positive change, and

adopting an entrepreneurial mindset, which drives innovation and, consequently, corporate entrepreneurship.

Strategic renewal can therefore be linked to proactiveness; new business creation can be linked to risk-taking; innovation represents innovativeness within firms. Therefore, these dimensions need to exist for organisations to prosper and thrive towards corporate entrepreneurship. In this study, the corporate entrepreneurship construct aligns with these arguments, supporting work by Covin & Slevin (1989), Wang et al. (2021) and Kreiser et al. (2021), which argue this construct to comprise of three unidimensional dimensions, innovativeness, proactiveness and risk-taking.

Innovativeness refers to the degree to which a firm is dedicated to fostering fresh thinking, originality, and experimentation in creating new products, services, and procedures (Lumpkin & Dess, 1996).

Proactiveness defines the degree to which a firm adopts a visionary mindset, is forward-looking, seeks new opportunities, and maintains a competitive advantage (Lumpkin & Dess, 1996; Wang et al., 2021).

Risk-taking, on the other hand, defines situations where firms, and their leadership, are willing to accept the high cost of failure, as a result of resource investment in strategic technologies and initiatives, in unknown environments (Miller, 1983; Lumpkin & Dess, 1996; Wang et al., 2021).

Therefore, for the purposes of this study, corporate entrepreneurship will be recognised as a construct comprising all three dimensions; innovativeness, proactiveness and risk-taking.

2.4 Environmental turbulence

Environmental turbulence is not a new concept in literature. In fact, researchers were already exploring this phenomenon in the mid-'60s with some pioneering work by Emery & Trist (1965). In their study, they argued that causal texture differentiates organisational environments with regard to the degree of uncertainty and other pivotal aspects. They, therefore, theorised that most organisations would confirm to four types of environments, (1) placid, randomised environments, (2) placid, clustered environments, (3) disturbed-reactive environments, and (4) dynamic in a

second order, arguing the first three to have already been described and understood in the literature. The last environment was described as dynamic in the second order, otherwise referred to as turbulent fields, giving rise to what is now referred to as environmental turbulence (Emery & Trist, 1965).

Since the work by Emery & Trist (1965), there has been more research in this field, unpacking this construct further, ultimately leading to emerging definitions of the construct. Khandwalla (1977) described environmental turbulence as “a dynamic, unpredictable, expandible, fluctuating environment; it is an environment in which the components are marked by change” (p. 333). This was later supported in the literature, arguing that it is an environment characterised by elevated complexity, ambiguity and unpredictability (Babüroglu, 1988).

There have since been developments in the environmental turbulence literature. In the late 2000s, Buganza et al. (2009) argued that environmental turbulence is beyond just having rapid changes within the environment. Should the rapid changes be predicted, there is, therefore, no turbulence that exists. Only when the environment is both rapid and unpredictable can it be concluded to be turbulent (Buganza et al., 2009). Therefore, turbulent environments are described as possessing elevated degrees of ever-changing (rapid) conditions that create uncertainty and unpredictability (Dess & Beard, 1984; Bourgeois III & Eisenhardt, 1988).

In the more recent literature, scholars describe environmental turbulence as otherwise uncertain, hostile, complex, dynamic and volatile in nature (Buganza et al., 2009). These environments are defined as those whereby technological and market changes are erratic and may impact the firm’s strategic direction and innovativeness (Calantone et al., 2003). There is also consistency in that most scholars hypothesize turbulent environments to embody market turbulence and technological turbulence (Calantone et al., 2003; Auh & Menguc, 2005; Lichtenthaler, 2009; Hung & Chou, 2013; Bodlaj & Čater, 2019; Zhou et al., 2019a, Alqahtani & Uslay, 2020; Ojha et al., 2020). However, a third aspect, competitive intensity, was hypothesized through the work of Jaworski & Kohli (1993) and has since been widely explored in literature.

Therefore, for the purposes of this study, environmental turbulence will be

recognised as a construct that consists of all these three dimensions, market turbulence, technological turbulence and competitive intensity, as widely used in literature and operationalised by Jaworski & Kohli (1993).

Market turbulence is more concerned about the shift in customer preferences and needs, technological turbulence is concerned about the degree of technological change, and competitive intensity, on the other hand, measures the conduct, resources, and capability for differentiation in the market (Jaworski & Kohli, 1993; Arshad & Arshad, 2018; Zhou et al., 2019a). For the purpose of this study, all these three elements are treated as sub-constructs to environmental turbulence and will be examined as part of the hypotheses testing.

2.4.1 Market turbulence

Market turbulence is described by frequent and rapid changes in consumers' cost composition, needs and price demands (Calantone et al., 2003; Wang et al., 2015). It is often steered by competitive intensity and volatile timing in technological instability (Wang et al., 2015). It is critical to understand as it increases the risk and obscurity of the organisation's business processes (Wang et al., 2015) and is the instrumental source of environmental turbulence (Tsai & Yang, 2013). High market turbulence forces organisations to differentiate themselves aggressively from competitors as they aim to respond to rapid customer demands and tight competition, eminent during these times (Li, 2022).

In addition, market turbulence is more concerned with the strategic choices of the organisation during uncertainty and unpredictability (Jaworski & Kohli, 1993). Moreover, Jaworski & Kohli (1993) argue that these environments encompass consumers who constantly need new products and services, rapidly altering their preferences.

2.4.2 Technological turbulence

Literature has multiple definitions of technological turbulence (Jaworski & Kohli, 1993; Tsai & Yang, 2013; Zhou et al., 2019a). However, this study resonates with the one suggested by Hanvanich et al. (2006), who defines it as "the degree of change associated with product and process technologies in the industry in which a firm embeds" (p. 602). Technological turbulence measures the degree of

technological change within the industry (Jaworski & Kohli, 1993; Huang & Tsai, 2014; Zhou et al., 2019a). Moreover, it may cause environmental turbulence by creating rapid change in both scientific and market communities (Calantone et al., 2003). However, these advancements are often short, creating a demand and encouraging organisations to invest in technological aptitudes to maintain a competitive advantage (Wang et al., 2015).

2.4.3 Competitive intensity

Competitive intensity measures the market's conduct, resources, and capability for differentiation (Jaworski & Kohli, 1993; Arshad & Arshad, 2018; Zhou et al., 2019a). It exists in a competitive market where there is a lack of future growth opportunities (Auh & Menguc, 2005) and resource constraints (Lusch & Laczniak, 1989). In essence, it indicates the intensity of inter-organisational rivalry within the industry, which includes price and promotion competition, the introduction of new rivals in the market, and improved product offerings, advertising, and value add services (Jaworski & Kohli, 1993; Cui et al., 2005; Auh & Menguc, 2005; Li et al., 2008; Turulja & Bajgoric, 2018).

2.5 Transformational leadership

Organisations exist, strive, or fail due to either internal or external factors, or both. Part of the internal factors lies in the organisational structure, in which leadership is an integral part. The leadership within the organisation is instrumental in crafting, communicating, and driving the company’s strategy. In crafting the organisational strategy, the leadership is also required to understand the different market conditions and develop means to manage them even during challenging times. Therefore, strategic leadership is required during turbulent environments, which refers to alignment in three domains: the environment, strategy, and the organisation itself (Crossan et al., 2008).

Literature notes multiple paradigms within the leadership domain, some common ones being transactional leadership, servant leadership, autocratic leadership, and transformational leadership, the latter being the preferred in this study. Transformational leadership has been widely accepted in literature following the seminal work by Burns (1978). Since then, there have been further developments in

this domain, with some of the scholarly work from Bass (1997), Bass (1999), Avolio et al. (1999), Crede et al. (2019), and Siangchokyoo et al. (2020), to mention just a few.

There are multiple definitions of transformational leadership. In the context of this study, transformational leadership is defined as the style of leadership where a "leader's support and encouragement raise the level of their morals, motivation, beliefs, perceptions, and association with the objectives of the organization" (Reza, 2019, p. 120).

Transformational leadership encourages increased performance and corporate entrepreneurship in an organisational context (Singh et al., 2020). The authors further argue that transformational leaders could maintain a robust futuristic view, even during ever-changing, turbulent environments. Similarly, there is a common view in the literature that argues this leadership style's ability to transform companies due to its ability to create a vision for the future, even during turbulent times (Buil et al., 2019). In essence, transformational leadership can be regarded as the source of an innovative organisational culture (García-Morales et al*.,* 2012). Through this style of leadership, the significance of possessing a shared mission can be conveyed (Bass, 1999).

Moreover, transformational leadership has been theorised to be the most efficient form of organisational leadership, as echoed by earlier work in this field, such as the Full Range Leadership Model (Crede et al., 2019). Furthermore, Crede et al. (2019) argued that the benefit of transformational leadership is that organisational leaders can be trained to exhibit these behaviours leading to effective organisational management outputs (Buil et al., 2019). Transformational leadership can therefore be argued to inspire and enhance corporate entrepreneurship and growth within an organisational context (Gumusluoğlu & Ilsev, 2009a; García-Morales et al., 2012).

This study will contextualise transformational leadership as argued by Bass (1997). He argued that there are four domains of transformational leadership, idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Idealized influence refers to a leader who presents a compelling vision as a role model to his followers. Inspirational motivation is the ability to provide

direction, motivating their followers to reach their goals amid adversity. Intellectual stimulation refers to promoting the innovativeness of their followers, and lastly, individualized consideration speaks to the ability of the leader to consider their follower's needs and, consequently, their management (Jena et al., 2018).

2.6 Environmental turbulence and corporate entrepreneurship

Turbulent environments threaten the organisation's survival, requiring them to be more entrepreneurial in their approach to remain relevant in the market. Thus, organisations must learn to develop dynamic capabilities, which are context-dependent (Song et al., 2005), if they aim to become entrepreneurial (Turulja & Bajgoric, 2018). Dynamic capabilities are described as "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (Teece, 2020, p. 9; Klofsten et al., 2021, p. 2). Corporate entrepreneurship can be viewed as dynamic capabilities as it refers to the organisation's propensity to assume philosophies that force them to deviate from how they would normally operate to address turbulent environments (Turulja & Bajgoric, 2018). Argued differently, during environmental turbulence, causal uncertainty intensifies, and the competitor's ability to replicate the organisation's strategy decreases, leading to corporate entrepreneurship (Lichtenthaler, 2009).

In the early 90s, the developing themes in corporate entrepreneurship literature suggested that the organisation's ability to achieve an entrepreneurial mindset rested in both its internal and external corporate environments (Zahra, 1991). Later, other scholars further argued that the ability of firms to become more risk-taking, proactive, and innovative, the three domains of corporate entrepreneurship, was influenced by the environments in which the organisations operated (Barringer & Bluedorn, 1999). They concluded that firms operating in turbulent environments exhibited more entrepreneurial mindsets than those in stable environments.

Furthermore, Calantone et al. (2003) further argued that organisations operating under turbulent environments must respond swiftly to customer needs and find means to be innovative, therefore building characteristics of corporate entrepreneurship. In addition, corporate entrepreneurship is argued to assist organisations in managing environmental turbulence, leading to long-term strategic success, especially in dynamic markets (Jiménez-Jiménez & Sanz-Valle, 2011).

Moreover, recent literature also argues that turbulent environments should lead to more corporate entrepreneurship (Ojha et al., 2020). In support of this theory, McCarthy et al. (2018) also argued that corporate entrepreneurship is significantly related to organisations with a higher appetite towards risks, which contrasts those organisations that operate in more stable environments. The need to become entrepreneurial and develop dynamic capabilities is common to organisations that operate in unstable/turbulent, hyper-competitive environments (Lee & Trimi, 2021), although other scholars have argued its importance even under stable environments (Helfat & Winter, 2011; Protogerou et al., 2012; Zhou et al., 2019b).

In contrast, it has been theorised that when environmental turbulence is low, the potential dynamic capabilities, and consequently corporate entrepreneurship, will also be limited (Zhou et al., 2019b). Therefore, to summarise, this study argues that environmental turbulence influences organisations to rethink how they would traditionally operate, and in so doing, they become more risk-taking and proactive and seek more innovative methods to serve their market. Therefore, the underlying hypothesis is that there is a positive relationship between environmental turbulence and corporate entrepreneurship.

2.6.1 Market turbulence and corporate entrepreneurship

To reiterate, market turbulence concerns the shift in customer preferences and needs. As the market changes its shape, becoming more turbulent, the outcome will be centred more on corporate entrepreneurship (Wang et al., 2015). This intensifies plans for new offerings, cost improvements, and process optimisation (Wang et al., 2015). Therefore, organisations need to act ahead of their competitors by enforcing corporate entrepreneurship to understand their customers' needs and preferences (Wang et al., 2015).

Moreover, environmental turbulence creates a market situation with frequent and impulsive changes in customer preferences and needs, calling for organisations to understand these shifting markets and adopt corporate entrepreneurship (Ch'Ng et al., 2021). Previous studies have argued that market turbulence plays an integral part in the relationship between dynamic capability and, consequently, corporate entrepreneurship (Wang et al., 2015; Wang et al., 2021). In support, further studies have also argued that market turbulence is indeed positively related to corporate

entrepreneurship (Tsai & Yang, 2013; Zhou et al., 2019b).

As there are continuous changes in market conditions because of changes associated with market turbulence, organisations generally find ways to enforce corporate entrepreneurship (Zaefarian et al., 2017; Turulja & Bajgoric, 2018). Therefore, this study argues that market turbulence influences organisations to adopt corporate entrepreneurship, hypothesising a positive relationship between market turbulence and corporate entrepreneurship.

2.6.2 Technological turbulence and corporate entrepreneurship

As argued earlier in research, technological turbulence concerns the degree of technological change. In order to endure environments with high technological turbulence, organisations must adopt a constant learning process, changing their technological requirements, leading towards corporate entrepreneurship (Hanvanich et al., 2006). Therefore, organisations must commit to continuous learning and improve their business processes by generating new ideas.

As other scholars have theorised, under high technological turbulence, creativity is elevated, leading towards corporate entrepreneurship (Moorman & Miner, 1997; Hanvanich et al., 2006), as compared to organisations operating under low technological environments (Miller, 1987; Slater & Narver, 1994). In the recent literature, Lee & Tang (2017) have supported this notion, arguing the positive role technological turbulence plays in the organisation's innovativeness, leading to better performance and corporate entrepreneurship.

This study considers these arguments and hypothesises that organisations operating under high technological turbulence lead to better learning and performance and, overall, positive corporate entrepreneurship than organisations with low technological turbulence.

2.6.3 Competitive intensity and corporate entrepreneurship

Lastly, the final subconstruct in environmental turbulence is competitive intensity, which was introduced in the scholarly work of Jaworski & Kohli (1993) and later widely adopted in literature by other scholars such as Auh & Menguc (2005), Cui et al. (2005), Li et al. (2008), Turulja & Bajgoric (2018) and Arshad & Arshad (2018). As

discussed earlier in this report, it measures the market's conduct, resources, and capability for differentiation (Jaworski & Kohli, 1993; Arshad & Arshad, 2018; Zhou et al., 2019a).

Scholars later argued that dynamic capabilities, and consequently, corporate entrepreneurship, are strongly related to competitive intensity in moderately turbulent rather than stable or highly turbulent environments (Zhou et al., 2019b). They argued that moderately turbulent environments create enough market disturbance to enforce the right level of corporate entrepreneurship. Wang et al. (2021) later supported this argument.

Furthermore, it was earlier argued that competitive intensity may require organisations to adopt corporate entrepreneurship (Teng & Cummings, 2002); in which according to Zhou et al. (2019b), competitive intensity can change the effects of corporate entrepreneurship. In their study, Tsai & Yang (2013) concluded that competitive intensity does indeed lead to corporate entrepreneurship, supporting later studies by Zhou et al. (2019b).

This study, therefore, considers these arguments and hypothesises that organisations operating under extreme competitive intensity lead to overall positive corporate entrepreneurship than organisations under low, competitive intensity.

2.7 The moderating role of transformational leadership

As argued in the preceding sections, transformational leadership is widely accepted in the literature as among the most influential and most actively explored styles in the leadership literature (Siangchokyoo et al., 2020). It is theorised to lead organisations to greater heights and performance (Buil et al., 2019). This leadership style inspires individuals and employee innovativeness within an organisational context, working with them to drive organisational outputs (García-Morales et al., 2012). In line with these arguments, as suggested by the preceding sections, there is evidence in the literature that this leadership style assists drive corporate innovation, which fosters corporate entrepreneurship (Hornsby et al., 2002).

As argued in the previous sections, there is an existing body of knowledge that argues the positive relationship between corporate entrepreneurship and

environmental turbulence (Calantone et al., 2003; Bodlaj & Čater, 2019; Lee & Trimi, 2021). However, there is a gap in the literature that examines moderating effects of this relationship (Gemici & Zehir, 2021).

Moreover, although there is overwhelming literature that argues the fundamental role of transformational leadership in driving organisations towards corporate entrepreneurship, even during turbulent environments, to our knowledge, there is limited research on the moderating role of transformational leadership on the positive relationship between environmental turbulence and corporate entrepreneurship. However, it is expected that by introducing a moderator, the form and/or strength of a relationship between a dependent and independent variable will be modified (McDonald, 1994).

Based on the above arguments, this study argues that transformational leadership can manage organisations during multifaceted environments, leading them to greater heights through innovation. This is why this study aims to test its moderating effect on the relationship between environmental turbulence and corporate entrepreneurship.

Furthermore, it has also been argued in the preceding sections of the three domains that exist within environmental turbulence; market turbulence, technological turbulence, and competitive intensity (Jaworski & Kohli, 1993; Calantone et al., 2003; Auh & Menguc, 2005; Lichtenthaler, 2009; Hung & Chou, 2013; Zhou et al., 2019a). This study will therefore aim to test the moderating role of transformational leadership in each of the three domains as well, hypothesising that:

- Transformational leadership moderates the hypothesised positive relationship between:
  - Market turbulence and corporate entrepreneurship
  - Technological turbulence and corporate entrepreneurship, and
  - Competitive intensity and corporate entrepreneurship.

2.8 Conclusion

The literature review on each of the constructs (*environmental turbulence, corporate entrepreneurship, and transformational leadership*), subconstructs (*market*

turbulence, technological turbulence, and competitive intensity), and the hypothesised relationships (*environmental turbulence/corporate entrepreneurship, market turbulence/corporate entrepreneurship, technological turbulence/corporate entrepreneurship, and competitive intensity/corporate entrepreneurship*), were discussed in this section. The gap in the literature, which is the moderating role of transformational leadership, was also presented, which became the basis for conducting this study.

The literature presented argued that there is a positive relationship between environmental turbulence and corporate entrepreneurship. It also argued that corporate entrepreneurship has a positive relationship between each subconstructs of environmental turbulence (market turbulence, technological turbulence, and competitive intensity).

It further recognised a gap in the literature, arguing the instrumental role played by transformational leadership in moderating the relationship between environmental turbulence and corporate entrepreneurship. The study then expanded this moderating role of transformational leadership to be consistent in the relationships between market turbulence, technological turbulence, and competitive intensity with corporate entrepreneurship.

Therefore, this study will test whether the proposed relationships exist and whether transformational leadership is a moderator in the positive proposed relationships.

CHAPTER 3: RESEARCH HYPOTHESES AND CONCEPTUAL MODEL

At the very least, the primary objective of this study is to understand how transformational leadership moderates the relationship between environmental turbulence and corporate entrepreneurship. Therefore, the research question that underpins the overall need for the study is outlined below:

- What influence does transformational leadership have on the relationship between environmental turbulence and corporate entrepreneurship?

Figure 1 represents the conceptual model based on the literature review argued in Chapter 2. What follows are the different hypotheses this study aims to explore and the respective tests in Chapter 5 of this report.

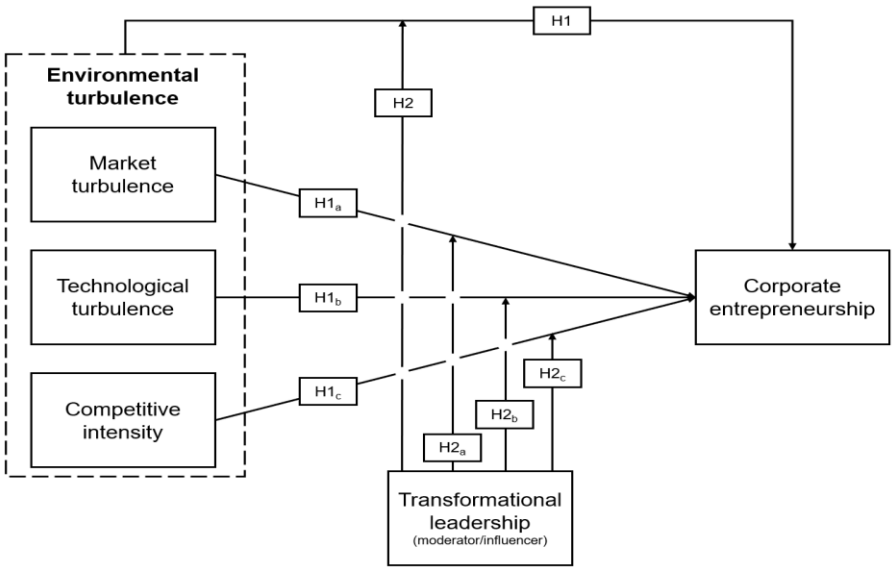

Figure 1: Conceptual model proposed for the study

3.1 Hypothesis 1

This study has provided evidence from the literature that suggests a positive relationship between environmental turbulence and corporate entrepreneurship (Zahra, 1991; Barringer & Bluedorn, 1999; McCarthy et al., 2018; Zhou et al., 2019b; Ojha et al., 2020, Wang et al., 2021). It has also been theorised in this study that when environmental turbulence is low, the potential dynamic capabilities, and consequently corporate entrepreneurship, will also be limited (Zhou et al., 2019b). Therefore, the first hypothesis is as follows:

H1: Environmental turbulence has a positive relationship to corporate entrepreneurship.

3.1.1 Hypothesis 1a

This study has also presented literature arguing that a positive relationship exists between the three domains of environmental turbulence. The first domain is market turbulence. This study has presented literature that argues the positive relationship between market turbulence and corporate entrepreneurship (Tsai & Yang, 2013; Wang et al., 2015; Zaefarian et al., 2017; Turulja & Bajgoric, 2018; Zhou et al., 2019b). Therefore, the first sub-hypothesis involves market turbulence and corporate entrepreneurship as follows:

H1a: Market turbulence has a positive relationship to corporate entrepreneurship.

3.1.2 Hypothesis 1b

The second domain of environmental turbulence is technological turbulence. This study has presented literature that argues that, under high technological turbulence, creativity is elevated, leading towards corporate entrepreneurship (Moorman & Miner, 1997; Hanvanich et al., 2006), as compared to organisations operating under low technological environments (Miller, 1987; Slater & Narver, 1994). Therefore, this suggests a positive relationship between technological turbulence and corporate entrepreneurship. Therefore, the second sub-hypothesis involves technological turbulence and corporate entrepreneurship as follows:

H1b: Technological turbulence has a positive relationship to corporate entrepreneurship.

3.1.3 Hypothesis 1c

The third and final domain of environmental turbulence is competitive intensity. This study has provided arguments on the positive relationship between competitive intensity and corporate entrepreneurship (Teng & Cummings, 2002; Tsai & Yang, 2013; Zhou et al., 2019b). Therefore, the third sub-hypothesis involves competitive intensity and corporate entrepreneurship as follows:

H1c: Competitive intensity has a positive relationship to corporate entrepreneurship.

3.2 Hypothesis 2

This study has presented a gap in the literature that aims to test the moderating role of transformational leadership on the positive relationship between environmental turbulence and corporate entrepreneurship. Supporting literature arguing the role of transformational leadership in managing organisations through multifaceted environments and its ability to lead them to greater heights through corporate entrepreneurship was also presented (Hornsby et al., 2002; García-Morales et al., 2012; Buil et al., 2019; Singh et al., 2020). Furthermore, the literature argues that the introduction of moderation between variables modifies a relationship's form and/or strength (McDonald, 1994) and will be the expected results in this study. Therefore, the second hypothesis is as follows:

H2: Transformational leadership moderates the relationship between environmental turbulence and corporate entrepreneurship.

This study also aimed to test the moderating role of transformational leadership with each of the three domains of environmental turbulence, also arguing that its introduction will modify the form and/or strength of the relationship, leading to the following three sub-hypothesis:

3.2.1 Hypothesis 2a

- **H2a:** Transformational leadership moderates the relationship between market turbulence and corporate entrepreneurship.

3.2.2 Hypothesis 2b

- **H2b:** Transformational leadership moderates the relationship between technological turbulence and corporate entrepreneurship.

3.2.3 Hypothesis 2c

- **H2c:** Transformational leadership moderates the relationship between competitive intensity and corporate entrepreneurship.

CHAPTER 4: RESEARCH METHODOLOGY AND DESIGN

4.1 Research design

The study intended to accurately interpret data that responded to each question presented in **Appendix A | Final questionnaire**, ultimately explaining the relationships hypothesised under Chapter 3. The demographic data, Section A of the questionnaire in **Appendix A | Final questionnaire**, is descriptive in nature, therefore implying a need for descriptive analysis of this data. Moreover, an explanatory study was also of concern, as the relationships between environmental turbulence and its subconstructs, market turbulence, technological turbulence, and competitive intensity tested with corporate entrepreneurship (Saunders & Lewis, 2018). Therefore, considering the descriptive and exploratory studies executed, this study justified a combination of both the descriptive and explanatory approaches, following a descripto-explanatory research design.

