Gordon Institute of Business Science
University of Pretoria

The moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance in the context of disruptive events

20803304

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.

1st November 2021

ABSTRACT

Globally, there is an increase in disruptive events such as natural disasters and pandemic diseases (Mithani, 2020), reflecting the increasing complexity of human development. There is a need to understand the functioning of firms during these events. While contextual ambidexterity and organisational resilience are established research areas, there is limited inquiry on the relationship between these constructs to maintain firm performance in the adaptation to these disruptive events, motivating the need for this study.

The aim of the study was a quantitative evaluation of the moderating role of contextual ambidexterity on the relationship between organisational resilience and firm performance in coping with disruptive events. The study context was the response of firms to the COVID-19 pandemic as an instance of a disruptive event.

The results revealed that within the study context, organisational resilience and contextual ambidexterity had weak positive relationships with firm performance. It was shown that neither contextual ambidexterity, exploitation or exploration had a moderating effect on the relationship between organisational resilience and firm performance in the context of disruptive events.

This study illustrated the close relationship between contextual ambidexterity and organisational resilience as organisational capabilities during disruptive events. Rather than a moderating variable, contextual ambidexterity was postulated as an antecedent for organisational resilience. This study highlighted the critical role of the business context in assessing how firms respond to these events. It was postulated that firms could have benefitted from a more focussed approach on either exploitation or exploration, suggesting that an ambidextrous response is not always appropriate. This study contributes to the literature on disruptive events by understanding the capabilities required to effectively respond to these events.

KEYWORDS: Contextual ambidexterity, disruptive events, firm performance, organisational resilience.

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.

_____

Student number: 20803304

Date: 1 November 2021

TABLE OF CONTENTS

INDEX OF FIGURES

INDEX OF TABLES

CHAPTER 1: INTRODUCTION TO RESEARCH PROBLEM

1.1. The context of disruptive events

A disruptive event, crisis or disaster can be defined as a “low-probability, high-impact event that threatens the viability of the system and is characterised by ambiguity of cause, effect, and means of resolution” (Pearson & Clair, 1998, p.60). During these disruptive events, the primary consideration for organisations is the physical safety of their employees, with the economic impact being a secondary consideration (Mithani, 2020). These events include non-natural disasters such as terrorist attacks and industrial incidents; and natural disasters such as pandemic diseases, hurricanes, earthquakes and increasingly climate change related events. Further, even in cases where the organisation is not directly affected, these events can impact operations, supply chains and customers, impacting employee engagement and firm performance (Mithani, 2020). The United Nations (2019) highlighted the risks of the increased complexity of human interaction, including the impact on natural, economic and socio-political systems. It cautioned that these interactions lead to non-linear and unpredictable outcomes, with the rate and scale of change occurring in an unprecedented manner and called for improved understanding to better prepare and adapt to these events.

In 2020, the world was significantly impacted by the emergence of the COVID-19 virus and the resulting global pandemic. The pandemic led to the immense loss of human life, national lockdowns and resulting global economic downturn. By 2021, while the roll-out of vaccines in some countries has enabled a phased return to economic and social activity, the impact on organisations has been profound and far-reaching (Deloitte, 2020). While the crisis had severely curtailed economic activity in some sectors threatening the survival of many organisations, it has also provided opportunities for organisations that were able to rapidly respond and adapt to meet different customer needs during this crisis (Deloitte, 2020). This study will be undertaken against the context of the COVID-19 pandemic to evaluate factors that have contributed to firm performance during this disruptive event, focussing on the role of organisational resilience and contextual ambidexterity.

1.2. The need to build organisational resilience

The concept of resilience originated in materials science, describing a property of substances to withstand deformation and maintain functionality from an external force (Mithani, 2020). van der Vegt et al. (2015) defined organisational resilience as the capacity for organisational systems to absorb, recover and adapt from disruptive events. Therefore, organisational resilience refers to the manner in which organisations respond to challenges in their business environments, with the characteristic of bouncing back from these challenges (Mithani, 2020). Mithani (2020) contends that while organisational resilience is well studied, resilience in the context of disruptive events has received limited academic inquiry. The need for research in this area is anticipated due to the increased occurrence of disruptive events such as the COVID-19 pandemic.

Disruptive events present a unique challenge to organisations, as organisations are better positioned for economic or technological change rather than the discontinuous change brought on by these events (Linnenluecke, 2017). van der Vegt et al. (2015) considered the functioning of organisations during these events as a grand challenge calling for further research into this area. The authors highlighted that traditional risk management approaches are inadequate to prepare organisations for these events, suggesting that organisations rather focus on building organisational resilience. In this way, organisations should focus on building flexible capabilities to rapidly respond, adapt and learn from these disruptive events (van der Vegt et al., 2015). Linnenluecke (2017) called for practical approaches of how organisations can enable organisational resilience, including the business processes, organisational structures and resources to respond to disruptive events. A review of organisational resilience affirmed the need for academic inquiry to understand the organisational capabilities that enable organisational resilience as a strategic imperative (Annarelli & Nonino, 2016).

1.3. Organisational ambidexterity

Organisational ambidexterity refers to the capability of organisations to balance the efficient operation of today's business (referred to as exploitation) while being able to adapt to changes in the business environment (referred to as exploration) (March, 1991). March (1991) considered a paradoxical thinking approach asserting that

successful organisations need to simultaneously pursue exploitation and exploration, rather than making a choice or trade-off between them. Turner et al. (2020) noted that ambidexterity could be operationalised in different ways in an organisation. Temporal ambidexterity refers to the "cycling through periods of exploitation and exploration" (Gupta et al., 2006, p.694). Structural ambidexterity refers to structuring an organisation into different business units that will pursue either exploitation or exploration (Simsek et al., 2009). An alternative approach is contextual ambidexterity, in which employees consider exploitation and exploration orientations in their daily work (Birkinshaw & Gibson, 2004). Therefore, in ambidextrous organisations, systems such as performance management allow employees to utilise their judgement to balance these competing demands.

Numerous studies have illustrated the benefits of ambidexterity on higher levels of firm performance (Birkinshaw & Gibson, 2004; Junni et al., 2013; Birkinshaw & Gupta, 2013; He & Wong, 2004). Luger et al. (2018), however, cautioned that the environmental context should guide an organisation's resource allocation toward exploitation and exploration activities, supporting that ambidexterity enables firm performance during periods of incremental change. However, during disruptive events, an ambidextrous approach can lead to organisational misalignment that can negatively impact firm performance (Luger et al., 2018). This study indicated the need to dynamically adjust between these competing demands, which Smith (2014, p.1599) referred to as the need to be "consistently inconsistent" in decision-making in order to respond to environmental requirements while maintaining a commitment to these paradoxical demands.

1.4. The relationship between organisational resilience and contextual ambidexterity

While contextual ambidexterity and organisational resilience are established fields of study (Linnenluecke, 2017; Iborra et al., 2020), there is limited inquiry on the relationship between ambidextrous organisations and the resilience of these organisations (Turner et al., 2020), specifically in the performance of firms in the context of disruptive events (Mithani, 2020). Mamouni Limnios et al. (2014) developed a conceptual framework called the Resilience Architecture Framework to illustrate the modalities of organisational resilience. The framework hypothesises

that resilience is not necessarily a beneficial organisational feature. For instance, resilience can manifest as rigidity or resistance to change and can be associated with exploitation. Conversely, resilience can manifest as adaptability, in which organisations develop adaptive capacity through ambidexterity. In this way, organisations are able to utilise ambidexterity as a dynamic capability to flexibly adjust resources. The study by Mamouni Limnios et al. (2014) provides a conceptual link between organisational resilience and ambidexterity, with the authors recommending empirical studies to validate their model. Iborra et al. (2020) evaluated the impact of organisational resilience on firm performance in small-medium enterprises (SME's) following the global financial crisis, observing that ambidexterity was a key antecedent for resilience that enabled firms to maintain financial performance.

Lengnick-Hall et al. (2011) evaluated the organisational capabilities and associated strategic human resources policies that enable organisational resilience. Birkinshaw & Gibson (2004) considered the employee behaviours that support contextual ambidexterity. A comparison of these approaches indicates synergies between individual behaviours and organisational capabilities that support organisational resilience and contextual ambidexterity (Birkinshaw & Gibson, 2004; Lengnick-Hall et al., 2011). Therefore, it is reasonable to hypothesise that contextual ambidexterity has played a role in supporting organisational resilience.

1.5. Research problem

Disruptive events pose a significant threat to organisations due to their unpredictable and often widespread impacts, and there is a need for organisations to build capabilities that enable a dynamic response to these events in order to minimise the impact on firm performance. The functioning of organisations during these disruptive events could be considered a grand challenge, necessitating further research to better equip organisations to respond to this challenge (van der Vegt et al., 2015). Organisational resilience has been proposed to enable organisations to build flexible capabilities to rapidly respond, adapt and learn from these disruptive events (van der Vegt et al., 2015). However, the conceptualisation of resilience in management and organisational studies remains fragmented, with several approaches on what resilience is, how to build resilience capacity in organisations and the process of

becoming resilient (Linnenluecke, 2017; Duchek, 2020). Therefore, there is a need to understand how more resilient organisations can be designed, including the capabilities that enable and enhance organisational resilience (Duit, 2016). Further, the study of organisational resilience in the context of disruptive events is relatively immature, with the need to do so in order to develop management practices, create shifts in employee behaviours and ensure aligned human resource (HR) policies (Mithani, 2020).

Contextual ambidexterity recognises the role of employee behaviours and decisions to balance the competing demands of exploitation and exploration, which is a dynamic capability that enables firm adaptation (O'Reilly & Tushman, 2008). However, the academic linkages between the concepts of organisational resilience and contextual ambidexterity remain limited (Iborra et al., 2020; Mamouni Limnios et al., 2014; Turner et al., 2020). From an employee behaviour perspective, extant research indicates that building contextually ambidextrous capabilities could also support organisational resilience capacity (Birkinshaw & Gibson, 2004; Lengnick-Hall et al., 2011) however it is unclear whether ambidexterity plays a moderating or mediating role in the process of building organisational resilience, motivating the need for the current study.

March (1991) contended that the competing demands of exploitation and exploration vie for the scarce resources of the organisations, requiring organisations to use ambidexterity either through structural, temporal or contextual means to manage this strategic paradox. However, it is not unclear whether an ambidextrous approach is the most beneficial in the context of the discontinuous change brought on by disruptive events. Luger et al. (2018) contended that the dynamics of the external environments should guide an organisation's resource allocation and that organisations need to continuously adjust this balance to maintain firm performance. Therefore, there is a need to evaluate whether, in the context of disruptive events, it is preferable to exploit in order to maintain (or minimise impact on) current performance or to rapidly innovate in order to capitalise on the opportunities brought on by the changes in the external environment and impact of this choice on firm performance.

1.6. Research purpose

The preceding discussion highlights the imperative for organisations to adapt to the rapid change brought on by disruptive events to maintain firm performance with the need to assess the factors that contribute to firm performance in these circumstances (van der Vegt et al., 2015). Mithani (2020) emphasised the role of building organisational resilience to enable organisational adaptation in disruptive events. Extant research demonstrated that ambidextrous organisations are better equipped to adjust to the evolving business environment (O'Reilly & Tushman, 2008; Birkinshaw & Gibson, 2004). While contextual ambidexterity and organisational resilience are established fields of study (Linnenluecke, 2017; Iborra et al., 2020), there is limited inquiry on the relationship between ambidextrous organisations and the resilience of these organisations (Turner et al., 2020), specifically in the performance of firms in the context of disruptive events (Mithani, 2020). This represents a gap within the current body of literature, motivating the need for this study. Further, there is a need to understand how to balance the competing demands of exploitation and exploration within the context of disruptive events and the impact of this choice on the relationship between organisational resilience and firm performance.

Therefore, the overall objective of this study is a quantitative evaluation of the moderating role of contextual ambidexterity on the relationship between organisational resilience and firm performance in coping with disruptive events. The response of firms to the COVID-19 pandemic will be utilised as context as an instance of a disruptive event requiring organisation resilience. The proposed conceptual framework is provided in **Figure 1**.

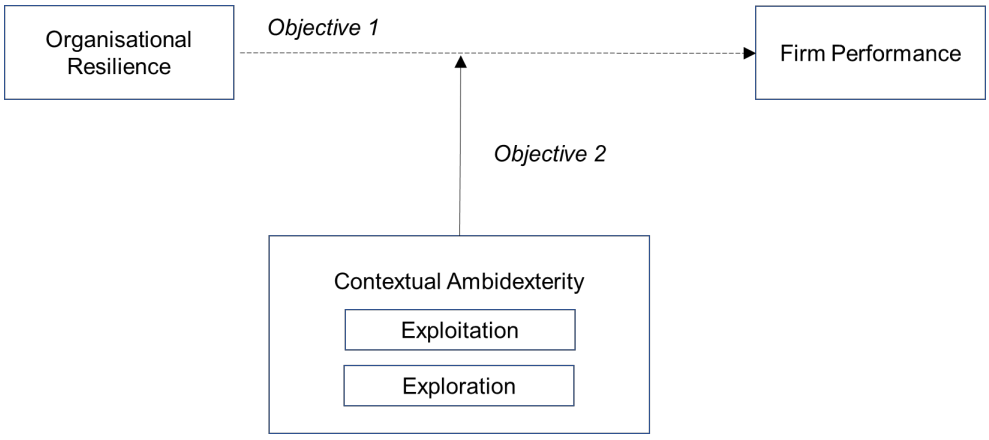

Figure 1 Proposed conceptual framework

The overall study objective will be operationalised into two research objectives:

- **Objective 1:** To assess the relationship between organisational resilience and firm performance within the context of disruptive events.

- **Objective 2:** To evaluate the moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance, where contextual ambidexterity consisted of two lower-order constructs of exploitation and exploration.

1.7. Contribution to theory and relevance to business

From an academic perspective, it is envisaged that the study will contribute to the body of knowledge in the fields of contextual ambidexterity and organisational resilience through the stated research objectives. The study will evaluate the role of organisational context (namely disruptive events) on how firm performance responds to change, the role of organisational resilience and contextual ambidexterity as capabilities that better enable organisational adaptation and the impact of the competing demands of exploitation and exploration on the relationship between organisational resilience and firm performance. The study will contribute to the understanding of the interplay between these concepts in maintaining firm performance. This study could therefore contribute toward an overall theory of organisational resilience and the capabilities that enable or enhance organisational resilience (Linnenluecke, 2017).

From a business perspective, the preceding discussion highlights that this study could contribute toward enabling organisations to better respond to disruptive changes and the enabling capabilities required to do so. This is vitally important as the nature of disruptive events limits the utility of traditional risk management approaches and necessitates that organisations build flexible capabilities that are able to dynamically adjust to the changing business environment (Teece et al., 2016; van der Vegt et al., 2015). The benefit of these capabilities is to better prepare for, adapt to and learn from disruptive change (van der Vegt et al., 2015). This will enable organisations to limit the reduction in firm performance and reduce the time to recovery (DesJardine et al., 2019). Further, the ability to build organisational

resilience can contribute toward long term organisational sustainability (Ortiz-de-Mandojana & Bansal, 2016).

1.8. Overview of document structure

In order to achieve the study objective, this report will be structured as follows to provide a logical, structured approach to the research:

- **Chapter 1 Introduction to research problem:** This section developed the need for the study based on academic and business rationale. Based on this, the research problem was identified, and research objectives were developed.
- **Chapter 2 Literature review:** This section will review the literature relevant to the research objectives and key theoretical constructs in order to assess the state of current knowledge and provide motivation for the current study.
- **Chapter 3 Research objectives and hypotheses:** This section will develop the conceptual framework, research objectives and hypotheses to be tested.
- **Chapter 4 Research methodology:** This section will describe the research methodology, including the research design, population, sampling methodology, measurement instrument, data analysis, quality assurance and limitations.
- **Chapter 5 Results:** This section will present the results from the statistical analysis of the survey questionnaire.
- **Chapter 6 Discussion of results:** This section will assess the results with reference to the research hypotheses, as well as compare and contrast these findings to literature.
- **Chapter 7 Conclusions and recommendations:** This section will discuss the conclusions, limitations of the study, as well as provide recommendations for business and future research.

CHAPTER 2: LITERATURE REVIEW

2.1. Organisational resilience

2.1.1. What is resilience?

The concept of resilience originated in engineering sciences describing a property of a material to withstand deformation and maintain functionality from an external force or shock (Mithani, 2020). van der Vegt et al. (2015) defined organisational resilience as the ability of organisational systems to absorb and recover from disruptive events, as well as to adapt to their changing circumstances. Therefore, organisational resilience refers to the manner in which organisations respond to challenges in their business environments, with a quality of enduring or bouncing back from these challenges (Mithani, 2020). Lengnick-Hall et al. (2011, p.244) described resilience as an organisational capability to absorb and respond to disruptions as well as to perform transformative activities that enable organisations to "capitalise on unexpected challenges and change". Within this transformational perspective, the authors viewed resilience not as a return to the status quo but a means of leveraging the organisation's resources and capabilities to capitalise on opportunities and thereby enable competitive advantage. While organisational resilience is well studied, Mithani (2020) stated that resilience in the context of disruptive events has received limited academic inquiry. The need for research is anticipated due to increased occurrence of disruptive events such as the COVID-19 pandemic.

2.1.2. Characteristics of organisational resilience

Mithani (2020) developed a typology of organisational resilience responses to disruptive events, stating that the organisational adaptation approach can be classified as recovery, static resilience or dynamic resilience. Recovery refers to an organisational response characterised by external intervention, and the goal of restoration of the original equilibrium and may be associated with disaster or crisis management. Static resilience refers to the development of internal capabilities to respond to the event with a focus on the return to the original equilibrium – with a focus on the past and current organisational goals even if these are sub-optimal in the new environment. In dynamic resilience, there is a realisation by the organisation

that the original equilibrium may no longer be viable or economically desirable and the organisation endeavours toward a new goal through its organisational capabilities. This approach results in an organisation that is constantly adapting to its changing environment.

Resilience is related to the theory of complex adaptive systems, which are characterised as “dynamic systems that are able to adapt in and evolve with the changing environment” (Uhl-Bien & Arena, 2017, p. 11). Within this framework, static resilience may be associated with the order response, where leaders follow a hierarchical, top-down approach aiming for a return to successful past solutions and approaches. Dynamic resilience may be associated with the adaptive response where organisations rely on self-organisation, networking, and decentralised decision-making. This perspective is supported by Barasa et al. (2018, p. 491), who described resilience as an “emergent property of complex adaptive systems”, referring to preparation before and adaptation after threats. Therefore, it is imperative to understand the enabling conditions and capabilities that enable dynamic resilience. Further, Williams et al. (2017) emphasised the interaction with the organisation and its environment and the need to understand the underlying system dynamics that can enable or constrain organisational adaptation.

Mithani (2020) conceptualised adaptation modes to disruptive events, namely: avoidance, absorption, elasticity, learning and rejuvenation. Avoidance refers to the deflection of the shock of the disruptive event. This modality is applicable when a threat is narrow in scope or localised, occurs frequently and predictably. Absorption refers to the organisation absorbing the impact of the shock and maintaining the status quo, with the ability to do so depending on the magnitude and frequency of the threat. This modality can be characterised by organisational features such as slack or flexible resources (Mithani, 2020). The elasticity mode of resilience refers to the organisation’s capacity to bounce back over a period (Mithani, 2020). The ability for an organisation to elastically resist will depend on the magnitude of the threat. While the aforementioned modes are part of the organisational functional design, learning refers to capabilities developed as a response to the disruptive event. Finally, rejuvenation refers to the rebuilding of an organisation, following a functional breakdown of the organisation’s operating model. These modes of adaptation, in turn, can be pursued through static or dynamic resilience approaches.

Mithani's (2020) conceptualisation of resilience can be viewed through the lens of the dynamic capabilities framework of sensing, seizing and transforming (Teece et al., 2016). Absorption and elasticity can be compared to seizing, where organisational features such as flexible sourcing arrangements, slack resources and redundancy systems can enable an organisation to quickly respond to disruptive events, to absorb and as well as to capitalise on opportunities. This may be complemented by innovation practices that speed up product development in line with market needs. The learning resilience modality has parallels with transforming in the dynamic capability's framework with rapid learning and feedback enabling organisational renewal through identification of future market opportunities and better preparedness for future disruptions. Williams et al. (2017) referred to this as the resilience feedback loop, where new learnings and insights are channelled into the organisation to influence tactical plans and resource allocation. Williams et al. (2017) also highlighted the role of experience in similar situations to build resilience, which Ortiz-de-Mandojana & Bansal (2016) referred to as the path dependency of resilience. Therefore, in times of rapid change or uncertainty, following the dynamic capabilities approach can enable organisational resilience. However, this approach creates tension between ordinary and dynamic capabilities, necessitating an ambidextrous approach, which can balance these competing demands.

Kantur & İşeri Say (2015) followed an inductive methodology to develop a measurement scale for organisational resilience, deconstructing resilience into three dimensions, namely integrity (referring to the strength of employee relationships), robustness (referring to the resistance capacity) and agility (referring to how readily organisations are able to respond and adapt). This methodology will be utilised for this study and will be discussed further in Chapter 4.

2.1.3. Theoretical frameworks of organisational resilience

While the construct of resilience has been applied in research areas such as ecology, materials studies and psychology, a literature review of organisational resilience by Linnenluecke (2017) indicated that the conceptualisation and operationalisation of the concept in management research remained fragmented, necessitating a unified theoretical framework for the concept (Duchek, 2020). This fragmentation results in difficulties in the broader application of the concept and hinders the development of

robust measurement scales for the concept (Hillmann & Guenther, 2021; Kantur & İşeri Say, 2015). Resilience is viewed as an organisational outcome, with the main theoretical approaches being understanding the organisational capabilities that enable resilience or the process by which organisations attain resilience (Duchek, 2020).

2.1.3.1. Resilience as an organisational capability

Resilience to enable organisational sensemaking

Deriving from disaster management studies, Weick (1993) provided a seminal view on resilience in his study of a wildfire disaster where he conceptualised that resilience was developed through organisational sensemaking, where sensemaking was defined as the retrospective process by which organisations create and sustain their interpretation of events and their business environment. Weick (1993, p.638) stated that sensemaking arises from four resilience capabilities, namely: "improvisation and bricolage, the attitude of wisdom, virtual role systems and respectful interaction". Improvisation and bricolage refer to being creative under pressure, for example, using whatever materials are at hand. Virtual role systems denote the flexibility of organisational roles during a disruptive event, where decision-making becomes decentralised to enable rapid response and adaptation. Wisdom, as Weick (1993) defined, referred to leveraging the organisation's collective knowledge to enable sense-making and adaptability. Respectful interaction refers to the need for interdependence and communication to create shared understanding, which is a vital requirement to interpret a rapidly changing reality.

The Resilience Architecture Framework

Mamouni Limnios et al. (2014) developed a theoretical framework called the Resilience Architecture Framework to illustrate the modalities of organisational resilience, depicted in Figure 2. The mode of resilience was dependent on two dimensions, namely: the level of organisational resilience and the desirability of the system state, resulting in four modes, namely rigidity, adaptability, transience and vulnerability, describing the organisational characteristics for each mode.

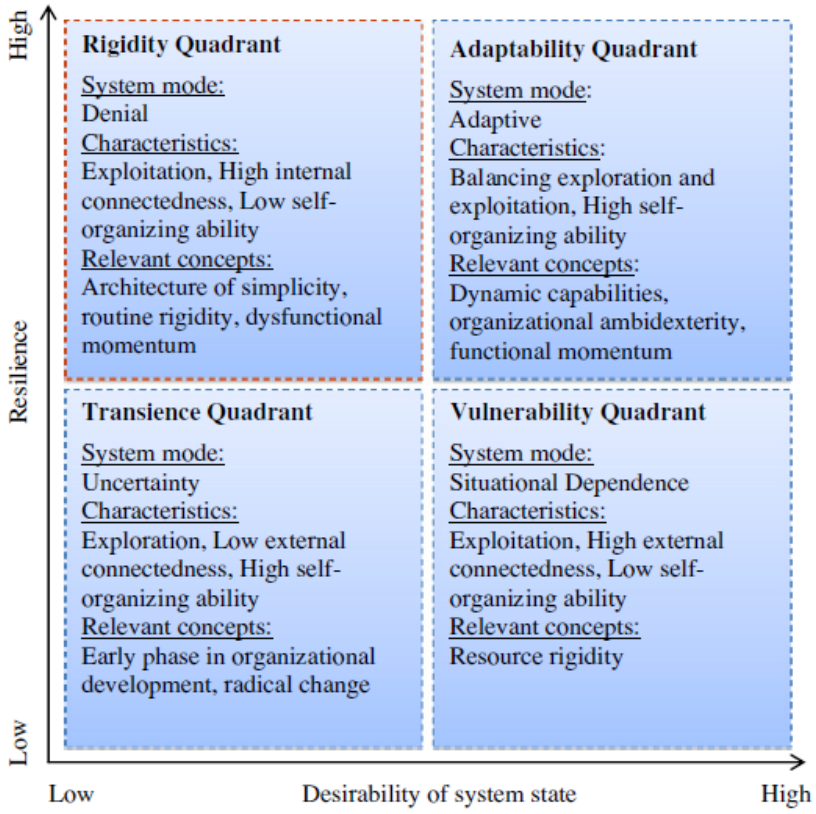

Figure 2 Resilience Architecture Framework *(Source: Mamouni Limnios et al., 2014)*

Mamouni Limnios et al. (2014) described that when resilience is high, and the desirability of system state is low, resilience is defensive and manifests as rigidity or resistance to change, therefore indicating that resilience is not necessarily a beneficial organisational feature. Williams et al. (2017, p. 750) referred to this phenomenon as the “dark side of resilience”, where resistance to change can manifest as a failure to learn, an escalation of commitment leading to organisational misalignment with the environment and can be associated with exploitation. Conversely, when resilience is high, and the desirability of the system state is also high, the organisation follows an offensive mode of adaptability, in which organisations develop adaptive capacity through ambidexterity and dynamic capabilities. These organisations are able to reconfigure organisational resources to meet the requirements of the external environment (Teece et al., 2016).

Strategic human resources approach to developing organisational resilience

Lengnick-Hall et al. (2011) theorised that organisational resilience is enabled through the development of cognitive, behavioural and contextual capabilities at an organisational level, which are enabled through strategic human resources policies. Williams et al. (2017, p. 751) referred to these as "capabilities for durability" that an organisation develops or possesses prior to a disruptive event that enables the organisation's adaptive capacity. Cognitive capabilities refer to aspects such as organisational purpose, vision and values that contribute to an organisation's identity. Lengnick-Hall et al. (2011) considered a shared mindset for flexibility consisting of expertise, creativity and decisiveness. Behavioural capabilities refer to employee behaviours such as preparedness, resourcefulness and bricolage. Contextual capabilities refer to the role of relationships to support a resilient response and include social capital, psychological safety, diffuse power and accountability (Lengnick-Hall et al., 2011). This approach is a refinement of the original conceptualisation by Weick (1993).

Lengnick-Hall et al. (2011) theorised that to build these resilience capabilities, the desirable employee behaviours and human resource (HR) principles must be matched and HR policies developed accordingly. Table 1 has been adapted from Lengnick-Hall et al. (2011), indicating the desired employee behaviours and enabling human resources principles that support these capabilities. This framework highlights the need for an integrative HR policy framework and builds from individual employee behaviours to develop aggregate organisational resilience. Bouaziz & Smaoui Hachicha (2018) performed an empirical analysis that confirmed the impact of strategic HR management practices on organisational resilience based on the resilience dimensions defined by Kantur & İşeri Say (2015). The authors found that these practices impacted the resilience dimensions to varying degrees. This finding may be utilised as a management tool to identify which HR practices should be targeted to improve the respective resilience dimensions.

This approach is supported by Cheese (2016), who highlighted the critical role of aligning employee behaviours through skills and learning to enable resilience capability. The authors noted the role of an organisational culture built on trust and respect, which are cornerstones to the respectful interaction described by Weick (1993). Barasa et al. (2018) noted the importance of a leadership attitude that view threats as potential opportunities in building an organisational culture towards

resilience. It is noteworthy that within the behavioural dimension, several desirable employee behaviours such as the development of novel solutions to challenges, following different approaches from organisational norms and proactive courses of action are enabled by organisational ambidexterity.

Table 1 Desirable employee behaviours and HR principles that support organisational resilience

Organisational resilience capabilities	Desired employee behaviour	Human resources principles
Cognitive capabilities	• Expertise • Opportunism • Creativity • Decisiveness in uncertain conditions • Questioning mindset • Ability to conceptualise solutions	• Building a partnership mentality with employees • Decentralise decision making • Developing relational instead of transactional relationships • Reduce rules and bureaucracy • Hiring practices to promote diversity
Behavioural capabilities	• Developing novel solutions to challenges • Combining originality and initiative to identify opportunities arising from an immediate situation • Following different approaches from organisational norms • Proactively considering courses of action before they are required	• Building organisational ambidexterity • Support communication practices that enhance collaboration • Emphasise employee flexibility • Develop individual hardiness • Encourage reflective practices • Reduce organisational silos • Utilise organisational learning as part of problem-solving
Contextual capabilities	• Enhancing relational networks that enable quick responses • Knowledge sharing and sense-making • Sharing of power and accountability	• Create broad resource networks • Develop a culture of trust and interconnection • Develop an orientation toward results • Develop an organisational mindset • Create a sense of personal accountability • Change bases of power to that of expertise rather than organisational position

(Source: Adapted from Lengnick-Hall et al., 2011)

2.1.3.2. Process-based approaches to resilience

Resilient and rigid responses to threat

Less academic inquiry has followed the approach of understanding the process of developing organisational resilience (Conz & Magnani, 2020). Sutcliffe & Vogus (2003) asserted that resilience follows a simple adaptation process supported by organisational processes and structures. However, the authors conceded that while the process may be straightforward, the organisational capabilities that give rise to resilience are not ubiquitous, describing these as enabling conditions of cognitive, relational and structural resources that are flexible to organisational needs. The process proposed by Sutcliffe & Vogus (2003) is presented in Figure 3, where it was theorised that a threat could result in a rigid or resilient response, which is based on the presence or absence of these enabling conditions.

In a rigid response, an organisation will restrict the processing of information, tighten controls, conserve resources and formalise processes such as decision making (Sutcliffe & Vogus, 2003). The authors cautioned that while the approach can be effective when the threat is minor, in the case of disruptive events, this approach could lead to organisational collapse. In contrast, a resilient response was characterised by broadening information processing, following a decentralised approach to decision making and redeployment of slack resources (Sutcliffe & Vogus, 2003). Therefore a supportive organisational environment including employee involvement and empowerment is critical to the resilient response, which Kantur & Íserí Say (2012) referred to as contextual integrity.

Each response leads to a positive or negative adjustment that forms a feedback loop that informs the response for future threats. This leads to a virtuous cycle for a resilient response that leads to effective action and reinforces competence, enabling an organisation to be better prepared for future threats. This view is supported by Ortiz-de-Mandojana & Bansal (2016, p.1615), who described resilience as a “latent, path-dependent set of capabilities”, referring to the difficulty of directly measuring resilience until called upon due to a threat, and that this capability is built over time through feedback and learning. Duit (2016, p. 367) referred to this process as “adaptive resilience”, as the ability of firms to learn from incidents and apply changes to withstand future events. This may be practically implemented by processes such

as evaluation of lessons learnt, by feeding these learnings back into the organisation to enable adjustments in tactical approaches.

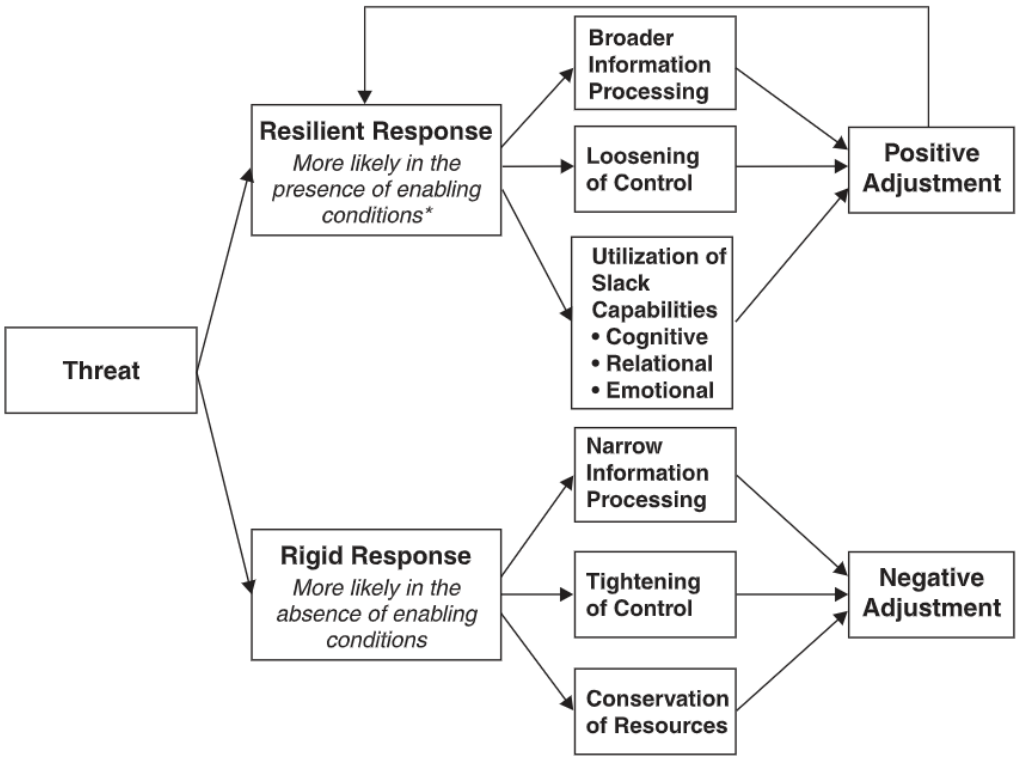

Figure 3 Resilient and rigid responses to threat *(Source: Sutcliffe & Vogus, 2003)*

An integrative capability-process perspective of organisational resilience

Duchek (2020) followed an integrative approach conceptualising resilience as a meta-capability in a process comprised of three temporal stages of anticipation, coping and adaptation, which are enabled by organisational capabilities for each stage (Figure 4). This approach is supported by Conz & Magnani (2020), who stated the need to understand resilience as a process in time. Anticipation (before the event) refers to the process of anticipating changes in the environment and preparing accordingly and is consistent with the offensive approach to resilience, described by Mamouni Limnios et al. (2014). The enabling capabilities are observation, identification and preparation, which are consistent with the capabilities described by Lengnick-Hall et al. (2011). Practices such as scenario planning aid in this process by enabling managers to understand the complexities of the environment and assess alternatives in order to develop robust long term strategies (Hillmann et

al., 2018). The second stage was coping (during the event), referring to effective handling of the disruptive event, which is enabled by accepting the situation, followed by developing and implementing solutions. This stage is often associated with crisis management (Williams et al., 2017). Lastly, adaptation refers to the adjustments made by the organisation following the event, which is characterised by reflection, organisational learning and change. Learning contributes to building the organisation's knowledge base or "wisdom" (Weick, 1993, p.641) and creates a feedback loop for anticipating future threats (Williams et al., 2017).

This framework is insightful as it illustrates the process in which an organisation anticipates, responds and adapts to a threat and that different organisational capabilities enable each step. Further, it highlights that an absence of these capabilities will lead to inadequate responses to threats and are aligned with the dynamic capabilities approach (Teece et al., 2016). As will be described later, this framework also highlights the importance of optimising current business (exploitation) while also anticipating and pro-actively preparing for changes in the environment (exploration), highlighting the need for an ambidextrous approach.

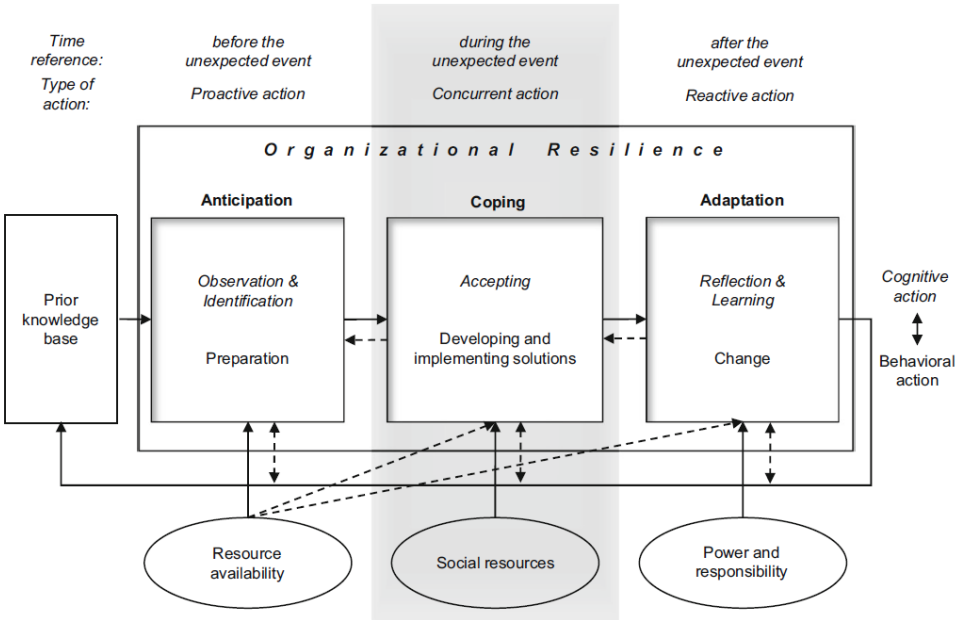

Figure 4 An integrative capability-process perspective of organisational resilience *(Source: Duchek, 2020)*

2.1.4. Organisational resilience and crisis management

Organisation resilience may be linked to crisis management, which relates to the process of returning systems (such as organisations) to normal functioning following a crisis or disaster (Williams et al., 2017). Crises may be viewed as either an event or a process (Williams et al., 2017). Considering a crisis as an event, crises were viewed as unanticipated high impact events that occur at a specific time and place, and as such, organisations have limited ability to plan for all potential crisis events (Pearson & Clair, 1998). The crisis as process perspective considered that in addition to discreet crisis events, crises could also develop over time in stages, progressively escalating toward a trigger event (Williams et al., 2017).

Crisis management research tended to focus on system responses to enable recovery following a crisis, disaster planning and preparedness, as well as the role of leadership during crises; however, there was limited consideration for organisational capabilities to overcome these crises (Williams et al., 2017). Consequently, the role of organisational resilience to enable organisational adaptability has received little attention in the crisis management literature (Williams et al., 2017). Boin et al. (2010) noted that the effectiveness of crisis responses required system capabilities such as the ability to improvise, to operate flexibly, and to endure, which are characteristics of resilience. Boin et al. (2010) also highlighted the increasing role of information and digital technologies that are integrated into organisational response systems to provide diagnostic and real-time information to support decision making. Therefore, to enable an adaptive response to disruptive events, both crisis management to enable recovery and organisational resilience to bounce back and learn from these events are required.

2.1.5. Organisational resilience and individual resilience

Originating from the social sciences, individual resilience refers to the capacity for individuals to overcome difficult circumstances or events (Rice & Liu, 2016). Individual resilience has been variously theorised as an individual trait, process or a capacity, with a strong dependence on the environmental context that influences an individual's resilience response (Kossek & Perrigino, 2016). In an organisational context, individual resilience has been extensively studied as an enabler for the effective performance of teams and organisations (Britt et al., 2016). There is a

difference between the capacity for resilience and the manifestation of resilience, with the former arising from personality traits and contextual factors such as upbringing, community and organisational conditions while the latter occurs as an adaptive response to adversity (Britt et al., 2016). The importance of individual resilience at an occupational level was emphasised, highlighting that specific occupations have a higher need for resilience due to the frequency of critical tasks for the successful performance of the role, such as surgeons or firefighters (Kossek & Perrigino, 2016). Further, the type of resilience can be classified as cognitive, emotional or physical and varies across occupations (Kossek & Perrigino, 2016).

Over the years, numerous models of individual resilience have been developed. The conservation of resources theory considers the resources available to individuals and how individuals will strive to minimise the loss of these resources (Bardoel et al., 2014). The job demands/resources theory theorised that job demands require physical, emotional and psychological effort that impact employee health which is counteracted by the resources available to an employee to enable the employee to persevere through these demands (van Woerkom et al., 2016). Britt et al. (2016) provided an integrative process model of employee resilience comprising a trigger such as an adverse event or circumstance, internal processes reflecting the individual's capacity for resilience (appraisal of adversity, coping and seeking help) and an adaptive response.

Bardoel et al. (2014) noted the importance of employee resilience as an adaptive resource for periods of organisational turbulence, highlighting the role of environmental dynamism at an organisational level and perceived environmental uncertainty at an individual level. Therefore, while organisational resilience is influenced by resilience at the individual level, organisational resilience is not simply the summation of the resilience of individuals in an organisation and encompasses the dynamic interactions of the organisation with its external environment (Lengnick-Hall et al., 2011).

2.2. Organisational ambidexterity

2.2.1. Exploration and exploitation

The increasing complexity of the business environment requires leaders to manage multiple competing strategic demands; however, many organisations fail to effectively balance them (Smith, 2014). March (1991, p. 71) defined exploitation as the efficient operation of today's business and associated this with characteristics such as "refinement, choice, production, efficiency, selection, implementation and execution." Exploitation is vital as it enables organisations to produce short-term profits by leveraging existing technologies through efficiency improvement. Exploitation is also linked with characteristics such as bureaucracy, rigid organisational structures, and mature industries (He & Wong, 2004). In contrast, March (1991, p. 71) defined exploration as the ability to adapt to changes in the business environment, with association to "search, variation, risk-taking, experimentation, play, flexibility, discovery and innovation." Exploration thus enables preparedness for new possibilities and enables longer-term business sustainability. Exploration is linked with emerging technologies and industries, flexible structures, decentralised decision-making, autonomy and improvisation (He & Wong, 2004). Exploitation may be associated with incremental innovation while exploration supports radical or disruptive innovation, referring to the different approaches to organisational learning (Benner & Tushman, 2003). Exploitation could also be viewed as focussing on current products, technologies and markets, while exploration has emphasis on the growing new products, technologies and markets (He & Wong, 2004). Gupta et al. (2006) therefore identified that the difference between exploitation and exploration was whether knowledge was developed along the existing path or followed a new path and the amount of knowledge gained, arguing that even when an organisation replicates tasks, experience is gained that could assist in improving efficiency or reducing variability.

March (1991) posited that while both exploitation and exploration are needed by organisations, these demands compete for the scarce resources of the organisation and result in managers needing to make choices such as investment or strategic decisions on an ongoing basis toward either exploitation or exploration. An organisational emphasis on exploitation may maintain near term business success,

but this performance is not sustainable without the ability to adapt to the changing needs of the external landscape (March, 1991). Conversely, an over-emphasis on exploration may develop new ideas and knowledge in new areas; however, it may result in business responses that cannot be practically implemented (March, 1991). Gupta et al. (2006) considered that each approach is self-reinforcing, postulating that when exploration leads to a failure, an alternative option is explored, referred to as a failure trap. In contrast, when an exploitation technique succeeds, it is bolstered further, creating a success trap. Further, an organisational focus on either exploitation or exploration requires different structures, human resources strategy, technology choices, business processes and organisational culture (He & Wong, 2004).

March (1991) considered a paradoxical thinking approach asserting that successful organisations need to simultaneously pursue exploitation and exploration, rather than a choice or trade-off between these competing demands. In contrast to a one-time decision, paradox theory asserts that tensions between opposing forces persist and require viewing these tensions as “both/and” rather than from an “either/or” perspective (Smith, 2014, p.1594). Zimmermann et al. (2018) asserted that the persistence of the exploitation-exploration tension required a continuous adaptation to changing business context, resulting in a dynamic equilibrium rather than a static, stable state. In this way, the balancing of the exploitation-exploration tension aligns with the dynamic resilience perspective of continuous adaptation and alignment.

March (1991) considered exploitation and exploration as opposite ends of a continuum, arguing that these opposing demands compete for finite organisational resources. Gupta et al. (2006), however, posited that these demands could be treated as orthogonal or complementary concepts (meaning that both could be pursued independently), contending that some organisational resources such as information and knowledge are practically infinite, and pursuit for exploitation (refining existing knowledge) does not compromise exploration (developing new knowledge). Therefore, the scarcity of resources would determine the extent of mutual exclusivity between exploration and exploitation. Further, in a fast-changing industry such as computer hardware, an organisation in this industry would need to vigorously pursue exploration for product development, while leveraging exploitation in their manufacturing facilities (Gupta et al., 2006). Indeed, for a large organisation consisting of multiple business units serving different market segments, there will

inevitably be a mix of explorative and exploitative approaches across the organisation. This implies that the unit of analysis (such as individual, department, function, business unit or organisational level) would determine whether exploration and exploitation can be simultaneously pursued (Gupta et al., 2006).

2.2.2. Organisational ambidexterity

Organisational ambidexterity refers to the ability of organisations to balance the efficient operation of today's business through evolutional change (exploitation) while being able to adapt to changes in the business environment through revolutionary change (exploration) (O'Reilly & Tushman, 1996). Birkinshaw & Gibson (2004) referred to ambidexterity as the ability to be proficient at alignment (value creation in the short term) and adaptability (rapid response to changes and opportunities in the business environment). Turner et al. (2020) observed that organisational ambidexterity might be operationalised in different ways in an organisation, namely structural, temporal and contextual ambidexterity.

2.2.2.1. Structural ambidexterity

Structural (or partitional) ambidexterity refers to structuring an organisation into different business units that will pursue either exploitation or exploration (Simsek et al., 2009). In this way, the "innovator's dilemma" is resolved by creating focus through business units or departments within business units with a goal of either exploitation or exploration (O'Reilly & Tushman, 2008, p.185). An example would be a sales and marketing department that focuses on current products and markets and a research and development department that focuses on developing new products or applications. While each business unit aligns its structures, processes and technologies to either exploration or exploitation, this approach relies on an overarching strategic vision at the corporate level to reconcile individual business unit tensions (Simsek et al., 2009). This approach has been criticised as it could lead to isolation or lack of integration of these departments limiting their effectiveness (Birkinshaw & Gibson, 2004). Benner & Tushman (2003, p.247) supported this view indicating that this approach leads to "highly differentiated but weakly integrated subunits", where each sub-unit has a tight culture and goal orientation, but with sub-units loosely connected to each other.

2.2.2.2. Temporal ambidexterity

Temporal ambidexterity or punctuated equilibrium, denotes the “cycling through periods of exploitation and exploration” (Gupta et al., 2006, p.694). This results in changes in resource allocation sequentially to meet changing business needs between exploitation and exploration (Gupta et al., 2006). While this approach may not be practical for large organisations due to the drastic shifts in resources, structures and processes, the sequential approach may be appropriate for environmental contexts with a strong focus on product innovation where cycles of rapid technological change are followed by technology maturity (Simsek et al., 2009). This approach could alleviate resource constraints and enable focus toward exploitation or exploration through more efficient specialisation (Simsek et al., 2009). This approach is reliant on effective switching between exploration and exploitation, highlighting the need for conflict management and interpersonal relationships (Floyd & Lane, 2000). There is also a need for an adaptative organisational culture that is supported by HR principles such as flexibility and teamwork (Simsek et al., 2009)

2.2.2.3. Contextual ambidexterity

An alternative approach is contextual ambidexterity, in which individual employees consider both exploitation and exploration orientations in their daily work (Birkinshaw & Gibson, 2004). In this system, exploration and exploitation are integrated at the business unit level and allow employees to make a judgement in how they use their time and effort in pursuit of both orientations (Birkinshaw & Gibson, 2004). Alignment in ambidextrous organisations is essential, requiring that HR policies such as performance management allow flexibility for employees to divide their time to these competing demands and reward them accordingly (Birkinshaw & Gibson, 2004).

In contrast to structural or temporal ambidexterity, where these competing demands are driven through leadership and line management decisions, in contextual ambidexterity, individual employees on the front line drive these orientations in alignment with overall corporate and business unit strategy (Birkinshaw & Gibson, 2004). Therefore, the role of leadership in this system is to develop the overall organisational context that enables individual action (Birkinshaw & Gibson, 2004). Thus, in a contextually ambidextrous organisation, employees are more likely to be generalists, in contrast to a structurally ambidextrous organisation, where employees

are likely to be specialists (Birkinshaw & Gibson, 2004). The former approach could be better suited to start-ups or entrepreneurial ventures. Birkinshaw & Gibson (2004) thus urged that structural and contextual ambidexterity should be viewed as complementary approaches. In practice, organisations will use a mix of these approaches according to their business needs.

Birkinshaw & Gibson (2004) put forward a set of employee behaviours that support contextual ambidexterity, listed in Table 2. It is noteworthy that these behaviours have synergies with the employee behaviours that support organisational resilience described in Table 1 (Lengnick-Hall et al., 2011). “Taking initiative and being alert to opportunities” aligns with the combining of originality and initiative to identify opportunities (Birkinshaw & Gibson, 2004, p.49). Collaboration and internal networks align with the resilience contextual dimension of the development of interpersonal connections and sharing of knowledge. Lastly, Birkinshaw & Gibson (2004, p.49) conceptualised “being comfortable wearing more than one hat” with an employee who can play multiple roles and use this to develop novel solutions. This aligns with aspects of the resilience behavioural dimension, such as developing novel solutions and following different approaches from organisational norms. Therefore, it is reasonable to hypothesise that employee behaviours that support contextual ambidexterity could also enable organisational resilience, thus providing a theoretical basis for this study.