Furthermore, a positivist study is argued since prior fixed relationships within phenomena are known and investigated using a structured tool (Orlikowski & Baroudi, 1991). To confirm, a structured questionnaire (**Appendix A | Final questionnaire**), generated from Google Forms ®, with questions that have already been established and tested in literature, was used to collect data. For demographics (Section A), the questions developed by the author of this report to get a deeper understanding of the sample group. The questions related to environmental turbulence (Section B) were adopted from Jaworski and Kohli (1993). Those related to corporate entrepreneurship (Section C) were adopted from Kreiser et al. (2021), based on work by Khandwalla (1976), Miller & Friesen (1982), Covin & Slevin (1989); and lastly for transformational leadership (Section D), they were adopted from Boukamcha (2019), based on work by Avolio et al. (1999) and Bass & Avolio (2002).

Moreover, Saunders & Lewis (2018) proposed three methodologies for theory development, deduction, induction, and abduction. When the move is from theory to data, the deduction approach applies. The induction approach applies if the move is from a generation of data to the development of theory. The abduction approach is applicable when there is a back-and-forth combining the two methods. In this study, the data was collected using a structured questionnaire presented in **Appendix A | Final questionnaire**. This study ultimately collected data from individual respondents

to test the moderating role of transformational leadership on the relationship between environmental turbulence, its subcontracts, and corporate entrepreneurship, thus arguing a deduction research approach.

Furthermore, quantitative research methods were applied to analyse the data in this study. This method was supported by scholarly work from Buganza et al. (2009), Al-Husseini & Elbeltagi (2016); Bodlaj & Čater (2019); Buil et al. (2019). This chosen method was because this study collected numerical data, analysed it, and provided findings based on the results generated from IBM ® SPSS ® tool. Ultimately, the moderating role of transformational leadership on the relationship between environmental turbulence and corporate entrepreneurship was sought, which justified the chosen method for this study (Taneja et al., 2011).

Ultimately, the research on each of the three constructs (environmental turbulence, corporate entrepreneurship, and transformational leadership) under investigation in this study was mature, some dating back to the 1960s. All constructs had established questionnaires to measure them. This study proposed relationships and developed hypotheses, which were then statistically analysed to determine the results. The use of quantitative methods is justified disregarding qualitative methods. Because this study focused only on collecting quantitative data on each of the constructs using a structured questionnaire, it combined the two methods, suggesting a quantitative mono-method, suggesting a survey strategy that followed and executed.

Lastly, there were two common studies executed during the collection of data, (1) cross-sectional studies, which involve collecting data at a particular point in time (Orlikowski & Baroudi, 1991), and (2) longitudinal studies, which involve collecting data over an intermittent period (Chen & Hirschheim, 2004). This study applied a cross-sectional study, collecting data over eight weeks. This method was consistent with previous studies in this field, which also adopted this method over longitudinal studies (Bodlaj & Čater (2019); Buil et al. (2019; Wang et al., 2021). Of course, time was also an important differentiator, therefore resorting to this method. This study also argues that this method was sufficient, based on the statistical data and hypotheses needed for execution, to ensure its robustness. The bias in the data was tested using statistical analysis on Microsoft Excel ® and SPSS.

4.2 Research methodology

4.2.1 Population

Businesses, both in the South African market and globally, are exposed to turbulent times emanating from both internal and external factors, and therefore forces them to re-think the traditional methods in which they undertake their organisational activities in order to remain competitive in the market (Aghina et al., 2018; Lee & Trimi, 2021). This study focused on the South African population, targeting individuals who work in any organisation within the market, sector, and industry, and excluded any respondents outside of this market. The size and age of the organisations were recorded as part of the data collection but were never used as an exclusion for analysis.

4.2.2 Unit of analysis

The unit of analysis strengthens the purpose of the study (Grünbaum, 2007) by describing what the research aims to focus on, examples being an individual, a firm, specific groups, and a country, etc. (Nor Berg, 2001 in Grünbaum, 2007). Similarly, Patel (2009) defines the unit of study as "the most elementary part of what is studied or observed" (p. 2), providing examples similar to those suggested by Grünbaum (2007).

The study aimed to determine the moderating role of transformational leadership on the relationship between environmental turbulence, its subconstructs, and corporate entrepreneurship for organisations within the South African market. This study, therefore, argued the organisation as the unit of analysis. However, individuals working in these organisations were requested to respond to the questionnaire in **Appendix A | Final questionnaire**, obtaining views on the constructs proposed in this study, hence identified as sampling elements. This was consistent with previous work that aligns with this study (e.g., Gemici & Zehir, 2021; Wang et al., 2021).

4.2.3 Sampling method and size

Sampling is an essential process in research. In quantitative research, an appropriately drawn sample allows the researcher to make deductions about the targeted populations, with less effort, where the entire population is studied (Short et al., 2002). Short et al. (2002) argue that an ill-drawn sample may be scientifically

biased, distorting results. In contrast, a well-drawn sample flawlessly mimics the population under investigation, justifying the interpretation of the results.

Furthermore, the literature suggests two standard sampling techniques: probability and non-probability. The probability sampling technique randomly selects a subset from a complete list of the population (Hernon & Schwartz, 2009), thus providing an equal chance for all population members to participate in the study (Saunders & Lewis, 2018). In contrast, non-probability sampling occurs when the researcher needs a complete list of the population under investigation (Saunders & Lewis, 2018). This study collected data from individuals who work in any organisation, sector, and industry in the South African market. It needed to isolate whether the company was listed in the Johannesburg Stock Exchange or any government database, making it difficult to obtain a complete list of the organisations that were eligible to be approached for sampling. Based on these arguments, a non-probability sampling technique was justified and executed for this study.

This study studied all organisations from the South African market, excluding respondents who work for any organisation outside this market. All individuals across all the nine provinces, sectors, and industries, across the different levels in their respective organisations, were considered for analysis. The reason for this was that this study aimed to understand the hypothesised relationships in Chapter 3 from a South African context. Respondents under 18 years were excluded from the study, arguing that they may not be exposed enough to the constructs proposed in this study. Lastly, respondents that did not have at least one manager they reported to were excluded, as the study aimed to understand the characteristics of their manager.

Moreover, regarding the sample size, the literature argues its pivotal role in statistical analysis and the outcomes thereof (Köhler et al., 2017). In their argument, Tabachnik & Fidell (2007) concluded that relationships between constructs could be better deduced if the sample size is larger instead of smaller.

A total of 178 respondents, of which, after the data clean-up, only 156 (87.6 per cent) could be utilised in the study. Similar studies in this field have presented sample sizes above 200 respondents (Auh & Menguc, 2005; Wang et al., 2015; Li, 2022). In

contrast, Wang et al. (2021) studied the relationship between environmental turbulence and entrepreneurial orientation with a sample size of 94 respondents. Similarly, Zahra (1993) and Lee et al. (2019), on the other hand, had sample sizes of 102 and 119, respectively, studying some of the constructs and relationships presented in this study and conducting some inferential statistics. Furthermore, other studies that introduced a moderating role presented sample sizes of 154 (Tsai & Yang, 2013), therefore arguing that the 156 used in this study was sufficient to perform the analysis and draw conclusions.

4.2.4 Measurement instrument

A structured questionnaire was the instrument of choice for this study (**Appendix A | Final questionnaire**). This is supported by the chosen descripto-explanatory research design and consistent with deductive and cross-sectional approaches discussed in the preceding sections. Moreover, since a positivist quantitative approach was preferred, questionnaires are common data-gathering practices for this methodology (Chen & Hirschheim, 2004). The questionnaire had four sections. The first covered the demographics of the final sample. The second section responded to questions designed to answer environmental turbulence, responding to the three dimensions argued in the literature. The third section addressed questions that respond to corporate entrepreneurship, whereas the last section focused on responding to questions addressing transformational leadership.

There were 13 questions that related to the respondent's demographics. These were asked to (1) get a better understanding of the respondents, understand if they reflected the South African population and demographics, and (2) to obtain enough information to deduce if the respondents met the criteria required to be studied, to respond to the main research question, and hypotheses outlined in Chapter 3.

The measurement for corporate entrepreneurship utilised the nine-point scale adopted from Kreiser et al. (2021), based on work by Khandwalla (1976), Miller & Friesen (1982) and Covin & Slevin (1989). This scale measures the three dimensions of corporate entrepreneurship, innovativeness (three items), proactiveness (three items) and risk-taking (three items), on a seven-point Likert scale, where 1="Strongly disagree," 2="Disagree," 3="Somewhat disagree," 4="Neutral" and 5="Somewhat agree," 6="Agree," and 7="Strongly agree." The Cronbach's alpha for each of the

dimensions was recorded as follows: Innovativeness (α = .729), Proactiveness (α = .758), and Risk-taking (α = .768), which were above the threshold limit of α = .70, widely accepted in the literature (Kline, 2016; Leckie et al., 2016).

The prominent scale adapted from Jaworski & Kohli (1993) to measure environmental turbulence was used for this study. This scale measures the three dimensions of environmental turbulence, market turbulence (six items), technological turbulence (five items), and competitive intensity (6 items) on a five-point Likert scale, where 1=”Strongly disagree,” 2=”Disagree,” 3=”Neutral,” 4=”Agree,” and 5=”Strongly agree.” After (1) reverse coding the last items on both technological turbulence and competitive intensity and (2) deleting the last item on market turbulence, as it resulted in the first Cronbach’s alpha value of α = .688, the final Cronbach’s alpha recorded for each of the dimensions were as follows: Market Turbulence (α = .767), Technological Turbulence (α = .703), and Competitive Intensity (α = .782), which were above the threshold limit of α = .70 widely accepted in the literature (Kline, 2016; Leckie et al., 2016).

Lastly, transformational leadership will be assessed using the scale adopted from Boukamcha (2019), which is based on work by Avolio et al. (1999) and Bass & Avolio (2002). This scale was then operationalised to fit the requirements for this study. This scale measures four dimensions of transformational leadership on a five-point Likert scale, where 1=”Strongly disagree,” 2=”Disagree,” 3=”Neutral,” 4=”Agree,” and 5=”Strongly agree.” The Cronbach’s alpha for each of the dimensions was recorded as follows: Idealized Influence (α = .934), Inspirational Motivation (α = .869), Intellectual Stimulation (α = .933), and Individual Consideration (α = .889), which were above the threshold limit of α = .70 widely accepted in the literature (Kline, 2016; Leckie et al., 2016).

4.2.5 Pilot study

The questionnaire was first piloted with five people to test if there were no errors that may have been overlooked, which can cause a problem with the data after mass distribution. Three comments came from this exercise.

- Firstly, a suggestion to include “I do not know” on the demographic question that asked the number of years the organisation has been in operation.

- Secondly, a suggestion to have “N/A” as part of the options on the demographic question that responded to the province where the organisation operates. This was to cater for respondents that may have no operations in the South African market.
- Lastly, a suggestion to include an option where a respondent is automatically kicked out of the process by Google Forms ® if they do not meet the two critical criteria, if their operation is outside the South African market, or if they do not have a manager they reported to.

All of these suggestions were executed in preparation for the final questionnaire.

4.2.6 Data gathering process

As suggested in the preceding sections, a quantitative mono-method and survey strategy was employed. For consistency, a structured, self-administered questionnaire was used to collect data, prepared on Google Forms ®, and the questions were designed to be answered in an orderly manner to make deductions from the collected data. The questionnaire was distributed online using various methods, to be discussed in detail below. The literature argues that a self-administered questionnaire allows for non-biased upward responses (Baruch & Holtom, 2008). The chosen distribution channel is arguably the most widely preferred method in organisational studies (Simsek & Veiga, 2001).

As stated above, the questionnaire was distributed online through email and social media platforms. This study had access and shared the questionnaire to the following population groups: Own organisation (20 email respondents); 2020/21 MBA Green Cohort (79 WhatsApp participants); 2021/22 MBA Green Cohort (91 WhatsApp participants); LinkedIn (712 connections); GIBS Buddies Telegram Group (581 members) and direct WhatsApp connection, from friends and acquaintances (63 members). The questionnaire was first distributed on the 27th of July. It was distributed in stages to each group, allowing this study to direct its follow-up to the relevant group in cases where the responses did not improve after the questionnaire was shared. The questionnaire was closed on the 22nd of September 2022, which meant it was in circulation for 57 days.

The population had N = 1 546, and the final sample size was n = 178, leading to an

11.5 per cent response rate. Of the 178, only 156 (87.6 percent) could be analysed after the data clean-up, removing respondents that did not meet the qualifying criteria set out by this study. This data was then stored on Google Drive ®, to ensure its protection and accessibility when needed.

4.2.7 Analysis approach

The final data, downloaded on the 22nd of September, was first cleaned to ensure it could be imported to the SPSS tool for analysis. Cleaning the data involved a couple of steps which will be discussed briefly. Firstly, the respondents used for the data gathering pilot phase were removed from the dataset using the date filter on Microsoft Excel ®. These were all five responses received before the final questionnaire was updated on the 27th of July and before the mass distribution of the questionnaire. Secondly, the respondent who did not have operations in the South African market were also removed from the dataset. Lastly, respondents who did not have at least one person they reported to were also filtered out of the final dataset.

The subsequent tests were the responded misconduct and Little's Missing Completely at Random (MCAR) tests. These are described in detail in Chapter 5, section 5.2. The first test was conducted to test if the respondents did not just answer all questions with the same response on the Likert scale. The MCAR was completed to test if the missing data in the responses were missing completely at random and were within acceptable limits to continue with statistical analysis.

The data was then imported onto SPSS in preparation for analysis. The data was then coded in the analysis tool, and the final codebook was presented in **Appendix B | Data coding on IBM ® SPSS ®**. After the data was coded, it was ready to be consumed for analysis in the tool.

The first set of tests completed was what this study termed as "pre-tests." These tests were conducted to (1) ensure that the data was robust enough for regression analysis and that the results obtained could be interpreted with high confidence, (2) test the hypotheses and assumptions required for regression testing and analysis. The following section discusses these tests in detail under the subtitle "Quality controls."

Lastly, after completing the above tests, a bivariate regression analysis was conducted to test hypotheses H1, H1a, H1b, and H1c, as hypothesised in Chapter 3. H2, H2a, H2b, and H2c were tested following a bivariate, stepwise hierarchal linear regression analysis (Li, 2022). The moderating role of transformational leadership was introduced, computing an interacting variable between the moderator and each independent variable.

The bivariate, stepwise hierarchal linear regression analysis results indicated a multicollinearity factor. In a multiple-regression model, multicollinearity is defined by a high level of linear intercorrelation among explanatory variables. This may cause regression analyses to yield false conclusions (Kim, 2019). The variance inflation factor (VIF) is one of the diagnostic techniques for multicollinearity and values greater than five to ten prove the existence of multicollinearity (Kim, 2019). In this study, the VIF obtained was below 2.0 for all analyses, consistent with the results from Hung & Chou (2013), suggesting that hypothesis testing and interpreting the results can proceed.

4.2.8 Quality controls

Quality controls included all pre-tests conducted to ensure the data's robustness before the detailed analysis. The final tests were carried out in Chapter 5. However, the discussion and need for each test are discussed in this section. The three quality tests executed in this study were tests for normality, validity, and reliability. Normality tests are crucial as they provide direction on whether to run parametric or non-parametric tests.

On the other hand, reliability and validity testing are the two common methods consistent with the chosen research methodology. Reliability testing is more concerned with the stability of the results, whereas validity testing focuses more on accuracy (Mohajan, 2017). This justifies the data's replicability and accuracy, and findings (Mohajan, 2017).

4.2.8.1 Common method bias (CMB)

Common method bias (CMB) is the measure of variance in the respondent's answers based on the respondent's situation, context, or the questionnaire design (Bilal, n.d.). Surveys run the risk of CMB, which can undermine the validity and dependability of

the empirical findings (Baumgartner & Steenkamp, 2001). It is usually present when the dependent and independent variables are measured in a single questionnaire, utilising the same response technique (e.g., ordinal scale) (Kock et al., 2021).

The CMB is important to understand in the survey dataset, as it can significantly influence the experimental findings and the conclusions thereof (Burton-Jones, 2009; Podsakoff et al., 2012; Kock et al., 2021). Should the % variance output be greater than 50%, then the results suggest the existence of CMB in the dataset (Bilal, n.d.), and it should be managed effectively if the analysis were to be executed (Kock et al., 2021). This test is executed, and the output is discussed in Chapter 5 of this study.

4.2.8.2 Test for normality

The test for normality was conducted to justify the assumptions for normality and is instrumental before running any parametric tests (Chua, 2013). The result from this test informs the type of statistical tests that can be performed for analysis, generalisation, and recommendations. In order to test for normality, descriptive statistics, which included the skewness and kurtosis, were run on each of the measured constructs to achieve a skewness range between -2 and +2 and a kurtosis range between -7 and +7 (Hair et al., 2010; Fuey & Idris, 2017). Should the data present values between these figures, the normality of the data was assumed.

4.2.8.3 Reliability testing

In order to test for reliability, Saunders, Lewis & Thornhill (2016) suggests three applicable methods, test re-test, alternative form, and internal consistency reliability. The first two methods are time-consuming; therefore, this study used the consistency reliability test, targeting a Cronbach's alpha of at least 0.70 as the acceptable figure to prove reliability (Leckie et al., 2016). In cases where the 0.70 target was not reached, items that would improve Cronbach's alpha were deleted one after the other until acceptable figures were achieved.

4.2.8.4 Validity testing

Although the measurement instruments used in this study were adopted from reputable literature sources, their validity was still tested to satisfy the context of this study. The literature argues four common validity tests, content validity, face validity,

construct validity and criterion-related validity (Mohajan, 2017). The literature, author's supervisor and GIBS faculty, with experience in the field of study, were consulted to test the content, face and construct validity.

On the other hand, criterion-related validity was tested using statistical methods to obtain both the convergent and discriminant validity of the instrument. The Exploratory Factor Analysis (EFA), based on Eigenvalues greater than 1, and Varimax rotated solution, was used to obtain factor loadings (λ), which in turn were computed mathematically to calculate the convergent validity, discriminant validity, and composite reliability of each construct/subconstruct. This study argued the validity of its constructs should the convergent validity reach values greater than 0.50 for the average variable extracted (AVE), discriminant validity (HTMT) greater than 0.70, and composite reliability (CR) be greater than 0.70 (Leckie et al., 2016; Hair et al., 2020). Equations 1, 2 and 3 show how the convergent validity (AVE), discriminant validity (HTMT), and composite reliability (CR) were computed (Hair Jr et al., 2014).

$$Average\ Variable\ Extracted\ (AVE) = \frac{\sum(\gamma^2)}{Number\ of\ items} \ldots \text{(Equation 1)}$$

$$Discriminant\ validity = \sqrt{AVE} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(Equation 2)}$$

$$Composite\ Reliability\ (CR) = \frac{\sum(\gamma)^2}{\sum(\gamma)^2 + \sum(1-\gamma)} \ldots\ldots\ldots\ldots\ldots \text{(Equation 3)}$$

where (1 – λ) is the Measurement Error

4.2.9 Multi-regression analysis assumptions

Before one can conduct any regression analysis, some assumptions need to be validated. Firstly, the sample size must be above recommended literature sub-minimum of n = 40 (Bonett & Wright, 2000). In the case of this study, the sample size obtained for analysis was n = 156. Secondly, the data distribution detects whether to run a parametric or non-parametric analysis (Chua, 2013). In the case of this study, normality was assumed based on the skewness and kurtosis analysis detailed in the preceding section in this chapter and Chapter 5, concluding on parametric regression testing. Thirdly, to test if the dataset is reliable and valid. This was explained in sections 4.2.8.3 and 4.2.8.4, and results were displayed in Chapter 5. Moreover, the test for multicollinearity was explained in section 4.2.7 and tested in Chapter 5.

4.2.10 Limitations

- The final sample size of n = 156 limited the data's robustness and the results' generalisability (Hair et al., 2010).
- This study utilised a non-probability sampling technique, which ultimately did not afford representation of all the organisations within the South African context to participate in the study.
- A cross-sectional study in this research limits any changes that may exist over time. Therefore, collecting data during a pandemic in a turbulent environment may lead to biased responses, which may be different in the case of no pandemic.
- Most of the responses were concentrated in Gauteng, which may lead to bias, although this represented the South African population.

CHAPTER 5: RESULTS

5.1 Introduction

This chapter presents the results from the data gathered through the online survey. The IBM ® SPSS ® version 28 was used to analyse the results, preparing them for interpretation. The chapter starts by indicating how the data was first prepared before it was consumed on SPSS. Secondly, the surveyed population's demographic descriptive statistical analysis was conducted. After this, statistical tests that assess the proposed hypotheses were conducted. This was initiated by first running data pre-tests to assess the reliability and validity of the data and actual regression tests required to test for the hypothesised relationships.

This study aimed to understand the moderating role of transformational leadership on the relationship between environmental turbulence and corporate entrepreneurship. This included understanding the subconstructs that measure each of the main constructs identified in the study. As outlined in Chapter 3, the study's main hypothesis was that transformational leadership moderates the positive relationship between environmental turbulence, its subconstructs, and corporate entrepreneurship.

5.2 Data preparation

The data was first prepared before exporting to SPSS for analysis. The study aimed to analyse individuals who work in South African organisations, in any industry, from all nine provinces. Using Microsoft Excel's ® filtering feature, the first part of data cleaning involved removing the five respondents used in the pilot study to test the operationalization of the tool, filtering by the date. Secondly, individuals who did not work for organisations with operations in South Africa were also removed from the dataset. Thirdly, respondents who did not have at least one person they reported to were also excluded from the dataset since the study focused on testing the transformational leadership characteristics of their manager.

The data was then exported to SPSS for further preparation. Little's Missing Completely at Random (MCAR) test was conducted in this round. This was to test whether there were any missing values from the dataset and whether they were missing completely at random or not (Little, 1988). The results from Little's MCAR

test are shown in **Appendix C | Little's MCAR**, and they illustrated that there were no missing values from each item in the dataset.

Lastly, respondent misconduct was conducted to test if the respondent did not provide the same answer for each question. This was done in two ways, firstly, questions TT5 and CI6 were reverse coded, and secondly, the standard deviation of each respondent's response was obtained. If the standard deviation were smaller than 0.25, then the data for that respondent would be deleted. In the case of this study, all values were above 0.25, concluding that the respondent misconduct was not present in the dataset. After completing these exercises, only 156 of the 178 (87.6%) respondents qualified for analysis. The final data was then coded into SPSS, and the final codebook is presented in **Appendix B | Data coding on IBM ® SPSS ®**.

5.3 Demographic analysis

This section provides a descriptive statistical analysis of the demographic data. Ten demographic questions were in the questionnaire, and their results are presented in tabular format, showing the frequency, percentage contribution, and valid percentage.

5.3.1 Respondent's gender

Table 1 illustrates that at least 53.8 per cent of respondents were females and male respondents made up the balance of 46.2 per cent.

Table 1: Gender of respondents

	Frequency	Percentage	Valid Percentage
Female	84	53.8	53.8
Male	72	46.2	46.2
Total	156	100.0	100.0

5.3.2 Respondent's age

Table 2 illustrates the age group of the respondents. The online survey received responses from 156 respondents aged 18 to 54. Almost nine out of ten respondents were between the ages of 25 and 44, with respondents between the ages of 35 and 44 accounting for more than half of the total (54.5 per cent).

Table 2: Age group of respondents

	Frequency	Percentage	Valid Percentage
18 – 24	1	0.6	6.0
25 – 34	59	37.8	37.8
35 – 44	85	54.5	54.5
45 – 54	11	7.1	7.1
55 – 64	0	0.0	0.0
+65	0	0.0	0.0
Total	156	100.0	100.0

5.3.3 Respondent's designation

The designation represents the respondent's role in the organisation at the time of the survey. Table 3 illustrates this distribution, suggesting that three-quarters of the respondents were at least from middle management to executive level. The front office workers represented the most negligible contribution of 5.8 per cent, with the middle managers leading the pack with 45.5 per cent of the total respondents.

Table 3: Respondent's role in the organisation

	Frequency	Percentage	Valid Percentage
Front office	9	5.8	5.8
Junior management	30	19.2	19.2
Middle management	71	45.5	45.5
Senior management	29	18.6	18.6
Executive	17	10.9	10.9
Total	156	100.0	100.0

5.3.4 Respondent's highest form of qualification

The respondent's highest form of qualification is recorded in Table 4. More than 98.0 per cent of the respondents have attended post-matric schooling, with over three-quarters of them having obtained Honors, PGDip, Masters, and Doctorate degrees. This may imply that the respondents were well equipped to have some context on the questions that responded to the individual constructs.

Table 4: Respondent's highest form of qualification

	Frequency	Percentage	Valid Percentage
NSC / Matric	3	1.9	1.9
Higher certificate	3	1.9	1.9
Diploma	11	7.1	7.1
Degree / BTech	20	12.8	12.8
Honours / PGDip	54	34.6	34.6
Master's degree	64	41.0	41.0
Doctorate / PhD	1	0.6	0.6
Total	156	100.0	100.0

5.3.5 Respondent's tenure in the current organisation

Table 5 illustrates the tenure of each respondent at the time of the survey. Only 13.5 per cent of the respondents had spent less than a year with their organisation during the survey. At least 21.2, 23.1, and 19.9 per cent of the respondents had served between 4 – 5 years, 6 – 10 years and over ten years, respectively, with their organisation. This gave them a clear understanding of the organisation and the industry through which it operates.

Table 5: Respondent's tenure with the current organisation

	Frequency	Percentage	Valid Percentage
Less than 1 year	21	13.5	13.5
1 – 3	35	22.4	22.4
4 – 5	33	21.2	21.2
6 – 10	36	23.1	23.1
10+	31	19.9	19.9
Total	156	100.0	100.0

5.3.6 Province where the organisation operates

Nearly 80 per cent of the respondents were from Gauteng province, the business hub of South Africa, as shown in Table 6. Kwa-Zulu Natal had the second most responses, at 10.9 per cent, with the rest of the other provinces contributing to only 9.5 per cent of the total respondents.

Table 6: Province where the organisation operates

	Frequency	Percentage	Valid Percentage
Free State	0	0.0	0.0
Eastern Cape	1	0.6	0.6
Limpopo	1	0.6	0.6
Mpumalanga	3	1.9	1.9
Northern Cape	3	1.9	1.9
Western Cape	3	1.9	1.9
North-West	4	2.6	2.6
Kwa-Zulu Natal	17	10.9	10.9
Gauteng	124	79.5	79.5
Total	156	100.0	100.0

5.3.7 Sector in which the organisation operates

Table 7 illustrates the sector to which the respondents belonged. At least 84 per cent of respondents were from private institutions, a sector that would appreciate environmental turbulence and corporate entrepreneurship.

Table 7: Sector in which the organisation operates

	Frequency	Percentage	Valid Percentage
Other	3	1.9	1.9
NGO / NPO	3	1.9	1.9
Public institution	19	12.2	12.2
Private institution	131	84.0	84.0
Total	156	100.0	100.0

5.3.8 Industry in which the organisation operates

Respondents from the Financial Services, Insurance, Mining, Energy, Oil and Gas industries made up more than half of the sample, at 53.2 per cent, as illustrated in Table 8. Only 7.1 per cent of respondents whose industries could not be identified.

Table 8: Industry in which the organisation operates

	Frequency	Percentage	Valid Percentage
Arts, Entertainment & Recreation	1	0.6	0.6
R&D	1	0.6	0.6
Education & Training	2	1.3	1.3
Infrastructure & Trans	3	1.9	1.9
Retail	3	1.9	1.9
Admin, Business Support & Consulting	5	3.2	3.2
Tech & Telecoms	8	5.1	5.1
Healthcare & Social Assistance	9	5.8	5.8
Construction	9	5.8	5.8
Other	11	7.1	7.1
Manufacturing	21	13.5	13.5
Mining, Energy, Oil & Gas	32	20.5	20.5
Financial Services & Insurance	51	32.7	32.7
Total	156	100.0	100.0

5.3.9 Age of the organisation

At least 86.5 per cent of the respondents came from organisations that have operated for over ten years, as shown in Table 9. Only a negligible number of respondents, 1.3 per cent, are unaware of their organisation's age.

Table 9: Age of the organisation

	Frequency	Percentage	Valid Percentage
I do not know	2	1.3	1.3
Less than 1 year	4	2.6	2.6
1 – 3	2	1.3	1.3
4 – 5	4	2.6	2.6
6 – 10	9	5.8	5.8
10+	135	86.5	86.5
Total	156	100.0	100.0

5.3.10 Size of the organisation

Table 10 illustrates the size of the organisation each respondent worked for at the time of the survey. At least 60.3, 10.3, and 28.8 per cent of the respondents were part of enterprises (1000+), large corporates (501 – 1000) and SMEs (<500), respectively. Only one responded (0.6 per cent) did not know the size of their organisation at the time of the survey.

Table 10: Size of the organisation

	Frequency	Percentage	Valid Percentage
I do not know	1	0.6	0.6
Less than or = to 10	7	4.5	4.5
11 – 50	11	7.1	7.1
51 – 250	17	10.9	10.9
251 – 500	10	6.4	6.4
501 – 1000	16	10.3	10.3
1000+	94	60.3	60.3
Total	156	100.0	100.0

5.4 Analysis pre-tests

In this section, the data pre-tests were conducted. Pre-tests are done to (1) validate the robustness of the data and (2) satisfy some of the assumptions required for parametric or non-parametric testing, therefore suggesting an analysis approach. This section aimed to validate the assumptions provided for each test under Chapter 4. The tests included the common method bias test (CMB), the test for normality on the constructs covered in this study, exploratory factor analysis (EFA), reliability tests, and validity tests.

5.4.1 Common method bias (CMB) test

CMB is a measure of variance in the respondent's answers based on the respondent's situation, context, or questionnaire design (Bilal, n.d.). In this study, the CMB was obtained by applying Harman's single test through EFA, using the principal axis factoring, and executed on the SPSS tool.

Appendix D | Common method bias (CMB) illustrates the test results. Since the % of the variance (marked in red) is less than 50%, there is no CMB in the dataset, and its analysis can proceed (Bilal, n.d.).

5.4.2 Test for normality | Skewness and kurtosis

Before conducting any statistical analysis, it is recommended that a normality test is conducted on each of the constructs to guarantee the assumption for normality before running parametric tests (Chua, 2013). The result from this test informs the type of statistical tests that can be performed for analysis, generalisation, and recommendations.

This study used a basic test based on observing the skewness and kurtosis from the descriptive statistics of the measured constructs. The data is considered normally distributed should the skewness range between -2 and +2 and kurtosis range between -7 and +7 (Hair et al., 2010; Fuey & Idris, 2017). Table 11 illustrates the descriptive statistics for each item used to measure each construct and their skewness and kurtosis indices. The skewness range was between -1.551 and 0.254, and the kurtosis range was between -1.291 and 1.923, suggesting a normal distribution from the data presented. Based on these results, this study concluded that parametric tests could be conducted during regression testing.

Table 11: Test for normality | The skewness and kurtosis method

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Z	Std.Error	Z	Std.Error
MT1	156	3.04	1.355	-.035	.914	-1.230	.386
MT2	156	2.94	1.385	.190	.914	-1.291	.386
MT3	156	3.57	1.240	-.534	.914	-.758	.386
MT4	156	3.37	1.240	-.294	.914	-.916	.386
MT5	156	3.03	1.312	.114	.914	-1.112	.386
MT6	156	4.00	1.022	-.881	.914	.146	.386
TT1	156	4.08	1.178	-1.062	.914	-.042	.386
TT2	156	4.31	1.001	-1.551	.914	1.923	.386
TT3	156	3.17	1.190	.091	.914	-1.043	.386
TT4	156	3.86	1.205	-.914	.914	-.067	.386
TT5	156	3.52	1.384	-.639	.914	-.863	.386
CI1	156	3.86	1.236	-.849	.914	-.299	.386
CI2	156	3.11	1.398	-.125	.914	-1.197	.386
CI3	156	3.58	1.229	-.581	.914	-.618	.386
CI4	156	3.38	1.321	-.285	.914	-1.120	.386
CI5	156	2.79	1.362	.254	.914	-1.160	.386
CI6	156	3.93	1.096	-.990	.914	.422	.386

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Z	Std.Error	Z	Std.Error
Inn1	156	4.96	1.850	-.522	.194	-.868	.386
Inn2	156	4.07	1.981	-.109	.194	-1.207	.386
Inn3	156	3.40	1.597	.126	.194	-.931	.386
Pro1	156	3.92	1.826	-.014	.194	-1.025	.386
Pro2	156	3.64	1.863	.154	.194	-1.062	.386
Pro3	156	3.81	1.766	.073	.194	-1.007	.386
RT1	156	4.15	1.771	-.208	.194	-.932	.386
RT2	156	5.04	1.571	-.742	.194	.111	.386
RT3	156	4.41	1.718	-.232	.194	-.687	.386
II1	156	3.81	1.213	-.787	.194	-.369	.386
II2	156	3.69	1.228	-.650	.194	-.585	.386
II3	156	3.81	1.233	-.769	.194	-.470	.386
IM1	156	3.55	1.188	-.615	.194	-.521	.386
IM2	156	3.57	1.159	-.564	.194	-.523	.386
IM3	156	3.54	1.282	-.529	.194	-.790	.386
IS1	156	3.63	1.209	-.605	.194	-.589	.386
IS2	156	3.57	1.197	-.511	.194	-.641	.386
IS3	156	3.61	1.189	-.648	.194	-.423	.386
IC1	156	3.53	1.332	-.554	.194	-.869	.386
IC2	156	3.60	1.248	-.645	.194	-.595	.386
IC3	156	3.20	1.282	-.193	.194	-1.010	.386

5.4.3 Reliability testing | Cronbach's alpha

The Cronbach's alpha test is the most consistent method used in literature to test for the internal consistent reliability of the questionnaire used when collecting data. It is often used when multiple Likert questions exits in a survey (Bland & Altman, 1997; Kline, 2016). Cronbach's alpha is more concerned about the stability of the results, therefore justifying the replicability and the accuracy of the data and its findings (Mohajan, 2017). A Cronbach's alpha of 0.70 was targeted for each of the constructs, as it is argued to be an acceptable level to prove reliability (Kline, 2016; Leckie et al., 2016).

The Cronbach's alpha was conducted on each subconstruct used to measure the main constructs. This was because the questions are related to each of the subconstructs, and the reliability of the main construct can only be deduced should the subconstruct's reliability also hold. Table 12 illustrates the summarised Cronbach's alpha for each measuring scale, and the detailed results for each of the constructs can be found in **Appendix E | Cronbach's alpha**. The results show that the final Cronbach alphas were all above 0.70, a value widely accepted in the literature (Kline, 2016; Leckie et al., 2016).

Table 12: Summarised internal reliability of subconstructs (Cronbach's alpha)

Scale	Sample size	Number of items from initial Cronbach alpha	Number of items from amended Cronbach alpha	Cronbach alpha	Decision
Market Turbulence	156	6	5	.767	Proceed
Technological Turbulence	156	5	5	.703	Proceed
Competitive Intensity	156	6	6	.782	Proceed
Innovativeness	156	3	3	.729	Proceed
Proactiveness	156	3	3	.758	Proceed
Risk-Taking	156	3	3	.768	Proceed
Idealized Influence	156	3	3	.934	Proceed
Inspirational Motivation	156	3	3	.869	Proceed
Intellectual Stimulation	156	3	3	.933	Proceed
Individual Consideration	156	3	3	.889	Proceed

Environmental Turbulence is measured from three subconstructs, *Market Turbulence, Technological Turbulence, and Competitive Intensity.* Three changes were made to the scales used to measure *Environmental Turbulence*.

- In the *Market Turbulence* scale, the last item (MT6) was removed from this measure, as removing it improved the reliability of the subconstruct to acceptable levels, from 0.688 to 0.767.
- In the *Technological Turbulence* scale, the last item (TT5) was reverse coded to get it to be affirmative as the other items in the scale.
- In the *Competitive Intensity* scale, the last item (CI6) was also reverse coded to get the item also to be affirmative as the other items in the scale.

All other scales were left as they were, as Cronbach's alpha for each was in line with the accepted values from the literature, of at least 0.70 and above (Kline, 2016; Leckie et al., 2016).

5.4.4 Dimension reduction | Exploratory Factor Analysis (EFA)

The factor analysis method is known as decreasing dimensionality technique, which assumes that observable and measurable variables can be reduced to a smaller number of latent variables with a common variance (Fuey & Idris, 2017). The Exploratory Factor Analysis (EFA) is one method to do this, as it compares an observed correlation matrix to the identity matrix, allowing for the identification of duplication between variables and the reduction of the number of components (Hair et al., 2010). The correlation coefficients from EFA will be used to consider how the item finally contributes to the construct, in doing so, evaluate the study's importance and describes the adequacy of the responses (Fuey & Idris, 2017).

The Kaiser-Meyer-Olkin (KMO), found in EFA, measures sample adequacy. It illustrates if variables may be reduced into fewer latent variables with a common variance (Hair et al., 2010). Possible KMO values range from 0 to 1, with zero indicating a negligible relationship and 1 indicating a perfect one, and values above 0.50 are regarded as appropriate for EFA (Hair et al., 2010; Fuey & Idris, 2017).

Table 13 summarises the results obtained after running the EFA, based on the Eigenvalues greater than 1 and Varimax rotated solution with a correlation matrix that includes anti-imaging, KMO and Bartlett’s test for sphericity. There are two things to note from this table. Firstly, this table does not include MT6, which was deleted during reliability tests. Secondly, TT3 was also deleted from the list, as it loaded on a different component, and Hait et al. (2010) argue that items may be deleted to improve the scale should they load on a different component. From the results, it is evident that the results are sound, as all the KMO values were above the acceptable figure of 0.50 (Hair et al., 2010; Fuey & Idris, 2017).

Table 13: Exploratory Factor Analysis (EFA) for each of the sub-dimensions

Dimension (Extraction sums of squared loadings)	KMO	Item	Component loading position	Item deleted?
Market Turbulence	.773	MT1	1	No
		MT2	1	No
(52.25%)		MT3	1	No
		MT4	1	No
		MT5	1	No
Technological Turbulence	.734	TT1	1	No
		TT2	1	No
(63.64%)		TT4	1	No
		TT5	1	No
Competitive Intensity	.805	CI1	1	No
		CI2	1	No
		CI3	1	No
(48.05%)		CI4	1	No
		CI5	1	No
		CI6	1	No
Innovativeness	.634	Inn1	1	No
		Inn2	1	No
(65.60%)		Inn3	1	No
Proactiveness	.671	Pro1	1	No
		Pro2	1	No
(67.39%)		Pro3	1	No
Risk-Taking	.694	RT1	1	No
		RT2	1	No
(68.49%)		RT3	1	No
Idealized Influence	.727	II1	1	No
		II2	1	No
(88.31%)		II3	1	No
Inspirational Motivation	.725	IM1	1	No
		IM2	1	No
(79.46%)		IM3	1	No
Intellectual Stimulation	.763	IS1	1	No
		IS2	1	No
(88.17%)		IS3	1	No
Individual Consideration	.744	IC1	1	No
		IC2	1	No
(81.91%)		IC3	1	No

After this exercise, the averages for each item representing only the loaded items of a subconstruct were obtained. The EFA tests were then re-run to test if the subconstructs load to the main constructs, environmental turbulence, corporate entrepreneurship and transformational leadership. The results are presented in Table 14, and they proved that all subconstructs load onto the main constructs, of which the new averages were then obtained, now representing the main constructs.

This exercise was necessary as the hypotheses were based on the main constructs and sub-constructs.

Table 14: Exploratory Factor Analysis (EFA) for each of the main dimensions

Dimension (Extraction sums of squared loadings)	KMO	Item	Component extracted	Interpretation
Environmental Turbulence (59.05%)	.620	MT	.827	Acceptable results
		TT	.673	
		CI	.797	
Transformational Leadership (84.65%)	.854	II	.925	Great results
		IM	.930	
		IS	.917	
		IC	.908	
Corporate Entrepreneurship (71.68%)	.650	Inn	.828	Acceptable results
		Pro	.907	
		RT	.802	

All items, for all subconstructs, load at a range between .673 and .925, which illustrates good factor loadings across. In the case of environmental turbulence, the extracted sums of squared loadings suggest that the subconstructs explain at least 59.05% of the variance. Secondly, the transformational leadership results suggest that at least 84.65% of subconstructs explain the variance and that the outcome of the results is “great” based on the KMO outputs. Lastly, for corporate entrepreneurship, items load above .650, explaining at least 71.68% of the variance, which also suggests good results.

5.4.5 Validity testing | Convergent validity, discriminant validity and CR

The convergent validity (AVE), discriminant validity (HTMT) and composite reliability (CR) were computed using statistical methods. In doing so, the EFA, based on Eigenvalues greater than 1, and Varimax rotated solution, was used to obtain factor loadings (λ), which in turn were computed mathematically to calculate the convergent validity, discriminant validity, and composite reliability for each construct/subconstruct. Data was first run on SPSS ® to obtain the factor loadings (λ), and Microsoft Excel ® was then used to compute the final outputs as per equations 1 to 3 (Hair Jr et al., 2014), as highlighted in section 4.2.8.4.

Table 15 illustrates the outputs from such calculations. The literature argues that the convergent validity, as represented by the average variable extracted (AVE), must at least be 0.50 and above, discriminant validity (HTMT) at least 0.70 and above, and

composite reliability (CR) at least 0.70 and above (Leckie et al., 2016; Hair et al., 2020). As for *Competitive Intensity,* satisfactory levels were only reached after removing the last item from the dataset since the initial AVE was .481below the acceptable levels suggested by the literature. This item had the lowest loading of .513 within the dimension. After its exclusion, the data was consistent with the acceptable figures, as seen in Table 15, for convergent validity, discriminant validity and composite reliability. Therefore its test for validity was accepted.

Table 15: Convergent validity (AVE), Discriminant validity (HTML) and Composite reliability (CR)

Item	Dimension	λ	Convergent Validity (AVE)	Discriminant Validity (HTMT)	Composite Reliability (CR)
MT1	Market Turbulence	0.814	.522	.723	.741
MT2		0.800			
MT3		0.553			
MT4		0.614			
MT5		0.792			
TT1	Technological Turbulence	0.900	.636	.798	.817
TT2		0.858			
TT4		0.759			
TT5		0.651			
CI1	Competitive Intensity	0.770	.524	.724	.743
CI2		0.758			
CI3		0.678			
CI4		0.708			
CI5		0.701			
Inn1	Innovativeness	0.764	.651	.807	.784
Inn2		0.872			
Inn3		0.780			
Pro1	Proactiveness	0.836	.674	.821	.807
Pro2		0.859			
Pro3		0.765			
RT1	Risk-Taking	0.802	.685	.828	.817
RT2		0.836			
RT3		0.844			
II1	Idealized Influence	0.912	.883	.940	.952
II2		0.943			
II3		0.963			
IM1	Inspirational Motivation	0.864	.795	.891	.902
IM2		0.914			
IM3		0.895			
IS1	Intellectual Stimulation	0.947	.882	.939	.952
IS2		0.928			
IS3		0.941			
IC1	Individual Consideration	0.912	.819	.905	.918
IC2		0.913			
IC3		0.890			

5.4.6 Summary of pre-test data analysis

Table 16 summarises the pretest's conduction in the proceeding sections under Chapter 5. This table aims to justify, at the very least, the robustness of the data analysed, the execution of the chosen approach, and that the results can be generalised in the South African context.

Table 16: Pre-tests results summary

	N	Cronbach's alpha (>.70)	KMO (>.50)	AVE (>.50)	HTMT (>.70)	CR (>.70)
Environmental Turbulence						
Market Turbulence (MT)	156	.767	.773	.522	.723	.741
Technological Turbulence (TT)	156	.703	.734	.636	.798	.817
Competitive Intensity (CI)	156	.782	.805	.524	.724	.743
Corporate Entrepreneurship						
Innovativeness (Inn)	156	.729	.634	.651	.807	.784
Proactiveness (Pro)	156	.758	.671	.674	.821	.807
Risk-Taking (RT)	156	.768	.694	.685	.828	.817
Transformational Leadership						
Idealized Influence (II)	156	.934	.727	.883	.940	.952
Inspirational Motivation (IM)	156	.869	.725	.795	.891	.902
Intellectual Stimulation (IS)	156	.933	.763	.882	.939	.952
Individual Consideration (IC)	156	.889	.744	.819	.905	.918

5.5 Hypothesis testing

In this section, the proposed hypotheses from Chapter 3 will be tested. This study has already established that normality exists in the data and conducted other pre-tests to justify a parametric approach to test each hypothesis.

As a reminder, this study aimed to understand the moderating role of transformational leadership on the positive relationship between environmental turbulence and corporate entrepreneurship. In doing so, the study proposed two main hypotheses, each of which had three sub-hypotheses, leading to eight tests in total. The study will first test the relationships between constructs and will then introduce the moderating variable to test if it does indeed strengthen the hypothesised relationships.

5.5.1 Constructs and subconstructs descriptive statistics

Table 17: Descriptive statistics of the constructs and subconstructs to be tested

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
MT	156	3.190	.94105	.886	-.038	.194	-.622	.386
TT	156	3.941	.93933	.882	-.973	.194	.384	.386
CI	156	3.344	.96166	.925	-.275	.194	-.568	.386
ET	156	3.491	.72542	.526	-.276	.194	-.685	.386
CE	156	4.157	1.22803	1.508	-.113	.194	-.733	.386
TL	156	3.592	1.03925	1.080	-.623	.194	-.397	.386

Using the skewness and kurtosis tests, one can appreciate that all the constructs and subconstructs are normally distributed since the skewness range between -2 and +2, and kurtosis range between -7 and +7 (Hair et al., 2010; Fuey & Idris, 2017) (Table 17). Each dimension had 156 responses with varying means, standard deviations, and variances. For market turbulence (MT), the results suggest that respondents generally described the market under which they operate as more stable, with a mean value of 3.19. However, the technological environment was more rapid, leading towards “Agree.”

On the other hand, similar responses for competitive intensity (CI), environmental turbulence (ET), and transformational leadership (TL) were observed, where most responses were in between “Neutral” and “Agree” for these constructs. Most respondents, however, “Agree” that their organisations are more corporate entrepreneurial (CE), with a mean value of 4.16.

Finally, the intercorrelation matrix, representing the constructs and subconstructs to be tested, is presented in Table 18. Although there is a significant correlation between market turbulence and all other constructs except transformational leadership, high correlation levels are recorded with competitive intensity, environmental turbulence, and corporate entrepreneurship. On the other hand, technological turbulence and competitive intensity illustrated a high correlation with just environmental turbulence. This is consistent with the fact that these are both argued to be subconstructs of environmental turbulence. Lastly, the only remaining high correlation is between environmental turbulence and corporate entrepreneurship, with transformational leadership and corporate entrepreneurship

only recording a moderate, significant relationship.

Table 18: Intercorrelation matrix for the constructs and subconstructs

	1	2	3	4	5	6
Market turbulence	-					
Technological Turbulence	.347**	-				
Competitive Intensity	.525**	.266**	-			
Environmental Turbulence	.814**	.699**	.783**	-		
Corporate Entrepreneurship	.581**	.361**	.323**	.550**	-	
Transformational Leadership	.043	.131	.009	.079	.320**	-
Mean	3.190	3.941	3.344	3.491	4.157	3.592
Standard Deviation	.941	.939	.962	0.725	1.228	1.039

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

5.5.2 Hypothesis 1

H1: Environmental turbulence has a positive relationship to corporate entrepreneurship.

A bivariate linear regression analysis was executed to conduct this test, with environmental turbulence as the independent variable and corporate entrepreneurship as the dependent variable.

The first assessment of the results was to test for linearity and normality. These need not be violated and hence are essential for the study. This was achieved by plotting the histogram and normal P-P plots of regression. Figure 2 and Figure 3 show histogram and P-P plots, respectively. It can be deduced from Figure 2 that since the histogram illustrates a shape that resembles a bell curve and that, in Figure 3, the data points lie along a straight line, the assumption for linearity and normality is not violated.

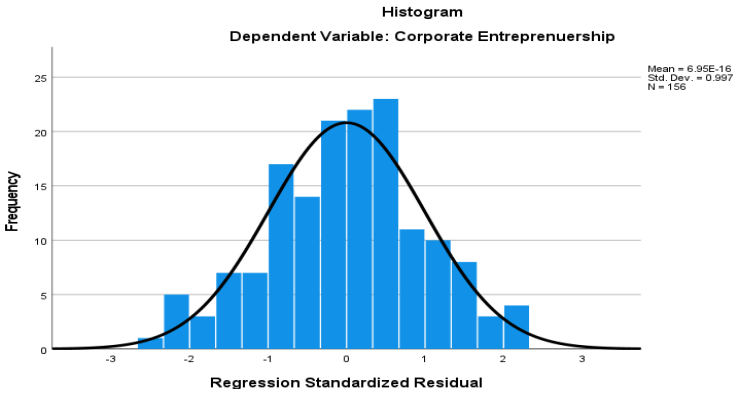

Figure 2: ET and CE | Histogram for regression standardized residual

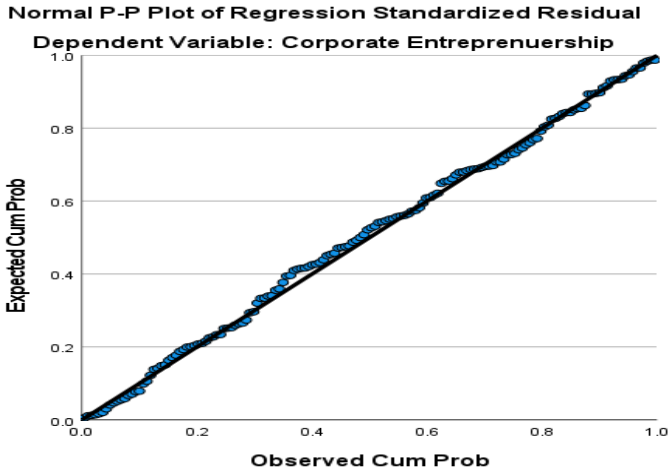

Figure 3: ET and CE | Normal P-P plots of regression standardized residual

The second assessment would be looking at the model summary table and analysing the output. Table 19 represents this output, and the focus was "R" and "R square". R =.550 and represents Pearson's correlation. Since the value is more towards the centre between 0 and 1, it suggests a moderate positive relationship between environmental turbulence and corporate entrepreneurship. R square =.302 implies that environmental turbulence explains 30.2% of the variability of corporate entrepreneurship.