Table 2 Employee behaviours that support contextual ambidexterity

“Ambidextrous individuals take the initiative and are alert to opportunities beyond the confines of their own jobs” (Birkinshaw & Gibson, 2004, p.49)
“Ambidextrous individuals are cooperative and seek out opportunities to combine their efforts with others” (Birkinshaw & Gibson, 2004, p.49)
“Ambidextrous individuals are brokers, always looking to build internal linkages” (Birkinshaw & Gibson, 2004, p.49)
“Ambidextrous individuals are multitaskers who are comfortable wearing more than one hat” (Birkinshaw & Gibson, 2004, p.49)

(Source: Birkinshaw & Gibson, 2004)

2.2.2.4. The antecedents of contextual ambidexterity

The role of organisational context to support contextual ambidexterity

Birkinshaw & Gibson (2004) evaluated the critical role of organisational context in building contextual ambidexterity, supporting Ghoshal & Bartlett (1994) that context is the unseen set of organisational drivers and beliefs that determine individual behaviours. Ghoshal & Bartlett (1994) posited that the creation of a supportive organisational context is a key responsibility of management and, over time shapes employee behaviours, resulting in improved firm performance. Organisational context is a crucial enabler for embedding behaviours that support contextual ambidexterity, underpinned by a high level of social support and a high level of performance management (Birkinshaw & Gibson, 2004). Social support refers to developing a culture of trust and support (Ghoshal & Bartlett, 1994). Performance management refers to creating a stimulating environment that encourages high performance and accountability, which consists of the constructs of stretch and discipline (Ghoshal & Bartlett, 1994). These constructs are described in Table 3, as defined by Ghoshal & Bartlett (1994).

Table 3 Dimensions of organisational context to support contextual ambidexterity

Social support	**Trust**	A culture where employees perceive fairness in decision making, involvement in decision-making and personal competence.
	Support	Availability of resources coupled with autonomy and a culture that encourages pro-activeness and idea generation.
Performance management	**Stretch**	Creating shared goals and personal meaning.
	Discipline	Creating clear standards and expectations, open feedback and consistency of sanctions.

(Source: Adapted from Ghoshal & Bartlett, 1994)

An evaluation of the dimensions of organisational context in Table 3 against the HR principles that enable organisational resilience in Table 1 support that the creation of a supportive organisational context enables both contextual ambidexterity and organisation resilience. The trust construct supports the resilience contextual dimension through the nurturing of a culture of trust and interdependence and the cognitive resilience dimension through the development of relational rather than transactional relationships. The support construct aligns with the cognitive resilience dimension through empowered decision-making and with several principles that support the behavioural resilience dimension, such as taking the initiative and developing unconventional solutions to threats. The discipline construct refers both to the creation of clear standards but also aligning expectations, gaining commitment and driving accountability which aligns with the behavioural resilience dimension. Lastly, the stretch construct purports the importance of creating a shared identity and vision which aligns with the resilience behavioural dimension through fostering an organisational orientation. Simsek et al. (2009) highlight that organisational context is enabled through supportive HR policies such as job enrichment, as well as training and skills development to encourage the exploitation/exploration integrative mindset.

The role of leadership to support contextual ambidexterity

O'Reilly & Tushman (1996) emphasised the critical role of organisational leadership to create the organisational vision, ensure alignment and fit of the strategy, structure and internal processes. Birkinshaw & Gibson (2004) underscored how leadership enables the organisational context for ambidexterity through the dynamic balancing of the performance management and social support contexts. The role of leadership to create a culture of trust, openness, and empowerment is crucial (Malik et al., 2017). Leaders who display this paradoxical leadership style of combining managerial support with high-performance expectations resulted in higher employee ambidexterity (Kauppila & Tempelaar, 2016). The impact of different leadership styles has been evaluated, finding that transformational leadership positively impacted exploration and negatively impacted exploitation, while a transactional leadership style had the opposite effect (Asif, 2019). However, while leadership plays a pivotal role to enable ambidexterity, this area has not received significant attention in the academic literature (Havermans et al., 2015).

An emerging area of study is the role of leadership to enable contextual ambidexterity as a response to complexity or complex adaptive systems. Havermans et al. (2015) found that everyday practices of interaction between managers and team members enabled interpretation of the complex environment and formulation of appropriate responses to these stimuli. This micro-level perspective indeed highlights the critical role of front-line managers to interpret the environment and reconcile this with the organisational vision and strategy. This is supported by Zimmermann et al. (2018), who highlighted the critical role of front-line managers in not only implementing the top-down strategy but enabling bottom-up adaptation, asserting that ambidexterity arises from the continuous interpretation of the operating context by front-line managers.

This perspective is supported by complexity leadership developed by Uhl-Bien & Arena (2017) which describes a leadership approach that considers organisations as complex adaptive systems. Their research introduces the construct of enabling leadership, which refers to the "enabling of conditions that support and sustain adaptive space" (Uhl-Bien & Arena, 2017, p.14). The authors referred to adaptive space as a network structure that enables self-organisation and emergent change to create order in the system (Uhl-Bien & Arena, 2017). The creation of adaptive space through enabling leadership practices could potentially support both ambidextrous (Table 2) and resilient (Table 1) employee behaviours. This view is supported by Diesel & Scheepers (2019), who found that complexity leadership contributed positively toward developing an organisational innovation climate which in turn contributed toward contextual ambidexterity. Uhl-Bien et al. (2020) considered a complexity leadership approach to managing employee burn-out in the nursing field, recommending that leaders should play the role of collaborators to enhance system effectiveness and adaptability. Understanding the role of complexity leadership to enable organisational resilience is nascent and warrants further academic inquiry.

The role of team dynamics to reconcile the demands of exploitation and exploration is another promising field of study, indicating that team factors of cohesion and efficacy are positively correlated to developing ambidexterity at a team level (Jansen et al., 2016). This emphasises the cascading effect of leadership to create a supportive organisational context down the organisation to enable contextual ambidexterity. It also highlights the role of front-line managers to create the micro-context at the team level.

2.3. The benefits of contextual ambidexterity and organisational resilience on firm performance

Teece et al. (2016) defined dynamic capabilities as an organisation's capacity to innovate, to adjust to the changing business environment as well as create change to enable competitive advantage. Dynamic capabilities enable firms to dynamically reconfigure resources and apply capabilities to the changing business environment (Teece et al., 2016). O'Reilly & Tushman (2008) asserted that the ability of firms to pursue both exploitation and exploration enables the long-term adaptability of organisations and is a dynamic capability. However, for this to be a dynamic capability, the pursuit of these competing demands need to be aligned to the firm's overarching strategic vision (Simsek et al., 2009). Birkinshaw et al. (2016) considered a contingency approach to the dynamic capabilities required for adaptation to discontinuous change, asserting that these capabilities are dependent on how ambidexterity is operationalised. The authors suggested that no mode of ambidexterity is inherently more successful but rather should be matched to the business context, organisational culture, history and leadership orientation with the requirement that dynamic capabilities are matched and developed accordingly.

In response to threats from the external business environment, Luger et al. (2018) supported that the external environmental context should guide an organisation's resource allocation toward exploitation and exploration activities, supporting that ambidexterity enables firm performance during periods of incremental change. However, during disruptive events, an ambidextrous approach can lead to organisational misalignment that can negatively impact firm performance. This study supported the need to dynamically adjust between these competing demands, which Smith (2014, p.1599) referred to as the need to be "consistently inconsistent" in decision-making to respond to environmental requirements but maintain commitments to these paradoxical demands.

In the foundational quantitative study of contextual ambidexterity, Birkinshaw & Gibson (2004) evaluated the performance of 41 business units in relation to their ambidexterity (defined as the product of alignment and adaptability), finding that ambidexterity was positively correlated with business unit performance. Numerous studies have subsequently illustrated the benefits of ambidexterity, including higher levels of firm performance (Birkinshaw & Gupta, 2013; He & Wong, 2004; Junni et al., 2013) and new product innovation (Wang & Rafiq, 2014; Lee et al., 2017).

Ismail et al. (2011) considered the organisational capabilities that enabled improved resilience of SME's toward meeting market requirements and achieving growth ambitions. The authors considered the construct of organisational agility, which has synergies with ambidexterity, where the constructs of robustness and responsiveness relate to optimally meeting current market needs, while proactiveness refers to being attentive to future customer requirements and preparing accordingly. The authors asserted that proactiveness could be guided by processes such as strategic planning to better prepare SME's for change, and in turn, enable improved firm performance.

The difficulty of measuring the impact of organisational resilience capability on firm performance is due to resilience being a latent characteristic of an organisation, not being quantifiable until it is called upon and only measurable through the impact on other measures (Ortiz-de-Mandojana & Bansal, 2016). Ortiz-de-Mandojana & Bansal (2016) considered the difficulties of measuring the financial benefits of organisational resilience by evaluating the impact of sustainable business practices on short term and longer-term business performance. The authors argued that sustainable business practices that foster environmental and social benefits contributed to resilience. Their findings indicated that while these practices did not result in differences in short term financial performance metrics, organisations that adopted these practices had higher chances of long-term survival and improved financial performance. DesJardine et al. (2019) considered an alternative measure of the impact of resilience on firm performance by considering the severity of loss - contending that more resilient firms suffered lower losses during disruptive events and time to recovery - contending that more resilient firms were able to more readily adapt. Similar to Ortiz-de-Mandojana & Bansal (2016), DesJardine et al. (2019) considered the impact of socially and environmentally sustainable practices, differentiating between tactical actions such as corporate social investment and strategic actions that contribute toward addressing the causes of these issues. The authors found that strategic social and environmental practices contributed to firm performance and, in turn, longer-term firm sustainability.

Industry type and organisational life cycle play a role in the relationship between contextual ambidexterity and firm performance. In a study of knowledge-intensive firms, it was found that ambidexterity did not significantly impact firm performance (Vrontis et al., 2017). Balboni et al. (2019) considered the effect of contextual

ambidexterity in the growth performance of technology start-ups during different phases of their firm's cycle. The findings suggest that ambidexterity is deleterious to firm performance during the initial phase of the start-up; however, as the firm grows, ambidexterity has a positive effect on firm performance. The study also found a need to shift focus during the life-cycle with a focus on exploitation once the business model has been finalised and the firm enters the growth phase of the S-curve to improve firm performance.

2.4. The conceptual linkages between organisational resilience and contextual ambidexterity

The Resilience Architecture Framework provided a conceptual link between organisational resilience and ambidexterity, positing that ambidexterity is a key organisational capability to enable a resilient organisational response (Mamouni Limnios et al., 2014). The framework posited that excessive focus on exploitation could lead to rigidity or resistance to change. While the framework proposed provides a conceptual link between organisational resilience and ambidexterity, the authors recommended empirical studies to validate their model.

Iborra et al. (2020) evaluated the impact of organisational resilience on firm performance in small-medium enterprises (SME's) following the global financial crisis, observing that ambidexterity was a key antecedent for resilience that enabled firms to maintain financial performance. The authors found that ambidextrous organisations were not only able to manage with these events but could recover and adapt by reconfiguring resources and applying their explorative capabilities to develop innovative solutions required by the changing business landscape. The authors found that ambidexterity strengthened organisational resilience that better enabled these SME's to bounce back from disruptive events.

Teixeira & Werther (2013, p.333) asserted that resilient organisations are future-looking "anticipatory innovators", which have internal processes, internal organisational environment and culture that encourage innovation, identifying ambidexterity as a vital characteristic of these organisations. The authors contended that in these organisations, change is expected, and innovation in response to the opportunities from the changing environment is inherent to their sustainable competitive advantage. Complementing this view, Williams et al. (2017) asserted

that the increasing environmental complexity necessitated that organisations develop systems to identify and respond to these challenges.

From the perspective of environmental and climate change, Clément & Rivera (2017) offered an alternative viewpoint calling not merely for adaptation but transformative change, highlighting that for affected industries, there is a need to balance continued relevance of current operations while transitioning to new business models in line with environmental requirements. The authors contended that there is a need to understand the conditions that enable this transformative change, asserting that ambidexterity is a key organisational capability to striking this balance.

Organisational context is a crucial enabler for embedding behaviours that support contextual ambidexterity, underpinned by the dimensions of a high level of social support and a high level of performance management (Birkinshaw & Gibson, 2004). Ghoshal & Bartlett (1994) posited that the creation of a supportive organisational context is a significant responsibility of management and shapes employee behaviours, resulting in improved firm performance. This view was supported by Kauppila & Tempelaar (2016), who found that leaders who combined managerial support with high performance expectations resulted in higher employee ambidexterity. An evaluation of the dimensions of organisational context against the HR principles that enable organisational resilience (Ghoshal & Bartlett, 1994; Lengnick-Hall et al., 2011) support that the creation of a supportive organisational context enables contextual ambidexterity and organisation resilience.

While the leadership approach is critical to enable ambidexterity (Zimmermann et al., 2018), this area has not received significant attention in the academic literature (Havermans et al., 2015). The role of leadership was demonstrated through the complexity leadership approach, which considers organisations as complex adaptive systems (Uhl-Bien & Arena, 2017). Complexity leadership contributed positively toward developing an organisational innovation climate which in turn contributed toward contextual ambidexterity (Diesel & Scheepers, 2019). It was also suggested that a complexity leadership approach might improve organisational adaptability (Uhl-Bien et al., 2020).

Further, the role of front-line managers was highlighted in both top-down strategic implementation and enabling bottom-up adaptation, aligning with the contextual ambidexterity approach, highlighting the need for empowerment of these managers

to enable this capability (Zimmermann et al., 2018). Turner et al. (2020) considered how managerial behaviours support resilience by evaluating the response to critical incidents. The authors considered the exploitative and explorative orientations to develop several response archetypes, finding that managerial responses were situation-specific and involved as a combination of exploitative and exploration responses. The implication is that managers need to evaluate the nature of the situation to ascertain the most appropriate response, which can enable more rapid and effective decision making.

2.5. Concluding remarks

Disruptive events present a unique challenge to organisations, as organisations are better positioned for economic or technological change rather than the discontinuous change brought on by these events (Linnenluecke, 2017). van der Vegt et al. (2015) considered the functioning of organisations during these events as a grand challenge calling for further research into this area. The authors highlighted that traditional risk management approaches are inadequate to prepare organisations for these events, suggesting that organisations rather focus on building organisational resilience. In this way, organisations should focus on building flexible capabilities to rapidly respond, adapt and learn from these events (van der Vegt et al., 2015). Linnenluecke (2017) called for practical approaches of how organisations can enable organisational resilience, including the specific business processes, organisational structures and resources to respond to disruptive events. A review of organisational resilience affirmed the need for academic inquiry to understand the organisational capabilities that enable organisational resilience as a strategic imperative (Annarelli & Nonino, 2016).

The preceding sections highlighted the imperative for organisations to adapt to the rapid change brought on by disruptive events to maintain firm performance with the need to assess the factors that contribute to firm performance in these circumstances (van der Vegt et al., 2015). This view is supported by Duit (2016), who called for a better understanding of how more resilient organisations could be designed. Mithani (2020) emphasised the role of building organisational resilience to enable organisational adaptation in disruptive events. Extant research demonstrated that ambidextrous organisations are better equipped to adapt to the changing business

environment (O'Reilly & Tushman, 2008; Birkinshaw & Gibson, 2004). While contextual ambidexterity and organisational resilience are established fields of study (Linnenluecke, 2017; Iborra et al., 2020), there is limited inquiry on the relationship between ambidextrous organisations and the resilience of these organisations (Turner et al., 2020), specifically in the performance of firms in the context of disruptive events (Mithani, 2020). This represents a gap within the body of literature, motivating the need for this study.

CHAPTER 3: RESEARCH HYPOTHESES

3.1. Conceptual framework

The overall objective of this study is a quantitative evaluation of the moderating role of contextual ambidexterity on the relationship between organisational resilience and firm performance in coping with disruptive events. The response of firms to the COVID-19 pandemic will be utilised as context as an instance of a disruptive event requiring organisation resilience. This is depicted in the proposed conceptual framework in Figure 5, indicating the theoretical constructs for this study, namely organisational resilience, firm performance, contextual ambidexterity, exploitation and exploration. Creswell (2015) states that research objectives express the goals to be achieved in a study. The overall study objective will be operationalised into two research objectives which will be utilised for hypothesis testing, namely:

- **Objective 1:** To assess the relationship between organisational resilience and firm performance within the context of disruptive events.

- **Objective 2:** To evaluate the moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance, where contextual ambidexterity consists of two lower-order constructs of exploitation and exploration.

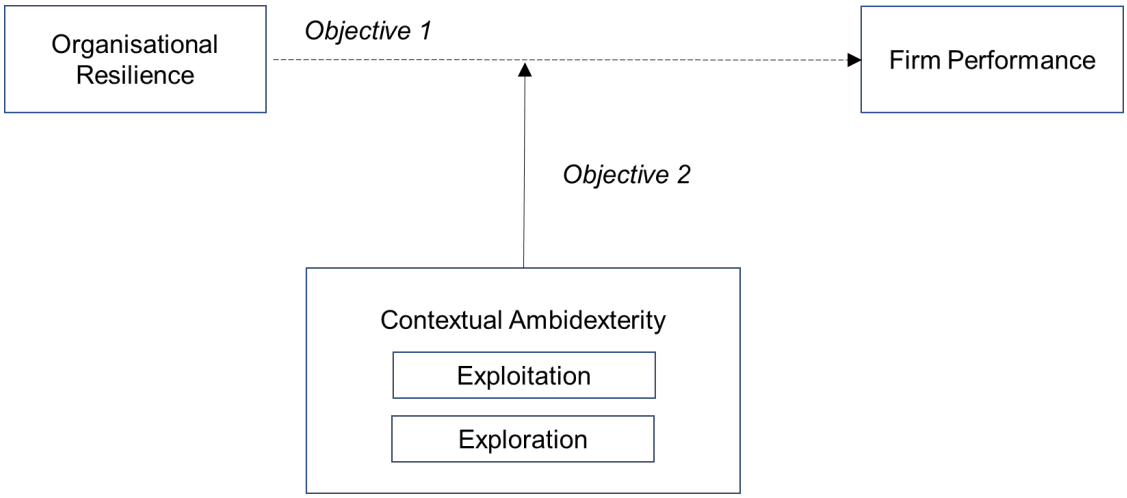

Figure 5 Proposed conceptual framework

The conceptual framework was utilised to develop a theoretical framework, which is depicted in Figure 6. The theoretical framework demonstrates the relationships between the theoretical constructs, which will be utilised to develop the hypotheses. In the proposed theoretical framework, organisational resilience is the independent variable, while firm performance is the dependent variable. Contextual ambidexterity and its constituent constructs of exploitation and exploration are independent moderator variables. It is important to note, however, that while this study will test relationships between variables, it does not purport causal relationships between these variables (Creswell, 2015). The proposed control variables are organisational size, years of experience in the industry, and the impact of COVID-19 on the organisation.

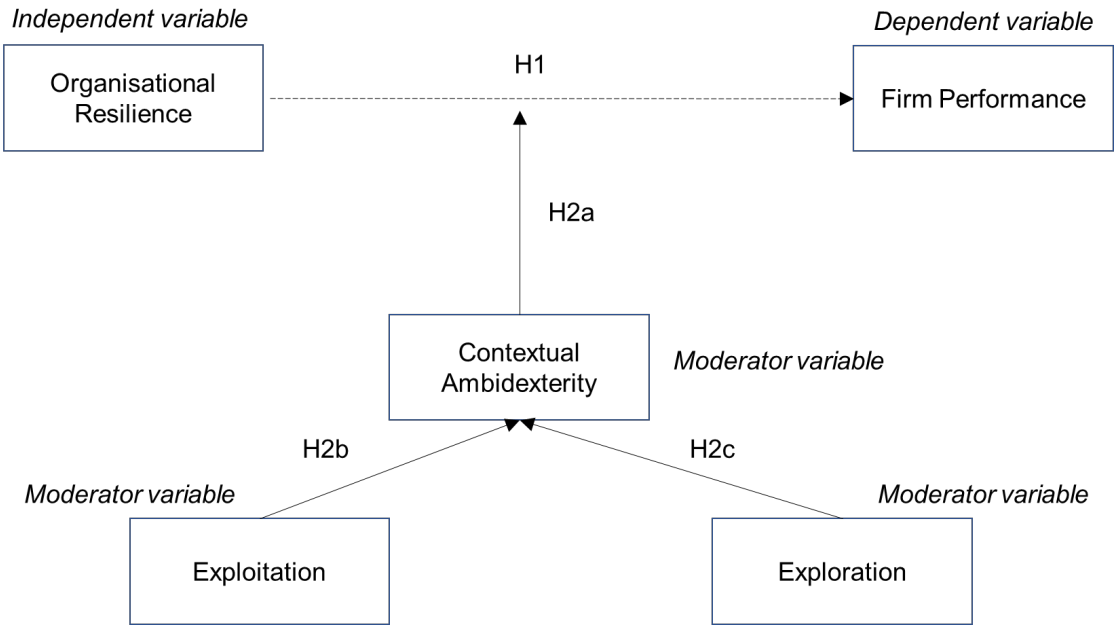

Figure 6 Proposed theoretical framework

3.2. Hypotheses

Creswell (2015) defines hypotheses as statements in a quantitative research study that postulate relationships between attributes or characteristics such as theoretical constructs. In this way, the research objectives are operationalised into hypotheses that can be tested statistically (Wegner, 2016). This is undertaken by defining the

statistical hypotheses comprising the null hypothesis, which represents the status quo and the alternative hypothesis, where the statistical parameter of interest is different to the value in the null hypothesis (Wegner, 2016). Based on hypothesis testing, the hypothesis is either supported or not supported. The following hypotheses are proposed to evaluate the research objectives, based on Figure 6:

Objective 1: To assess the relationship between organisational resilience and firm performance within the context of disruptive events.

Hypothesis 1:

- **Alternative hypothesis 1:** There is a significant positive relationship between organisational resilience and firm performance.
- **Null hypothesis 1:** There is no relationship between organisational resilience and firm performance.

Objective 2: Based on the relationships in Hypothesis 1, to evaluate the moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance, where contextual ambidexterity consisted of two lower-order constructs of exploitation and exploration.

Sub-hypotheses:

Hypothesis 2a:

- **Alternative hypothesis 2a:** Contextual ambidexterity has a positive moderating effect on the relationship between organisational resilience and firm performance.
- **Null hypothesis 2a:** Contextual ambidexterity has no moderating effect on the relationship between organisational resilience and firm performance.

Hypothesis 2b:

- **Alternative hypothesis 2b:** Exploitation has a moderating effect on the relationship between organisational resilience and firm performance.
- **Null hypothesis 2b:** Exploitation has no moderating effect on the relationship between organisational resilience and firm performance.

Hypothesis 2c:

- **Alternative hypothesis 2c:** Exploration has a moderating effect on the relationship between organisational resilience and firm performance.
- **Null hypothesis 2c:** Exploration has no moderating effect on the relationship between organisational resilience and firm performance.

The consistency matrix is provided in Appendix D, indicating the link between key literature, hypotheses, data collection tools and data analysis techniques.

CHAPTER 4: RESEARCH METHODOLOGY

4.1. Introduction to research methodology

In this study, a positivist philosophy and explanatory research design were utilised. The methodological choice was quantitative, where a single quantitative data collection technique of a survey questionnaire was followed. This chapter will outline the various aspects of the research methodology followed, including the rationale for the research design, population, unit of analysis, sampling methodology, data collection, and measurement scales. The approach to data analysis will be detailed, including the statistical analysis techniques utilised, assumptions of these techniques, tests for validity and reliability, and limitations of the study.

4.2. Choice of methodology

4.2.1. Purpose of research design

The research methodology entailed an evaluation of literature on the business problem to develop a theoretical basis for the study. The evaluation of this literature enabled the identification of research gaps in theories of the business problem, which enabled the development of a research objective. The research objective consisted of known theoretical constructs related to the business problem. The research objective was operationalised into testable hypotheses, which posited potential relationships between the identified constructs (Creswell, 2015). These hypotheses were tested by the collection and analysis of data. Based on this analysis, the hypothesised relationships between the variables were supported or not supported. These results were compared to existing literature to draw conclusions and make recommendations for business and further research. This process was consistent with an explanatory research design. The choice of research design was consistent with the literature on the chosen theoretical constructs (Bouaziz & Hachicha, 2018; Chams-Anturi et al., 2019; Wang & Rafiq, 2014), where the purpose was to evaluate the degree to which variables correlate with each other (Creswell, 2015). The characteristics of an explanatory research design include data collection in a single instance and statistical testing of hypothesised relationships between variables

(Creswell, 2015). While this research design tests relationships between variables, it does not evaluate causal relationships between the variables (Creswell, 2015).

4.2.2. Philosophy

Consistent with the explanatory research design, a positivist philosophy was adopted where existing theory was utilised to develop hypotheses that were tested using structured empirical observations (Neuman, 2014). The key characteristics of this approach include value-free research, where the researcher follows a research strategy that attempts to be detached from the data to remain impartial (Neuman, 2014). This was consistent with the data collection method of a survey strategy and quantitative analysis of the hypothesised relationships between the variables.

4.2.3. Approach selected

In line with the positivist philosophy and explanatory research design, the approach to theory development was deductive. In the deductive approach, literature sources were utilised to research the business problem and identify research constructs. These constructs were operationalised into research hypotheses. A research methodology was developed to test these hypotheses, namely a survey questionnaire. Thereafter, the survey results were statistically analysed to test these hypotheses (Creswell & Creswell, 2018). A structured methodology is consistent with the need for reliability and to enable future replication (Saunders et al., 2016).

4.2.4. Methodological choice and strategy

Due to the limited time period, a mono-method approach consisting of a quantitative methodological choice where a single quantitative data collection technique and a single instance was followed. A survey strategy using a questionnaire was utilised. This was aligned with the positivist philosophy and deductive approach. This was supported by the need to collect consistent quantitative information from a suitably large sample set and enables statistical analysis to evaluate the research hypotheses (Creswell, 2015).

4.2.5. Time horizon

A cross-sectional time horizon was utilised where data was collected in a single period, representing a snapshot perspective (Kumar, 2011). This choice was appropriate for the proposed research design as the purpose was to collect data to evaluate the relationship between the chosen theoretical constructs through statistical analysis. The time horizon of this study was crucial, as the survey data was collected during the COVID-19 pandemic as an instance of a disruptive event.

4.3. Population

The population refers to the complete set of group members relevant to the study (Saunders & Lewis, 2018). This was aligned with the research objective and was utilised for sample selection. For this study, the population consisted of all managers and knowledge workers for all for-profit business organisations across all business sectors in South Africa. This population was applicable as the objective of this study was a quantitative evaluation of the relationships between contextual ambidexterity, organisational resilience and firm performance. Managers and knowledge workers were chosen as this population was expected to have a good understanding of their organisation's innovation approach in terms of exploitation and exploration tendencies, organisational resilience and firm performance. It was also expected that managers and knowledge workers could influence to some extent ambidexterity and resilience at an organisational level. The approach was to evaluate a range of business sectors and organisations of different sizes to provide a broad perspective. The context of this study was narrowed to how organisations have responded to the COVID-19 pandemic to assess these constructs in the context of the adaptation of organisations to disruptive events. Due to the severe impact of the COVID-19 pandemic on South African organisations, this provided a rich context for the study.

4.4. Unit of analysis

This represented a case in the population (Neuman, 2014) and indicated the level of aggregation at which data was collected (Creswell, 2015). The unit of analysis was at the individual level through survey questionnaires to a sample of managers and

knowledge workers in for-profit business organisations across business sectors in South Africa and was utilised as the criteria for participation in this study.

4.5. Sampling method and size

A non-probability sampling method was chosen as a complete list of the population (sample frame) was not available (Creswell, 2015). This precluded the evaluation of the probability of a member of the population being selected, required for probability sampling (Creswell, 2015). The non-probability sampling method negated generalisation about the target population (Creswell, 2015). The non-probability sampling method is useful when time and resources are limited; the population is scattered and difficult to gain access to (Daniel, 2012). However, the drawbacks include the statistical representativeness of the sample, the potential for selection bias, especially when the population is heterogeneous and the inability to estimate the sampling error (Daniel, 2012). Based on these considerations, the non-probability sampling method was deemed suitable and was aligned with the research objective and chosen research methodology.

For quantitative research, a key consideration is a sufficiently large sample size, based on the principle that a higher sample size enables better estimation of the true population mean of a chosen parameter (Kumar, 2011). If a sample size is too small, this limits the reliability of the quantitative analysis and the ability to replicate the study (Pallant, 2016). Pallant (2016) specify a formula for the minimum number of samples (N) for statistical analysis through multiple regression as: $N > 50 + 8m$ (the number of independent variables is denoted by m). In this study, there were four variables, namely organisational resilience, exploitation, exploration, and firm performance (ambidexterity was derived from exploitation and exploration); therefore, the minimum required sample size was 82. A minimum sample size of 150 was targeted, aligned to the requirements of the statistical tests utilised (Pallant, 2016).

4.6. Measurement instrument

The measurement instrument was a self-administered structured questionnaire that was coded into an online survey tool. The benefits of this approach included standardisation, cost-effectiveness and convenience due to the large sample size and limited bias, which was aligned with the positivist philosophy (Saunders et al., 2016). Filters questions were posed at the beginning of the survey to ensure that the criteria for participation were met, namely managers and knowledge workers working in for-profit organisations in South Africa.

The survey questionnaire consisted of two main sections. In the first section, categorical questions were asked to assess the demographics of the sample at an individual and organisational level, including the number of years in the current industry, functional job area, organisational size, industry type and the impact of COVID-19 on the organisation. In the second section, questions were posed using a Likert-scale related to the theoretical constructs, which were based on extant reflective measurement scales as described in the following section. Likert-scales are valuable tools as they reflect the relative strength of a respondent's attitude toward a question in relation to another respondent (Kumar, 2011). This method has, however, been criticised due to the potential uneven weighting of scale items in relation to measuring attitude toward a particular question (Kumar, 2011).

The control variables were organisational size, the number of years in the current industry, and the impact of COVID-19 on the organisation. The survey questionnaire included an introduction, the time commitment required from participants, a statement that the study was voluntary and that the participant data would be reported anonymously. The survey questionnaire is provided in Appendix A.

4.6.1. Organisational resilience

Organisational resilience was defined as the ability "to cope with stressful conditions, preserve position and benefit from unfavourable conditions" (Kantur & İşeri Say, 2015, p.457). It referred to the ability of organisations to bounce back and adapt to challenges (Mithani, 2020). An extant scale consisting of a nine-item seven-point Likert-scale was established by Kantur & İşeri Say (2015), who operationalised organisational resilience as three dimensions, namely integrity (measured the strength of employee relationships), robustness (measured the resistance capacity)

and agility (measured the ability to rapidly respond to changes). A subsequent study affirmed the reliability of this scale, with Cronbach's Alpha exceeding 0.8 for the three dimensions (Bouaziz & Hachicha, 2018). For this study, organisational resilience as the composite of these three dimensions was evaluated.

4.6.2. Contextual ambidexterity

Contextual ambidexterity was defined as the capability of firms to explore new competencies while exploiting existing competencies (Raisch & Birkinshaw, 2008). This construct was indirectly measured based on its constituent constructs of exploitation and exploration, which were each measured by a five-item seven-point Likert-scale which was based on the extant scales developed by Wang & Rafiq (2014) for which the Cronbach's Alpha was reported as 0.82 for exploration and 0.86 for exploitation. Contextual ambidexterity was computed as the multiplicative product of exploitation and exploration (He & Wong, 2004).

4.6.3. Firm performance

As this study spanned multiple organisations across various business sectors, a subjective approach was followed for the measurement of Firm Performance using a three-item seven-point Likert-scale utilised by Chams-Anturi et al. (2019), with the reliability and validity verified with Cronbach's Alpha, reported as 0.96.

4.7. Data collection process

The data gathering process consisted of two steps. In the first step, a convenience sampling approach was followed where the researcher utilised his social and industry networks to identify suitable respondents that met the criteria of the population. These criteria were employees of for-profit organisations across all business sectors in South Africa who are managers or knowledge workers. Electronic survey questionnaires were sent to these individuals for self-completion. In the second step, a snowball technique was utilised, where the individuals in the first step were requested to distribute the survey questionnaire to other potential respondents within their social network. A key drawback was sampling bias, as it

was expected that the snowball technique could result in a more homogeneous sample than the population (Kumar, 2011). While it was expected that the proposed sampling approach would introduce some geographic concentration of respondents to Gauteng, it was not expected to be a significant drawback due to the diversity of business activity in Gauteng.

4.8. Pilot testing of the survey questionnaire

Following the obtaining of ethical clearance, the survey questionnaire was pilot tested, where the researcher distributed the survey questionnaire to nine participants to assess potential gaps and improvements. Respondents were requested to complete the survey in the presence of the researcher or provide written feedback on the quality of the survey questions. Based on the feedback received, no questions (items) were added to the survey; however, several questions were updated to improve the clarity of the questions. The updated survey questionnaire and supporting documentation was resubmitted for ethical clearance, which was obtained on 16 August, provided as Appendix B. The online survey tool was revised with the updated questionnaire and distributed to potential respondents.

4.9. Data processing

4.9.1. Editing

Once the survey questionnaire data was collected, the next step was data analysis. Aligned with the quantitative positivist approach, a structured process of statistical analysis was followed to test the hypotheses. Kumar (2011) states that the steps followed in data processing are editing, coding and analysis. In the editing step, response data was analysed. A total of 207 survey responses were received, with 171 fully completed surveys. The difference was attributed to items 1 and 2, which were utilised to screen the respondents for employees of for-profit organisations in South Africa who are managers or knowledge workers. If respondents answered negatively to either question, the survey terminated following item 7, resulting in 184 responses that met both criteria. The remainder of the difference comprised of respondents who did not fully complete the survey. The approach followed was to eliminate the respondents who did not fully complete the survey (Creswell, 2015),

rather than substitute data for the surveys with incomplete data. While this reduced the number of respondents, the 171 fully completed responses were deemed sufficient to take forward for further analysis.

4.9.2. Assessment of outliers

The data was evaluated for outliers, which are values significantly higher or lower than the other scores for a specific variable (Pallant, 2016). This was critical as statistical tests such as regression analysis are sensitive to these outliers (Pallant, 2016). This assessment was undertaken by evaluating the standardised residuals of the regression analyses, where an absolute value of 3 maximum was utilised as the cut-off criterion (Field, 2018). The term residual refers to the difference between the measured and predicted values for the dependent variable (Pallant, 2016). The Mahalanobis distances were evaluated against the critical chi-square value of 13.82, which was determined by evaluating the number of independent variables for the regression analysis as the degrees of freedom, which was two (Pallant, 2016). This procedure was undertaken for the regression analysis for Hypotheses 2a, 2b and 2c. One outlier was identified based on the Mahalanobis distances exceeding the critical chi-square value, which was removed. Following the removal of the single outlier, the maximum absolute value of the standardised residuals was 2.256.

The presence of outliers was also assessed by inspection of the scatter plot of the regression standardised residuals, where it was expected that the residuals followed an approximately centralised rectangular pattern (Pallant, 2016). The scatter plots of the standardised residuals (Figures 18, 21 and 24) provided in Appendix C indicated a centrally located rectangular distribution, with no evidence of a specific pattern (Pallant, 2016). Therefore, following the removal of the single outlier, the assumption for the regression analysis that the data contained no outliers was supported. A final number of 170 responses was taken forward for statistical analysis.

4.9.3. Coding

In the next step, response data was coded for analysis in IBM SPSS Statistics 27. For this purpose, the researcher developed a code book, provided in Appendix E. The intent of the code book is to provide a set of rules for the assignment of values

to the data obtained from the survey questionnaire, which may be utilised for statistical analysis (Kumar, 2011). Categorical data from the first part of the survey was coded as nominal variables, while the Likert-scale data from the remainder of the survey was coded as ordinal variables and treated as parametric data (Creswell, 2015). No negatively worded items were posed; therefore, no reversal of scoring was required (Kumar, 2011). Individual items were utilised to calculate the composite scores for the constructs of Exploitation, Exploration, Contextual Ambidexterity, Organisational Resilience and Firm Performance per respondent.

4.10. Data analysis

4.10.1. Descriptive statistical analysis

Descriptive statistical analysis was undertaken to evaluate the demographic characteristics of the sample. Frequency distributions and percentages were assessed for the categorical data at an individual and organisational level (Wegner, 2016), including the number of years in the current industry, functional job area, organisational size and industry type. Descriptive statistical analysis was also undertaken on the Likert-scale data for each item and the composite constructs. For each item, a measure of central tendency (mean), variability (standard deviation), the minimum and maximum value was assessed.

4.10.2. Simple linear regression for hypothesis testing

For Hypothesis 1, simple linear regression was utilised to evaluate the relationship between organisational resilience and firm performance. Simple linear regression is utilised to represent a relationship between two variables using a straight-line equation, following the form, $y = b_0 + b_1x$. This equation describes the extent to which the variables x and y vary in a linear manner (Wegner, 2016). The coefficient, b_1, is the slope of the regression line and represents the marginal rate of change of the y variable for each unit change of the x variable (Wegner, 2016). The coefficient b_0 is the y-intercept. A positive value for b_1 indicates a positive or direct linear relationship, while a negative value for b_1 indicates a negative or inverse linear relationship (Wegner, 2016).

This analysis used the least squares method to determine the best fitting linear relationship between the variables (Wegner, 2016). A scatter plot diagram was utilised to visually depict the relationship between the variables (Wegner, 2016). The strength of the relationship was assessed based on the r^2 coefficient and the statistical significance, which was tested at the 5% level of significance to support or not support the hypothesis (Wegner, 2016). A correlation test was utilised to measure the degree of linear correlation between the constructs (Wegner, 2016).

4.10.3. Assumptions of simple linear regression

The linear regression technique made the following assumptions: the Likert-scale data for each construct was paired and treated as ordinal data, measurements were independent, there were no outliers, and the data followed a normal distribution (Wegner, 2016). For the data gathered, the Likert-scale data for each construct was paired, and each measurement was independent. The presence of outliers was assessed based on the process described previously by evaluation of the standardised residuals (Field, 2018) and visual inspection of the scatter plot of the standardised residuals (Pallant, 2016). The assumption of normality was evaluated through a histogram, skewness and kurtosis of each variable (Appendix C).

4.10.4. Multiple linear regression for hypothesis testing

For Hypothesis 2a, the moderating effect of ambidexterity on the relationship between organisational resilience and firm performance was tested using multiple linear regression (Pallant, 2016). The moderating effects of exploitation and exploration were also tested (Hypotheses 2b & 2c respectively) using multiple linear regression. Multiple regression is a valuable technique to test the impact of a moderator variable on the relationship between variables and tests whether the inclusion of the additional variable improves the model predictability (Pallant, 2016). The model results were evaluated with the r^2 coefficient and statistical significance. The effect of each independent variable on the dependent variable was evaluated. Based on these results, the hypotheses were supported or not supported. The multiple regression analysis was undertaken according to the statistical procedure detailed in Pallant (2016).

4.10.5. Assumptions of multiple linear regression

The suitability of the data for the multiple linear regression technique was assessed against the assumptions of multicollinearity, normality, no outliers, linearity and homoscedasticity (Pallant, 2016):

- The **multicollinearity**, defined as the degree of correlation between the independent variables, was assessed using the collinearity statistics of the variance inflation factor (VIF) and tolerance obtained from the SPSS outputs in the coefficients table of the multiple regression analysis (Pallant, 2016). The tolerance indicates the variability of an independent variable that is not accounted for by the other independent variables, while the VIF is the mathematical inverse of the tolerance (Pallant, 2016). Field (2018) recommended the following guidelines to assess multicollinearity, indicating multicollinearity is not a concern if the following conditions are met:
  - The largest VIF <10
  - Average VIF is not substantially greater than 1
  - Tolerances are above 0.2
- The assumption that the regression analysis follows a **normal distribution** was evaluated by assessing the histograms for the regression standardised residuals for each regression analysis, where the data should follow a bell-shaped distribution (Pallant, 2016).
- The normal probability (P-P) plot of the regression standardised residuals was evaluated to test for **linearity**, where the data should be positioned along the diagonal line from bottom left to top right (Pallant, 2016).
- The presence of **outliers** was assessed by evaluation of the standardised residuals where an absolute value of 3 maximum was utilised as the cut-off criterion (Field, 2018). The Mahalanobis distances were evaluated against the critical chi-square value (Pallant, 2016). The scatter plot of the regression standardised residuals were visually inspected with the requirement that the data followed a centrally located rectangular distribution, with no evidence of a specific pattern (Pallant, 2016).
- The **homoscedasticity** refers to the assumption that the dependent variable has equal variance across the range of the independent variables (Hair et al., 2019). The homoscedasticity was evaluated by visual inspection of the scatter plots of the regression standardised residual, where it was required that there was an

equal dispersion of the residuals across the range of the predicted values (Hair et al., 2019).

4.11. Reliability

It was essential to evaluate the scale reliability to assess the degree of random error (Pallant, 2016). Internal consistency is a measure of scale reliability, referring to the degree to which survey items for each construct measure the same latent construct (Pallant, 2016). This was tested by calculating Cronbach's Alpha as a measure of the average correlation of the items for each construct, with a minimum Cronbach's Alpha required for satisfactory reliability of 0.7 (Pallant, 2016).

4.12. Validity

The overall construct validity was assessed through convergent and divergent validity. Hair et al. (2019) states that exploratory factor analysis may be used to establish the underlying structure of variables within a data set, in this case, being the survey items. This technique was utilised to test the convergent validity by assessing the loading of the survey items on the latent variables using the procedure detailed in Pallant (2016):

- **Assessing the suitability of data for factor analysis** – The suitability of the data for factor analysis was assessed based on sufficient sample size and the strength of the relationship between the items, where a sample size of at least 150 was recommended (Pallant, 2016). The suitability of the data for factor analysis was determined using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Barlett's Test of Sphericity. For the KMO, a criterion of a minimum of 0.6 was deemed acceptable, while Barlett's Test of Sphericity should be significant at the 0.05 level of significance (Pallant, 2016).
- **Factor extraction** – This refers to the evaluation of the smallest number of factors that may be utilised to represent the relationships between the data, typically undertaken using principal component analysis (Pallant, 2016). In order to assess the number of factors, Kaiser's criterion was utilised where factors with an eigenvalue of at least 1.0 were considered. The number of factors was iterated until the components accounted for at least 60% of the cumulative variance (Pallant, 2016).

- **Factor rotation and interpretation** – The next step was to rotate the factors to a more understandable form where the orthogonal rotation approach using Varimax rotation was followed (Pallant, 2016). The objective was to ensure that variables were loaded on the components with which they loaded the strongest (Pallant, 2016). This was followed by an interpretation of the components based on theory and the hypothesised constructs.

The discriminant validity measures the distinctiveness between the model constructs, measured through their respective scales (Hair et al., 2019). The discriminant validity was assessed by evaluating the Spearman correlation coefficient between the latent constructs using a correlation matrix (Creswell, 2015).

4.13. Limitations

- As the area of organisational resilience during disruptive events requires further research enquiry, a deductive approach negated the opportunity for theory development and a more profound understanding that could have been obtained from an inductive approach. The researcher was limited to the survey responses and could not probe for more detail. Thus, this study could have benefitted from triangulation through a mixed-method approach.
- The use of a survey questionnaire could have introduced random sampling error, with Zikmund et al. (2010) indicating that a sample size of at least 400 being required to minimise this error. Further, while the survey instrument was piloted, any unidentified issues may have resulted in a systematic error.
- The use of a non-probability sampling technique negated generalisability to the population (Creswell, 2015).
- While the researcher had made all attempts to ensure that a good spread of survey responses was obtained, due to the sampling methodology utilised, it was possible that sample bias was experienced, including self-selection bias (Zikmund et al., 2010). This will be explored further in Chapter 5.
- The cross-sectional time horizon for this study is a potential limitation, as the context of this study was that of a global pandemic illustrative of a disruptive event, which had a significant impact on the business environment. Therefore, it is anticipated that the strength of the relationships between the research

constructs could differ in a different time horizon, and this study could benefit from a longitudinal approach to assess these differences.

4.14. Chapter conclusion

In this chapter, the methodological basis for this study was detailed. The study followed a positivist philosophy, and an explanatory research design was employed. Survey questionnaires were developed, and responses were collected to enable the testing of the hypotheses proposed. The survey questionnaires were based on extant measurement scales (Bouaziz & Hachicha, 2018; Chams-Anturi et al., 2019; Wang & Rafiq, 2014) and pilot tested. The method for statistical data analysis was detailed, including descriptive statistics, approach to hypothesis testing, assessment of reliability and validity and limitations of the chosen approach. Chapter 5 will provide the results of these statistical analyses.

CHAPTER 5: RESULTS

5.1. Introduction to chapter

This study assessed the impact of organisational resilience on firm performance within the context of disruptive events. The study further evaluated the moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance within the context of disruptive events, where contextual ambidexterity consisted of two lower-order constructs of exploitation and exploration. In order to test the hypotheses, an explanatory research design was employed where a survey questionnaire was developed based on extant measurement scales (Bouaziz & Hachicha, 2018; Chams-Anturi et al., 2019; Wang & Rafiq, 2014). The survey questionnaire was pilot tested and sent to potential respondents for completion. This chapter will statistically analyse the results of this survey. The survey questionnaire consisted of two main sections. In the first section, categorical questions were asked to assess the demographics of the sample at an individual and organisational level. In the second section, questions were posed related to the theoretical constructs based on the hypotheses and aligned with the research objective.

In this chapter, the results of this study will be presented in the following format. A descriptive statistical analysis of the sample will be undertaken for the categorical data from the first part of the survey, which were coded as nominal variables (Questions 1 to 7) and the Likert-scale data from the remainder of the survey, which were coded as ordinal variables (Questions 8 to 29). Thereafter, reliability and validity will be tested. Inferential statistical analysis will be utilised to test the research hypotheses. Simple linear regression will be applied to test Hypothesis 1, while multiple regression will be utilised for the moderator analysis for Hypotheses 2a/2b/2c. The assumptions for these techniques will be tested to ascertain their applicability and limitations. Based on hypothesis testing, the hypotheses will either be supported or not supported. Additional relationships between constructs will be explored. Chapter 6 will provide a discussion of the results and relate these results to the theoretical basis for this study.

5.2. Descriptive statistics for categorical questions

A total of 207 survey responses were received, with 171 fully completed surveys. As described in the data processing section of Chapter 4, the difference was attributed to items 1 and 2, which were utilised as screening questions. The screening criteria were employees of for-profit organisations in South Africa (Question 1) and managers or knowledge workers (Question 2). If respondents answered negatively to either question, the survey terminated following item 7, resulting in 184 responses that met both criteria. The remainder of the difference comprised of respondents who did not fully complete the survey. As described previously, the data was assessed for outliers, where one outlier was removed, resulting in 170 responses taken forward for data analysis.

Tables 4 and 5 indicate the frequency distributions for Question 1 and Question 2, where respondents were asked if they were employees of for-profit organisations in South Africa (Question 1) and managers or knowledge workers (Question 2). Since these were utilised as screening questions for the study, 100% of respondents responded positively to both of these questions.

Table 4 Frequency of respondents for Question 1: *Are you currently employed at a for-profit company operating in South Africa?*

Response	Frequency	Percentage
Yes	170	100%
No	0	0%
Total	170	100%

Table 5 Frequency of respondents for Question 2: *Does your current job fall within the description of either manager or knowledge worker?*

Response	Frequency	Percentage
Yes	170	100%
No	0	0%
Total	170	100%

Table 6 below provides the frequency distribution for the type of industry that the respondents were employed. Of the respondents, 58.8% were employed in the manufacturing sector, 22.9% in the banking, financial services, insurance, real estate and business services sector and 5.3 % in the communication and information technology sector. The remaining industries, therefore, comprised 13.0% of the sample. Therefore, the results indicate a strong concentration of the respondents in these three industries, with manufacturing by far exceeding the other industries in the sample. Therefore, caution should be taken in the interpretation of these results with regard to their applicability across industries. Only three responses were captured in the other activities, which comprised the education and media sectors.

Table 6 Frequency of respondents for Question 3: *What type of industry do you work in?*

Industry type	Frequency	Percentage
Agriculture, forestry and fishing	1	0.6
Mining and quarrying	4	2.4
Manufacturing industries such as the oil & gas sector, food manufacturing, automotive industry, chemicals and textiles	100	58.8
Pharmaceuticals and healthcare	4	2.4
Construction	1	0.6
Wholesale and retail trade	2	1.2
Hospitality and tourism, including hotels and restaurants	1	0.6
Transportation, logistics and storage	6	3.5
Communication and information technology	9	5.3
Banking, financial services, insurance, real estate and business services	39	22.9
Community, social and personal services	0	0
Other activities	3	1.8
Total	**170**	**100.0**

Table 7 provides the frequency distribution for the number of years the respondents had been employed within their industry. In terms of the years of experience of the

respondents, 47.1% had 11-20 years, 23.5% had 6-10 years, 17.1% had more than 20 years, 10.6% had 3-5 years, and 1.8% had 0-2 years. This indicates a satisfactory spread of the sample across the years of experience of the respondents with a concentration of respondents in the 11-20 years category, followed by 6-10 years and more than 20 years categories.