Table 19: ET and CE | Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.550[a]	.302	.298	1.02906

Thirdly, the model fit of the data will be presented and illustrated in Table 20. The ANOVA test notes a p-value less than .001, which is less than .05, implying a good fit for the data.

Table 20: ET and CE | Test for the model fit of data

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	70.669	1	70.669	66.734	<.001[b]
	Residual	163.080	154	1.059		
	Total	233.750	155			

a. Dependent Variable: Corporate Entrepreneurship
b. Predictors: (Constant), Environmental Turbulence

Lastly, the output from the coefficients table (Table 21) was studied. If p < .05, we

would fail to reject the null hypothesis. Table 21 suggests a p <.001, therefore failing to reject the null hypothesis.

Table 21: ET and CE | Coefficients results

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.907	0.406		2.232	.027
	Environmental Turbulence	0.931	0.114	0.550	8.169	<.001

a. Dependent Variable: Corporate Entrepreneurship

In summary, the null hypothesis, in this case, is represented by H1, and per the results, the tests conducted fail to reject the null hypothesis. Therefore, this implies a significant, moderately positive relationship between environmental turbulence and corporate entrepreneurship.

5.5.2.1 Hypothesis 1a

H1a: Market turbulence has a positive relationship to corporate entrepreneurship.

The assumption for linearity and normality was not violated in this test. The detailed graphs are presented in **Appendix F | Test for linearity and normality** of this report, as Figure 5 and Figure 6.

Table 22 represents the output from the model summary. R =.581 represents Pearson's correlation. It suggests a moderate positive relationship between market turbulence and corporate entrepreneurship. R square =.337 implies that market turbulence explains 33.7% of the variability of corporate entrepreneurship.

Table 22: MT and CE | Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.581[a]	.337	.333	1.00295

Furthermore, Table 23 illustrates the model fit of the data. The ANOVA test notes a p-value less than .001, which is significantly less than .05, implying a good fit for the data.

Table 23: MT and CE | Test for the model fit of data

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	78.840	1	78.840	78.378	<.001[b]
	Residual	154.909	154	1.006		
	Total	233.750	155			

a. Dependent Variable: Corporate Entrepreneurship
b. Predictors: (Constant), Market Turbulence

Lastly, Table 24 illustrates the output from the coefficients table at p <.000. If p < .05, we fail to reject the null hypothesis.

Table 24: MT and CE | Coefficients results

Coefficients[a]						
		Unstandardized Coefficients		**Standardized Coefficients**		
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	1.739	.285		6.111	<.001
	Market Turbulence	.758	.086	.581	8.853	<.001

a. Dependent Variable: Corporate Entrepreneurship

In summary, in this case, the null hypothesis is represented by H1a, and per the results, the tests conducted fail to reject the null hypothesis. Therefore, this implies a significant, moderately positive relationship between market turbulence and corporate entrepreneurship.

5.5.2.2 Hypothesis 1b

H1b: Technological turbulence has a positive relationship to corporate entrepreneurship.

The assumption for linearity and normality was not violated in this test. The detailed graphs are presented in **Appendix F | Test for linearity and normality** of this report, as Figure 7 and Figure 8.

From Table 25, Pearson's correlation is R =.361. It suggests a weak positive relationship between technological turbulence and corporate entrepreneurship. R square =.130 implies that technological turbulence explains 13.0% of the variability of corporate entrepreneurship.

Table 25: TT and CE | Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.361[a]	.130	.125	1.14889

Table 26 illustrates the model fit of the data. The ANOVA test notes a p-value less than .001, which is significantly less than .05, implying a good fit for the data.

Table 26: TT and CE | Test for the model fit of data

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.476	1	30.476	23.089	<.001[b]
	Residual	203.274	154	1.320		
	Total	233.750	155			

a. Dependent Variable: Corporate Entrepreneurship
b. Predictors: (Constant), Technological Turbulence

Lastly, Table 27 illustrates the output from the coefficients table at p <.000. If p < .05, we fail to reject the null hypothesis.

Table 27: TT and CE | Coefficients results

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.296	.398		5.771	<.001
	Technological Turbulence	.472	.098	.361	4.085	<.001

a. Dependent Variable: Corporate Entrepreneurship

In summary, the null hypothesis, in this case, is represented by H1b, and per the results, the tests conducted fail to reject the null hypothesis. Therefore, this implies a significant, weak positive relationship between technological turbulence and corporate entrepreneurship.

5.5.2.3 Hypothesis 1c

H1c: Competitive intensity has a positive relationship to corporate entrepreneurship.

The assumption for linearity and normality was also not violated in this test. The detailed graphs are presented in **Appendix F | Test for linearity and normality** of this report, as Figure 9 and Figure 10.

Table 28 represents the output from the model summary. R =.361 represents

Pearson's correlation. It suggests a weak positive relationship between competitive intensity and corporate entrepreneurship. R square =.105 implies that competitive intensity explains 10.5% of the variability of corporate entrepreneurship.

Table 28: CI and CE | Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.323[a]	.105	.99	1.16585

Table 29 illustrates the model fit of the data. The ANOVA test notes a p-value less than .001, which is significantly less than .05, implying a good fit for the data.

Table 29: CI and CE | Test for the model fit of data

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.432	1	24.432	17.975	<.001[b]
	Residual	209.318	154	1.359		
	Total	233.750	155			

a. Dependent Variable: Corporate Entrepreneurship
b. Predictors: (Constant), Competitive Intensity

Lastly, Table 30 illustrates the output from the coefficients table at p <.001. If p < .05, then we fail to reject the null hypothesis.

Table 30: CI and CE | Coefficients results

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.776	.398		8.197	<.001
	Competitive Intensity	.413	.097	.323	4.249	<.001

a. Dependent Variable: Corporate Entrepreneurship

In summary, the null hypothesis, in this case, is represented by H1c, and per the results, the tests conducted fail to reject the null hypothesis. Therefore, this implies a significant, weak positive relationship between competitive intensity and corporate entrepreneurship.

5.5.3 Hypothesis 2

H2: Transformational leadership moderates the positive relationship between

environmental turbulence and corporate entrepreneurship.

A bivariate, stepwise hierarchal linear regression analysis was conducted (Li, 2022). The moderating role of transformational leadership was introduced, computing an interacting variable between the moderator and independent variable.

The first test was to test if normality was violated. The output suggests that this test's assumption for linearity and normality was not violated. The detailed graphs are presented in **Appendix F | Test for linearity and normality** of this report, as Figure 11 and Figure 12.

The second assessment would be looking at the model summary table and analysing the output. Table 31 represents this output, and the focus was “R” and “R square” for model 1 and model 2. Model 1 values represent the conditions before the moderator was introduced, and model 2, after the moderator was introduced. Pearson’s correlation, R, improved from R =.550 to R =.607 after the introduction of the moderator. This suggests that the introduction of the moderator improved the relationship between environmental turbulence and corporate entrepreneurship from a moderate to a strong correlation.

Furthermore, the R squared also improved from R squared =.302 to R squared =.368 after the introduction of the moderator. The improvement of R squared implies that, following the introduction of the moderator, the environmental turbulence now explains 36.8% of the variability of corporate entrepreneurship from 30.2% before moderation.

Table 31: ET, TL, and CE | Model summary

Model Summary[c]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.550[a]	.302	.298	1.02906	.000
2	.607[b]	.368	.360	.98229	.000

a. Predictors: (Constant), Environmental Turbulence
b. Predictors: (Constant), Environmental Turbulence, ET x TL
c. Dependent Variable: Corporate Entrepreneurship

Thirdly, the model fit of the data is presented in Table 32. The ANOVA test notes a p-value less than .001, which is less than .05, implying a good data fit.

Table 32: ET, TL, and CE | Test for the model fit of data

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	70.669	1	70.669	66.734	<.001[b]
	Residual	163.080	154	1.059		
	Total	233.750	155			
2	Regression	86.122	2	43.061	44.628	<.001[c]
	Residual	147.628	153	.965		
	Total	233.750	155			

a. Dependent Variable: Corporate Entrepreneurship
b. Predictors: (Constant), Environmental Turbulence
c. Predictors: (Constant), Environmental Turbulence, ET x TL

Lastly, the output from the coefficients table (Table 33) was studied. If $p < .05$, we would fail to reject the null hypothesis. Table 33 suggests a p-value of <.001, even after the introduction of the moderating variable, therefore failing to reject the null hypothesis. Furthermore, both models have no multicollinearity, as the VIF values are below five (Kim, 2019).

Table 33: ET, TL, and CE | Coefficients results

Coefficients[a]								
		Unstandardized Coefficients		**Standardized Coefficients**			**Collinearity Statistics**	
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**	**Tolerance**	**VIF**
1	(Constant)	.907	.406		2.232	.027		
	Environmental Turbulence	.931	.114	.550	8.169	.000	1.000	1.000
2	(Constant)	1.029	.389		2.644	.009		
	Environmental Turbulence	.587	.139	.347	4.234	.000	.616	1.624
	ET x TL	.086	.021	.328	4.002	.000	.616	1.624

a. Dependent Variable: Corporate Entrepreneurship

In summary, the null hypothesis, in this case, is represented by H2, and per the results, the tests conducted fail to reject the null hypothesis. This implies that transformational leadership significantly moderates the positive relationship between environmental turbulence and corporate entrepreneurship.

5.5.3.1 Hypothesis 2a

H2a: Transformational leadership moderates the positive relationship between market turbulence and corporate entrepreneurship.

The assumption for linearity and normality was also not violated in this test. The

detailed graphs are presented in **Appendix F | Test for linearity and normality** of this report, as Figure 13 and Figure 14.

Table 34 represents the model summary output. Pearson's correlation, R, improved from R =.581 to R =.640 after the introduction of the moderator. This suggests that the introduction of the moderator improved the relationship between market turbulence and corporate entrepreneurship from a moderate to a strong correlation.

Furthermore, the R squared also improved from R squared =.337 to R squared =.401 after the introduction of the moderator. The improvement of R squared implies that, following the introduction of the moderator, the market turbulence now explains 40.9% of the variability of corporate entrepreneurship from 33.7% before moderation.

Table 34: MT, TL, and CE | Model summary

Model Summary[c]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.581[a]	.337	.333	1.00295	.000
2	.640[b]	.409	.401	.95015	.000

a. Predictors: (Constant), Market turbulence
b. Predictors: (Constant), Market turbulence, MT x TL
c. Dependent Variable: Corporate Entrepreneurship

Thirdly, the model fit of the data is presented in Table 35. The ANOVA test notes a p-value less than .001, which is less than .05, implying a good data fit.

Table 35: MT, TL, and CE | Test for the model fit of data

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	78.840	1	78.840	78.378	<.001[b]
	Residual	154.909	154	1.006		
	Total	233.750	155			
2	Regression	95.625	2	47.812	52.961	<.001[c]
	Residual	138.125	153	.903		
	Total	233.750	155			

a. Dependent Variable: Corporate Entrepreneurship
b. Predictors: (Constant), Market turbulence
c. Predictors: (Constant), Market turbulence, MT x TL

Lastly, the output from the coefficients (Table 36) was studied. If p < .05, we would fail to reject the null hypothesis. Table 36 suggests a p-value of <.001, even after the introduction of the moderating variable, therefore failing to reject the null hypothesis.

Table 36: MT, TL, and CE | Coefficients results

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.739	.285		6.111	.000		
	Market turbulence	0.758	.086	.581	8.853	.000	1.000	1.000
2	(Constant)	1.784	.270		6.612	.000		
	Market turbulence	.419	.113	.321	3.717	.000	.516	1.937
	MT x TL	.090	.021	.373	4.312	.000	.516	1.937

a. Dependent Variable: Corporate Entrepreneurship

In summary, in this case, the null hypothesis is represented by H2a, and per the results, the tests conducted fail to reject the null hypothesis. This implies that transformational leadership significantly moderates the positive relationship between market turbulence and corporate entrepreneurship. Furthermore, both models have no multicollinearity, as the VIF values are below five (Kim, 2019).

5.5.3.2 Hypothesis 2b

H2b: Transformational leadership moderates the positive relationship between technological turbulence and corporate entrepreneurship.

The assumption for linearity and normality was not violated in this test. The detailed graphs are presented in **Appendix F | Test for linearity and normality** of this report, as Figure 15 and Figure 16.

Table 37 represents the model summary output. Pearson's correlation, R, improved from R =.361 to R =.449 after the introduction of the moderator. This suggests that the introduction of the moderator improved the relationship between technological turbulence and corporate entrepreneurship from a weak to moderate correlation.

Furthermore, the R squared also improved from R squared =.130 to R squared =.202 after the introduction of the moderator. The improvement of R squared implies that, following the introduction of the moderator, the technological turbulence now explains 20.2% of the variability of corporate entrepreneurship from 13.0% before moderation.

Table 37: TT, TL, and CE | Model summary

Model Summary[c]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.361[a]	.130	.125	1.14889	.000
2	.449[b]	.202	.192	1.10417	.000

a. Predictors: (Constant), Technological Turbulence
b. Predictors: (Constant), Technological Turbulence, TT x TL
c. Dependent Variable: Corporate Entrepreneurship

Thirdly, the model fit of the data is presented in Table 38. The ANOVA test notes a p-value less than .001, which is less than .05, implying a good data fit.

Table 38: TT, TL, and CE | Test for the model fit of data

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.476	1	30.476	23.089	<.001[b]
	Residual	203.274	154	1.320		
	Total	233.750	155			
2	Regression	47.215	2	23.607	19.363	<.001[c]
	Residual	186.535	153	1.219		
	Total	233.750	155			

a. Dependent Variable: Corporate Entrepreneurship
b. Predictors: (Constant), Technological Turbulence
c. Predictors: (Constant), Technological Turbulence, TT x TL

Lastly, the output from the coefficients table (Table 39) was studied. If $p < .05$, we would fail to reject the null hypothesis. Table 39 suggests a p-value of <.001, even after the introduction of the moderating variable, therefore failing to reject the null hypothesis. Furthermore, both models have no multicollinearity, as the VIF values are below five (Kim, 2019).

Table 39: TT, TL, and CE | Coefficients results

Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	2.296	.398		5.771	.000		
	Technological Turbulence	.472	.098	.361	4.805	.000	1.000	1.000
2	(Constant)	2.458	.385		6.385	.000		
	Technological Turbulence	.141	.130	.108	1.084	.028	.527	1.896
	TT x TL	.080	.022	.368	3.705	.000	.527	1.896

a. Dependent Variable: Corporate Entrepreneurship

In summary, the null hypothesis, in this case, is represented by H2b, and per the results, the tests conducted fail to reject the null hypothesis. This implies that transformational leadership significantly moderates the positive relationship between technological turbulence and corporate entrepreneurship. Furthermore, both models have no multicollinearity, as the VIF values are below five (Kim, 2019).

5.5.3.3 Hypothesis 2c

H2c: Transformational leadership moderates the positive relationship between competitive intensity and corporate entrepreneurship.

The assumption for linearity and normality was not violated in this test. The detailed graphs are presented in **Appendix F | Test for linearity and normality** of this report, as Figure 17 and Figure 18.

Table 40 represents the model summary output. Pearson's correlation, R, improved from R =.323 to R =.429 after the introduction of the moderator. This suggests that the introduction of the moderator improved the relationship between competitive intensity and corporate entrepreneurship from a weak to a moderate correlation.

Furthermore, the R squared also improved from R squared =.105 to R squared =.184 after the introduction of the moderator. The improvement of R squared implies that, following the introduction of the moderator, the competitive intensity now explains 18.4% of the variability of corporate entrepreneurship from 10.5% before moderation.

Table 40: CI, TL, and CE | Model summary

Model Summary[c]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.323[a]	.105	.099	1.16585	.000
2	.429[b]	.184	.174	1.11623	.000

a. Predictors: (Constant), Competitive Intensity
b. Predictors: (Constant), Competitive Intensity, CI x TL
c. Dependent Variable: Corporate Entrepreneurship

Thirdly, the model fit of the data is presented in Table 41. The ANOVA test notes a p-value less than .001, which is less than .05, implying a good data fit.

Table 41: CI, TL, and CE | Test for the model fit of data

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	24.432	1	24.432	17.975	<.001[b]
	Residual	209.318	154	1.359		
	Total	233.750	155			
2	Regression	43.115	2	21.558	17.302	<.001[c]
	Residual	190.635	153	1.246		
	Total	233.750	155			

a. Dependent Variable: Corporate Entrepreneurship
b. Predictors: (Constant), Competitive Intensity
c. Predictors: (Constant), Competitive Intensity, CI x TL

Lastly, the output from the coefficients table (Table 42) was studied. If $p < .05$, we would fail to reject the null hypothesis. Table 42 suggests a p-value of <.001, even after the introduction of the moderating variable, therefore failing to reject the null hypothesis.

Table 42: CI, TL, and CE | Coefficients results

Coefficients[a]								
		Unstandardized Coefficients		**Standardized Coefficients**			**Collinearity Statistics**	
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**	**Tolerance**	**VIF**
1	(Constant)	2.776	.339		8.197	.000		
	Competitive Intensity	.413	.097	.323	4.240	.000	1.000	1.000
2	(Constant)	2.788	.324		8.596	.000		
	Competitive Intensity	.051	.132	.040	.387	.699	.499	2.004
	CI x TL	.100	.026	.400	3.872	.000	.499	2.004

a. Dependent Variable: Corporate Entrepreneurship

In summary, the null hypothesis, in this case, is represented by H2c, and per the results, the tests conducted fail to reject the null hypothesis. This implies that transformational leadership significantly moderates the positive relationship between competitive intensity and corporate entrepreneurship. Furthermore, both models have no multicollinearity, as the VIF values are below five (Kim, 2019).

5.6 Conclusion

In conclusion, this chapter presented the data collected following the analysis. It included first running the pre-tests to measure the robustness of data, deleting items from the questionnaire that would be immaterial for analysis, and conducting the tests

required to test the hypotheses. The results suggested that all hypotheses were supported (Table 43). The next chapter will therefore focus on linking the literature (Chapter 2) with the results to discuss findings from this study.

Table 43: Hypotheses summary

Hypothesis	**Correlation (p-value)**	**Supported / Not Supported**
H1	.550 (p <.000)	Supported
$H1_a$	.581 (p <.000)	Supported
$H1_b$	.361 (p <.000)	Supported
$H1_c$	.323 (p <.000)	Supported
H2	.607 (p <.000)	Supported
$H2_a$	.640 (p <.000)	Supported
$H2_b$	.449 (p <.000)	Supported
$H2_c$	.429 (p <.000)	Supported

CHAPTER 6: DISCUSSION

6.1 Introduction

This study aimed to test the moderating role of transformational leadership on the positive relationship between environmental turbulence, its subcontracts, and corporate entrepreneurship. This study has provided a literature review, elaborating on the relationships between the different constructs introduced and argued in Chapter 2. Following these relationships, hypotheses were generated, formulating the proposed model presented in Chapter 3. The research design and methodology devised the tools and techniques required to collect the data and conduct pre and post-tests to validate if the hypotheses are significant and if the proposed model holds.

This chapter summarises the results obtained in Chapter 5 and then argues the extent to which the proposed model was justified. The chapter starts by providing a comprehensive overview of both pre and post-test conducted. It then brings back the proposed model, showing the strengths and significance of the proposed relationships and whether they were supported.

A detailed analysis of each test is then conducted, providing insights that support or contradict the views from the presented literature review in Chapter 2. This will include discussing the pre-tests conducted and the hypothesised relationships.

6.2 Summary of the results

This section considers all the tests conducted in Chapter 5 of this study, and Table 44 presents a tabulated view of all the results obtained. This is to assist the reader take stock of all the tests and results at a glance. As discussed in Chapter 5 of this study, the results were separated into two major groups: the pretest results, which tested the robustness of the collected data and ensured that the chosen approach would respond to the main research question. This was followed by the post-test results, which ultimately tested the hypotheses presented in Chapter 3.

Table 44: Results summary

Data preparation		
Test	**Results**	**Comments**
Filtered data	There was a total of 178 respondents that responded to the questionnaire. However, only 156 (87.6%) were considered for analysis after removing those that did not qualify for analysis.	The disqualified respondents were one's that were: • Used for the pilot study. • Did not work in the SA market. • Did not have a 1-up manager.
MCAR	There were no values missing at random.	The Little's Missing Completely at Random test was conducted.
Respondent misconduct	All responses from each respondent had a standard deviation >.25	There was no data deleted as a result of respondent misconduct.
Demographic analysis		
Gender, Age, Role, Qualification, Tenure, Province, Sector, Industry, OrgAge, OrgSize	Multiple results were generated from IMB ® SPSS ®, and data was represented in frequency tabular format.	These tests will be discussed in some detail in the upcoming sections.
Pre-tests		
Common method bias (CMB)	% of variance = **24.754**	• This is less than the threshold of 50% suggested by the literature. • **The test was successful.**
Test for normality	For all items: Skewness: -1.551 < z < .254 Kurtosis: -1.291 < z < 1.923	• Literature suggests an acceptable range of: ○ Skewness: -2.00 < z < 2.00 ○ Kurtosis: -7.00 < z < 7.00 • Range within limits. Therefore, (1) data is **normally distributed**, (2) parametric tests can be conducted.
Reliability tests (Cronbach's alpha)	For all constructs: .703 < α < .934	• Literature suggests at least α >= .70. • MT6 was removed to improve α. • TT5 and CI6 were reverse-coded. • Data **passed the reliability test**.
EFA (subconstruct level)	For all subconstructs: .634 < KMO < .805	• Literature suggests at least KMO >= .50. • TT3 was removed as it a loaded in two components.
EFA (construct level)	For all constructs: .620 < KMO < .854	• Literature suggests at least KMO >= .50. • **Factor loadings concluded**.
Convergent validity (AVE)	For all subconstructs: .522 < AVE < .883	• Literature suggests at least AVE >= .50. • **AVE is acceptable**.

Pre-tests *continues….*		
Test	**Results**	**Comments**
Discriminant validity (HTMT)	For all subconstructs: .723 < HTMT < .940	• Literature suggests at least HTMT >= .70. • **HTMT is acceptable**.
Composite reliability (CR)	For all subconstructs: .741 < CR < .952	• Literature suggests at least CR >= .70. • **CR is acceptable**.
Hypotheses testing		
Test	**Results**	**Comments**
H1	.550 (p <.000)	Hypothesis supported
$H1_a$	.581 (p <.000)	Hypothesis supported
$H1_b$	.361 (p <.000)	Hypothesis supported
$H1_c$	.323 (p <.000)	Hypothesis supported
H2	.607 (p <.000)	Hypothesis supported
$H2_a$	.640 (p <.000)	Hypothesis supported
$H2_b$	.449 (p <.000)	Hypothesis supported
$H2_c$	.429 (p <.000)	Hypothesis supported

6.3 Final model

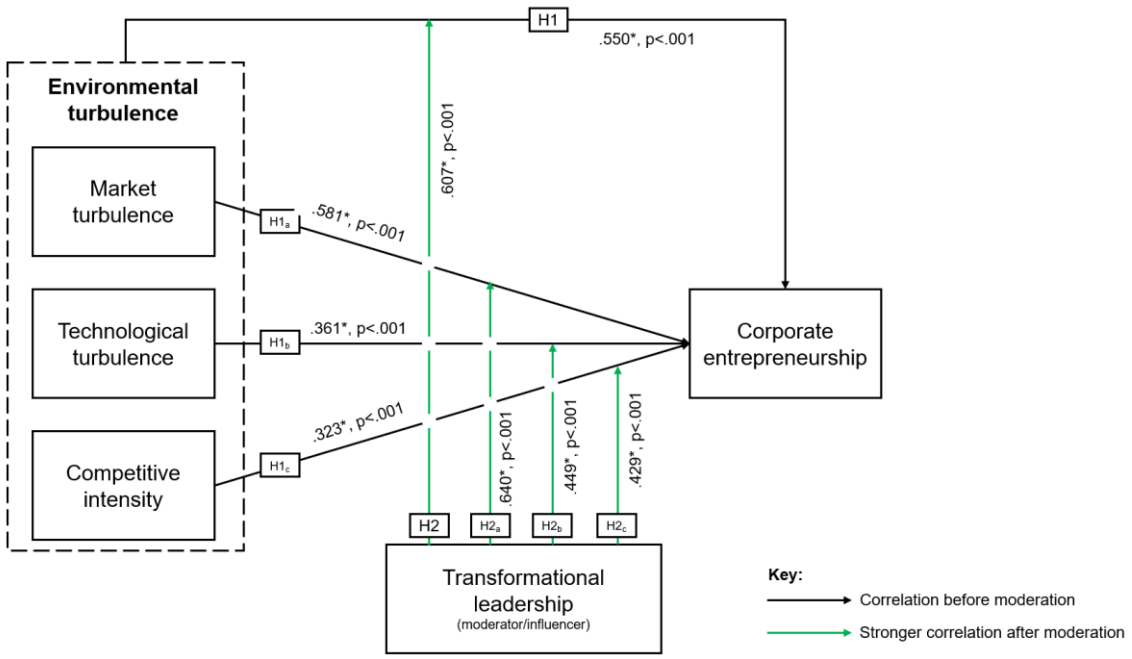

Figure 4: Final model based on results

Figure 4 provides an improved summary of the research results based on the model and hypotheses presented in Chapter 3. The black arrows represent the correlation between constructs before the moderation effect was introduced, whereas the green arrows illustrate the same correlations after the introduction of the moderator. The output depicts a significant correlation between all the hypothesised relationships, and their strengths are improved when the moderator is introduced. Other findings emerged from the analysis and will be discussed in detail in section 6.7 of this chapter.