Table 7 Frequency of respondents for Question 4: *How many years have you been employed within this industry?*

Years of experience	Frequency	Percentage
0-2 years	3	1.8
3-5 years	18	10.6
6-10 years	40	23.5
11-20 years	80	47.1
More than 20 years	29	17.1
Total	**170**	**100.0**

Table 8 indicates the frequency distribution for the number of employees in the organisations that the respondents were employed. In terms of the number of employees in the organisations, 84.7% had more than 250 employees, 8.2% had 51-250 employees, 4.7% had 11-50 employees, and 2.4% had 1-10 employees. This indicates that the majority of the sample was represented by large organisations with more than 250 employees. This is ideal as the theoretical framework for this study is based on the organisational level constructs of resilience and ambidexterity.

Table 8 Frequency of respondents for Question 5: *Approximately how many employees does your organisation employ in South Africa?*

Number of employees in organisation	Frequency	Percentage
1-10	4	2.4
11-50	8	4.7
51-250	14	8.2
More than 250	144	84.7
Total	**170**	**100.0**

Table 9 indicates the frequency distribution for the respondents work functional area. Of the respondents, 22.4% were employed in the operations/manufacturing area, 19.4% in other areas, 11.2% in finance, and 10.6% in information management, with the other job categories comprising the balance. The other work functional areas included engineering, strategy, new business development and risk management. This indicates a satisfactory sample spread across job functions without a single function dominating the sample. The highest concentration in the operations/manufacturing and finance functions corresponds well with the industry types where the manufacturing and banking, financial services, insurance, real estate and business services were highest.

Table 9 Frequency of respondents for Question 6: *What is the functional area of your current job?*

Functional area	Frequency	Percentage
Sales and marketing	15	8.8
Operations/manufacturing	38	22.4
Supply chain	16	9.4
Finance	19	11.2
Research and development	17	10.0
Customer services	3	1.8
Human resources	6	3.5
Information management	18	10.6
Procurement	0	0
Legal and regulatory services	5	2.9
Other	33	19.4
Total	**170**	**100.0**

Table 10 indicates the frequency distribution for the direct impact of the COVID-19 pandemic on the organisations that the respondents were employed. In terms of the direct impact of the COVID-19 pandemic on the organisations, 47.1% had a high or severe impact, 47.1% had a moderate impact, and 5.9% had little or no impact. This is ideal as the research is focused on understanding the context of the COVID-19 pandemic on the research constructs of organisational resilience, firm performance and ambidexterity.

Table 10 Frequency of respondents for Question 7: *Taking a holistic perspective, how much of a direct impact has the COVID-19 pandemic had on your organisation?*

Direct impact of the COVID-19 pandemic	Frequency	Percentage
Little or no impact	10	5.9
Moderate impact	80	47.1
High or severe impact	80	47.1
Total	**170**	**100.0**

A holistic overview of the research sample indicated a satisfactory spread across work functional areas, organisational size and employee years of experience. The sample indicated a higher concentration of moderate and high or severe impact of the COVID-19 pandemic on the organisations, which is ideal as the intent of the study was to evaluate the context of the COVID-19 pandemic on the organisational level constructs of resilience, firm performance and ambidexterity. The sample indicated the highest concentration in the manufacturing sector (58.8%), which indicated that there was sampling bias, which will limit the ability to apply these results across industries. The sample was deemed adequate for the evaluation of the research hypotheses.

5.3. Descriptive statistics for Likert-scale data

Table 11 indicates the descriptive statistics for the Likert-scale questions of the survey. Questions 8 to 16 were related to the organisational resilience construct, questions 17 to 19 on the firm performance construct, questions 20 to 24 on the construct of exploration and questions 25 to 29 on the construct of exploitation. For each item, the number of responses, the minimum response received, maximum response received, mean score per item and standard deviation per item are indicated. The lowest mean score was 3.84, which was received for question 18 related to firm performance where the extent to which market share had increased relative to previous years was posed. The highest mean score was 5.78, which was received for question 8 related to organisational resilience where the extent to which the respondent's organisation stood straight and preserved its strategic position in the business environment was posed.

Table 11 Descriptive statistics for Likert-scale data

		Number	Minimum	Maximum	Mean	Std. Deviation
Organisational resilience	Question 8	170	1	7	5.78	1.174
	Question 9	170	1	7	5.50	1.351
	Question 10	170	1	7	5.23	1.550
	Question 11	170	1	7	5.26	1.445
	Question 12	170	1	7	5.00	1.580
	Question 13	170	1	7	4.91	1.629
	Question 14	170	1	7	4.64	1.478
	Question 15	170	1	7	5.54	1.250
	Question 16	170	1	7	5.74	1.189
Firm performance	Question 17	170	1	7	3.86	1.907
	Question 18	170	1	7	3.84	1.728
	Question 19	170	1	7	3.95	1.839
Exploration	Question 20	170	1	7	4.52	1.844
	Question 21	170	1	7	4.46	1.794
	Question 22	170	1	7	4.28	1.745
	Question 23	170	1	7	4.03	1.745
	Question 24	170	1	7	4.42	1.719
Exploitation	Question 25	170	1	7	4.66	1.587
	Question 26	170	1	7	4.85	1.443
	Question 27	170	1	7	5.04	1.477
	Question 28	170	1	7	4.72	1.595
	Question 29	170	1	7	4.75	1.639

The individual survey items were utilised to compute the scores for the composite research constructs. For the constructs of organisational resilience, firm performance, exploitation and exploration, a mean score was computed. Contextual ambidexterity was computed as the multiplicative product of exploitation and exploration (He & Wong, 2004).

Table 12 indicates the descriptive statistics for the research constructs. For each construct, the number of responses, minimum score, maximum score, mean score and standard deviation were computed. Organisational resilience received the highest construct mean score of 5.29, while the lowest construct mean score was received for firm performance. The lower construct mean score for firm performance could be an indication of the impact of the COVID-19 on organisations. The construct mean scores for exploration and exploitation were similar, with exploitation being higher than exploration, indicative of a slightly higher focus on exploitation in the organisations in the sample. This supports the ambidexterity construct that organisations balance their resources toward both exploration and exploitation. The highest standard deviation was for firm performance, while the lowest standard deviation was for organisational resilience. The higher standard deviation for firm performance could be due to the varied impact of the COVID-19 pandemic on different organisations.

Table 12 Descriptive statistics for the research constructs

Constructs	Number	Minimum	Maximum	Mean	Std. Deviation
Organisational resilience (ORES)	170	1.78	7.00	5.29	1.090
Firm performance (FP)	170	1.00	7.00	3.88	1.657
Exploration (EXPLORE)	170	1.00	7.00	4.34	1.529
Exploitation (EXPLOIT)	170	1.00	7.00	4.80	1.334
Contextual ambidexterity (AMB)	170	1.00	49.00	22.46	12.077

5.4. Reliability and validity

5.4.1. Reliability

Cronbach's Alpha was computed for each research construct to test the internal consistency of the measurement scales utilised. This is a measure of scale reliability, referring to the degree to which the survey items for each construct measure the

same latent construct (Pallant, 2016). Pallant (2016) recommends a minimum Cronbach's Alpha for satisfactory reliability of 0.7. Table 13 indicates Cronbach's Alpha for each research construct with each well above this minimum threshold. Therefore, each measurement scale was deemed as reliable, with the items measuring the same latent constructs respectively.

Table 13 Cronbach's Alpha for research constructs

Constructs	Cronbach's Alpha	Number of items
Organisational resilience (ORES)	0.915	9
Firm performance (FP)	0.892	3
Exploration (EXPLORE)	0.915	5
Exploitation (EXPLOIT)	0.912	5

5.4.2. Validity

5.4.2.1. Factor analysis

The validity of the constructs utilised in this study was evaluated through convergent and divergent validity. Exploratory factor analysis may be utilised to evaluate scale items to reduce a large number of scale items into a smaller number of composite constructs, which may be utilised for further analysis such as linear or multiple regression (Pallant, 2016). In this case, the exploratory factor analysis was utilised to confirm the loading of the survey items on the latent constructs, as insufficient responses were received to undertake a confirmatory factor analysis.

The suitability of the data for factor analysis was assessed by evaluation of the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Barlett's Test of Sphericity (Table 14). For the KMO, a criterion of a minimum of 0.6 was deemed acceptable, while Barlett's Test of Sphericity should be significant at the 0.05 level of significance (Pallant, 2016). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was reported as 0.929, exceeding the minimum threshold of 0.6, therefore deemed acceptable. Barlett's Test of Sphericity was statistically significant with a

p-value of 0.000, which was less than 0.05. The results support the suitability of the data for factor analysis.

Table 14 Results of Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin (KMO) and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.929	
Bartlett's Test of Sphericity	Approx. Chi-Square	2822.071
	df	231
	Sig.	0.000

The components were determined based on Kaiser's criterion, where components with an eigenvalue of at least 1.0 were considered. Therefore, three components were identified, which accounted for 66.75% of the cumulative variance, as indicated in Table 15. Component 1 accounted for 49.7% of the total variance.

Table 15 Rotated component matrix (extract of first five components)

Component	Total	% of Variance	Cumulative %
1	10.934	49.700	49.700
2	2.078	9.447	59.147
3	1.672	7.598	66.745
4	0.962	4.373	71.118
5	0.837	3.804	74.922

This is supported by Figure 7, which depicts the Scree Plot where the components were plotted against the eigenvalues, supporting that the three factors lie above the elbow in the plot.

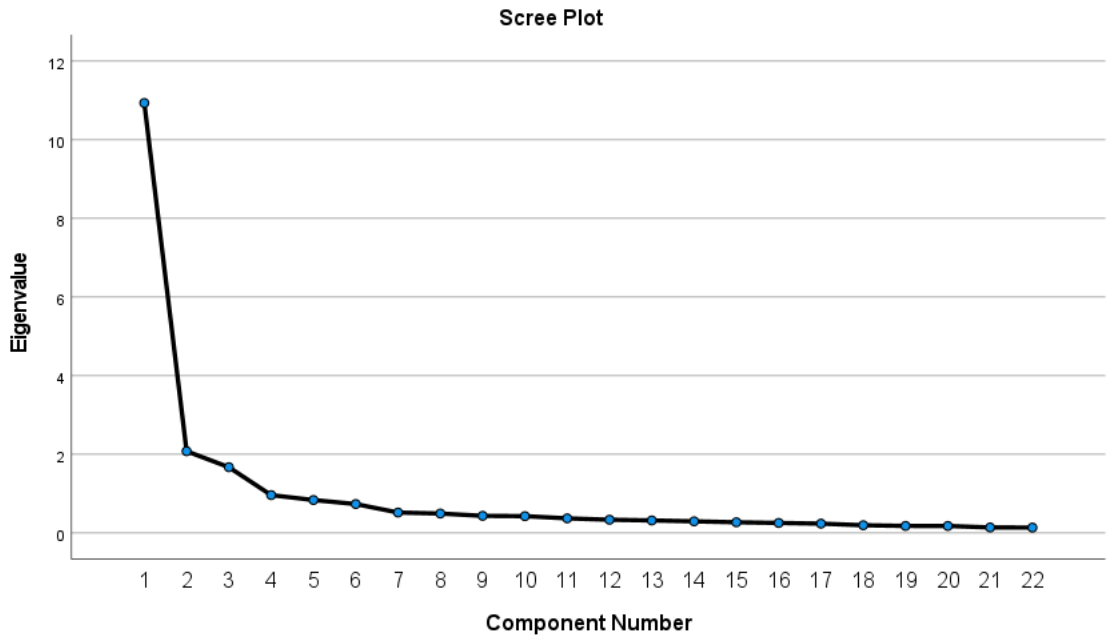

Figure 7 Scree plot for evaluation of principal components

The results of the factor analysis are provided in Table 16, identifying three factors indicating the loading of the survey items to the respective factors. In some instances, an item loaded on to more than a single component. The component onto which the item loaded the highest is indicated in bold. Component 1 accounted for the majority of the variance of 49.7 % and an Eigenvalue of 10.93. The results confirm the underlying constructs utilised in the study. Component 1 represented ambidexterity; however, it did not distinguish between exploitation and exploration as distinct factors. Component 2 represented organisational resilience, while Component 3 represented firm performance. It is noteworthy that while some items loaded on to more than a single component, the factor loadings were in the approximate region of 0.3 to 0.45. Hair et al. (2019) recommends that while factor loadings in the region of ±0.3 to ±0.4 are minimal satisfactory, higher factor loadings are recommended, depending on the sample size. Therefore, these were not considered to be a concern. Based on the analysis undertaken, the results support the convergent validity of the survey instrument, confirming that the survey items may be reduced to the proposed theoretical constructs.

Table 16 Rotated component matrix

		Component 1	Component 2	Component 3
Organisational Resilience	Q8		**0.632**	0.351
	Q9	0.316	**0.696**	
	Q10	0.301	**0.751**	
	Q11		**0.622**	
	Q12	0.405	**0.731**	
	Q13		**0.754**	
	Q14	0.335	**0.728**	
	Q15	0.307	**0.732**	
	Q16		**0.659**	
Firm Performance	Q17			**0.872**
	Q18			**0.855**
	Q19			**0.899**
Exploration	Q20	**0.755**	0.369	
	Q21	**0.749**		
	Q22	**0.757**	0.333	
	Q23	**0.794**		
	Q24	**0.800**		
Exploitation	Q25	**0.805**		
	Q26	**0.642**	0.365	
	Q27	**0.615**	0.432	
	Q28	**0.722**	0.381	
	Q29	**0.699**	0.447	

The component onto which the item loaded the highest is indicated in **bold**.

5.4.2.2. Correlation matrix

The discriminant validity measures the distinctiveness between the model constructs (Hair et al., 2019). The discriminant validity was assessed by evaluating the Spearman correlation between the latent constructs using a correlation matrix (Creswell, 2015), provided in Table 17. This also assists in exploring the relationships between the various constructs, which will be evaluated further in hypothesis testing.

In consideration of the correlation matrix, it is necessary to evaluate the following:

- **The direction of the relationship.** This is indicated by the sign associated with the correlation coefficient, where a positive sign indicates a direct relationship while a negative sign indicates an inverse relationship (Pallant, 2016).
- **The strength of the relationship.** This is determined by the magnitude of the correlation coefficient, where $0.1 < |r| < 0.3$ represents small/weak relationship, $0.31 < |r| < 0.5$ represents a medium/moderate relationship and $|r| \geq 0.5$ represents a large/strong relationship (Pallant, 2016). A correlation coefficient of zero represents no relationship , -1 represents a perfect negative correlation and +1 represents a perfect positive correlation (Pallant, 2016).
- **The significance of the relationship** – This assesses whether the correlation is statistically significant, which requires that the p-value is lower than 0.05 to be considered statistically significant at the 5% level of significance (Pallant, 2016).

Table 17 Correlation matrix of research constructs

		ORES	FP	EXPLORE	EXPLOIT	AMB
ORES	Correlation Coefficient					
	Sig. (2-tailed)					
	Number					
FP	Correlation Coefficient	0.369**				
	Sig. (2-tailed)	0.000				
	Number	170				
EXPLORE	Correlation Coefficient	0.655**	0.327**			
	Sig. (2-tailed)	0.000	0.000			
	Number	170	170			
EXPLOIT	Correlation Coefficient	0.704**	0.350**	0.783**		
	Sig. (2-tailed)	0.000	0.000	0.000		
	Number	170	170	170		
AMB	Correlation Coefficient	0.707**	0.355**	0.967**	0.909**	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	Number	170	170	170	170	

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

The following observations were noted:

- There was a strong positive correlation of exploration, exploitation and ambidexterity with organisational resilience.
- There was a moderate positive correlation between organisational resilience and firm performance.
- There was a moderate positive correlation of exploration, exploitation and ambidexterity with firm performance.
- There was a strong positive correlation between exploitation and exploration.

5.5. Testing of research hypotheses

5.5.1. Hypothesis 1

The objective of Hypothesis 1 was to assess the relationship between organisational resilience and firm performance within the context of disruptive events. This was tested using simple linear regression to evaluate the strength, direction and statistical significance of the relationship between organisational resilience and firm performance, where the least squares method was utilised to determine the best fitting linear relationship between the variables (Wegner, 2016).

Hypothesis 1:

- **Alternative hypothesis 1:** There is a significant positive relationship between organisational resilience and firm performance.
- **Null hypothesis 1:** There is no relationship between organisational resilience and firm performance.

Figure 8 depicts the scatter plot between organisational resilience on the x-axis and firm performance on the y-axis per respondent. The scatter plot is indicative of a weak correlation between organisational resilience and firm performance. The strength of the relationship was assessed based on the r^2 coefficient and the statistical significance, which was tested at the 5% level of significance (Wegner, 2016). The results of the regression analysis are provided in Table 18.

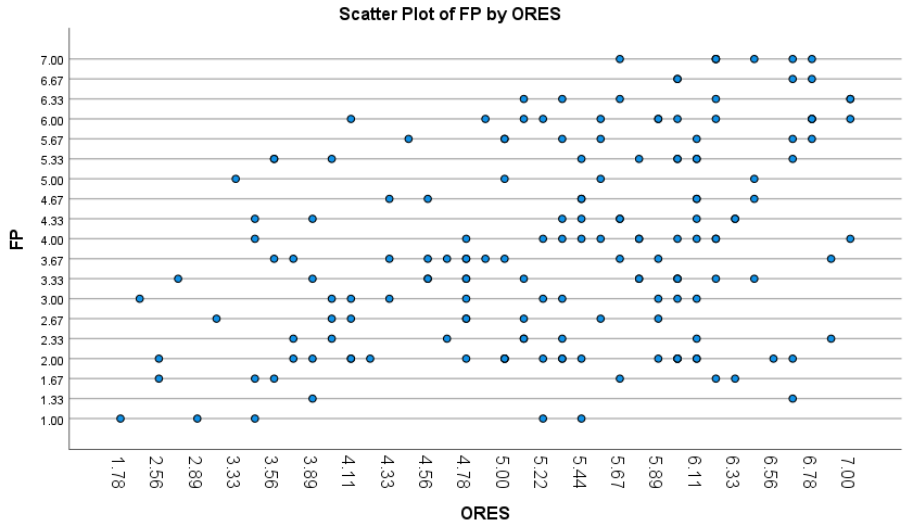

Figure 8 Scatter plot of organisational resilience and firm performance

The regression analysis indicated a weak positive relationship between organisational resilience and firm performance, which was statistically significant at the 5% level of significance. The R^2 coefficient indicated that only 15% of the variance in firm performance was due to the variation in organisational resilience.

Table 18 Linear regression analysis – organisational resilience and firm performance

R		0.387
R^2		0.150
	Coefficients	**p-value**
Constant	0.77	0.185
Organisational Resilience	0.387	0.000

Linear Regression equation 1: Firm Performance = 0.77 + 0.387 x Organisational Resilience

Conclusion for Hypothesis 1: The regression analysis supported a weak positive relationship between organisational resilience and firm performance, which was statistically significant at the 5% level of significance. Therefore, the null hypothesis is rejected in support of the alternative hypothesis that there is a significant weak positive relationship between organisational resilience and firm performance.

Verification of assumptions for linear regression

The assumption of normality was evaluated through a histogram, as well as the skewness and kurtosis for the constructs of organisational resilience and firm performance (Appendix C).

- **Organisational resilience** – The histogram for organisational resilience followed a roughly bell-shaped curve (Figure 14), however displaying a deviation around a value of 6. The skewness was reported as -0.710 (Table 29), indicating that the histogram was negatively skewed, however, greater than -1, supporting that the data was not excessively skewed (Wegner, 2016). The Z-value for the kurtosis was calculated based on the procedure described in Hair et al. (2019), with a value of 0.141. This was within the critical value of the kurtosis, not exceeding an absolute value of 2.58 (at the 0.01 significance level), supporting a normal distribution.
- **Firm performance** – The histogram for firm performance followed a relatively flat bell-shaped curve (Figure 15), however displaying a deviation around a value of 2. The skewness was reported as 0.213 (Table 29), indicating that the histogram was positively skewed, however below +1, supporting that the data was not excessively skewed (Wegner, 2016). The Z-value for the kurtosis was calculated based on the procedure described in Hair et al. (2019), of a value of -2.8. This exceeded the critical value of the kurtosis of an absolute value of 2.58 (at the 0.01 significance level), therefore not supporting a normal distribution. As this value only marginally exceeded the critical value for the kurtosis, this deviation was not deemed to meaningfully impact the linear regression results.

The presence of outliers was assessed based on the procedure described previously, by evaluation of the standardised residuals (Field, 2018) and visual inspection of the scatter plot of the standardised residuals (Pallant, 2016) (discussed in section 4.9.2).

5.5.2. Hypothesis 2

The objective of Hypothesis 2 was to evaluate the moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance, where contextual ambidexterity consisted of two lower-order constructs of exploitation and exploration. This objective was evaluated through Hypotheses 2a, 2b and 2c below:

Hypothesis 2a:

- **Alternative hypothesis 2a:** Contextual ambidexterity has a positive moderating effect on the relationship between organisational resilience and firm performance.
- **Null hypothesis 2a:** Contextual ambidexterity has no moderating effect on the relationship between organisational resilience and firm performance.

Hypothesis 2b:

- **Alternative hypothesis 2b:** Exploitation has a moderating effect on the relationship between organisational resilience and firm performance.
- **Null hypothesis 2b:** Exploitation has no moderating effect on the relationship between organisational resilience and firm performance.

Hypothesis 2c:

- **Alternative hypothesis 2c:** Exploration has a moderating effect on the relationship between organisational resilience and firm performance.
- **Null hypothesis 2c:** Exploration has no moderating effect on the relationship between organisational resilience and firm performance.

These were tested using multiple linear regression to evaluate the strength, direction and statistical significance of the relationship between these variables. For each of the multiple regression assessments, firm performance was the dependent variable, with organisational resilience being one of the independent variables. The other independent variable was contextual ambidexterity for Hypothesis 2a, exploitation for Hypothesis 2b and exploration for Hypothesis 2c. The control variables were also

evaluated, namely organisational size, years of experience in the industry, and the impact of COVID-19 on the organisation.

5.5.2.1. Hypothesis 2a

Prior to undertaking the linear regression for Hypothesis 2a, it was necessary to evaluate the multicollinearity, referring to the degree of correlation between the independent variables. This was assessed through the collinearity statistics of the variance inflation factor (VIF) and tolerance provided in Table 19 using the following criteria (Field, 2018):

- The largest VIF <10
- Average VIF is not substantially greater than 1
- Tolerances are above 0.2

Table 19 Variance inflation factor (VIF) and tolerance (Hypothesis 2a)

	Tolerance	VIF
Organisational resilience	0.495	2.019
Contextual ambidexterity	0.498	2.006
Dependent variable: Firm performance		

Table 19 indicates that the tolerances for both independent variables were higher than 0.2 and that the largest VIF was well below 10. The average VIF is a potential cause for concern being substantially greater than 1. This is supported by the previous correlation analysis (Table 17), which indicated a significant correlation between organisational resilience and contextual ambidexterity. These findings, therefore, support that there is some degree of correlation between the independent variables.

Table 20 depicts the multiple linear regression results for Hypothesis 2a, with the dependent variable being firm performance and the independent variables of organisational resilience and contextual ambidexterity, as well as the control variables of organisational size, years of experience in the industry, and the impact of COVID-19 on the organisation.

Table 20 Multiple regression results for Hypothesis 2a

	Standardised Coefficients Beta	t	p-value	LLCI	ULCI
(Constant)		3.748	**0.000**	1.508	4.867
Organisational resilience	0.236	2.447	**0.015**	0.069	0.649
Contextual ambidexterity	0.158	1.643	0.102	-0.004	0.048
Years of experience in industry	-0.010	-0.135	0.893	-0.268	0.234
Organisational size	-0.102	-1.458	0.147	-0.611	0.092
Impact of COVID-19 on organisation	-0.239	-3.350	**0.001**	-1.048	-0.271

p-values that were statistically significant at the 5% level of significance indicated in bold

The adjusted R^2 coefficient for the regression analysis was 0.218, indicating that the variables tested accounted for 21.8% of the variation of firm performance. In order to evaluate the contribution of each independent variable, the standardised beta coefficients were compared, with the highest beta values being for organisation resilience and the impact of COVID-19 on the organisation. A weak positive relationship was observed between organisational resilience and firm performance, which was statistically significant at the 5% level of significance, with a p-value of 0.015, less than 0.05. The impact of COVID-19 on the organisation was found to have a weak negative relationship with firm performance, which was statistically significant at the 5% level of significance, with a p-value of 0.001, less than 0.05. Contextual ambidexterity exhibited a weak positive relationship with firm performance; however, it was concluded to not be statistically significant. In terms of control variables, only the impact of COVID-19 on the organisation was found to be statistically significant.

Conclusion for Hypothesis 2a: The regression analysis did not support that contextual ambidexterity had a statistically significant relationship with firm performance. Therefore, there was insufficient evidence to reject the null hypothesis that contextual ambidexterity has no moderating effect on the relationship between organisational resilience and firm performance. However, the multicollinearity analysis supported that the reason for this result could be due to the overlap of the independent variables of organisational resilience and contextual ambidexterity, impacting the unique contribution of contextual ambidexterity to the prediction of firm performance.

5.5.2.2. Hypothesis 2b

The multicollinearity statistics of the variance inflation factor (VIF) and tolerance were evaluated for Hypothesis 2b and are provided in Table 21.

Table 21 Variance inflation factor (VIF) and tolerance (Hypothesis 2b)

	Tolerance	VIF
Organisational resilience	0.496	2.015
Exploitation	0.497	2.012
Dependent variable: Firm performance		

An evaluation was undertaken against the multicollinearity criteria defined by Field (2018) discussed previously. The results in Table 21 indicated that tolerances for both independent variables were higher than 0.2 and that the largest VIF was well below 10. The average VIF was, however, 2.014, which was substantially greater than 1. The result corresponds with the correlation analysis in Table 17, where it was observed that there was a statistically significant correlation between organisational resilience and exploitation. These findings, therefore, support that there is some degree of correlation between organisational resilience and exploitation. The multiple regression results for Hypothesis 2b are provided in Table 22.

Table 22 Multiple regression results for Hypothesis 2b

	Standardised Coefficients Beta	t	p-value	LLCI	ULCI
(Constant)		3.241	**0.001**	1.054	4.338
Organisational resilience	0.242	2.505	**0.013**	0.078	0.658
Exploitation	0.151	1.563	0.120	-0.049	0.424
Years of experience in industry	-0.012	-0.165	0.869	-0.272	0.230
Organisational size	-0.094	-1.339	0.182	-0.591	0.113
Impact of COVID-19 on organisation	-0.242	-3.392	**0.001**	-1.056	-0.279

p-values that were statistically significant at the 5% level of significance indicated in bold

The adjusted R^2 coefficient for the regression analysis was 0.217, indicating that the modelled variables accounted for 21.7% of the variation of firm performance. An evaluation of the standardised beta coefficients indicated the strongest influence of organisational resilience and the impact of COVID-19 on the organisation. A weak positive linear relationship was observed between organisational resilience and firm performance, which was statistically significant at the 5% level of significance with a p-value of 0.013. The impact of COVID-19 on the organisation was found to have a weak negative relationship with firm performance, which was statistically significant at the 5% level of significance, with a p-value of 0.001. Exploitation did not exhibit a statistically significant relationship with firm performance with a p-value of 0.120. In terms of the control variables, years of experience in the industry and organisational size did not exhibit a statistically significant relationship with firm performance.

Conclusion for Hypothesis 2b: The regression analysis did not support that exploitation had a statistically significant relationship with firm performance, at the 5% level of significance. Therefore, there was insufficient evidence to reject the null hypothesis that exploitation has no moderating effect on the relationship between organisational resilience and firm performance. As indicated by the multicollinearity analysis, exploitation exhibited overlap with organisational resilience with a

correlation coefficient of 0.704, impacting the unique contribution to the prediction of firm performance.

5.5.2.3. Hypothesis 2c

Prior to undertaking the linear regression for Hypothesis 2c, it was necessary to evaluate the multicollinearity, using the procedure previously described (Field, 2018), with the results depicted in Table 23.

Table 23 Variance inflation factor (VIF) and tolerance (Hypothesis 2c)

	Tolerance	VIF
Organisational resilience	0.540	1.851
Exploration	0.546	1.831
Dependent variable: Firm performance		

Table 23 indicates that the tolerances for both independent variables were higher than 0.2 and that the largest VIF was well below 10. The average VIF was, however, substantially greater than 1, with a value of 1.841. This is supported by the previous correlation analysis (Table 17), which indicated a statistically significant correlation between organisational resilience and exploration of 0.655. These findings, therefore, support that there is some degree of correlation between organisational resilience and exploration, which should be accounted for in the assessment of the regression results. Table 24 depict the multiple regression results for Hypothesis 2c.

Table 24 Multiple regression results for Hypothesis 2c

	Standardised Coefficients Beta	t	p-value	LLCI	ULCI
(Constant)		3.495	**0.001**	1.259	4.530
Organisational resilience	0.265	2.861	**0.005**	0.125	0.682
Exploration	0.123	1.330	0.185	-0.064	0.330
Years of experience in industry	-0.013	-.176	0.860	-0.274	0.229
Organisational size	-0.103	-1.471	0.143	-0.615	0.090
Impact of COVID-19 on organisation	-0.241	-3.365	**0.001**	-1.054	-0.274

p-values that were statistically significant at the 5% level of significance indicated in bold

The adjusted R^2 coefficient for the regression analysis was 0.214, indicating that the variables tested accounted for 21.4% of the variation of firm performance. The standardised beta coefficients were compared, with the highest beta values being for organisation resilience and the impact of COVID-19 on the organisation. A weak positive correlation was observed between organisational resilience and firm performance, with a beta value of 0.265, which was statistically significant at the 5% level of significance. The impact of COVID-19 on the organisation was found to have a weak negative relationship with firm performance, with a beta value of -0.241, which was statistically significant at the 5% level of significance. Exploration exhibited a weak positive relationship with firm performance with a beta value of 0.123; however, it was concluded to not be statistically significant. In terms of control variables, years of experience in the industry and organisational size were also found to not be statistically significant.

Conclusion for Hypothesis 2c: The regression analysis did not support that exploration had a statistically significant relationship with firm performance, with a p-value of 0.185, higher than 0.05. This indicated that exploration did not make a unique contribution to the prediction of firm performance. Therefore, there was insufficient evidence to reject the null hypothesis that exploration has no moderating

effect on the relationship between organisational resilience and firm performance. However, the multicollinearity analysis supported that the reason for this result could be due to the overlap of organisational resilience and exploration.

5.5.2.4. Verification of assumptions for multiple regression

The multiple linear regression technique was supported by verification of the assumptions of multicollinearity, normality, no outliers, linearity and homoscedasticity (Pallant, 2016):

- The **multicollinearity** was assessed as described previously. It was observed that there was some overlap between organisation resilience with the constructs of ambidexterity, exploitation and exploration, which corresponded to the correlation analysis in Table 17.
- The assumption that the constructs follow a **normal distribution** was assessed by evaluating the histograms for the regression standardised residuals for each regression analysis depicted in Figures 16, 19 and 22. For each regression analysis, the regression standardised residuals followed an approximately bell-shaped distribution, supporting the assumption of normality.
- Figures 17, 20 and 23 in Appendix C depict the normal probability (P-P) plots of the regression standardised residual for Hypotheses 2a, 2b and 2c to test for **linearity**. It was observed that the data was fairly well positioned along the diagonal line from bottom left to top right, supporting the assumption of linearity.
- The presence of **outliers** was assessed by evaluation of the standardised residuals, the Mahalanobis distances, and the scatter plots of the regression standardised residuals for each regression analysis, as described in Section 4.9.2. A single outlier was identified and removed prior to statistical analysis.
- The **homoscedasticity** was evaluated by visual inspection of the scatter plots of regression standardised residuals for Hypotheses 2a, 2b and 2c (Figures 18, 21 and 24 respectively in Appendix C). It was observed that there was an approximately equal dispersion of the residuals across the range of the predicted values for each regression analysis, supporting the assumption of homoscedasticity.

5.6. Additional analysis

In order to support the statistical results obtained, additional analyses were undertaken to explore the observations and postulate on potential relationships between the research constructs.

5.6.1. Exploitation and exploration

The correlation matrix (Table 17) demonstrated a positive relationship between the constructs of exploitation and exploration. To evaluate this relationship further, a scatter plot of exploitation and exploration was plotted. The independent and dependent variables were assumed to be exploitation and exploration respectively. The scatter plot (Figure 9) indicated the potential for a positive linear correlation between exploitation and exploration. To quantify this relationship, a simple linear regression was undertaken. The results are provided in Table 25.

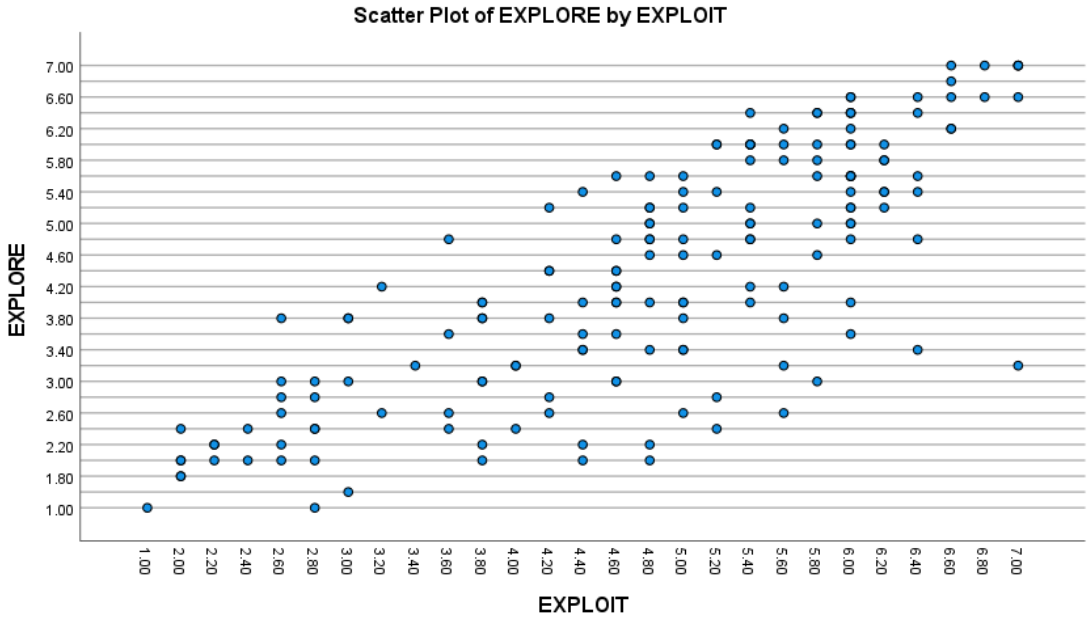

Figure 9 Scatter plot of exploitation and exploration

The results supported a strong positive relationship between exploitation and exploration, which was statistically significant at the 5% level of significance, with a beta coefficient of 0.902 and a p-value of 0.000. The R^2 coefficient for the regression analysis was 0.620, indicating that exploitation accounted for 62.0% of the variation of exploration. The p-value of the constant was not statistically significant at 0.981.

Table 25 Linear regression analysis – exploitation (independent variable) and exploration (dependent variable)

R		0.787
R^2		0.620
	Coefficients	**p-value**
Constant	0.006	0.981
Exploitation	0.902	0.000

Linear Regression equation 2: Exploration = 0.006 + 0.902 x Exploitation

The strong correlation of exploitation and exploration and linear regression results suggest that exploitation and exploration activities in an organisation are mutually reinforcing. This will be discussed further in Chapter 6.

5.6.2. Organisational resilience and contextual ambidexterity

The multicollinearity evaluation undertaken for Hypothesis 2a indicated the overlap of the constructs of organisational resilience and contextual ambidexterity. To assess this relationship further, a scatter plot of contextual ambidexterity and organisational resilience was plotted. The scatter plot (Figure 10) demonstrated the likelihood of a positive linear correlation between contextual ambidexterity and organisational resilience. This result corresponded to the correlation matrix (Table 17), where a correlation coefficient of 0.707 was observed between these constructs. A simple linear regression was undertaken to assess the statistical significance and strength of the relationship (Table 26). It was postulated that contextual ambidexterity was the independent variable and organisational resilience

the dependent variable, as it is expected that ambidextrous behaviours could create an environment conducive to organisational resilience (Lengnick-Hall et al., 2011).

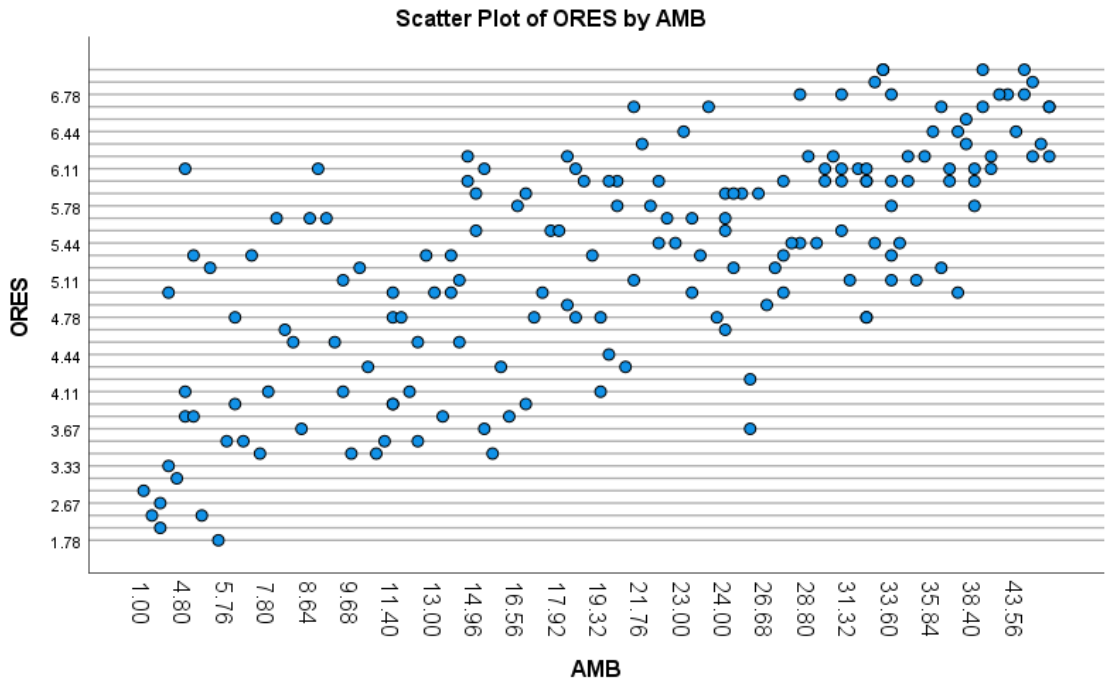

Figure 10 Scatter plot of contextual ambidexterity and organisational resilience

The results in Table 26 supported a moderate positive relationship between contextual ambidexterity and organisational resilience, which was statistically significant at the 5% level of significance, with a p-value of 0.000. The R^2 coefficient for the regression analysis was 0.494, indicating that contextual ambidexterity accounted for 49.4% of the variation of organisational resilience.

Table 26 Linear regression analysis – contextual ambidexterity (independent variable) and organisational resilience (dependent variable)

R		0.703
R^2		0.494
	Coefficients	**p-value**
Constant	3.864	0.000
Contextual Ambidexterity	0.063	0.000

Linear Regression equation 3: Organisational Resilience = 3.864 + 0.063 x Contextual Ambidexterity

The linear regression results indicated that there is a moderate positive correlation between contextual ambidexterity and organisational resilience. This will be discussed further in Chapter 6.

5.6.3. Contextual ambidexterity and firm performance

The hypothesis testing for Hypothesis 2a indicated that contextual ambidexterity did not have a statistically significant relationship with firm performance. However, the multicollinearity analysis for Hypothesis 2a indicated that the reason could be due to the overlap of the independent variables of organisational resilience and contextual ambidexterity, which impacted the unique contribution of contextual ambidexterity to the prediction of firm performance. Therefore, the correlation of contextual ambidexterity and firm performance was evaluated based on extant literature on the impact of contextual ambidexterity on firm performance (Birkinshaw & Gibson, 2004). A scatter plot was compiled, with contextual ambidexterity on the x-axis and firm performance on the y-axis (Figure 11). The scatter plot indicated the likelihood of a weak positive linear correlation between contextual ambidexterity and firm performance. This result corresponded to the correlation matrix (Table 17), where a correlation coefficient of 0.355 was observed between contextual ambidexterity and firm performance. In order to evaluate the statistical significance and strength of the relationship, a simple linear regression was undertaken (Table 27).

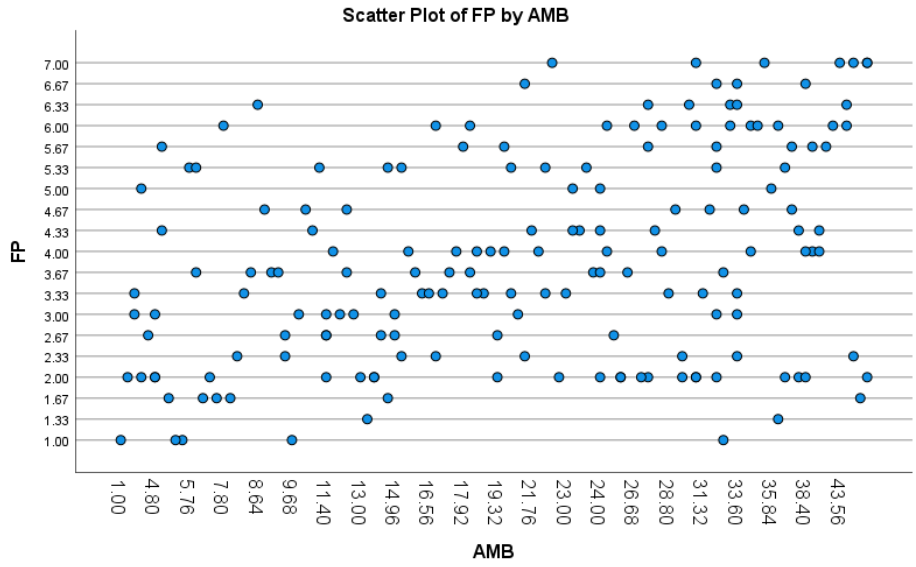

Figure 11 Scatter plot of contextual ambidexterity and firm performance

The regression analysis indicated a weak positive relationship between contextual ambidexterity and firm performance, which was statistically significant at the 5% level of significance. The R^2 coefficient for the regression analysis was 0.134, indicating that contextual ambidexterity accounted for 13.4% of the variation of firm performance.

Table 27 Linear regression analysis – contextual ambidexterity (independent variable) and firm performance (dependent variable)

R		0.366
R^2		0.134
	Coefficients	**p-value**
Constant	2.756	0.000
Contextual Ambidexterity	0.050	0.000

Linear Regression equation 4: Firm Performance = 2.756 + 0.050 x Contextual Ambidexterity

The linear regression results indicated that there was a weak positive correlation between contextual ambidexterity and firm performance. In comparison to organisational resilience (R^2 of 0.150), contextual ambidexterity had a similar correlation (R^2 of 0.134) with firm performance within the context of disruptive events.

5.7. Summary of hypotheses

A synopsis of the hypothesis testing is presented in Table 28. The outcomes of the hypothesis testing are displayed in Figure 12, expressed in terms of the study theoretical framework (Figure 2).

Table 28 Summary of findings for research hypotheses

Hypothesis	Null hypothesis	p-value	Result
1	There is no relationship between organisational resilience and firm performance.	0.000	Null hypothesis rejected.
2a	Contextual ambidexterity has no moderating effect on the relationship between organisational resilience and firm performance.	0.102	Failed to reject the null hypothesis.
2b	Exploitation has no moderating effect on the relationship between organisational resilience and firm performance.	0.120	Failed to reject the null hypothesis.
2c	Exploration has no moderating effect on the relationship between organisational resilience and firm performance.	0.185	Failed to reject the null hypothesis.

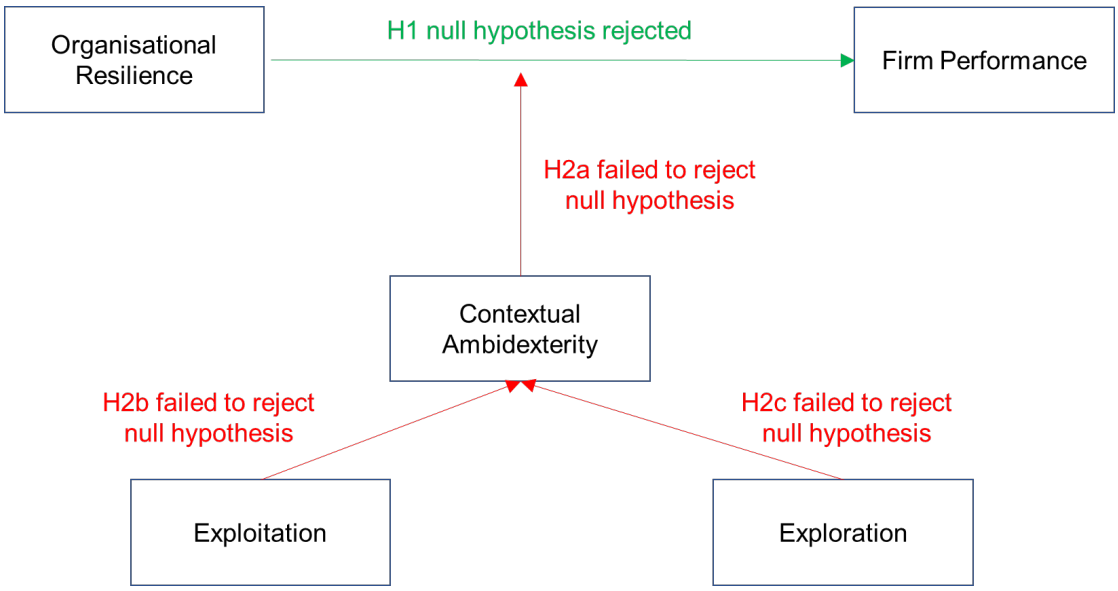

Figure 12 Research hypotheses findings expressed in terms of study theoretical framework

5.8. Chapter conclusion

This chapter provided the statistical analysis of the survey questionnaire results, utilised to test the research hypotheses for this study. Descriptive statistics were undertaken for the categorical and Likert-scale survey items. The reliability and validity of the measurement instrument and research constructs were verified. The research hypotheses were tested using simple linear regression for Hypothesis 1 and multiple linear regression for Hypotheses 2a, 2b and 2c. A summary of the findings is provided in Table 28. Additional statistical tests were undertaken to further explore the results obtained. Chapter 6 will provide a discussion of the results and relate these findings to the literature.

CHAPTER 6: DISCUSSION OF RESULTS

6.1. Introduction to chapter

This study assessed the relationship between organisational resilience and firm performance within the context of disruptive events, including the evaluation of the moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance. Contextual ambidexterity consisted of the two lower-order constructs of exploitation and exploration. In Chapter 5, the statistical analysis of the survey questionnaire results was presented. These results consisted of descriptive statistical analysis of the sample, reliability and validity assessments, inferential statistical analysis to test the research hypotheses and additional analysis. In this chapter, these results will be systematically discussed, and relevance to theory and previous studies will be provided. The chapter will conclude with a summary of the key findings.

6.2. Descriptive statistical results

6.2.1. Selection of managers and knowledge workers

This study focussed on managers and knowledge workers as the target population by utilising this as a screening criterion for participation in the study. This group is relevant from both an organisational resilience and contextual ambidexterity perspective toward enabling firm performance. Lengnick-Hall et al. (2011) considered the need for resilience capabilities at an organisational level, highlighting the role of desirable employee behaviours and human resource (HR) principles that are aligned to the development of these behaviours. Managers and knowledge workers are critical in the development of these capabilities as leaders in their teams and organisations. In terms of contextual ambidexterity, Birkinshaw & Gibson (2004) highlighted the need to create an enabling organisational context through a high level of social support and a high level of performance management. Managers play an integral role in the performance management process, while managers and knowledge workers support the development of a culture of trust and social support.

6.2.2. Industry sector

An analysis of respondents by industry sector indicated the highest concentration in the manufacturing sector (58.8%), followed by 22.9% in the banking, financial services, insurance, real estate and business services sector and 5.3 % in the communication and information technology sector. These results are indicative of sampling bias, which will limit the ability to apply these results across industries. However, the manufacturing sector and banking and related sectors are important sectors in the South African economy, with the performance of these sectors significantly impacted by the COVID-19 pandemic. This is supported by the majority of respondents, which indicated a high or severe impact (47.1%) or moderate impact (47.1%) of the COVID-19 pandemic on their organisation. It was expected that the constructs of organisational resilience and contextual ambidexterity would be extremely relevant in these industry sectors due to the need to proactively and continuously respond to the changing business environment. An interesting finding was made by Vrontis et al. (2017), who asserted that knowledge-intensive firms, which were defined as firms where a high level of scientific and technological knowledge are inherent in production processes and products, did not benefit from higher levels of ambidexterity in relation to firm performance. Unfortunately, the research methodology did not granulate industries according to this construct, and this study could benefit from a more industry-specific approach to understand this dimension further. In terms of organisational resilience, Ismail et al. (2011) evaluated manufacturing-based small-medium enterprises (SME's), finding that the development of appropriate organisational capabilities such as strategic planning better prepared these organisations for turbulent business environments. Therefore, based on the industry sector, the sample enabled evaluation of the constructs of organisational resilience and contextual ambidexterity on firm performance within the context of disruptive events.