6.4 Data preparation

There were 178 respondents, of which, after the data clean-up, only 156 (87.6 per cent) could be utilised in the study. Since this study used non-probability sampling for data collection, the sample size was informed by previous studies.

For example, studies in this field have presented sample sizes of over 200 respondents (Auh & Menguc, 2005; Wang et al., 2015; Li, 2022). In contrast, Wang et al. (2021) studied the relationship between environmental turbulence and entrepreneurial orientation with a sample size of 94 respondents. Similarly, Zahra (1993) and Lee et al. (2019), on the other hand, had sample sizes of 102 and 119, respectively, studying some of the constructs presented in this study and the relationships between them. Furthermore, other studies that introduced a moderating role presented sample sizes of 154 (Tsai & Yang, 2013), suggesting the 156 used in this study was sufficient to perform the analysis and draw conclusions.

6.5 Demographics

There were ten demographic questions presented in the questionnaire. These were asked to ensure that:

- Respondents who did not fit the profile required for the study could be identified and excluded for analysis, and
- The profile of each respondent could be well understood to ensure they are well-equipped to comprehend the questions and constructs presented in the questionnaire. These are discussed in detail below.

For example, observing the sample and South African population. There was an almost even split between the gender categories that responded to the survey. About 53.8 per cent of the respondents were female, and the balance was made up of male respondents (Table 1). This meant that the responses were not biased to one sex and did indeed align with statistical ratios as presented by StatSA (2022), which acknowledges a South African population dominated by female groups. Furthermore, Gauteng and Kwa-Zulu Natal are the two most populated provinces in the country, which is also displayed by this study's data, recording 79.5 and 10.9 per cent, respectively (Table 6). Moreover, Table 2 illustrates the age group between 25 – 44, which dominates the responses and represents the South African population (StatsSA, 2022).

There are other exciting outputs from the demographic data. Table 3 and Table 4 illustrate the respondents' role distribution and highest qualification, respectively. Over three-quarters of the respondents are middle management and higher, and more than 95 per cent have attended post-matric schooling. This may imply that the respondents were well equipped to have some context on the questions that responded to the individual constructs.

Furthermore, Table 5 suggests that just 13.5 per cent of the respondents had spent less than a year within their organisations at the time of the survey. In contrast, at least 86.5 per cent had spent over one year concluding that they understood their organisations and the industries they operated under to comprehend the survey questions in their organisational context. In addition, 84 per cent of the respondents represented the private sector in South Africa, a sector that appreciates environmental turbulence and corporate entrepreneurship.

In conclusion, demographic data is crucial in statistical analysis. It creates context and meaning for the data studied. Based on this demographic data, this study argues that (1) it does represent the South African population, the country investigated in this study, (2) the sample is well equipped to respond to the questions in the survey, and therefore the data can be accepted for further statistical analysis.

6.6 Hypothesis testing

6.6.1 Hypothesis 1

H1: Environmental turbulence has a positive relationship to corporate entrepreneurship.

This study hypothesised a positive relationship between environmental turbulence and corporate entrepreneurship. In developing this hypothesis, this study argued how turbulent environments threaten the organisation's survival, forcing organisations to inhibit an entrepreneurial mindset from surviving and thriving. Zahra (1991) and Wang et al. (2021) argue that the organisation's internal and external environments shape its entrepreneurial mindset. More turbulent environments lead to increased corporate entrepreneurship than less turbulent environments (McCarthy et al., 2018; Lee & Trimi, 2021), with other scholars arguing the importance of corporate entrepreneurship even under stable, less turbulent environments (Helfat & Winter, 2011; Protogerou et al., 2012; Zhou et al., 2019b).

An organisation is considered entrepreneurial if it exhibits elevated levels of entrepreneurial orientation (Kreiser et al., 2021). The term entrepreneurial orientation was introduced in earlier work by Covin & Slevin (1989), who were consistent with the theory from Miller (1983). In their arguments, they characterised entrepreneurial orientation as comprising of three unidimensional dimensions, innovativeness, proactiveness and risk-taking. As the studies in this field developed, corporate entrepreneurship became another term used in literature to describe entrepreneurial orientation (Ireland et al., 2009; Kreiser et al., 2021).

Therefore, this study adopted these views to argue that corporate entrepreneurship is a construct comprising three dimensions: innovativeness, proactiveness and risk-taking. The items that measured each dimension were subjected to a dimension reduction process using exploratory factor analysis (EFA), which led to KMO test results of .650, and a 71.68 per cent variance, which meant that the three dimensions explain 71.68% of the variance in corporate entrepreneurship.

Similarly, environmental turbulence theory has consistently recognised market and technological turbulence as the dimensions that explain this construct (Calantone et al., 2003; Auh & Menguc, 2005; Lichtenthaler, 2009; Hung & Chou, 2013; Zhou et

al., 2019a). However, a third aspect, competitive intensity, was hypothesized through the work of Jaworski & Kohli (1993) and has since been widely explored in literature. Like in the corporate entrepreneurship construct, the items that measured each dimension were subjected to a dimension reduction process using EFA, which led to KMO test results of .620, and a 59.05 per cent variance. This means that the three dimensions explain 59.05% of the variance in environmental turbulence.

This study has recognised the resounding literature surrounding the relationship between corporate entrepreneurship and organisational/firm performance (Zahra, 1993; Lee et al., 2019). However, it has argued that limited attention has been given to the antecedents of corporate entrepreneurship, in which this study explored environmental turbulence.

After testing the first hypothesis (H1), Pearson's correlation was R =.550 (at p <.001) and an R squared value of 30.2 per cent. This suggests that environmental turbulence explains 30.2% of the variability of corporate entrepreneurship.

Therefore, the results indicated that there is indeed a moderate, significant positive correlation between environmental turbulence and corporate entrepreneurship.

The results are consistent with arguments in the literature that theorises that more turbulent environments lead to improved corporate entrepreneurship (Zahra, 1991; Calantone et al., 2003; Lichtenthaler, 2009; McCarthy et al., 2018; Lee & Trimi, 2021). Although the results suggest a significant relationship between environmental turbulence and corporate entrepreneurship, a 69.8% variability is still not explained. An introduction of a moderating variable may assist improve this relationship. This is what this study aims to test, and the moderator will be introduced under H2 to test if the relationship and variance explained improves.

6.6.1.1 Hypothesis 1a

H1a: Market turbulence has a positive relationship to corporate entrepreneurship.

After conducting some extensive literature review, this study has further hypothesised that there is a positive relationship between market turbulence, a subdimension of environmental turbulence, and corporate entrepreneurship. During market turbulence, more frequent and rapid customer needs, cost composition and

price demand are eminent (Calantone et al., 2003; Wang et al., 2015), forcing organisations to differentiate themselves to stay ahead of the competition (Li, 2022).

Market turbulence ultimately measures the extent to which customer needs change over time (Jaworski & Kohli, 1993). The measure of market turbulence was adopted from the scale used by Jaworski & Kohli (1993), which has been widely used in literature (e.g., Jaworski & Kohli, 1993; Lichtenthaler, 2009; Bodlaj & Čater, 2019; Zhou et al., 2019a, Alqahtani & Uslay, 2020). In the scale, six items measure market turbulence. Firstly, the reliability of the scale was tested. The Cronbach's alpha obtained using the six items was .688, consistent with Jaworski & Kohli (1993). However, in this study, the last item was removed to improve the scale's reliability to .767, slightly better than the value obtained by Lichtenthaler (2009) of $\alpha = .730$.

These final five items were subjected to a dimension reduction process using EFA, which led to KMO test results of .773, and a 52.25 per cent variance. This means that the five remaining items explain at least 52.25% of the variance in market turbulence.

As in environmental turbulence, a regression analysis was performed to test the relationship between market turbulence and corporate entrepreneurship. After testing this hypothesis (H1a), Pearson's correlation was $R = .581$ (at $p < .001$) and an R squared value of 33.7 per cent, which suggests that market turbulence explains 33.7% of the variability of corporate entrepreneurship.

The final results indicated that there is indeed a moderate, significant positive correlation between market turbulence and corporate entrepreneurship.

These results support the literature that argues that market turbulence leads to corporate entrepreneurship (Wang et al., 2015). In their study, Ch'Ng et al. (2021) also support this argument, just as Tsai & Yang (2013) and Zhou et al. (2019b). However, although the results suggest a significant, positive relationship between market turbulence and corporate entrepreneurship, there is still 66.3% variability that is not explained. This study introduces a moderator to test H2a, and whether the relationship and variance have improved.

6.6.1.2 Hypothesis 1b

H1b: Technological turbulence has a positive relationship to corporate entrepreneurship.

After going through the literature, the second sub-hypothesis presented a positive relationship between technological turbulence, a subdimension of environmental turbulence, and corporate entrepreneurship. This study has presented literature that argues that, under high technological turbulence, creativity is elevated, leading towards corporate entrepreneurship (Moorman & Miner, 1997; Hanvanich et al., 2006; Lee & Tang, 2017), as compared to organisations operating under low technological environments (Miller, 1987; Slater & Narver, 1994).

Literature has argued that technological turbulence measures the degree of technological change among organisations within an industry (Jaworski & Kohli, 1993; Huang & Tsai, 2014; Zhou et al., 2019a). To operationalise it, it is measured using a five-item, widely accepted measurement tool, as in studies by Jaworski & Kohli (1993) and, Lichtenthaler (2009).

Firstly, to obtain the construct's Cronbach's alpha, the last question was reverse-coded, which makes it more affirmative like the other questions in the scale. This was also consistent with other scholars who measured the same dimension (e.g., Lichtenthaler, 2009). After reverse coding, Cronbach's alpha was .703. This indicated proceeding with the scale and was consistent with the reliability results obtained in similar studies which tested this dimension, for example, Jaworski & Kohli (1993), who obtained a value of $\alpha = .720$. To further test the scale, the five items were subjected to a dimension reduction process using EFA, which led to the deletion of the third item, TT3, loaded on two components. The KMO test result was then .734, with a 63.64 per cent variance. This means that the remaining four items explain at least 63.64% of the variance in technological turbulence.

A regression analysis was performed to test for the hypothesised relationship between technological turbulence and corporate entrepreneurship. After conducting this hypothesis (H1b), Pearson's correlation was $R = .361$ (at $p < .001$) and an R squared value of 13.0 per cent, which suggests that technological turbulence explains 13.0% in the variability of corporate entrepreneurship.

The final results indicated that there is indeed a weak, significant positive correlation between technological turbulence and corporate entrepreneurship.

This output is consistent with the literature, which argues that technological turbulence within an industry does indeed leads to corporate entrepreneurship (Moorman & Miner, 1997; Hanvanich et al., 2006; Lee & Tang, 2017). There are, however, concerns about the strength of the relationship and the unexplained variability of 87.0%. Therefore, this study introduces a moderator to test H2b and whether the relationship and variance have improved.

6.6.1.3 Hypothesis 1c

H1c: Competitive intensity has a positive relationship to corporate entrepreneurship.

Lastly, this study also hypothesised a positive relationship between competitive intensity, a subdimension of environmental turbulence, and corporate entrepreneurship. Competitive intensity is argued to exist in competitive environments with resource constraints (Lusch & Laczniak, 1989) and a lack of future growth opportunities (Auh & Menguc, 2005).

For contextualisation, competitive intensity measures the conduct, resources, and capability for differentiation in the market (Jaworski & Kohli, 1993; Arshad & Arshad, 2018; Zhou et al., 2019a). However, to operationalise, this study measured competitive intensity using a six-item scale adopted from Jaworski & Kohli (1993). To test for the subcontract's reliability, the last item in the scale was reverse coded, leading to a Cronbach's alpha of .782. A dimension reduction, through EFA, was then executed. The KMO output was .805, which is well beyond the accepted value in literature and a 48.05 per cent variance. Therefore, the items explain at least 48.05% of the variance in competitive intensity. The variance output was, however, a concern and subjected to further analysis through validity testing.

After conducting the validity test, the computed AVE (.481) was below the acceptable standard in the literature. To improve its validity, the last item, CI6, which had the lowest factor loading. It was, therefore, not included in the construct formulation. After this exercise, the AVE, HTMT and CR were at .524, .724 and .743, respectively.

Following these tests, a regression analysis was conducted to test for the

hypothesised relationship, H1c. Pearson's correlation was R =.323 (at p <.001) and an R squared value of 10.5 per cent, which suggests that competitive intensity explains 10.5% of the variability of corporate entrepreneurship.

The final results indicated a weak, significant positive correlation between competitive intensity and corporate entrepreneurship.

Early developments in this literature have argued that the degree of competitive intensity in the industry may require an organisation to adopt corporate entrepreneurship (Teng & Cummings, 2002). The results from this study align with the literature in that Tsai & Yang (2013) argue a position where there are some effects of corporate entrepreneurship under competitive intensity. This is also supported by later scholarly arguments, theorising that competitive intensity does indeed lead to corporate entrepreneurship (Zhou et al., 2019b). The correlation is relatively weak, and there is evidence of a high unexplained variance of 89.5%. This study will therefore introduce a moderating variable to test if the relationship can be strengthened, as hypothesised in H2c.

6.6.2 Hypothesis 2

Following the seminal work by Burns (1978), transformational leadership is widely accepted in literature. Since then, many studies in this domain of leadership have emerged, involving some of the great scholars in the field, such as Bass (1997), Bass (1999), Crede et al. (2019), Siangchokyoo et al. (2020) and Avolio et al. (1999). The literature in this domain has therefore given rise to multiple definitions of transformational leadership. In this study, transformational leadership is defined as the style of leadership where a "leader's support and encouragement raise the level of their morals, motivation, beliefs, perceptions, and association with the objectives of the organization" (Reza, 2019, p. 120).

Transformational leadership is strongly associated with strategic leadership, which is instrumental during environmental turbulence (Crossan et al., 2008). However, Wang et al. (2021) argue that leaders' limited level of awareness of the external environment. This style of leadership encourages organisational performance, and it can maintain a futuristic view, leading organisations during ever-changing, turbulent environments (Singh et al., 2020).

Contextually, Bass (1997) argued that there are four domains of transformational leadership, idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. To operationalise transformational leadership, a scale adopted from Boukamcha (2019) was utilised based on the work by Bass (1997), Avolio et al. (1999) and Bass & Avolio (2002). This scale argues that transformational leadership is a unidimensional construct comprising idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration dimensions.

The items that measured each dimension were subjected for reliability, validity, and dimension reduction process to obtain transformational leadership. The scale was considered reliable and valid with a Cronbach's alpha and AVE range from $.869 < \alpha < .934$ and $.795 < AVE < .883$, respectively. The dimension reduction process utilised exploratory factor analysis (EFA), which led to KMO test results of .854, and an 84.65 per cent variance, which meant that the four dimensions explain 84.65% of the variance in transformational leadership. These results were then accepted to represent the transformational leadership construct and used when measuring its moderating effect against the hypothesised relationships.

This study has argued that little attention has been given to the relationships hypothesised in Chapter 3, and the moderating role of transformational leadership has also received little to no attention. Furthermore, the relationships tested between H1, H1a, H1b and H1c have shown weak to moderate correlations with low variances. The following hypotheses, H2, H2a, H2b and H2c, aim to test the moderating effect of transformational leadership, hypothesising that it should strengthen these relationships (McDonal, 1994).

H2: Transformational leadership moderates the positive relationship between environmental turbulence and corporate entrepreneurship.

In order to introduce the moderating effect, an interacting variable between the independent variable and the moderator needed to be computed, which is purely the product of environmental turbulence and transformational leadership. Once the interacting variable was computed, a stepwise hierarchal linear regression analysis was conducted to test H2 (Li, 2022).

After this test, Pearson's correlation improved from $R = .550$ to $R = .607$ at $p = .000$,

which is significant. This implies a significant correlation between environmental turbulence and corporate entrepreneurship, improving the strength of the relationship from a moderate to a strong correlation. Furthermore, the R squared improved from R squared =.302 to R squared =.368, concluding that environmental turbulence now explains 36.8% of the variability of corporate entrepreneurship, from 30.2%. Multicollinearity was also observed and recorded at IVF = 1.00 on the main relationship and IVF = 1.62 with the introduction of moderation. These results concluded that there is no multicollinearity, suggesting that hypothesis testing and results interpretation can proceed (Hung & Chou, 2013).

Previous studies have looked at the role played by transformational leadership in transforming organisations even during environmental turbulence (Hornsby et al., 2002; Buil et al., 2019). To this study's knowledge, there has been limited research in the context of measuring the moderating effect of transformational leadership on the relationships under H1, H1a, H1b and H1c, meaning comparison and contrasts to previous research will prove to be a challenge (Gemici & Zehir, 2021). However, it is expected that by introducing a moderator, the form and/or strength of a relationship between a dependent and independent variable will be modified (McDonald, 1994).

Therefore, based on the results, it can be concluded that transformational leadership indeed moderates the positive relationship between environmental turbulence and corporate entrepreneurship.

6.6.2.1 Hypothesis 2a

H2a: Transformational leadership moderates the positive relationship between market turbulence and corporate entrepreneurship.

Transformational leadership is again introduced as a moderator to test its moderating effect on the relationship between market turbulence, a dimension of environmental turbulence, and corporate entrepreneurship. It is expected that by the moderator's introduction, the form and/or strength of a relationship between a dependent and independent variable will be modified (McDonald, 1994).

After this test, Pearson's correlation improved from R =.581 to R = .640, at p =.000.

This implies a significant correlation between market turbulence and corporate entrepreneurship, improving the strength of the relationship from a moderate to a strong correlation. Furthermore, the R squared improved from R squared =.337 to R squared =.401, concluding that market turbulence now explains 40.1% of the variability of corporate entrepreneurship, from 33.7%. Multicollinearity was also observed and recorded at IVF = 1.00 on the main relationship and IVF = 1.94 with the introduction of moderation. These results concluded that there is no multicollinearity, suggesting that hypothesis testing and results interpretation can proceed (Hung & Chou, 2013).

Therefore, based on the results, it can be concluded that transformational leadership moderates the positive relationship between market turbulence and corporate entrepreneurship. This supports the literature that argues that the introduction of moderation modifies the form and/or strength of a relationship between a dependent and independent variable (McDonald, 1994).

6.6.2.2 Hypothesis 2b

H2b: Transformational leadership moderates the positive relationship between technological turbulence and corporate entrepreneurship.

Transformational leadership is again introduced as a moderator to test its moderating effect on the relationship between technological turbulence, a dimension of environmental turbulence, and corporate entrepreneurship. It is expected that by the moderator's introduction, the form and/or strength of a relationship between a dependent and independent variable will be modified (McDonald, 1994).

After this test, Pearson’s correlation improved from R =.361 to R = .449 at p =.000. This implies that there is a significant correlation between technological turbulence and corporate entrepreneurship; however, in this case, the strength of the relationship has improved from a weak to a moderate correlation. Furthermore, the R squared improved from R squared =.130 to R squared =.202, concluding that technological turbulence now explains 20.2% of the variability of corporate entrepreneurship, from 33.7%. Multicollinearity was also observed and recorded at IVF = 1.00 on the main relationship and IVF = 1.90 with the introduction of moderation. These results concluded that there is no multicollinearity, suggesting

that hypothesis testing and results interpretation can proceed (Hung & Chou, 2013).

Therefore, based on the results, it can be concluded that transformational leadership moderates the positive relationship between technological turbulence and corporate entrepreneurship. This supports the literature that argues that the introduction of moderation modifies the form and/or strength of a relationship between a dependent and independent variable (McDonald, 1994).

6.6.2.3 Hypothesis 2c

H2c: Transformational leadership moderates the positive relationship between competitive intensity and corporate entrepreneurship.

Transformational leadership is again introduced as a moderator to test its moderating effect on the relationship between competitive intensity, a dimension of environmental turbulence, and corporate entrepreneurship. It is expected that by the moderator's introduction, the form and/or strength of a relationship between a dependent and independent variable will be modified (McDonald, 1994).

After this test, Pearson's correlation improved from R =.323 to R = .429 at p =.000. This implies a significant correlation between competitive intensity and corporate entrepreneurship, improving the strength of the relationship from a weak to a moderate correlation. Furthermore, the R squared improved from R squared =.105 to R squared =.184, concluding that competitive intensity now explains 18.4% of the variability of corporate entrepreneurship, from 10.5%. Multicollinearity was also observed and recorded at IVF = 1.00 on the main relationship and IVF = 2.00 with the introduction of moderation. These results concluded that there is no multicollinearity, suggesting that hypothesis testing and results interpretation can proceed (Hung & Chou, 2013).

Therefore, based on the results, it can be concluded that transformational leadership moderates the positive relationship between competitive intensity and corporate entrepreneurship. This supports the literature that argues that the introduction of moderation modifies the form and/or strength of a relationship between a dependent and independent variable (McDonald, 1994).

6.7 Additional findings

This study further discusses two interesting outputs from the study. The first scenario involves the introduction of transformational leadership as a moderator on the relationship between technological turbulence and corporate entrepreneurship, H2b. The second scenario involves the introduction of transformational leadership as the moderator. However, in this case, between competitive intensity and corporate entrepreneurship relationship, H2c.

The results in the first scenario proved that the relationship between technological turbulence and corporate entrepreneurship was insignificant, at p = .280. However, after the introduction of transformational leadership, the relationship became significant, at p = .000. It was presented earlier that technological turbulence measures the degree of technological change within the industry (Jaworski & Kohli, 1993; Huang & Tsai, 2014; Zhou et al., 2019a). Therefore, this suggests that organisations in the South African context do not appreciate the change brought by technological turbulence. It is only through transformational leadership that it is recognised and appreciated.

It was interesting to note that more than half of the respondents came from the mining, energy, oil & gas, and financial services & insurance industries, which made up 20.5 per cent and 32.7 per cent, respectively. One would expect the financial services & insurance industries to be more technologically inclined, and of course, in contrast, mining, energy, oil and gas industries to be less inclined to technological changes. This study did not go to the extent of controlling any of the variables. It would, however, advise future studies to test the outputs from this test. Nevertheless, this study can argue that transformational leadership is indeed instrumental in shaping organisations to appreciate technological turbulence, which fosters corporate entrepreneurship, supported by the moderating effect results, as discussed in detail under section 6.6.2.2.

The results in the second scenario proved that the relationship between competitive intensity and corporate entrepreneurship was insignificant, at p = .699. However, after the introduction of transformational leadership, the relationship became significant, at p = .000. It was presented in preceding sections that competitive intensity indicates the intensity of inter-organisational rivalry within the industry

(Jaworski & Kohli, 1993; Cui et al., 2005; Auh & Menguc, 2005; Li et al., 2008; Turulja & Bajgoric, 2018). These results suggest that organisations in the South African context do not appreciate the intensity of the industry rivalry, and it is only through transformational leadership that this is appreciated.

Over a fifth of the respondents represented the mining, energy, oil & gas industries, which can be considered less competitive in the South African context. This also goes for construction (5.8 per cent), healthcare & social assistance (5.8 per cent), and to some degree, manufacturing (13.5 per cent), which could have steered the results to represent this finding. This study suggests future exploration by controlling the industry variable. However, it can conclude that transformational leadership is indeed instrumental in shaping organisations to appreciate the competitive intensity, which then fosters corporate entrepreneurship, supported by the moderating effect results, as discussed in detail under section 6.6.2.3.

6.8 Conclusion

This chapter presented the summary of the results and discussions thereof. It first provided the overall summary of all the tests conducted and the interpretation of the results. It then provided final model, showing correlations and the significance in the relationships. It then provided a section that covered how the data was prepared, followed by the demographic data analysis. The hypotheses results were then discussed in detail, agreeing and contrasting where possible. Lastly, some interesting results, those not mentioned in earlier sections, were discussed. The closing chapter will cover the study's overall conclusion, providing a brief discussion and recommendations for future studies.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

Chapter 7 presents the last and final chapter of this study, which is ultimately the primary conclusion of this study. The chapter will start by providing general conclusions based on this study's intent and its findings. Based on the findings presented in this study, this chapter will provide a perspective on the academic and management implications. A section highlighting some of the identified limitations will also be included, concluding with a section presenting recommendations for future research.

7.2 General conclusions

The study's main objective was to understand the moderating role of transformational leaders in the relationship between environmental turbulence and corporate entrepreneurship. The hypotheses and proposed model were generated after an extensive literature review and are presented in Chapter 3. The final model is presented in Chapter 6, Figure 4, based on the bivariate, stepwise hierarchical regression results presented in Chapter 5.