6.2.3. Organisational size

In terms of organisational size, the sample comprised mostly of respondents from organisations with more than 250 employees (84.7%), followed by 8.2% with 51-250 employees, 4.7% with 11-50 employees and 2.4% with 1-10 employees. While the spread of the samples indicates a strong bias towards large organisations, this is

ideal as organisational resilience and contextual ambidexterity were relevant in these organisations. The low proportion of smaller enterprises is a consequence of the sampling methodology, and it is recommended to understand the nuances of these constructs and the context of disruptive events in terms of the performance of these smaller organisations. Ismail et al. (2011) studied the organisational resilience of small-medium enterprises (SME's) within turbulent business environments, recommending that these organisations could benefit from a more structured and strategic approach to improve performance in this context. It has also been demonstrated that ambidexterity is an antecedent for organisational resilience in the performance of small-medium enterprises (SME's) (Iborra et al., 2020). Ambidextrous capabilities enabled these firms to more readily recover and adapt from disruptive events by reconfiguring resources and developing innovative solutions.

6.2.4. Numbers of years of experience of respondents

The frequency distribution for the number of years the respondents had been employed within their industry indicated 47.1% had 11-20 years, 23.5% had 6-10 years, 17.1% had more than 20 years, 10.6% had 3-5 years, and 1.8% had 0-2 years. This distribution indicates a bias toward respondents with higher years of experience and may be attributed to the sampling methodology where survey questionnaires were sent to the researcher's personal networks. However, this is also a result of the screening question where respondents were targeted as managers or knowledge workers. As a result, this would also have resulted in a bias toward respondents with higher years of experience. This distribution is desirable as it is expected that respondents with higher years of experience would have more awareness and influence over practices in their teams and organisation in terms of contextual ambidexterity and organisational resilience.

6.2.5. The context of the COVID-19 pandemic

The context of the COVID-19 pandemic was utilised as an instance of a disruptive event. The sample indicated a high proportion of respondents with a high or severe impact (47.1%) or moderate impact (47.1%) of the COVID-19 pandemic on their organisation. This provided an insightful context for the study, as the respondents

were able to apply their experience of this disruptive event to the constructs of contextual ambidexterity and organisational resilience. This is significant as there has been little research on organisational resilience within the context of disruptive events (Mithani, 2020). Linnenluecke (2017) contended that organisations are better equipped to handle economic or technological change rather than the discontinuous change as a result of disruptive events. The impact of the context of the COVID-19 pandemic on the research constructs will be discussed later.

6.3. Research objectives

The overall objective of this study was a quantitative evaluation of the moderating role of contextual ambidexterity on organisational resilience in coping with disruptive events to maintain firm performance. This was operationalised into two research objectives. The first research objective was to assess the relationship between organisational resilience and firm performance within the context of disruptive events. This was tested through Hypothesis 1, which stated that there was a significant positive relationship between organisational resilience and firm performance. This hypothesis was tested using simple linear regression to evaluate the relationship between organisational resilience and firm performance.

The second research objective was to evaluate the moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance, where contextual ambidexterity consisted of two lower-order constructs of exploitation and exploration. This was operationalised into three hypotheses, namely: contextual ambidexterity has a positive moderating effect on the relationship between organisational resilience and firm performance (Hypothesis 2a), exploitation has a moderating effect on the relationship between organisational resilience and firm performance (Hypothesis 2b), and exploration has a moderating effect on the relationship between organisational resilience and firm performance (Hypothesis 2c).

The results of the statistical analysis for each hypothesis were presented in Chapter 5 and will be discussed in the following sections. This will be followed by a discussion of the additional analysis undertaken on potential relationships between the research constructs not addressed by the research objectives. Finally, a chapter conclusion will be presented, highlighting the major findings from this study.

6.4. Hypothesis 1

The purpose of Hypothesis 1 was to assess the correlation between organisational resilience on firm performance within the context of disruptive events. It was postulated that there was a significant positive relationship between organisational resilience and firm performance within the context of disruptive events. A simple linear regression was utilised to evaluate the strength, direction and statistical significance of the relationship between organisational resilience and firm performance using a least squares method.

6.4.1. Summary of findings for Hypothesis 1

The scatter plot between organisational resilience and firm performance (Figure 8) was indicative of a weak correlation between organisational resilience and firm performance. This was confirmed through the linear regression analysis (Table 18), which supported a weak positive relationship between organisational resilience and firm performance, which was statistically significant at the 5% level of significance, with a p-value of 0.000, which was less than 0.05. The R^2 coefficient was 0.150, which indicated that only 15% of the variance in firm performance was due to the variation in organisational resilience.

Therefore, the null hypothesis was rejected in support of the alternative hypothesis that there is a significant weak positive relationship between organisational resilience and firm performance.

6.4.2. Hypothesis 1

The findings of Hypothesis 1 were aligned with the work of Ortiz-de-Mandojana & Bansal (2016) and DesJardine et al. (2019), who each evaluated the benefits of organisational resilience on firm performance. Ortiz-de-Mandojana & Bansal (2016) considered the benefits of sustainable business practices (such as environmental and social practices) that contributed to organisational resilience on short and longer-term business performance. The authors found that while these sustainable business practices did not contribute to short term financial performance, these practices enabled a higher probability of longer-term firm survival and financial performance. DesJardine et al. (2019) evaluated the impact of resilience on firm

performance through the severity of loss - contending that more resilient firms suffered lower losses during disruptive events and a shorter time to recovery. The implication was that firms with higher levels of organisational resilience could more readily adapt to the changing business environment. The authors found that strategic alignment with social and environmental practices contributed to firm performance and longer-term firm sustainability. The current study was limited in that it followed a subjective approach to assessing firm performance by requesting respondents on their views of firm performance. A more objective approach would have been to conduct the study within a selection of firms or industries and calculate firm performance before and during the COVID-19 pandemic. The study was also limited to evaluating the impact of organisational resilience on short term firm performance, whereas Ortiz-de-Mandojana & Bansal (2016) contended that organisational resilience was more strongly related to longer-term firm viability by strategically aligning the firm with longer-term goals such as environmental and social drivers.

While the findings of Hypothesis 1 indicate that organisational resilience plays a role in firm performance in the context of disruptive events, this relationship was found to be of a weak nature, and it is necessary to consider the nuances of this finding. The results indicated that 15% of the variance in firm performance was due to the variation in organisational resilience. This finding indicates that within the context of the disruptive event studied, namely the COVID-19 pandemic, most of the variation in firm performance was not due to the variation in organisational resilience, and it is essential to consider other factors that may have contributed to this variation.

Porter (2008) considered an industry-based competition view consisting of five forces that strongly influence competition in a given industry and, in turn, the profitability of firms in these industries, namely the bargaining power of suppliers, the bargaining power of buyers, the threat of new entrants, the threat of substitute products and competition among existing competitors. This implies that the performance of firms during the COVID-19 pandemic could be a function of the competitive dynamics of the specific industry. The sample indicated the highest percentage of respondents in the manufacturing sector industry (58.8%). These industries were severely impacted by the lockdowns and economic restrictions as a result of the COVID-19 pandemic, as well as the reduction in customer demand. This was confirmed by the high proportion of respondents who indicated a high or severe impact (47.1%) or moderate impact (47.1%) of the COVID-19 pandemic on their

organisation. Therefore, it is postulated that the macro-economic environment also plays a significant role in the performance of firms during disruptive events.

Cummings et al. (2020) developed the organisational diagnostic model as a tool to understand the factors that influence firm performance. The model proposes that an organisation's strategy is determined by external factors, namely its macro-economic environment, task or industry environment as described above and the organisation's perceived or enacted view of their external environment. The organisation's strategy should then be utilised to develop the organisational design elements, namely organisational structure, technology, human resource systems and management processes. These elements, in turn, determine the culture of the organisation, which directly impacts firm performance. Organisational resilience is, therefore, a product of how effectively these organisational design elements enable an organisation to prepare for disruptive events. It is postulated that within this framework, the highly uncertain and restrictive nature of the COVID-19 pandemic impacted the macro-economic environment and industry environment to such an extent that this limited the ability of firms to effectively respond to the COVID-19 pandemic. Therefore, within this specific context and for the sample evaluated, organisational resilience played only a weak role in supporting firm performance.

An alternative perspective is to consider the strategy tripod consisting of the industry-based competition view, the resource-based view and institutional view as determinants of organisational strategy and, in turn, firm performance (Peng et al., 2008). Within this framework, organisational resilience may be considered as a firm-specific capability. The impact of the COVID-19 pandemic in terms of government regulations and limitations on business operations reflect the dynamics of the regulative pillar of the institutional environment. The institutional view includes the normative and cultural-cognitive pillars (Scott, 2008), which were affected by the lack of social stability due to the COVID-19 pandemic. Industry-specific factors are reflective of the forces of competition in an industry, with each sector being affected to varying degrees by the institutional environment. Therefore, disruptive events present a particular challenge to firms, where the business environment could be changing dynamically and without certainty. Within this context, it is postulated that while organisational capabilities such as organisational resilience are important, they have limited ability to influence firm performance.

This also highlights the critical role of external context on the strength of the relationship between organisational resilience and firm performance. Iborra et al. (2020) evaluated the impact of organisational resilience on firm performance in small-medium enterprises (SME's) following the global financial crisis. The authors found that ambidexterity was a key antecedent for resilience that enabled firms to maintain financial performance. However, the global financial crisis was an example of a change in the economic environment rather than a disruptive event. This is supported by Linnenluecke (2017), who indicated that organisations are better positioned for economic or technological change rather than the discontinuous change brought on by disruptive events. It is therefore proposed that this study could benefit from a cross-sectional time horizon approach to evaluate the strength of the relationship between organisational resilience and firm performance within a more stable business environment. It would also be worthwhile to consider a more focussed approach to evaluate the dynamics within a specific industry to assess the strength of the relationships between these constructs.

In retrospect, a limitation of the current study was the measurement scale utilised for organisational resilience. Kantur & İşeri Say (2015) devised a measurement scale for organisational resilience consisting of three dimensions, namely integrity (referring to the strength of employee relationships), robustness (referring to the resistance capacity) and agility (referring to how readily organisations are able to respond and adapt). While the measurement scale was able to assess the level of organisational resilience, the scale did not elucidate how resilience was operationalised in the organisation.

Sutcliffe & Vogus (2003) theorised that a threat could result in a rigid or resilient organisational response. In the rigid response, an organisation would restrict the processing of information, tighten controls, conserve resources and formalise processes such as decision making. While this response could be effective for minor or isolated threats, this response could lead to an organisational collapse in the instance of a disruptive event. In a resilient response, the opposite approach would be followed (Sutcliffe & Vogus, 2003). Mamouni Limnios et al. (2014) referred to this aspect as the desirability of the system state where resilience could manifest as rigidity or a resistance to change or, alternatively, as the desire to adapt to the changing environment. Mithani (2020) proposed adaptation modes to disruptive events, which differentiates between alternative approaches that organisations could

follow in response to disruptive events. An understanding of these responses or adaption modes is crucial in order to understand the impact on firm performance. For example, two firms could have similar levels of organisational resilience; however, they could exhibit different modalities of resilience that could impact firm performance.

It is also noteworthy that while this study considered the role of contextual ambidexterity to strengthen the relationship between organisational resilience and firm performance, the study did not evaluate the underlying the factors that contribute toward building and maintaining organisational resilience within the context of disruptive events. An understanding of these antecedents would be essential to improve organisational resilience capabilities. The framework proposed by Lengnick-Hall et al. (2011) would be helpful in this regard through the development of cognitive, behavioural and contextual capabilities (Table 1).

6.5. Hypotheses 2a, 2b and 2c

The second objective of this study was to evaluate the moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance, where contextual ambidexterity consisted of the two lower-order constructs of exploitation and exploration. This was operationalised into Hypothesis 2a, Hypothesis 2b and Hypothesis 2c as described previously, which were statistically evaluated using multiple linear regression.

6.5.1. Summary of findings for Hypothesis 2a

The multiple linear regression analysis indicated an adjusted R^2 coefficient of 0.218, indicating that the variables tested accounted for 21.8% of the variation of firm performance. An evaluation of the standardised beta coefficients indicated the highest beta values for organisational resilience and the impact of COVID-19 on the organisation. A weak positive linear relationship was observed between organisational resilience and firm performance, which was statistically significant at the 5% level of significance. The impact of COVID-19 on the organisation was found to have a weak negative relationship with firm performance, which was statistically significant at the 5% level of significance. Contextual ambidexterity exhibited a weak

positive relationship with firm performance; however, it was found to not be statistically significant. The multicollinearity assessment (Table 19) and correlation analysis (Table 17), however, indicated some degree of correlation between the independent variables of organisational resilience and contextual ambidexterity.

Based on these results, there was insufficient evidence to reject the null hypothesis that contextual ambidexterity had no moderating effect on the relationship between organisational resilience and firm performance. However, the multicollinearity analysis supported that the reason for this result could be due to the overlap of the independent variables of organisational resilience and contextual ambidexterity. It was also demonstrated that the impact of COVID-19 had a significant negative impact on firm performance. The other control variables of organisational size and years of experience in the industry were not statistically significant determinants of firm performance.

6.5.2. Hypothesis 2a

The key finding of Hypothesis 2a was that contextual ambidexterity did not have a moderating effect on the relationship between organisational resilience and firm performance in the context of disruptive events. This finding is, however, supported by Iborra et al. (2020), who found that rather a moderating variable, ambidexterity was an antecedent for organisational resilience in maintaining firm performance during disruptive events. Iborra et al. (2020) stated that ambidextrous organisations were better able to reconfigure organisational resources and develop novel solutions in response to the changing business environment based on their explorative capabilities. It was found that this ambidextrous capability not only enabled organisations to react to disruptive events but also to recover and adapt more readily to these events.

This result is supported by Lengnick-Hall et al. (2011), who conceptualised that organisational resilience was enabled through the development of cognitive, behavioural and contextual capabilities, which could be unlocked through enabling human resources principles. Within this framework (Table 1), the contextual ambidexterity capability was viewed as a key antecedent for organisational resilience by supporting several key employee behaviours. Within the behavioural dimension, desirable employee behaviours included the development of novel solutions, the

pursuit of alternative approaches to problem-solving and pro-active courses of action to benefit from potential changes in the business environment. Within the contextual dimension, the desirable employee behaviours included the development of interpersonal networks and knowledge sharing. Lastly, within the cognitive dimension, the relevant employee behaviours included opportunism, creativity and a questioning mindset. These employee behaviours are well aligned with the employee behaviours that support contextual ambidexterity (Birkinshaw & Gibson, 2004), namely "taking initiative and being alert to opportunities beyond their jobs, being co-operative and seeking out opportunities to collaborate with others to enhance their ideas, seeking to build internal linkages and being a multi-tasker and being comfortable wearing more than one hat" (Birkinshaw & Gibson, 2004, p.49). These employee behaviours are congruent with the four resilience capabilities described by Weick (1993, p.638), namely: "improvisation and bricolage, the attitude of wisdom, virtual role systems and respectful interaction". These theoretical linkages, therefore, support that contextual ambidexterity could be an enabler or antecedent for organisational resilience rather than a moderator in the relationship with firm performance.

The finding of Hypothesis 2a is supported by the Resilience Architecture Framework developed by Mamouni Limnios et al. (2014), which described a desirable organisational mode of resilience referred to as adaptability. When an organisation operated in this mode, it was able to utilise the ambidextrous capabilities of the balancing of exploration and exploitation as well as dynamic capabilities to respond to changes in the business environment. The authors supported Teece et al. (2016) that there is a need for capabilities for sensing, seizing and transforming, highlighting the need to integrate external knowledge with internal capabilities to inform business decisions. Mamouni Limnios et al. (2014) also supported the need for a dynamic perspective of ambidexterity rather than a static or ideal state. The study by Mamouni Limnios et al. (2014) is also noteworthy as it highlighted that organisational resilience in the absence of contextual ambidexterity could lead to a mode of resilience of rigidity or resistance to change. As indicated previously, this mode of resilience can be disastrous in the context of disruptive events.

The preceding discussion highlights the role of contextual ambidexterity to support the learning mode of adaptation proposed by Mithani (2020), where an organisation develops capabilities in response to a disruptive event. This learning mode of

adaptation was characterised by facets such as the capacity to tolerate uncertainty, the development of novel solutions, participative leadership style, broadening of access to information and development of new ways of working (Mithani, 2020). The characteristics of this learning mode of adaptation are well aligned with the employee behaviours that support contextual ambidexterity (Birkinshaw & Gibson, 2004).

It is also essential to consider that the methodology utilised to determine contextual ambidexterity could also have influenced the outcome of Hypothesis 2a, as a subjective Likert-scale approach was utilised using an existing, validated measurement scale developed by Wang & Rafiq (2014). While this approach has been widely utilised (He & Wong, 2004; Birkinshaw & Gibson, 2004), Iborra et al. (2020) contended that this approach could result in misleading results due to the potential ambiguity of the interpretation by respondents and proposed more objective measurements such as new patents filed or products developed to measure exploration and productivity or efficiency measures for exploitation.

A secondary finding from Hypothesis 2a was the significant negative impact of COVID-19 on firm performance. This result complements the earlier finding from Hypothesis 1 that in addition to organisational resilience, which accounted for 15% of the variance in firm performance, other factors were significant contributors to firm performance within the context of disruptive events. It is also noteworthy that while the sample comprised few small-medium enterprises, organisational size was not a significant determinant of firm performance within the context. The result complements the findings by Iborra et al. (2020), who found that ambidexterity was a key antecedent for resilience in small-medium enterprises (SME's) that enabled firms to maintain financial performance. This supports that the constructs of organisational resilience and contextual ambidexterity may be applied to organisations of different sizes.

6.5.3. Organisational resilience and contextual ambidexterity

At this juncture, it is appropriate to consider the findings from the additional analysis that evaluated the correlation between organisational resilience and contextual ambidexterity. The preceding discussion highlighted the interplay between these constructs. A simple linear regression, correlation analysis, and scatter plot were utilised to assess the strength, direction and statistical significance of this relationship (Wegner, 2016).

The scatter plot (Figure 10) supported the likelihood of a positive linear correlation between contextual ambidexterity and organisational resilience. The correlation analysis (Table 17) exhibited a correlation coefficient of 0.707, indicating a strong positive correlation between the constructs. The linear regression indicated a moderate positive relationship between contextual ambidexterity and organisational resilience, which was statistically significant at the 5% level of significance, with a p-value of 0.000. The R^2 coefficient for the regression analysis was 0.494, indicating that contextual ambidexterity accounted for 49.4% of the variation of organisational resilience. These results were supported by the multicollinearity analysis, which exhibited a variance inflation factor (VIF) that was substantially greater than one, indicating a degree of overlap of these constructs. These findings, therefore, support that there is a moderate positive correlation between organisational resilience and contextual ambidexterity.

The moderate positive correlation between organisational resilience and contextual ambidexterity is supported by the preceding discussion, which highlighted the theoretical linkages between these constructs. It was shown that employee behaviours and human resource principles that support organisational resilience also support the development of contextually ambidextrous capabilities (Lengnick-Hall et al., 2011). It was indicated that contextual ambidexterity is a key enabler for organisational resilience to maintain firm performance within the context of disruptive events (Iborra et al., 2020). Therefore, it is reasonable to propose that contextual ambidexterity could be an antecedent (independent variable) for organisational resilience (dependent variable) within the context of disruptive events. This proposed relationship is shown graphically in Figure 13.

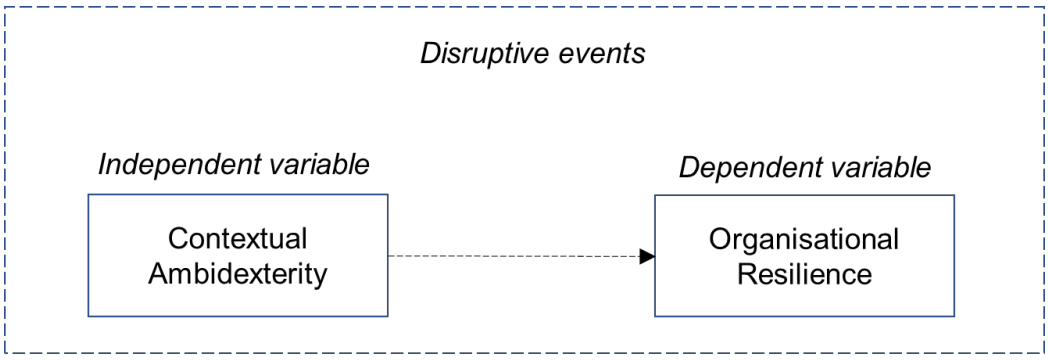

Figure 13 Proposed relationship between contextual ambidexterity and organisational resilience

Further, it is vital to highlight the role of organisational context to create a conducive environment for contextual ambidexterity and organisational resilience. In terms of the organisational context for contextual ambidexterity, Table 3 highlighted the dimension of social support comprising trust and support and the dimension of performance management comprising stretch and discipline (Ghoshal & Bartlett, 1994). In terms of organisational resilience, Table 1 illustrated the enabling human resources principles for organisational resilience along the three dimensions of cognitive, behavioural and contextual capabilities. A comparison of these elements indicated that the creation of a supportive organisational context enabled both contextual ambidexterity and organisation resilience. The implication for business is the need for managers to create a supportive organisational context to improve and maintain firm performance (Ghoshal & Bartlett, 1994).

6.5.4. Summary of findings for Hypotheses 2b and Hypotheses 2c

In order to elaborate on the moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance, contextual ambidexterity was decomposed into its constituent constructs of exploitation and exploration, which were operationalised into Hypothesis 2b and Hypothesis 2c. Exploitation was defined as the efficient operation of today's business, while exploration was defined as the ability to adapt to changes in the business environment (March, 1991). Hypothesis 2b hypothesised that exploitation had a moderating effect on the relationship between organisational resilience and firm performance, while Hypothesis 2c hypothesised that exploration had a moderating

effect on the relationship between organisational resilience and firm performance. These hypotheses were each evaluated using multiple linear regression.

Hypothesis 2b: The multiple regression analysis did not support that exploitation had a statistically significant relationship with firm performance, with a p-value of 0.120, higher than 0.05. Therefore, there was insufficient evidence to reject the null hypothesis that exploitation had no moderating effect on the relationship between organisational resilience and firm performance. An analysis of the multicollinearity, however, indicated that the reason for this result could be due to the overlap of the constructs of organisational resilience and exploitation. It was also found that the impact of COVID-19 on the organisation had a weak negative relationship with firm performance, which was statistically significant at the 5% level of significance.

Hypothesis 2c: The regression analysis did not support that exploration had a statistically significant relationship with firm performance, at the 5% level of significance. Therefore, there was insufficient evidence to reject the null hypothesis that exploration had no moderating effect on the relationship between organisational resilience and firm performance. Similar to ambidexterity and exploitation, the multicollinearity analysis indicated that exploration exhibited an overlap with organisational resilience, impacting the unique contribution to the prediction of firm performance. The impact of COVID-19 on the organisation was found to have a weak negative relationship with firm performance, which was statistically significant at the 5% level of significance, with a p-value of 0.001.

6.5.5. Hypotheses 2b and Hypotheses 2c

The key finding of Hypothesis 2b and Hypothesis 2c was that neither exploitation or exploration had a moderating effect on the relationship between organisational resilience and firm performance in the context of disruptive events. Based on the previous discussion, these results indicated that rather than moderator variables, exploitation and exploration could be viewed as antecedents of organisational resilience through contextual ambidexterity - namely, the dynamic balancing of exploitative and explorative competencies.

This is supported by the Resilience Architecture Framework developed by Mamouni Limnios et al. (2014), which described the modalities of organisational resilience (Figure 2). Within this framework, in the transience organisational mode of resilience, while a strong focus on exploration can enable organisational adaptability, this could lead to low connectedness with the external environment. This mode of resilience is typical of organisations undergoing a period of change or organisations early in their life cycle (Mamouni Limnios et al., 2014). In contrast, in the rigidity organisational mode of resilience, a focus on exploitation can lead to an internal focus, resulting in resistance to adapt to the changing environment. This type of resilience is typical in a stable business environment with low rates of technological change or highly regulated industries. These industries can be rapidly disrupted due to the rigidity of their processes and structures. This results in denial of changes to the business environment in anticipation that the status quo returns (Mamouni Limnios et al., 2014). This is related to the static resilience described by Mithani (2020), where organisations develop capabilities to respond to disruptive events, with a focus on the return to the original equilibrium. This approach does not enable organisations to benefit from potential opportunities from the new environment. It is evident that an ambidextrous approach is preferable through the continuous balancing of exploitative and explorative capabilities to enable adaptation. This is aligned to the dynamic resilience described by Mithani (2020), where organisations assess the impact of the changing business environment, potentially endeavouring toward a new equilibrium rather than a return to the status quo, resulting in an organisational mindset of continuous adaptation. The persistence of the exploitation-exploration tension requires a continuous adaptation to changing business context, resulting in a dynamic equilibrium rather than a static, stable state (Zimmermann et al., 2018).