Existing instruments that measured the three constructs investigated in this study, corporate entrepreneurship, environmental turbulence, and transformational leadership, were used to ultimately respond to the main research question and the hypotheses presented in Chapter 3. Each of the instruments demonstrated good reliability and validity in the context of this study and therefore justified use to test the hypotheses in order to provide insights on the findings. This study was motivated based on prior research, which identified two fundamental gaps in the corporate entrepreneurship literature. A gap that:

- aimed to explore the antecedents of corporate entrepreneurship, which will ultimately improve its consequential outcomes (Urbano et al., 2022; Wang et al., 2021), and;
- addresses related organisational factors, which aim to improve the relationship between its antecedents, and environmental turbulence being the chosen antecedent in the case of this study (Gemici & Zehir, 2021; Wang et al., 2021).

This study operated on a central theory that argued that transformational leadership moderates the positive relationship between environmental turbulence, its subdimensions, and corporate entrepreneurship. The subdimensions for environmental turbulence were adopted from previous research in this field and presented as (1) market turbulence, which measures the unprecedented nature of customer demands; (2) technological turbulence, which addresses technological advancements within the industry; and (3) competitive intensity, which relates to the rivalry within the industry (Jaworski & Kohli, 1993; Wang et al., 2021).

The study, therefore, used survey data solicited from a sample of 156 individuals working in organisations within the South African market across different industries for analysis. Afterwards, a bivariate regression analysis and a bivariate stepwise hierarchal linear regression analysis were executed to test the hypotheses presented in Chapter 3.

The first main hypothesis, H1, aimed to test the relationship between environmental turbulence and corporate entrepreneurship. After running the bivariate regression, the results proved that there was indeed a moderate, significantly positive relationship between environmental turbulence and corporate entrepreneurship. The results were consistent with the prior studies from the literature. For example, the literature argues that higher turbulent environments would lead to improved corporate entrepreneurship (Zahra, 1991; Calantone et al., 2003; Lichtenthaler, 2009; McCarthy et al., 2018; Lee & Trimi, 2021).

Moreover, this is also consistent with earlier studies from Lichtenthaler (2009), who reported that, during environmental turbulence, causal uncertainty intensifies, and the competitor's ability to replicate the organisation's strategy decreases, leading to corporate entrepreneurship. Organisations must, in fact, adopt corporate entrepreneurship during turbulent environments, as they need to respond swiftly to customer demands (Calantone et al., 2003), as this will lead to long-term strategic success (Jiménez-Jiménez & Sanz-Valle, 2011).

The first sub-hypothesis to H1, H1a, aimed to test the relationship between market turbulence and corporate entrepreneurship. After running the bivariate regression, the results proved that there was indeed a moderate, significantly positive

relationship between market turbulence and corporate entrepreneurship. These results were consistent with prior literature on these variables, which argued that market turbulence does lead to corporate entrepreneurship (Tsai & Yang, 2013; Wang et al., 2015; Zhou et al., 2019b; Ch'Ng et al., 2021).

The second sub-hypothesis to H1, H1b, aimed to test the relationship between technological turbulence and corporate entrepreneurship. After running the bivariate regression, the results proved a weak, significantly positive relationship between technological turbulence and corporate entrepreneurship, consistent with arguments from previous studies (Moorman & Miner, 1997; Hanvanich et al., 2006; Lee & Tang, 2017).

The third sub-hypothesis to H1, H1c, aimed to test the relationship between competitive intensity and corporate entrepreneurship. After running the bivariate regression, the results proved a weak, significantly positive relationship between competitive intensity and corporate entrepreneurship, consistent with arguments from previous studies (Teng & Cummings, 2002; Zhou et al., 2019b).

The second main hypothesis, H2, introduced a moderating variable, transformational leadership. It aimed to test the moderating role of transformational leadership on the relationship between environmental turbulence and corporate entrepreneurship. The introduction of moderation resulted in executing a bivariate stepwise hierarchical linear regression for analysis. The results proved that transformational leadership significantly moderates the positive relationship between environmental turbulence and corporate entrepreneurship, changing the strength from a moderate to strong correlation. These results are consistent with the literature, arguing that the introduction of moderation between variables modifies a relationship's form and/or strength (McDonald, 1994).

The first sub-hypothesis to H2, H2a, aimed to test the moderating role of transformational leadership on the relationship between market turbulence and corporate entrepreneurship. The introduction of moderation resulted in executing a bivariate stepwise hierarchical linear regression for analysis. The results proved that transformational leadership significantly moderates the positive relationship between market turbulence and corporate entrepreneurship, changing the strength from a

moderate to strong correlation. These results are consistent with the literature, arguing that the introduction of moderation between variables modifies a relationship's form and/or strength (McDonald, 1994).

The second sub-hypothesis to H2, H2b, aimed to test the moderating role of transformational leadership on the relationship between technological turbulence and corporate entrepreneurship. Similarly, the introduction of moderation resulted in executing a bivariate stepwise hierarchical linear regression for analysis. The results proved that transformational leadership significantly moderates the positive relationship between technological turbulence and corporate entrepreneurship. However, in this scenario, the strength changed from a weak to moderate correlation. These results are also consistent with the literature, arguing that the introduction of moderation between variables modifies a relationship's form and/or strength (McDonald, 1994).

The third and last sub-hypothesis to H2, H2c, aimed to test the moderating role of transformational leadership on the relationship between competitive intensity and corporate entrepreneurship. Similarly, the introduction of moderation resulted in executing a bivariate stepwise hierarchical linear regression for analysis. The results also proved that transformational leadership significantly moderates the positive relationship between competitive intensity and corporate entrepreneurship. However, in this instance, the strength changes from a weak to moderate correlation. These results are consistent with the literature, arguing that the introduction of moderation between variables modifies a relationship's form and/or strength (McDonald, 1994).

7.3 Academic implications

This study tested the relationships between an antecedent of corporate entrepreneurship, which was environmental turbulence and its subdimensions, and also introduced transformational leadership to moderate the relationship between the two variables. Although this study supports the intense focus on corporate entrepreneurship and its consequences, it believes that more focus must also be afforded to the antecedents of corporate entrepreneurship and constructs that will help strengthen these relationships.

Although the introduction of transformational leadership improved correlation strengths, in each of the relationships hypothesised, there was still a high unexplained variability recorded in each relationship. This could be argued to have been one of many reasons. For example, the sample size might not have been large enough, impacting the results, or the time in which the data was collected, in this case, during the pandemic.

Nonetheless, this does not change the fact that introducing a “sufficient” moderator between corporate entrepreneurship and its antecedent may result in improved predictability of corporate entrepreneurship. Accordingly, this may lead to improved relationships between corporate entrepreneurship and its consequential variables.

7.4 Business and managerial implications

Turbulent environments, such as the global economic crisis in 2008, the 2015/16 stock market selloff, and the more recent COVID-19, require organisations to re-think how they would traditionally operate to remain competitive in the markets they serve. The environments under which organisations operate are constantly changing at extraordinary magnitudes and unimaginable speeds (Brosseau et al., 2019). These changes, therefore, result in complex market environments developing at an unprecedented pace, increasing uncertainty in the marketplace (Lee & Trimi, 2021).

This, therefore, calls for urgent, impactful corporate entrepreneurship that will assist organisations in maintaining a competitive advantage in their respective markets (Bello et al., 2020). Therefore (1) adaptability becomes key, (2) deploying innovative solutions also becomes key, and all of this needs to be implemented at increased speeds for organisations operating in volatile and dynamic environments (Aghina et al., 2018). This extends to all sectors, whether private, public, or non-profit (Veronica et al., 2020).

Leadership is also instrumental when leading organisations through volatile, unpredictable, and complex situations. This study argues that transformational leadership embodies an organisational mindset that creates a supportive environment for individuals and teams. Transformational leadership is also forward-thinking and can create a vision amidst turbulence.

Therefore, in conclusion, instead of viewing environmental turbulence as a threat, organisations must embrace it and, where possible, create it to become entrepreneurial. This requires visionary leadership, such as transformational leadership, which must help drive and support this notion. Transformational leadership led to improved outcomes, as it helped strengthen each of the hypothesised positive relationships from either weak to a moderate correlation or a moderate to a strong correlation. Through the existence of transformational leadership, organisations will be able to cater to the unprecedented nature of their customer demands (market turbulence), fast technological advancements (technological turbulence) and assist build resilience when there is rivalry within the industry (competitive intensity).

7.5 Study limitations

- The final sample size of n = 156 limited the data's robustness and the results' generalisability (Hair et al., 2010).
- This study utilised a non-probability sampling technique, which ultimately did not afford representation of all the organisations within the South African context to participate in the study.
- A cross-sectional study in this research limits any changes that may exist over time. Therefore, collecting data during a pandemic in a turbulent environment may lead to biased responses, which may be different in the case of no pandemic.
- Most of the responses were concentrated in Gauteng, which may lead to bias, although this represented the South African population.

7.6 Recommendations for future research

The main objective of this study was to understand the moderating role of transformational leadership in the relationship between environmental turbulence and corporate entrepreneurship. The study achieved its objective, proving that transformational leadership significantly moderates the relationship between environmental turbulence and its dimensions and corporate entrepreneurship.

However, the unexplained variability in each of the relationships was low. Future studies can look into (1) obtaining more samples to improve the regression results,

(2) collecting data under non-turbulent times, which may cause non-bias to the responses facilitated by the turbulent environment, or (3) introducing another moderator that is argued to improve the relationships between the independent and dependent variables.

Secondly, this study did not control any demographic data to test for differences measured against any of the constructs. Future studies can focus on these tests. The most prominent one would be to test the outcome of corporate entrepreneurship based on the age of organisations, respondent seniority within the organisation, or even the industry in which the organisation operates.

Thirdly, this study also found that organisations in the South African context did not appreciate technological turbulence. However, it was only after the introduction of transformational leadership that the relationship between technological turbulence and corporate entrepreneurship improved. Future studies can look into controlling industry type to measure technological turbulence outcomes and deduce if it may influence the outputs.

Similarly, this study also found that organisations in the South African context did not appreciate competitive intensity. However, it was only after the introduction of transformational leadership that the relationship between competitive intensity and corporate entrepreneurship improved. Future studies can look into controlling industry type to measure competitive intensity outcomes and deduce if it may influence the outputs.

REFERENCE LIST

Aghina, W., De Smet, A., Lackey, G., Lurie, M., and Muraka, M. (2018, January 22). The five trademarks of agile organizations. *McKinsey & Company*. https://www.mckinsey.com/business-functions/people-and-organizational-performance/our-insights/the-five-trademarks-of-agile-organizations

Al-Husseini, S., & Elbeltagi, I. (2016). Transformational leadership and innovation: A comparison study between Iraq's public and private higher education. *Studies in Higher Education*, *41*(1), 159-181. https://doi.org/10.1080/03075079.2014.927848

Alqahtani, N., & Uslay, C. (2020). Entrepreneurial marketing and firm performance: Synthesis and conceptual development. *Journal of Business Research, 113,* 62-71. https://doi.org/10.1016/j.jbusres.2018.12.035

Arshad, M. Z., & Arshad, D. (2018). Intellectual capital and SMEs performance in Pakistan: the role of environmental turbulence. *International Journal of Entrepreneurship, 22*(1), 1-14.

Auh, S., & Menguc, B. (2005). Balancing exploration and exploitation: The moderating role of competitive intensity. *Journal of Business Research, 58*(12), 1652–1661. https://doi.org/10.1016/j.jbusres.2004.11.007

Auh, S., & Menguc, B. (2005). The influence of top management team functional diversity on strategic orientations: The moderating role of environmental turbulence and inter-functional coordination. *International Journal of Research in Marketing, 22*(3), 333-350. https://doi.org/10.1016/j.ijresmar.2004.12.003

Avolio, B. J., Bass, B. M., & Jung, D. I. (1999). Re-examining the components of transformational and transactional leadership using the Multifactor Leadership. *Journal of occupational and organizational psychology*, *72*(4), 441-462. https://doi.org/10.1348/096317999166789

Babüroglu, O. N. (1988). The vortical environment: The fifth in the Emery-Trist levels of organizational environments. *Human Relations, 41*(3), 181-210. https://doi.org/10.1177/001872678804100301

Barringer, B. R., & Bluedorn, A. C. (1999). The relationship between corporate entrepreneurship and strategic management. *Strategic Management Journal, 20*(5), 421-444. https://doi.org/10.1002/(SICI)1097-0266(199905)20:5%3C421::AID-SMJ30%3E3.0.CO;2-O

Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations, 61*(8), 1139-1160. https://doi.org/10.1177/0018726708094863

Bass, B. M. (1997). Does the transactional transformational leadership paradigm transcend organizational and national boundaries? *American Psychologist, 52*(2), 130-139. https://psycnet.apa.org/doi/10.1037/0003-066X.52.2.130

Bass, B. M. (1999). Two decades of research and development in transformational leadership. *European Journal of Work and Organizational Psychology*, *8*(1), 9-32. https://doi.org/10.1080/135943299398410

Baumgartner, H., & Steenkamp, J.-B. E. M. (2001). Response styles in marketing research: A cross-national investigation. *Journal of Marketing Research, 38*(2), 143–156. https://doi.org/10.1509/jmkr.38.2.143.18840

Bello, J., Collins, S., Dreischmeier, R., & Libarikian, A. (2020, April 16). Innovating from necessity: The business-building imperative in the current crisis. *McKinsey Digital*. https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/innovating-from-necessity-the-business-building-imperative-in-the-

current-crisis
Bellstam, G., Bhagat, S., & Cookson, J. A. (2021). A text-based analysis of corporate innovation. *Management Science, 67*(7), 4004-4031. https://doi.org/10.1287/mnsc.2020.3682
Bilal, A. (n.d.). *Common method bias and Harman's single factor test.* [Video]. YouTube. https://www.youtube.com/watch?v=-RhxlC_3VIE
Bland, J. M., & Altman, D. G. (1997). Statistics notes: Cronbach's alpha. *British Medical Journal, 314*(7080), 572. https://doi.org/10.1136/bmj.314.7080.572
Bodlaj, M., & Čater, B. (2019). The impact of environmental turbulence on the perceived importance of innovation and innovativeness in SMEs. *Journal of Small Business Management, 57*(2), 417-435. https://doi.org/10.1111/jsbm.12482
Bonett, D. G., & Wright, T. A. (2000). Sample size requirements for estimating Pearson, Kendall and Spearman correlations. *Psychometrika*, *65*(1), 23-28.
Bonn, I., & Rundle-Thiele, S. (2007). Do or die – Strategic decision-making following a shock event. *Tourism Management*, *28*(2), 615-620. https://doi.org/10.1016/j.tourman.2006.04.021
Boone, C., Lokshin, B., Guenter, H., & Belderbos, R. (2019). Top management team nationality diversity, corporate entrepreneurship, and innovation in multinational firms. *Strategic Management Journal, 40*(2), 277-302. https://doi.org/10.1002/smj.2976
Boukamcha, F. (2019). The effect of transformational leadership on corporate entrepreneurship in Tunisian SMEs. *Leadership & Organization Development Journal, 40*(3), 286-304. https://doi.org/10.1108/LODJ-07-2018-0262
Bourgeois III, L. J., & Eisenhardt, K. M. (1988). Strategic decision processes in high velocity environments: Four cases in the microcomputer industry. *Management science, 34*(7), 816-835. https://doi.org/10.1287/mnsc.34.7.816
Brosseau, D., Ebrahim, S., Handscomb, C., & Thaker, S. (2019, May 10). The journey to an agile organisation. *McKinsey & Company*. https://www.mckinsey.com/business-functions/people-and-organizational-performance/our-insights/the-journey-to-an-agile-organization
Buganza, T., Dell'Era, C., & Verganti, R. (2009). Exploring the relationships between product development and environmental turbulence: The case of mobile TLC services. *Journal of Product Innovation Management*, *26*(3), 308-321. https://doi.org/10.1111/j.1540-5885.2009.00660.x
Buil, I., Martínez, E., & Matute, J. (2019). Transformational leadership and employee performance: The role of identification, engagement and proactive personality. *International Journal of Hospitality Management, 77*, 64-75. https://doi.org/10.1016/j.ijhm.2018.06.014
Burns, J. M. (1978). *Leadership*. Harper & Row.
Burton-Jones. (2009). Minimizing method bias through programmatic research. *MIS Quarterly, 33*(3), 445. https://doi.org/10.2307/20650304
Calantone, R., Garcia, R., and Droge, C. (2003). The effects of environmental turbulence on new product development strategy planning. *Journal of Product Innovation Management 20*, 90-103. https://doi.org/10.1111/1540-5885.2002003
Cano, C. R., Carrillat, F. A., & Jaramillo, F. (2004). A meta-analysis of the relationship between market orientation and business performance: Evidence from five continents. *International Journal of Research in Marketing,* 21(2), 179-200. https://doi.org/10.1016/j.ijresmar.2003.07.001
Ch'Ng, P., Cheah, J., & Amran, A. (2021). Eco-innovation practices and sustainable business performance: The moderating effect of market turbulence in the

Malaysian technology industry. *Journal of Cleaner Production, 283*, 1-11. https://doi.org/10.1016/j.jclepro.2020.124556

Chebbi, H., Yahiaoui, D., Sellami, M., Papasolomou, I., & Melanthiou, Y. (2020). Focusing on internal stakeholders to enable the implementation of organizational change towards corporate entrepreneurship: A case study from France. *Journal of Business Research, 119*, 209-217. https://doi.org/10.1016/j.jbusres.2019.06.003

Chen, W., & Hirschheim, R. (2004). A paradigmatic and methodological examination of information systems research from 1991 to 2001. *Information Systems Journal, 14*(3), 197-235. https://doi.org/10.1111/j.1365-2575.2004.00173.x

Chua, Y. P. (2013). *Mastering research statistics*. McGraw-Hill Education.

Covin, J. G., & Slevin, D. P. (1989). Strategic management of small firms in hostile and benign environments. *Strategic Management Journal, 10*(1), 75-87. https://doi.org/10.1002/smj.4250100107

Crede, M., Jong, J., & Harms, P. (2019). The generalizability of transformational leadership across cultures: A meta-analysis. *Journal of Managerial Psychology, 34*(3), 139-155. https://doi.org/10.1108/JMP-11-2018-0506

Crossan, M., Vera, D., & Nanjad, L. (2008). Transcendent leadership: Strategic leadership in dynamic environments. *The Leadership Quarterly, 19*(5), 569-581. https://doi.org/10.1016/j.leaqua.2008.07.008

Cui, A. S., Griffith, D. A., & Cavusgil, S. T. (2005). The influence of competitive intensity and market dynamism on knowledge management capabilities of multinational corporation subsidiaries. *Journal of International Marketing, 13*(3), 32–53. https://doi.org/10.1509/jimk.13.3.32

Dess, G. G., & Beard, D. W. (1984). Dimensions of organizational task environments. *Administrative science quarterly*, *29*, 52-73. https://doi.org/10.2307/2393080

Dost, M., Pahi, M. H., Magsi, H. B., & Umrani, W. A. (2019). Effects of sources of knowledge on frugal innovation: Moderating role of environmental turbulence. *Journal of Knowledge Management*, *23*(7), 1245-1259. http://dx.doi.org/10.1108/JKM-01-2019-0035

Emery, F. E., & Trist, E. L. (1965). The causal texture of organizational environments. *Human Relations, 18*(1), 21-32. https://doi.org/10.1177/001872676501800103

Fuey, G. S., & Idris, N. (2017). Assessing the validity of the element for pre-service mathematics teacher education curriculum. *International Journal of Academic Research in Business and Social Sciences, 7*(12), 284-295. http://dx.doi.org/10.6007/IJARBSS/v7-i12/3611

García-Morales, V. J., Jiménez-Barrionuevo, M. M., & Gutiérrez-Gutiérrez, L. (2012). Transformational leadership influence on organizational performance through organizational learning and innovation. *Journal of Business Research*, *65*(7), 1040-1050. https://doi.org/10.1016/j.jbusres.2011.03.005

Gemici, E., & Zehir, C. (2021). High-performance work systems, learning orientation and innovativeness: The antecedent role of environmental turbulence. *European Journal of Innovation Management.* https://doi.org/10.1108/EJIM-05-2021-0243

Grünbaum, N. N. (2007). Identification of ambiguity in the case study research typology: What is a unit of analysis? *Qualitative Market Research: An International Journal, 10*(1), 78–97. https://doi.org/10.1108/13522750710720413

Gumusluoğlu, L., & Ilsev, A. (2009a). Transformational leadership and organizational innovation: The roles of internal and external support for innovation. *Journal of Product Innovation Management*, *26*(3), 264-277. https://doi.org/10.1111/j.1540-5885.2009.00657.x

Gumusluoğlu, L., & Ilsev, A. (2009b). Transformational leadership, creativity, and organizational innovation. *Journal of Business Research*, *62*(4), 461-473. https://doi.org/10.1016/j.jbusres.2007.07.032

Guth, W. D., & Ginsberg, A. (1990). Guest editors' introduction: Corporate entrepreneurship. *Strategic Management Journal*, 5-15.

Hair Jr, J. F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research*, *109*, 101-110. https://doi.org/10.1016/j.jbusres.2019.11.069

Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modelling (PLS-SEM): An emerging tool in business research. *European Business Review, 26*(2), 106-121. https://doi.org/10.1108/EBR-10-2013-0128

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis: A Global Perspective*. Pearson Education International.

Hanvanich, S., Sivakumar, K., & Hult, G. T. M. (2006). The relationship of learning and memory with organizational performance: The moderating role of turbulence. *Journal of the Academy of Marketing Science, 34*(4), 600-612. https://doi.org/10.1177/0092070306287327

Heavey, C., & Simsek, Z. (2013). Top management compositional effects on corporate entrepreneurship: The moderating role of perceived technological uncertainty. *Journal of Product Innovation Management, 30*(5), 837–855. https://doi.org/10.1111/jpim.12033

Helfat, C. E., & Winter, S. G. (2011). Untangling dynamic and operational capabilities: Strategy for the (n) ever - changing world. *Strategic Management Journal, 32*(11), 1243–1250. https://doi.org/10.1002/smj.955

Hernon, P., & Schwartz, C. (2009). Procedures: research design. *Library and Information Science Research, 1*(31), 1–2. http://dx.doi.org/10.1016%2Fj.lisr.2008.10.005

Ho, J., & Plewa, C. (2020). Recipes for new product success: The interplay between orientations and environmental turbulence. *Journal of Business & Industrial Marketing, (35)*8, 1345-1357. https://doi.org/10.1108/JBIM-08-2019-0387

Hornsby, J. S., Kuratko, D. F., & Zahra, S. A. (2002). Middle managers' perception of the internal environment for corporate entrepreneurship: assessing a measurement scale. *Journal of business Venturing, 17*(3), 253-273. https://doi.org/10.1016/S0883-9026(00)00059-8

Huang, C. T., & Tsai, K. H. (2014). Synergy, environmental context, and new product performance: A review based on manufacturing firms. *Industrial Marketing Management, 43*(8), 1407-1419. https://doi.org/10.1016/j.indmarman.2014.06.010

Hung, K. P., & Chou, C. (2013). The impact of open innovation on firm performance: The moderating effects of internal R&D and environmental turbulence. *Technovation, 33*(10-11), 368-380. https://doi.org/10.1016/j.technovation.2013.06.006

Ireland, R. D., Covin, J. G., & Kuratko, D. F. (2009). Conceptualizing corporate entrepreneurship strategy. *Entrepreneurship Theory and Practice, 33*(1), 19–46. https://doi.org/10.1111/j.1540-6520.2008.00279.x

Jaworski, B. J., & Kohli, A. K. (1993). Market orientation: Antecedents and consequences. *Journal of Marketing, 57*(3), 53-70. https://doi.org/10.1177/002224299305700304

Jena, L. K., Pradhan, S., & Panigrahy, N. P. (2018). Pursuit of organisational trust:

Role of employee engagement, psychological well-being and transformational leadership. *Asia Pacific Management Review, 23*(3), 227-234. https://doi.org/10.1016/j.apmrv.2017.11.001

Jiménez-Jiménez, D., & Sanz-Valle, R. (2011). Innovation, organizational learning, and performance. *Journal of Business Research, 64*(4), 408–417. https://doi.org/10.1016/j.jbusres.2010.09.010

Kane, G. C., Nanda, R., Phillips, A. N., & Copulsky, J. R. (2021, October 26). Teaming your way through disruption. *Deloitte Insights Magazine*. https://www2.deloitte.com/za/en/insights/topics/strategy/cross-functional-collaboration.html

Khandwalla, P. N. (1976). Some top management styles, their context and performance. *Organization and Administrative Sciences, 7*(4), 21–51.

Khandwalla, P. N. (1977). *The design of organizations*. Harcourt Brace Jovanovich.

Kim, J. H. (2019). Multicollinearity and misleading statistical results. *Korean Journal of Anesthesiology, 72*(6), 558-569. https://doi.org/10.4097/kja.19087

Kirca, A. H., Jayachandran, S., & Bearden, W. O. (2005). Market orientation: A meta-analytic review and assessment of its antecedents and impact on performance. *Journal of Marketing*, 69(2), 24-41. https://doi.org/10.1509/jmkg.69.2.24.60761

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.

Klofsten, M., Urbano, D., & Heaton, S. (2021). Managing intrapreneurial capabilities: An overview. *Technovation, 99*, 102177. https://doi.org/10.1016/j.technovation.2020.102177

Kock, F., Berbekova, A., & Assaf, A. G. (2021). Understanding and managing the threat of common method bias: Detection, prevention and control. *Tourism Management, 86*, 1-10. https://doi.org/10.1016/j.tourman.2021.104330

Köhler, T., Landis, R. S., & Cortina, J. M. (2017). From the editors: Establishing methodological rigor in quantitative management learning and education research: The role of design, statistical methods, and reporting standards. *Academy of Management Learning & Education, 16*(2), 173–192. https://doi.org/https://doi-org.uplib.idm.oclc.org/10.5465/amle.2017.0079

Kreiser, P. M., Kuratko, D. F., Covin, J. G., Ireland, R. D., & Hornsby, J. S. (2021). Corporate entrepreneurship strategy: Extending our knowledge boundaries through configuration theory. *Small Business Economics, 56*(2), 739-758. https://doi.org/10.1007/s11187-019-00198-x

Kuratko, D. F., Hornsby, J. S., & Covin, J. G. (2014). Diagnosing a firm's internal environment for corporate entrepreneurship. *Business Horizons, 57*(1), 37-47. https://doi.org/10.1016/j.bushor.2013.08.009

Leckie, C., Nyadzayo, M. W., & Johnson, L. W. (2016). Antecedents of consumer brand engagement and brand loyalty. *Journal of Marketing Management*, *32*(5-6), 558-578. https://doi.org/10.1080/0267257X.2015.1131735

Lee, R. P. & Tang, X. (2017). Does it pay to be innovation and imitation oriented? An examination of the antecedents and consequences of innovation and imitation orientations. *Journal of Product Innovation Management, 35*(1), 11-26. https://doi.org/10.1111/jpim.12370

Lee, S. M., & Trimi, S. (2021). Convergence innovation in the digital age and in the COVID-19 pandemic crisis. *Journal of Business Research, 123*, 14-22. https://doi.org/10.1016/j.jbusres.2020.09.041

Lee, Y., Zhuang, Y., Joo, M., & Bae, T. J. (2019). Revisiting Covin and Slevin (1989): Replication and extension of the relationship between entrepreneurial orientation

and firm performance. *Journal of Business Venturing Insights, 12*, e00144. https://doi.org/10.1016/j.jbvi.2019.e00144

Li, J. J., Poppo, L., & Zhou, K. Z. (2008). Do managerial ties in China always produce value? Competition, uncertainty, and domestic vs. foreign firms. *Strategic Management Journal, 29*(4), 383–400. https://doi.org/10.1002/smj.665

Li, L. (2022). Digital transformation and sustainable performance: The moderating role of market turbulence. *Industrial Marketing Management, 104*, 28-37. https://doi.org/10.1016/j.indmarman.2022.04.007

Lichtenthaler, U. (2009). Absorptive capacity, environmental turbulence, and the complementarity of organizational learning processes. *Academy of Management Journal, 52*(4), 822-846. https://doi.org/10.5465/amj.2009.43670902

Little, R. J. A. (1988). A Test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198-1202. http://dx.doi.org/10.1080/01621459.1988.10478722

Lumpkin, G.T., & Dess, G.G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *The Academy of Management Review, 21*(1), 135-172. https://doi.org/10.5465/amr.1996.9602161568

Lusch, R. F., & Laczniak, G. R. (1989). Macroenvironmental forces, marketing strategy and business performance: A futures research approach. *Journal of the Academy of Marketing Science, 17*(4), 283–295.

Martín-Rojas, R., Fernández-Pérez, V., & García-Sánchez, E. (2017). Encouraging organizational performance through the influence of technological distinctive competencies on components of corporate entrepreneurship. *International Entrepreneurship Management Journal, 13*, 397–426. https://doi.org/10.1007/s11365-016-0406-7

McCarthy, D. J., Puffer, S. M., & Lamin, A. (2018). Entrepreneurial orientation in a hostile and turbulent environment: Risk and innovativeness among successful Russian entrepreneurs. *European Journal of International Management, 12*(1-2), 191-221. https://doi.org/10.1504/EJIM.2018.089033

McDonald, W. J. (1994). Psychological associations with shopping: A moderator variable perspective. *Psychology & Marketing, 11*(6), 549-568. https://doi.org/10.1002/mar.4220110604

Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management science, 29*(7), 770-791. https://doi.org/10.1287/mnsc.29.7.770

Miller, D. (1987). The structural and environmental correlates of business strategy. *Strategic Management Journal, 8*(1), 55-76. https://doi.org/10.1002/smj.4250080106

Miller, D., & Friesen, P. (1982). Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic Management Journal, 3*(1), 1–25. https://doi.org/10.1002/smj.4250030102

Minola, T., Kammerlander, N., Kellermanns, F. W., & Hoy, F. (2021). Corporate entrepreneurship and family business: Learning across domains. *Journal of Management Studies, 58*(1), 1-26. https://doi.org/10.1111/joms.12672

Mohajan, H. K. (2017). Two criteria for good measurements in research: Validity and reliability. *Annals of Spiru Haret University. Economic Series*, *17*(4), 59-82.

Moorman, C., & Miner, A. S. (1997). The impact of organizational memory on new product performance and creativity. *Journal of Marketing Research, 34*(1), 91-106. https://doi.org/10.1177/002224379703400108

Ojha, D., Struckell, E., Acharya, C., & Patel, P. C. (2020). Managing environmental turbulence through innovation speed and operational flexibility in B2B service

organizations. *Journal of Business & Industrial Marketing, 36*(9), 1627-1645. https://doi.org/10.1108/JBIM-01-2020-0026

Orlikowski, W. J., & Baroudi, J. J. (1991). Studying information technology in organizations: Research approaches and assumptions. *Information Systems Research, 2*(1), 1-28. https://doi.org/10.1287/isre.2.1.1

Patel, P. (2009). Introduction to quantitative methods. In *Empirical Law Seminar* (Vol. 14). Retrieved from http://hls.harvard.edu/content/uploads/2011/12/quantitative_methods.pdf

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 63*(1), 539–569. https://doi.org/10.1146/annurev-psych-120710-100452

Protogerou, A., Caloghirou, Y., & Lioukas, S. (2012). Dynamic capabilities and their indirect impact on firm performance. *Industrial and Corporate Change, 21*(3), 615–647. https://doi.org/10.1093/icc/dtr049

Reza, M. H. (2019). Components of transformational leadership behavior. *EPRA International Journal of Multidisciplinary Research, 5*(3), 119-124.

Sathe, V. (1989). Fostering entrepreneurship in the large, diversified firm. *Organizational Dynamics, 18*(1), 20-32. https://doi.org/10.1016/0090-2616(89)90029-6

Saunders, M., & Lewis, P. (2018). *Doing research in business and management: An essential guide to planning your project* (2nd ed.). Pearson Education Limited.

Saunders, M., Lewis, P., & Thornhill, A. (2016). *Research methods for business students* (7th ed.). Pearson Education Limited.

Short, J. C., Ketchen Jr, D. J., & Palmer, T. B. (2002). The role of sampling in strategic management research on performance: A two-study analysis. *Journal of Management, 28*(3), 363-385. https://doi.org/10.1177/014920630202800306

Siangchokyoo, N., Klinger, R. L., & Campion, E. D. (2020). Follower transformation as the linchpin of transformational leadership theory: A systematic review and future research agenda. *The Leadership Quarterly, 31*(1), 101341. https://doi.org/10.1016/j.leaqua.2019.101341

Simba, A., & Thai, M. T. T. (2019). Advancing entrepreneurial leadership as a practice in MSME management and development. *Journal of Small Business Management, 57*(sup2), 397–416. https://doi.org/10.1111/jsbm.12481

Simsek, Z., & Veiga, J. F. (2001). A primer on internet organizational surveys. *Organizational Research Methods, 4*(3), 218-235. https://doi.org/10.1177/109442810143003

Singh, S. K., Del Giudice, M., Chierici, R., & Graziano, D. (2020). Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change, 150*, 119762. https://doi.org/10.1016/j.techfore.2019.119762

Slater, S. F., & Narver, J. C. (1994). Does competitive environment moderate the market orientation-performance relationship? *Journal of Marketing 58,* 46-55. https://doi.org/10.1177/002224299405800104

Song, M., Droge, C., Hanvanich, S., & Calantone, R. (2005). Marketing and technology resource complementarity: An analysis of their interaction effect in two environmental contexts. *Strategic Management Journal, 26*, 259–276. https://doi.org/10.1002/smj.450

Statistics South Africa. (2022). *Gender series volume IX: Women empowerment, 2017 – 2022.* Department: Statistics South Africa, Republic of South Africa.

https://www.statssa.gov.za/publications/Report-03-10-26/Report-03-10-262022.pdf

Tabachnik, B. G., & Fidell, L. S. (2007). Experimental designs using ANOVA. Thomson/Brooks/Cole.

Taneja, S. S., Taneja, P. K., & Gupta, R. K. (2011). Researches in corporate social responsibility: A review of shifting focus, paradigms, and methodologies. *Journal of Business Ethics, 101*(3), 343-364. https://doi.org/10.1007/s10551-010-0732-6

Teece, D. J. (2020). Hand in glove: Open innovation and the dynamic capabilities framework. *Strategic Management Review, 1*(2), 233-253.

Teng, B. S., & Cummings, J. L. (2002). Trade-offs in managing resources and capabilities. *The Academy of Management Executive, 16*(2), 81–91. https://doi.org/10.5465/ame.2002.7173548

Tsai, K., & Yang, S. (2013). Firm innovativeness and business performance: The joint moderating effects of market turbulence and competition. *Industrial Marketing Management, 42*(8), 1279-1294. https://doi-org.uplib.idm.oclc.org/10.1016/j.indmarman.2013.06.001

Turulja, L., & Bajgoric, N. (2018). Innovation, firms' performance and environmental turbulence: Is there a moderator or mediator? *European Journal of Innovation Management, 22*(1), 213-232. https://doi.org/10.1108/EJIM-03-2018-0064

Urbano, D., Turro, A., Wright, M., & Zahra, S. (2022). Corporate entrepreneurship: A systemgatic literature review and future research agenda. *Small Business Economics*, 1-25. https://doi.org/10.1007/s11187-021-00590-6

Veronica, S., Alexeis, G. P., Valentina, C., & Elisa, G. (2020). Do stakeholders' capabilities promote sustainable business innovation in the small and medium-sized enterprises? Evidence from Italy. *Journal of Business Research, 119,* 131-141. https://doi.org/10.1016/j.jbusres.2019.06.025

Wang, G., Dou, W., Zhu, W., & Zhou, N. (2015). The effects of firm capabilities on external collaboration and performance: The moderating role of market turbulence. *Journal of Business Research, 68*(9), 1928-1936. https://doi.org/10.1016/j.jbusres.2015.01.002

Wang, M. C., Chen, P. C., & Fang, S. C. (2021). How environmental turbulence influences firms' entrepreneurial orientation: The moderating role of network relationships and organizational inertia. *Journal of Business and Industrial Marketing, 36*(1), 48-59. https://doi.org/10.1108/JBIM-05-2019-0170

Yang, Z., Li-Hua, R., Zhang, X., & Wang, Y. (2007). Corporate entrepreneurship and market performance: an empirical study in China. *Journal of Technology Management in China, 2*(2), 154-162. https://doi.org/10.1108/17468770710756086

Yunis, M., Tarhini, A., & Kassar, A. (2018). The role of ICT and innovation in enhancing organizational performance: The catalysing effect of corporate entrepreneurship. *Journal of Business Research, 88*, 344-356. https://doi.org/10.1016/j.jbusres.2017.12.030

Zaefarian, G., Forkmann, S., Mitrega, M., & Henneberg, S. C. (2017). A capability perspective on relationship ending and its impact on product innovation success and firm performance. *Long Range Planning, 50*(2), 184-199. https://doi.org/10.1016/j.lrp.2015.12.023

Zahra, S. A. (1991). Predictors and financial outcomes of corporate entrepreneurship. *Journal of Business Venturing, 6*, 259–285. https://doi.org/10.1016/0883-9026(91)90019-A

Zahra, S. A. (1993). Environment, corporate entrepreneurship, and financial

performance: A taxonomic approach. *Journal of Business Venturing, 8*(4), 319-340. https://doi.org/10.1016/0883-9026(93)90003-N

Zahra, S. A., & Covin, J. G. (1995). Contextual influences on the corporate entrepreneurship-performance relationship: A longitudinal analysis. *Journal of business venturing, 10*(1), 43-58. https://doi.org/10.1016/0883-9026(94)00004-E

Zhou, J., Mavondo, F. T., & Saunders, S. G. (2019b). The relationship between marketing agility and financial performance under different levels of market turbulence. *Industrial Marketing Management, 83*, 31-41. https://doi.org/10.1016/j.indmarman.2018.11.008

Zhou, Y., Shu, C., Jiang, W., & Gao, S. (2019a). Green management, firm innovations, and environmental turbulence. *Business Strategy and the Environment, 28*(4), 567-581. https://doi.org/10.1002/bse.2265

Zhu, Y. Q., & Chen, H. G. (2016). Empowering leadership in R & D teams: A closer look at its components, process, and outcomes. *R&D Management*, *46*(4), 726-735. https://doi.org/10.1111/radm.12114

APPENDICES

Appendix A | Final questionnaire

Section A: Demographics and organisational information

Demographics						
Role in organisations	Front office (*e.g. Admin, Consultant, etc.*)	Junior Management (*e.g. Team Leader, Young Professionals, etc.*)	Middle Management (*e.g. Professionals, Manager, Senior Manager, etc.*)	Senior Management (*e.g. Dept head, etc.*)	Executive (*e.g. BU head, Head of Ops, Principal, EXCO, CEO*)	
Gender	Male	Female	Other	Prefer not to disclose		
Age	18 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65+
	I do not fall within these ranges					
Highest level of education	NSC / Matric	Higher Certificate	Diploma	Degree / BTech	Honours / Postgradute Diploma	Master's Degree
	Doctor's Degree (PhD)					
Number of employees in my organisation	<=10	11 - 50	51 - 250	251 - 500	501 - 1000	1001+
	I do not know					
Number of years the organisation has been in operation	<1	1 - 3	4 - 5	6 - 10	10+	I do not know
Experience with current organisation (years)	<1	1 - 3	4 - 5	6 - 10	10+	
Sector	Private institution	Public institution (*incl. SOE's/COE's*)	NGO / NPO	Other		
Industry	Mining, Energy, Oil & Gas	Manufacturing	Financial Services & Insurance	Agriculture, Forestry & Fishing	Healthcare & Social Assistance	Construction
	Technology & Telecommunications	R&D	Hospitality	Retail	Infrastructure & Transportation	Administration, Business Support & Consulting
	Arts, Entertainment & Recreation	Education & Training	Other			
Does your organisation have operations in South Africa	Yes	No				
If "No," please specify country of operations						
Province where your organisation operates	Gauteng	Kwa-Zulu Natal	Mpumalanga	Free States	North West	Limpopo
	Northern Cape	Eastern Cape	Western Cape			
Do you report to at least one person within your organisation	Yes	No				

Section B: Environmental turbulence

	1 - Strongly disagree	2 - Disagree	3 - Neutral	4 - Agree	5 - Strongly Agree
Market turbulence					
In our kind of business, customers' product preferences change quite a bit over time.					
Our customers tend to look for new product all the time.					
Sometimes our customers are very price-sensitive, but on other occasions, price is relatively unimportant.					
We are witnessing demand for our products and services from customers who never bought them before.					
New customers tend to have product-related needs that are different from those of our existing customers.					
We cater to many of the same customers that we used to in the past.					
Technological turbulence					
The technology in our industry is changing rapidly.					
Technological changes provide big opportunities in our industry.					
It is very difficult to forecast where the technology in our industry will be in the next 2 to 3 years.					
A large number of new product ideas have been made possible through technological breakthroughs in our industry.					
Technological developments in our industry are rather minor.					
Competitive intensity					
Competition in our industry is cutthroat.					
There are many "promotion wars" in our industry.					
Anything that one competitor can offer, others can match readily.					
Price competition is a hallmark of our industry.					
One hears of a new competitive move almost every day.					
Our competitors are relatively weak.					

Source: Adapted from Jaworski & Kohli (1993).

Section C: Corporate entrepreneurship

	1	2	3	4	5	6	7
Innovativeness							
My organisations puts a strong emphasis on R&D, technological leadership, and innovations.							
My organisation has many new lines of products or services.							
In my organisation, changes in products or service lines have usually been quite dramatic.							
Proactiveness							
My organisation typically initiates actions which competitors then respond to.							
My organisation is very often the first business to introduce new products/services, administrative techniques operating technologies, etc.							
My organisation typically adopts a very competitive, 'undo- thecompetitors' posture.							
Risk-Taking							
My organisation has a strong proclivity for high-risk projects (with chances of very high returns).							
Owing to the nature of the environment, bold, wideranging acts are necessary to achieve the firm's objectives.							
My organisation typically adopts a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities.							

Source: Adopted from Kreiser et al., (2021), based on work by Khandwalla (1976); Miller & Friesen (1982); Covin & Slevin (1989).

Section D: Transformational leadership

	1 - Strongly disagree	2 - Disagree	3 - Neutral	4 - Agree	5 - Strongly Agree
Idealized influence					
My line manager makes it feel good to be around him/her.					
I have complete faith in my line manager.					
I am proud to be associated with my line manager.					
Inspirational motivation					
My line manager expresses with a few simple words on what I could and should do.					
My line manager provides appealing images about what can be done.					
My line manager helps me find meaning in the work I do.					
Intellectual stimulation					
My line manager enables me to think about old problems in new ways.					
My line manager provides me with new ways of looking at puzzling things.					
My line manager gets me to rethink ideas that I have never questioned before.					
Individual consideration					
My line manager helps me to develop myself.					
My line manager lets me know how he/she thinks I am doing.					
My line manager gives personal attention to me when I seem rejected.					

Source: Adopted from Boukamcha (2019), based on work by Avolio et al. (1999) and Bass & Avolio (2002).

Appendix B | Data coding on IBM ® SPSS ®

Table 45: Data coding | Survey questions data labels

Question	Label
Demographics	
Does your organisation have operations in South Africa?	SAOps
Province where your organisation operates (where you are employed)?	Province
Role in organisation?	Designation
Gender	Gender
Age (years)	Age
Highest level of education	Qualification
Number of employees in my organisation	OrgSize
Number of years the organisation has been in operation	OrgAge
Experience with current organisation (years)	Tenure
Sector	Sector
Industry	Industry
Do you report to at least one person within your organisation?	DirectReport
Market Turbulence (MT)	
In our kind of business, customers' product preferences change quite a bit over time.	MT1
Our customers tend to look for new products all the time.	MT2
Sometimes our customers are very price-sensitive, but on other occasions, price is relatively unimportant.	MT3
We are witnessing demand for our products and services from customers who never bought them before.	MT4
New customers tend to have product-related needs that are different from those of our existing customers.	MT5
We cater to many of the same customers that we used to in the past.	MT6
Technological Turbulence (TT)	
The technology in our industry is changing rapidly.	TT1
Technological changes provide big opportunities in our industry.	TT2
It is very difficult to forecast where the technology in our industry will be in the next 2 to 3 years.	TT3
A large number of new product ideas have been made possible through technological breakthroughs in our industry.	TT4
Technological developments in our industry are rather minor.	TT5
Competitive Intensity (CI)	
Competition in our industry is cutthroat.	CI1
There are many "promotion wars" in our industry.	CI2
Anything that one competitor can offer, others can match readily.	CI3
Price competition is a hallmark of our industry.	CI4

Question	Label
Demographics	
One hears of a new competitive move almost every day.	CI5
Our competitors are relatively weak.	CI6
Innovativeness (Inn)	
My organisations puts a strong emphasis on R&D, technological leadership, and innovations.	Inn1
My organisation has many new lines of products or services.	Inn2
In my organisation, changes in products or service lines have usually been quite dramatic.	Inn3
Proactiveness (Pro)	
My organisation typically initiates actions which competitors then respond to.	Pro1
My organisation is very often the first business to introduce new products/services, administrative techniques operating technologies, etc.	Pro2
My organisation typically adopts a very competitive, 'undo-the competitors' posture.	Pro3
Risk-Taking (RT)	
My organisation has a strong proclivity for high-risk projects (with chances of very high returns).	RT1
Owing to the nature of the environment, bold, wide ranging acts are necessary to achieve the firm's objectives.	RT2
My organisation typically adopts a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities.	RT3
Idealized Influence (II)	
My line manager makes it feel good to be around him/her.	II1
I have complete faith in my line manager.	II2
I am proud to be associated with my line manager.	II3
Inspirational Motivation	
My line manager expresses with a few simple words on what I could and should do.	IM1
My line manager provides appealing images about what can be done.	IM2
My line manager helps me find meaning in the work I do.	IM3
Intellectual Stimulation	
My line manager enables me to think about old problems in new ways.	IS1
My line manager provides me with new ways of looking at puzzling things.	IS2
My line manager gets me to rethink ideas that I have never questioned before.	IS3
Individual Consideration	
My line manager helps me to develop myself.	IC1
My line manager lets me know how he/she thinks I am doing.	IC2
My line manager gives personal attention to me when I seem rejected.	IC3

Table 46: Data coding | Demographics to numeric data

Demographics	
Label	**Code**
SAOPs	
Yes	1
No	2
Province	
Eastern Cape	1
Free State	2
Gauteng	3
Kwa-Zulu Natal	4
Limpopo	5
Mpumalanga	6
North-West	7
Northern Cape	8
Western Cape	9
Designation	
Front office	1
Junior management	2
Middle management	3
Senior management	4
Executive	5
Gender	
Male	1
Female	2
Other	3
Prefer not to say	4
Age	
18 – 24	1
25 – 34	2
35 – 44	3
45 – 54	4
55 – 64	5
65+	6
None	7
Qualification	
Matric / NSC	1
Higher certificate	2
Diploma	3
Degree / BTech	4
Honors / PGDip	5
Maters Degree	6
Doctorate (PhD)	7

Demographics	
Label	**Code**
Tenure	
Less than 1 year	1
1 – 3	2
4 – 5	3
6 – 10	4
10+	5
OrgAge	
Less than 1 year	1
1 – 3	2
4 – 5	3
6 – 10	4
10+	5
I do not know	6
Org Size	
<=10	1
11 – 50	2
51 – 250	3
251 – 500	4
501 – 1000	5
1000+	6
Sector	
Private	1
Public	2
NPO / NGO	3
Other	4
Industry	
Mining, Energy, Oil & Gas	1
Manufacturing	2
Financial Services & Insurance	3
Agriculture, Forestry & Fisheries	4
Health & Social Assistance	5
Construction	6
Technology & Telecommunications	7
R&D	8
Hospitality	9
Retail	10
Infrastructure & Transportation	11
Administration, Business Support	12
Arts, Entertainment & Recreation	13
Education & Training	14
Other	15
DirectReport	
Yes	1
No	2

Table 47: Data coding | Scales

Demographics	
Label	**Code**
Likert scale (1 – 5)	
Strongly disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5
Likert scale (1 – 7)	
Strongly disagree	1
Disagree	2
Somewhat disagree	3
Neutral	4
Somewhat agree	5
Agree	6
Strongly agree	7

Appendix C | Little's MCAR

Table 48: Little's MCAR

Univariate Statistics							
			Std.	Missing		No. of Extremes[a]	
	N	Mean	Deviation	Count	Percent	Low	High
ET_MT_Q1	156	3.04	1.355	0	.0	0	0
ET_MT_Q2	156	2.94	1.385	0	.0	0	0
ET_MT_Q3	156	3.57	1.240	0	.0	0	0
ET_MT_Q4	156	3.37	1.240	0	.0	0	0
ET_MT_Q5	156	3.03	1.312	0	.0	0	0
ET_MT_Q6	156	4.00	1.022	0	.0	0	0
ET_TT_Q1	156	4.08	1.178	0	.0	0	0
ET_TT_Q2	156	4.31	1.001	0	.0	11	0
ET_TT_Q3	156	3.17	1.190	0	.0	0	0
ET_TT_Q4	156	3.86	1.205	0	.0	0	0
ET_TT_Q5	156	3.52	1.384	0	.0	0	0
ET_CI_Q1	156	3.86	1.236	0	.0	0	0
ET_CI_Q2	156	3.11	1.398	0	.0	0	0
ET_CI_Q3	156	3.58	1.229	0	.0	0	0
ET_CI_Q4	156	3.38	1.321	0	.0	0	0
ET_CI_Q5	156	2.79	1.362	0	.0	0	0
ET_CI_Q6	156	3.93	1.096	0	.0	0	0
CE_Inn_Q1	156	4.96	1.850	0	.0	0	0
CE_Inn_Q2	156	4.07	1.981	0	.0	0	0
CE_Inn_Q3	156	3.40	1.597	0	.0	0	0
CE_Pro_Q1	156	3.92	1.826	0	.0	0	0
CE_Pro_Q2	156	3.64	1.863	0	.0	0	0
CE_Pro_Q3	156	3.81	1.766	0	.0	0	0
CE_RT_Q1	156	4.15	1.771	0	.0	0	0
CE_RT_Q2	156	5.04	1.571	0	.0	6	0
CE_RT_Q3	156	4.41	1.718	0	.0	0	0
TL_II_Q1	156	3.81	1.213	0	.0	0	0
TL_II_Q2	156	3.69	1.228	0	.0	0	0
TL_II_Q3	156	3.81	1.233	0	.0	0	0
TL_IM_Q1	156	3.55	1.188	0	.0	11	0
TL_IM_Q2	156	3.57	1.159	0	.0	9	0
TL_IM_Q3	156	3.54	1.282	0	.0	0	0
TL_IS_Q1	156	3.63	1.209	0	.0	0	0
TL_IS_Q2	156	3.57	1.197	0	.0	0	0

Univariate Statistics							
	N	Mean	Std. Deviation	Missing		No. of Extremes[a]	
				Count	Percent	Low	High
TL_IS_Q3	156	3.61	1.189	0	.0	0	0
TL_IC_Q1	156	3.53	1.332	0	.0	0	0
TL_IC_Q2	156	3.60	1.248	0	.0	0	0
TL_IC_Q3	156	3.20	1.282	0	.0	0	0

a. Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).

Appendix D | Common method bias (CMB)

Table 49: Common method bias (CMB) test

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.951	26.187	26.187	9.407	24.754	24.754
2	6.455	16.987	43.174			
3	2.474	6.510	49.684			
4	2.267	5.966	55.650			
5	1.469	3.866	59.515			
6	1.328	3.494	63.009			
7	1.124	2.958	65.967			
8	1.032	2.717	68.684			
9	.961	2.530	71.214			
10	.856	2.253	73.466			
11	.748	1.969	75.436			
12	.691	1.819	77.254			
13	.673	1.771	79.025			
14	.651	1.713	80.738			
15	.631	1.660	82.398			
16	.577	1.520	83.917			
17	.553	1.454	85.372			
18	.537	1.414	86.786			
19	.457	1.202	87.988			
20	.438	1.152	89.139			
21	.428	1.126	90.265			
22	.399	1.049	91.314			
23	.371	.977	92.291			
24	.336	.885	93.176			
25	.299	.786	93.962			
26	.272	.715	94.677			
27	.264	.695	95.372			
28	.252	.664	96.036			
29	.234	.616	96.653			
30	.216	.569	97.222			
31	.206	.542	97.764			
32	.186	.490	98.254			

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
33	.160	.421	98.675			
34	.141	.371	99.046			
35	.114	.301	99.347			
36	.101	.265	99.612			
37	.088	.232	99.844			
38	.059	.156	100.000			
Extraction Method: Principal Axis Factoring.						

Appendix E | Cronbach's alpha

Table 50: Market Turbulence (MT) Cronbach's alpha

Case Processing Summary		
	N	%
Valid	156	100
Excluded	0	0.0
Total	156	100

Reliability Statistics	
Cronbach alpha	N of items
.688	6

Item Statistics				
Scale: Market Turbulence				
Item	Mean	Std. Dev	N	Cronbach alpha if item deleted
MT1: In our kind of business, customers' product preferences change quite a bit over time.	3.04	1.355	156	0.579
MT2: Our customers tend to look for new product all the time.	2.94	1.385	156	0.595
MT3: Sometimes our customers are very price-sensitive, but on other occasions, price is relatively unimportant.	3.57	1.240	156	0.654
MT4: We are witnessing demand for our products and services from customers who never bought them before.	3.37	1.240	156	0.647
MT5: New customers tend to have product-related needs that are different from those of our existing customers.	3.03	1.312	156	0.579
MT6: We cater to many of the same customers that we used to in the past.	4.00	1.022	156	0.767

Table 51: Technological Turbulence (TT) Cronbach's alpha

Case Processing Summary		
	N	%
Valid	156	100
Excluded	0	0.0
Total	156	100

Reliability Statistics	
Cronbach alpha	N of items
.703	5

Item Statistics				
Scale: Technological Turbulence				
Item	Mean	Std. Dev	N	Cronbach alpha if item deleted
TT1: The technology in our industry is changing rapidly.	4.08	1.178	156	0.518
TT2: Technological changes provide big opportunities in our industry.	4.31	1.001	156	0.582
TT3: It is very difficult to forecast where the technology in our industry will be in the next 2 to 3 years.	3.17	1.190	156	0.790
TT4: A large number of new product ideas have been made possible through technological breakthroughs in our industry.	3.86	1.205	156	0.603
TT5: Technological developments in our industry are rather minor.	3.52	1.384	156	0.717

Table 52: Competitive Intensity (CI) Cronbach's alpha

Case Processing Summary		
	N	%
Valid	156	100
Excluded	0	0.0
Total	156	100

Reliability Statistics	
Cronbach alpha	N of items
.782	6

Item Statistics				
Scale: Competitive Intensity				
Item	Mean	Std. Dev	N	Cronbach alpha if item deleted
CI1: Competition in our industry is cutthroat.	3.86	1.236	156	0.727
CI2: There are many "promotion wars" in our industry.	3.11	1.398	156	0.730
CI3: Anything that one competitor can offer, others can match readily.	3.58	1.229	156	0.751
CI4: Price competition is a hallmark of our industry.	3.38	1.321	156	0.746
CI5: One hears of a new competitive move almost every day.	2.79	1.362	156	0.747
CI6: Our competitors are relatively weak.	3.93	1.096	156	0.785

Table 53: Innovativeness (Inn) Cronbach's alpha

Case Processing Summary		
	N	%
Valid	156	100
Excluded	0	0.0
Total	156	100

Reliability Statistics	
Cronbach alpha	N of items
.729	3

Item Statistics				
Scale: Innovativeness				
Item	Mean	Std. Dev	N	Cronbach alpha if item deleted
Inn1: My organisations puts a strong emphasis on R&D, technological leadership, and innovations.	4.96	1.850	156	0.699
Inn2: My organisation has many new lines of products or services.	4.07	1.981	156	0.508
Inn3: In my organisation, changes in products or service lines have usually been quite dramatic.	3.40	1.597	156	0.688

Table 54: Proactiveness (Pro) Cronbach's alpha

Case Processing Summary		
	N	%
Valid	156	100
Excluded	0	0.0
Total	156	100

Reliability Statistics	
Cronbach alpha	N of items
.758	3

Item Statistics				
Scale: Proactiveness				
Item	Mean	Std. Dev	N	Cronbach alpha if item deleted
Pro1: My organisation typically initiates actions which competitors then respond to.	3.92	1.826	156	0.653
Pro2: My organisation is very often the first business to introduce new products/services, administrative techniques operating technologies, etc.	3.64	1.863	156	0.607
Pro3: My organisation typically adopts a very competitive, 'undo- the competitors' posture.	3.81	1.766	156	0.755

Table 55: Risk-Taking (RT) Cronbach's alpha

Case Processing Summary		
	N	%
Valid	156	100
Excluded	0	0.0
Total	156	100

Reliability Statistics	
Cronbach alpha	N of items
.768	3

Item Statistics				
Scale: Risk-Taking				
Item	Mean	Std. Dev	N	Cronbach alpha if item deleted
RT1: My organisation has a strong proclivity for high-risk projects (with chances of very high returns).	4.15	1.771	156	0.727
RT2: Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives.	5.04	1.571	156	0.676
RT3: My organisation typically adopts a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities.	4.41	1.718	156	0.660

Table 56: Idealized influence (II) Cronbach's alpha

Case Processing Summary		
	N	%
Valid	156	100
Excluded	0	0.0
Total	156	100

Reliability Statistics	
Cronbach alpha	N of items
.934	3

Item Statistics				
Scale: Idealized Influence				
Item	Mean	Std. Dev	N	Cronbach alpha if item deleted
II1: My line manager makes it feel good to be around him/her.	3.81	1.213	156	0.944
II2: I have complete faith in my line manager.	3.69	1.228	156	0.899
II3: I am proud to be associated with my line manager.	3.81	1.233	156	0.864

Table 57: Inspirational Motivation (IM) Cronbach's alpha

Case Processing Summary		
	N	%
Valid	156	100
Excluded	0	0.0
Total	156	100

Reliability Statistics	
Cronbach alpha	N of items
.869	3

Item Statistics				
Scale: Inspirational Motivation				
Item	Mean	Std. Dev	N	Cronbach alpha if item deleted
IM1: My line manager expresses with a few simple words on what I could and should do.	3.55	1.188	156	0.857
IM2: My line manager provides appealing images about what can be done.	3.57	1.159	156	0.776
IM3: My line manager helps me find meaning in the work I do.	3.54	1.282	156	0.812

Table 58: Intellectual Stimulation (IS) Cronbach's alpha

Case Processing Summary		
	N	%
Valid	156	100
Excluded	0	0.0
Total	156	100

Reliability Statistics	
Cronbach alpha	N of items
.933	3

Item Statistics				
Scale: Intellectual Stimulation				
Item	Mean	Std. Dev	N	Cronbach alpha if item deleted
IS1: My line manager enables me to think about old problems in new ways.	3.63	1.209	156	0.890
IS2: My line manager provides me with new ways of looking at puzzling things.	3.57	1.197	156	0.919
IS3: My line manager gets me to rethink ideas that I have never questioned before.	3.61	1.189	156	0.899

Table 59: Individual Consideration (IC) Cronbach's alpha

Case Processing Summary		
	N	%
Valid	156	100
Excluded	0	0.0
Total	156	100

Reliability Statistics	
Cronbach alpha	N of items
.889	3

Item Statistics				
Scale: Individual Consideration				
Item	Mean	Std. Dev	N	Cronbach alpha if item deleted
IC1: My line manager helps me to develop myself.	3.53	1.332	156	0.831
IC2: My line manager lets me know how he/she thinks I am doing.	3.60	1.248	156	0.830
IC3: My line manager gives personal attention to me when I seem rejected.	3.20	1.282	156	0.866

Appendix F | Test for linearity and normality

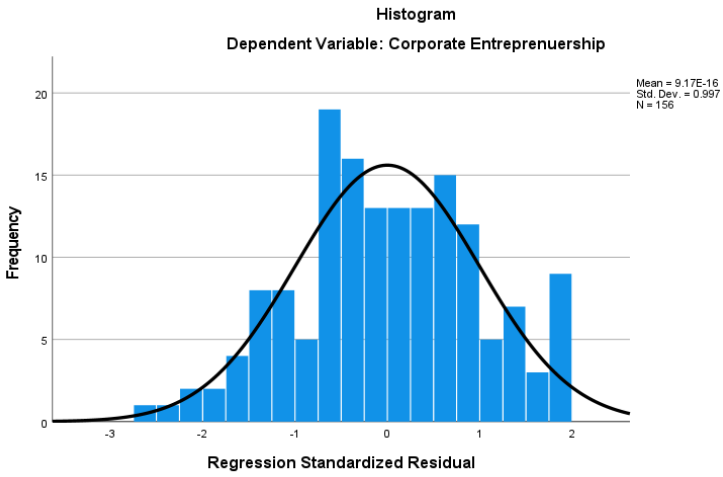

Figure 5: MT and CE | Histogram for regression standardized residual

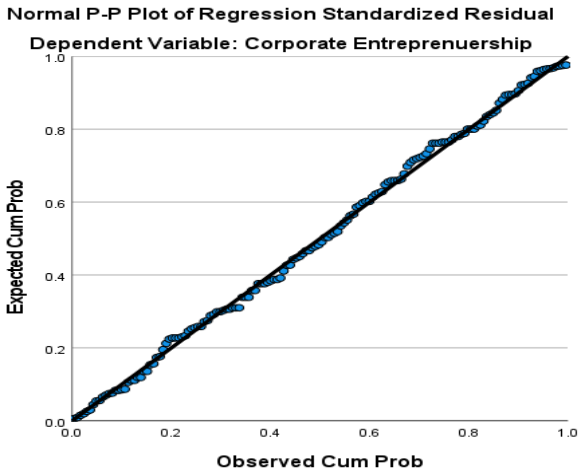

Figure 6: MT and CE | Normal P-P plots of regression standardized residual

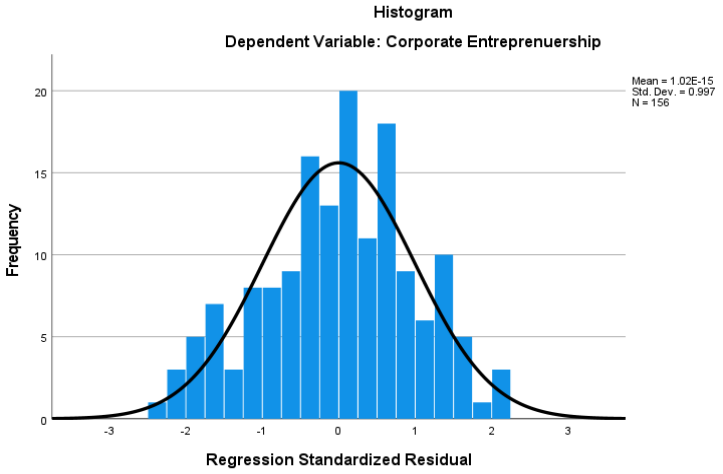

Figure 7: TT and CE | Histogram for regression standardized residual

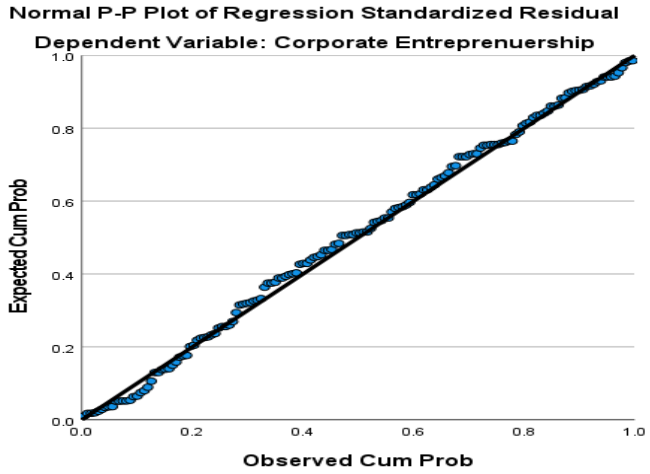

Figure 8: TT and CE | Normal P-P plots of regression standardized residual

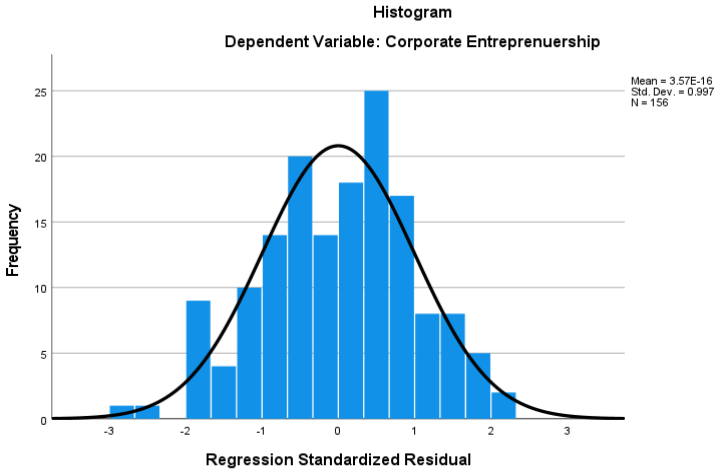

Figure 9: CI and CE | Histogram for regression standardized residual

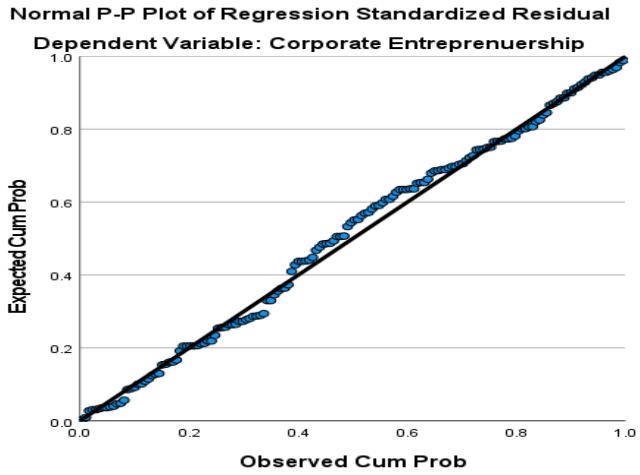

Figure 10: CI and CE | Normal P-P plots of regression standardized residual

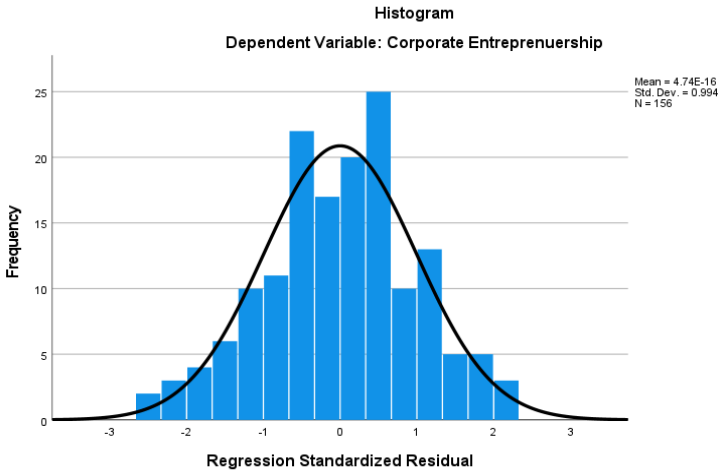

Figure 11: ET, TL, and CE | Histogram for regression standardized residual

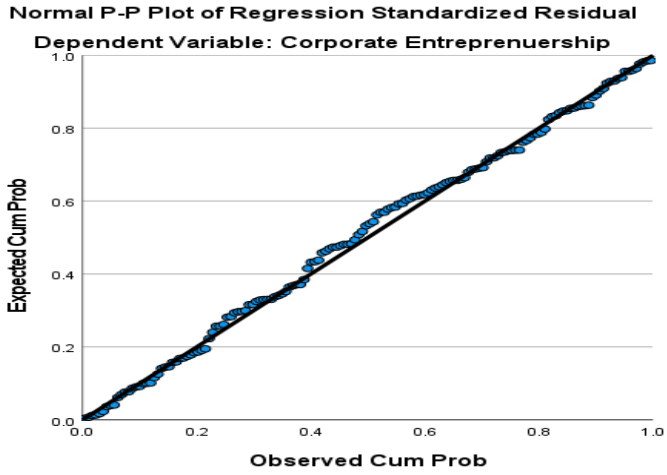

Figure 12: ET, TL, and CE | Normal P-P plots of regression standardized residual

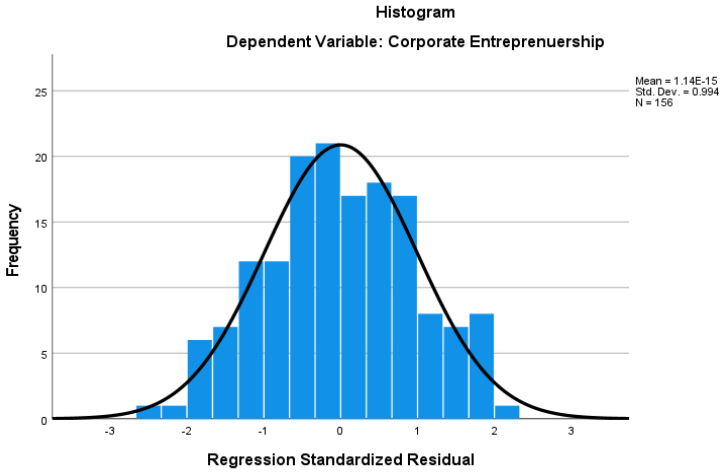

Figure 13: MT, TL, and CE | Histogram for regression standardized residual

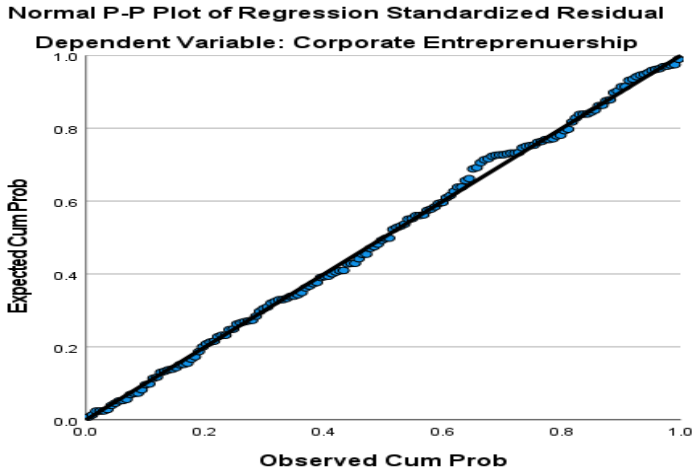

Figure 14: MT, TL, and CE | Normal P-P plots of regression standardized residual

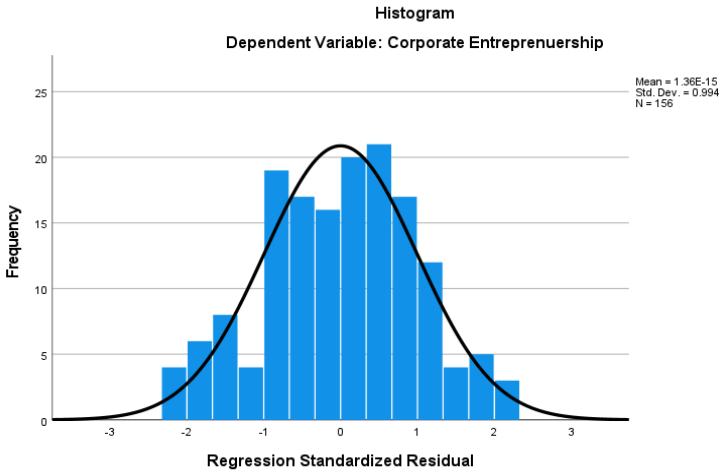

Figure 15: TT, TL, and CE | Histogram for regression standardized residual

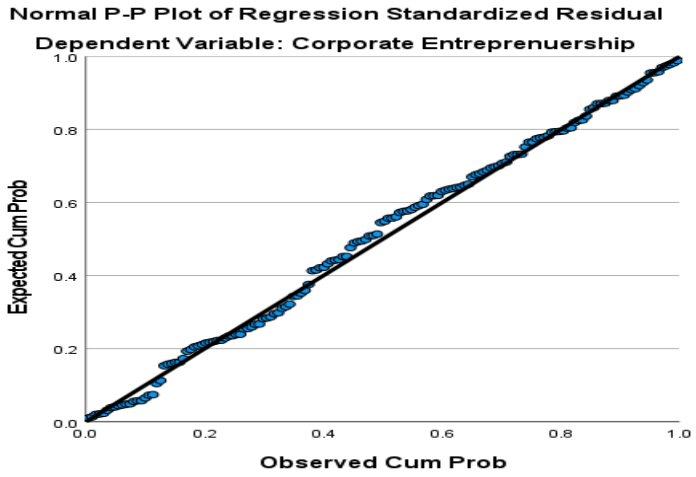

Figure 16: TT, TL, and CE | Normal P-P plots of regression standardized residual

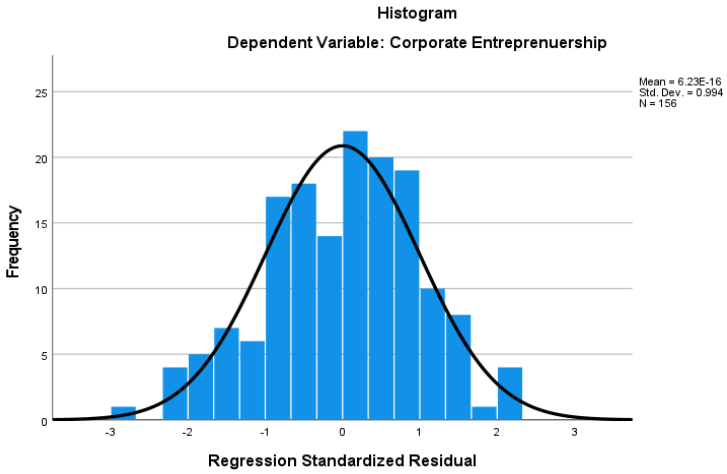

Figure 17: CI, TL, and CE | Histogram for regression standardized residual

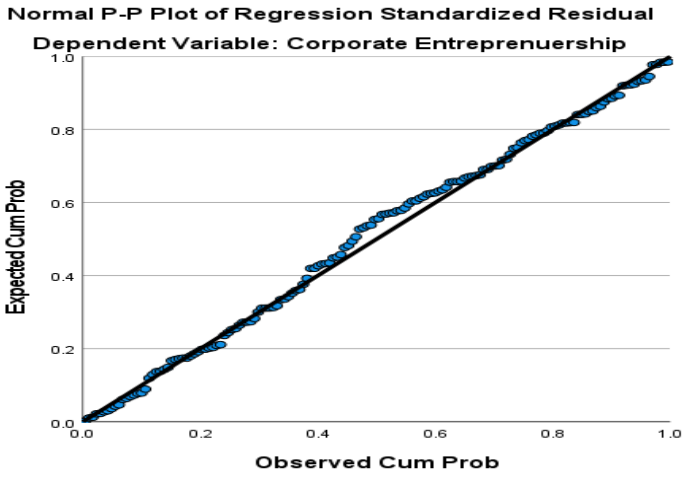

Figure 18: CI, TL, and CE | Normal P-P plots of regression standardized residual