6.6. Exploitation and exploration

The relationship between exploitation and exploration was evaluated. Simple linear regression analysis was undertaken, and a scatter plot between exploitation and exploration was plotted. The scatter plot suggested the potential for a positive linear correlation between exploitation and exploration. This was aligned with the results of the correlation analysis (Table 17). The R^2 coefficient for the regression analysis was 0.620, indicative of a strong positive linear correlation between exploitation and exploration, which was statistically significant at the 5% level of significance.

This result is aligned with March (1991), who stated that successful organisations need to simultaneously pursue exploitation and exploration rather than a choice between these competing demands. The survey results corroborate this statement as the construct mean scores for exploration and exploitation were similar, with exploitation being slightly higher than exploration. This is indicative of a slightly higher focus on exploitation in the organisations in the sample. A potential reason for the higher focus on exploitation over exploration could be the nature of the firms in the sample being mainly in the manufacturing/operations sector. Mithani (2020) stated that during disruptive events, firms should consider a dynamic resilience approach. This is necessary as for some organisations, their existing business model may no longer be viable, and they may need to move toward a new equilibrium, with the exploration being a key competency for this adaptation.

It is noteworthy that the exploratory factor analysis (Table 16) did not differentiate between exploitation and exploration as distinct factors. These results suggest that exploitation and exploration could be mutually reinforcing in an organisation. This is supported by Gupta et al. (2006), who stated that the competing demands of exploitation and exploration could be treated as orthogonal or complementary concepts. This means that both modalities of innovation could be pursued by an organisation independently without impacting the other. It is postulated that within the context of disruptive events, it is a necessity for organisations to simultaneously optimise the efficiency of their current mode of operations as well as experiment and more disruptively innovate to remain viable, adapt and realise opportunities.

The notion of the reinforcing nature of exploitation and exploration is evident when considering a model of organisational learning, where new knowledge is generated through exploration, which is subsequently refined by productivity improvement through exploitation (Asif, 2019). Vera & Crossan (2004) considered exploitation and exploration through two modes of organisational learning, namely feed-forward and feedback. In the feed-forward learning, information flows from the individual to the organisation, typical of exploration where new knowledge is developed that needs to be institutionalised. In feedback learning, information flows from the organisation to the individual, which enables knowledge sharing, thereby solidifying existing knowledge, which is more aligned with exploitation.

6.7. Contextual ambidexterity and firm performance

The results of Hypothesis 2a indicated that contextual ambidexterity did not have a statistically significant relationship with firm performance. However, this result was not aligned with the findings of Birkinshaw & Gibson (2004), who found a strong positive relationship between ambidexterity and business unit performance with an R^2 coefficient for the linear regression analysis of 0.578, which was statistically significant. However, the findings from the multicollinearity analysis for Hypothesis 2a indicated that the reason could be due to the overlap of the independent variables of organisational resilience and contextual ambidexterity. Therefore, the correlation between contextual ambidexterity and firm performance was evaluated separately using a scatter plot and simple linear regression. The scatter plot indicated the likelihood of a weak positive linear correlation between contextual ambidexterity and firm performance, while the linear regression yielded an R^2 coefficient for the linear regression analysis of 0.134, which was statistically significant at the 5% level of significance. This supported a weak positive relationship between contextual ambidexterity and firm performance. It is noteworthy that the magnitude of the correlation was similar for contextual ambidexterity and organisational resilience with regard to firm performance.

It is postulated, therefore, that the reason for the weak correlation of contextual ambidexterity with firm performance in comparison to previous studies that supported the benefits of contextual ambidexterity on firm performance (Birkinshaw & Gupta, 2013; He & Wong, 2004; Junni et al., 2013) was due to the overlapping of these constructs in this study. Further, based on the preceding discussion on the interrelationship between organisational resilience and contextual ambidexterity, that contextual ambidexterity could be an antecedent for organisational resilience within the context of disruptive events (Lengnick-Hall et al., 2011; Iborra et al., 2020).

An alternative explanation is related to the role of the context of disruptive events, where a mode of contextual ambidexterity could be less effective in terms of firm performance than would be achieved through a focus on either exploitation or exploration in this situation. This view is supported by Gulati & Puranam (2009), who asserted that in some situations, the nature of the disruptive events is out of the control of the organisation, and the organisation could benefit from “more focus on the poles of duality” (Gulati & Puranam, 2009, p.423). This view is supported by Luger et al. (2018) who asserted that during disruptive events, an ambidextrous

approach can lead to organisational misalignment that could negatively impact firm performance. Therefore, within the context of the COVID-19 pandemic, government lockdowns and reductions in customer demand were primarily out of the control of most organisations. In this case, a focussed approach on either exploitation or exploration could have been more beneficial for some firms. This hypothesis should be considered for future studies.

6.8. Chapter conclusion

A discussion of the statistical analyses from the survey questionnaire was provided in this chapter. The findings from the statistical analyses for the research objectives were evaluated against relevant literature, and conclusions were drawn. A summary of this discussion for the hypotheses and additional statistical analyses follow.

Hypothesis 1 evaluated the relationship between organisational resilience and firm performance in the context of disruptive events. The simple linear regression analysis indicated a weak positive relationship between organisational resilience and firm performance, with an R^2 coefficient of 0.150, which was statistically significant at the 5% level of significance. This finding is congruent with pertinent literature, which found that organisational resilience has contingent benefits for short term profitability and longer-term business sustainability (DesJardine et al., 2019; Ortiz-de-Mandojana & Bansal, 2016). However, it was noted that only 15% of the variance in firm performance was due to the variation in organisational resilience, indicating that there are other elements that influence firm performance, which were postulated as factors such as industry structure and macro-economic context. The specific context of the COVID-19 pandemic was highlighted as essential factor in predicting firm performance, which was subsequently confirmed in Hypotheses 2a, 2b and 2c.

Hypothesis 2a evaluated the moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance. It was found that contextual ambidexterity did not have a moderating effect on the relationship between organisational resilience and firm performance in the context of disruptive events. However, it was demonstrated that there was potential overlap between the independent variables of organisational resilience and contextual ambidexterity. This result was congruent with extant literature, which found that rather than a moderating variable, ambidexterity was an antecedent for organisational resilience in

maintaining firm performance during disruptive events (Iborra et al., 2020; Mamouni Limnios et al., 2014).

Hypothesis 2b and Hypothesis 2c respectively evaluated the moderating effect of exploitation (Hypothesis 2b) and exploration (Hypothesis 2c) on the relationship between organisational resilience and firm performance. Analogous to contextual ambidexterity, neither exploitation or exploration was found to have a moderating effect on the relationship between organisational resilience and firm performance in the context of disruptive events. It was postulated that rather than moderator variables, exploitation and exploration could be viewed as antecedents of organisational resilience through contextual ambidexterity based on the dynamic balancing of exploitative and explorative competencies. This is supported by Mamouni Limnios et al. (2014), who highlighted the need to balance exploitation and exploration through ambidexterity to enable organisational resilience, emphasising that excessive focus on either can lead to sub-optimal firm adaptability.

Additional analysis was undertaken to explore the relationship between exploitation and exploration, where it was found that there was a strong positive correlation between these constructs. It was postulated that exploitation and exploration were mutually reinforcing, which was supported by extant literature which found that these constructs were reinforced through modes of organisational learning (Asif, 2019; Vera & Crossan, 2004).

The relationship between contextual ambidexterity and firm performance was separately assessed, based on the previous finding of the overlap of the constructs of organisational resilience and contextual ambidexterity in the prediction of firm performance. It was found that there was a weak positive relationship between contextual ambidexterity and firm performance. This contrasted to the extant literature, which found a strong positive relationship between ambidexterity and business unit performance (Birkinshaw & Gibson, 2004). However, when considering the context of the COVID-19 pandemic, it was postulated that a mode of contextual ambidexterity could be less effective in terms of firm performance than would be achieved through a focus on either exploitation or exploration in this situation. This was supported by extant literature, which stated the need for organisational focus on either exploitation or exploration in specific situations, such as where the organisation has little control over the disruptive event (Gulati & Puranam, 2009).

CHAPTER 7: CONCLUSION

7.1. Introduction to chapter

The objective of this study was a quantitative evaluation of the moderating role of contextual ambidexterity on organisational resilience in coping with disruptive events to maintain firm performance, where contextual ambidexterity consisted of the lower-order constructs of exploitation and exploration. The response of firms to the COVID-19 pandemic was utilised as the business context, as an instance of a disruptive event requiring organisation resilience. This was necessitated by the difficulty of directly measuring organisational resilience until called upon due to a threat (Ortiz-de-Mandojana & Bansal, 2016). It was noted that disruptive events presented a different challenge to organisations, who were better positioned for economic or technological change rather than the discontinuous and potentially unpredictable change brought on by disruptive events (Linnenluecke, 2017). This study contributes to the body of academic knowledge through an understanding of the context of disruptive events through the instance of the COVID-19 pandemic on the relationships between organisational resilience, contextual ambidexterity and firm performance. This chapter will expound on the principle findings of this study, theoretical contributions, implications for managers and organisations, indicate limitations of the study and make recommendations for further studies in this area.

7.2. Summary of principle findings of the study

7.2.1. Research objective 1

Research objective 1 (Hypothesis 1) evaluated whether there was a significant positive relationship between organisational resilience and firm performance in the context of disruptive events. The linear regression analysis indicated a statistically significant weak positive relationship between organisational resilience and firm performance, with an R^2 coefficient of 0.150. This finding is aligned with previous studies, which found that organisational resilience benefited short term firm performance and longer-term business sustainability (DesJardine et al., 2019; Ortiz-de-Mandojana & Bansal, 2016).

7.2.2. Research objective 2

The second research objective was to evaluate the moderating effect of contextual ambidexterity on the relationship between organisational resilience and firm performance. Contextual ambidexterity consisted of the constructs of exploitation and exploration. It was observed that contextual ambidexterity did not have a moderating effect on the relationship between organisational resilience and firm performance in the context of disruptive events. Extant literature supported this finding, indicating that ambidexterity was an antecedent for organisational resilience in maintaining firm performance during disruptive events (Iborra et al., 2020; Mamouni Limnios et al., 2014). Neither exploitation or exploration was found to have a moderating effect on the relationship between organisational resilience and firm performance in the context of disruptive events. Exploitation and exploration were postulated as antecedents of organisational resilience through contextual ambidexterity by dynamically balancing exploitation and exploration. This is aligned with previous findings that highlighted that excessive focus on either exploitation or exploration could inhibit the ability of firms to adapt effectively to change (Mamouni Limnios et al., 2014).

7.2.3. Additional research findings

It was found that there was a strong positive correlation between exploitation and exploration. It was postulated that exploitation and exploration were mutually reinforcing, which was supported by extant literature which found that these constructs were reinforced through modes of organisational learning (Asif, 2019; Vera & Crossan, 2004).

It was observed that there was a weak positive relationship between contextual ambidexterity and firm performance. This contrasted to the extant literature, which indicated a strong positive relationship between ambidexterity and business unit performance (Birkinshaw & Gibson, 2004). However, when considering the context of the COVID-19 pandemic, it was postulated that a mode of contextual ambidexterity could be less effective in terms of firm performance than would be achieved through a focussed approach on either exploitation or exploration. This was supported by extant literature, which stated that organisational focus on either exploitation or exploration could be more beneficial in specific situations (Gulati & Puranam, 2009).

7.3. Theoretical contributions of the study

Within the context of disruptive events, organisational resilience had a weak positive linear relationship with firm performance. The R^2 coefficient for the regression analysis was 0.150, which indicated that only 15% of the variance in firm performance was due to the variation in organisational resilience. This result was evaluated through the organisational diagnostic model (Cummings et al., 2020), where it was postulated that the highly uncertain and restrictive nature of the COVID-19 pandemic impacted the macro-economic environment and industry environment to such an extent that this limited the ability of firms to effectively respond to the COVID-19 pandemic. Therefore, within this specific context and for the sample evaluated, organisational resilience played only a weak role in supporting firm performance. This result is postulated to be specific to particular circumstances of the event, be it a disruptive event, economic or technological change. Therefore, organisational resilience is not the only factor that can have a significant impact on firm performance within the context of disruptive events.

Neither contextual ambidexterity, exploitation or exploration had a moderating effect on the relationship between organisational resilience and firm performance in the context of disruptive events. These results were supported by Iborra et al. (2020), who found that contextual ambidexterity was a key enabler for organisational resilience to maintain firm performance within the context of disruptive events. Therefore, it was postulated that rather than a moderating variable, ambidexterity was an antecedent for organisational resilience in maintaining firm performance during disruptive events. This was supported by Lengnick-Hall et al. (2011), who demonstrated that employee behaviours that support organisational resilience also support contextual ambidexterity through the development of cognitive, behavioural and contextual capabilities at an organisational level. The dynamic balancing of exploitation and exploration was postulated in the development of this contextual ambidextrous capability as an antecedent of organisational resilience. This was supported by the Resilience Architecture Framework (Mamouni Limnios et al., 2014), which highlighted the need to balance exploitation and exploration through ambidexterity to enable organisational resilience, emphasising that excessive focus on either can lead to a sub-optimal mode of firm adaptability of either transience or rigidity.

There was a strong positive correlation between exploitation and exploration. It was postulated that exploitation and exploration were mutually reinforcing capabilities within an organisation. This was supported by Gupta et al. (2006), who stated that the competing demands of exploitation and exploration could be treated as orthogonal or complementary concepts, meaning that both could be pursued by an organisation independently. Further, Asif (2019) indicated that the interdependencies of these constructs were aligned with organisational learning models, where initially, new knowledge is generated through exploration, which is subsequently refined by productivity improvement through exploitation.

Contrary to extant research on the benefits of contextual ambidexterity on firm performance (Birkinshaw & Gibson, 2004), it was found that contextual ambidexterity had only a weak positive relationship with firm performance in the context of disruptive events. This was postulated to be due to the specific context of the COVID-19 pandemic, where government lockdowns and reductions in customer demand were primarily out of the control of most organisations. Therefore, the business context could be viewed as a moderating variable in the relationship between contextual ambidexterity and firm performance.

7.4. Implications for managers and organisations

A key implication for managers and organisations is to understand that contextual ambidexterity and organisational resilience are closely related organisational capabilities. This is supported by the regression analysis for which the R^2 coefficient was 0.494, indicating that contextual ambidexterity accounted for 49.4% of the variation of organisational resilience. Therefore, it is worthwhile for organisations to consider how organisational resilience can be developed or enhanced to enable firm performance during disruptive events. Table 1, which was adapted from Lengnick-Hall et al. (2011), indicates the desired employee behaviours and enabling human resources principles that support organisational resilience. This framework indicates that organisational resilience can be developed through cognitive, behavioural and contextual capabilities enabled through contextual ambidexterity (Lengnick-Hall et al., 2011). This may be practically implemented through an integrative HR policy framework as well as manager and employee behaviours to develop organisational resilience.

The business context of the disruptive event should be considered in the determination of how organisations respond to these events. It was demonstrated that organisational resilience and contextual ambidexterity both had weak positive linear relationships with firm performance within the context of disruptive events. This indicates that other factors play a significant role, where it was demonstrated that the impact of the COVID-19 pandemic on organisations was a significant factor in the prediction of firm performance. Further, this study was set across all industry sectors in South Africa; however, it was postulated that a sector-specific study could have uncovered industry-specific factors that could influence the strength of these relationships, further illustrating the role of business context and industry environment on firm performance (Cummings et al., 2020).

In addition to developing capabilities for organisational resilience and contextual ambidexterity, organisations should dynamically evaluate the role of the business context to assess how to deploy these capabilities. The weak correlation of contextual ambidexterity with firm performance could indicate that organisations could have benefitted from a more focussed approach on either exploitation or exploration within this context. Therefore, contextual ambidexterity may not always be preferable, depending on the nature of the disruptive event (Gulati & Puranam, 2009). This is aligned with the dynamic capabilities framework of sensing, seizing and transforming (Teece et al., 2016), which requires an assessment of the external environment to identify threats and opportunities. This is supported by Birkinshaw et al. (2016), who stated that firms need to assess their approach to ambidexterity based on their environmental context and firm heritage.

Despite literature considering exploration and exploitation as distinct capabilities that need to be developed by organisations to be successful (March, 1991), in practice, when considering contextual ambidexterity, these capabilities are applied fluidly in an organisation. This was demonstrated by the exploratory factor analysis (Table 16), which did not differentiate between exploitation and exploration as distinct factors. These results suggest that exploitation and exploration could be mutually reinforcing in an organisation. This logic is consistent with Vera & Crossan (2004), who considered exploitation and exploration as two modes of organisational learning. Therefore, the key learning for managers is to apply an integrative approach to these concepts, rather rigidly considering that they are operating in an exploitative or explorative mode of innovation.

7.5. Limitations of the study

The following limitations of this study were identified, which are important considerations in the contextualisation of this study and for future research:

- While this study followed a broad perspective by evaluation of the research constructs across all industry sectors, this limited the ability to interpret the results within the context of specific industries. Further, while the research methodology aimed for diverse responses across industry sectors, the sample indicated a bias toward the manufacturing and banking sectors, which limited the ability to apply these results across industries.
- The study followed a deductive research methodology, which limited the ability to collect more profound insights that could have been obtained through a qualitative approach, for example, using interviews. This methodology would have been helpful for theory development to understand the factors that contribute toward firm performance within the context of disruptive events.
- The cross-sectional time horizon for this study is a potential limitation, as the context of this study was that of a global pandemic illustrative of a disruptive event, which had a significant impact on the business environment. Therefore, it is anticipated that the strength of the relationships between the research constructs could differ in a different time horizon. It was also observed that the particular circumstances of a disruptive event impact the ability of firms to respond appropriately; therefore, it would be beneficial to assess other types of disruptive events to assess the applicability of the results of this study.
- While this study considered the role of contextual ambidexterity as a moderator to the relationship between organisational resilience and firm performance, the study did not evaluate the underlying factors that contribute toward building and maintaining firm performance within the context of disruptive events.
- A limitation of the current study was the measurement scale utilised for organisational resilience. While the measurement scale was able to assess the level of organisational resilience, the scale did not elucidate how resilience was operationalised in the organisation.

7.6. Recommendations for future research

It is recommended that the research hypotheses postulated within this study are tested within specific industry sectors, such as those with a strong focus on

innovation or the ability to rapidly modify their product and service offerings to respond to disruptive events. This would allow for richer contextualisation of the study and the ability to provide deeper insights on industry-specific factors that influence the relationships between the research constructs.

While organisational resilience and contextual ambidexterity are important considerations for firm performance within the context of disruptive events, this study did not evaluate the contributing factors of firm performance within the context of disruptive events. An understanding of the antecedents of firm performance would be essential to improve organisational adaptation. A mixed-method research approach is recommended using interviews, complemented with a survey questionnaire. The use of interviews would enable the discovery of the contributing factors of firm performance within the context of disruptive events, which would enable inductive theory development. This approach would enable triangulation with a survey questionnaire.

This study indicated the critical role that business context plays on the factors that influence firm performance. It was demonstrated that the benefits of organisational resilience and contextual ambidexterity were dampened by the circumstances of the disruptive event due to the limited control that firms had over their external environment. Therefore, it is recommended to explore the role of business context further, as a moderating variable between organisational resilience and firm performance, using a construct such as environmental dynamism (Lombard, 2017). It is recommended to assess the impact of business context using a longitudinal research approach.

While this study evaluated the construct of organisational resilience, it did not assess how organisational resilience is operationalised in organisations during disruptive events. Therefore, it would be instructive to develop a measurement scale using the frameworks developed by Mamouni Limnios et al. (2014) or Mithani (2020) to assess the modes of organisational resilience. Mithani (2020) considered that resilience followed different adaptation modes during disruptive events, namely: avoidance, absorption, elasticity, learning and rejuvenation. Mamouni Limnios et al. (2014) considered modalities of organisational resilience, namely rigidity, adaptability, transience and vulnerability. These frameworks would be helpful to understand the types of responses of firms and the role of contextual ambidexterity in these responses.

7.7. Conclusions

This study evaluated the moderating role of contextual ambidexterity on the relationship between organisational resilience and firm performance in coping with disruptive events, where contextual ambidexterity consisted of the lower-order constructs of exploitation and exploration. The response of firms to the COVID-19 pandemic was utilised as the business context, as an instance of a disruptive event.

The results indicated that within the context of disruptive events, organisational resilience and contextual ambidexterity had weak positive relationships with firm performance. Further, it was shown that neither contextual ambidexterity, exploitation or exploration had a moderating effect on the relationship between organisational resilience and firm performance in the context of disruptive events.

For managers and organisations, this study illustrates the close relationship between contextual ambidexterity and organisational resilience as organisational capabilities for firm performance during disruptive events. Rather than a moderating variable, ambidexterity could be viewed as an antecedent for organisational resilience in maintaining firm performance during disruptive events (Iborra et al., 2020; Mamouni Limnios et al., 2014). Therefore, from a practical perspective, this highlights the need for integrative HR policies to develop the competencies for organisational resilience (Lengnick-Hall et al., 2011).

This study highlighted the critical role of the business context of the disruptive event in assessing how organisations respond to these events. It was demonstrated that organisational resilience and contextual ambidexterity both had weak positive linear relationships with firm performance within this specific context. This indicated that other factors such as business context and industry environment play a significant role on firm performance (Cummings et al., 2020). It was postulated that firms could have benefitted from a more focussed approach on either exploitation or exploration within this specific context, indicating that an ambidextrous response is not always appropriate, depending on the business context.

This study contributes to the growing body of academic knowledge on organisational responses to disruptive events through the instance of the COVID-19 pandemic by evaluation of the relationships between organisational resilience, contextual ambidexterity and firm performance. This will enable organisations to better understand the capabilities required to effectively respond to these events.

REFERENCES

Annarelli, A., & Nonino, F. (2016). Strategic and operational management of organizational resilience: Current state of research and future directions. *Omega (United Kingdom)*, *62*, 1–18. https://doi.org/10.1016/j.omega.2015.08.004

Asif, M. (2019). Exploring the role of exploration/exploitation and strategic leadership in organizational learning. *International Journal of Quality and Service Sciences*, *11*(3), 409–423. https://doi.org/10.1108/IJQSS-04-2018-0038

Balboni, B., Bortoluzzi, G., Pugliese, R., & Tracogna, A. (2019). Business model evolution, contextual ambidexterity and the growth performance of high-tech start-ups. *Journal of Business Research*, *99*(August 2018), 115–124. https://doi.org/10.1016/j.jbusres.2019.02.029

Barasa, E., Mbau, R., & Gilson, L. (2018). What is resilience and how can it be nurtured? A systematic review of empirical literature on organizational resilience. *International Journal of Health Policy and Management*, *7*(6), 491–503. https://doi.org/10.15171/ijhpm.2018.06

Bardoel, E. A., Pettit, T. M., De Cieri, H., & Mcmillan, L. (2014). Employee resilience: An emerging challenge for HRM. *Asia Pacific Journal of Human Resources*, *52*(3), 279–297. https://doi.org/10.1111/1744-7941.12033

Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration, and process management: The productivity dilemma revisited. *The Academy of Management Review*, *28*(2), 238–256. http://www.jstor.org/stable/30040711

Birkinshaw, J., & Gibson, C. (2004). Building ambidexterity into an organization. *MIT Sloan Management Review*, *45*(4), 47–55.

Birkinshaw, J., & Gupta, K. (2013). Clarifying the distinctive contribution of ambidexterity to the field of organizational studies. *Academy of Management Perspectives*, *27*(4), 287–298.

Birkinshaw, J., Zimmermann, A., & Raisch, S. (2016). How Do Firms Adapt to Discontinuous Change? *California Management Review*, *58*(4), 36–58.

Boin, A., Comfort, L. K., & Demchak, C. C. (2010). The rise of resilience. In L. K. Comfort, A. Boin, & C. C. Demchak (Eds.), *Designing resilience: Preparing for*

extreme events (pp. 1–12). University of Pittsburgh Press.

Bouaziz, F., & Hachicha, Z. S. (2018). Strategic human resource management practices and organizational resilience. *Journal of Management Development*, *37*(7), 537–551. https://doi.org/10.1108/JMD-11-2017-0358

Britt, T. W., Shen, W., Sinclair, R. R., Grossman, M. R., & Klieger, D. M. (2016). How much do we really know about employee resilience? *Industrial and Organizational Psychology*, *9*(2), 378–404. https://doi.org/10.1017/iop.2015.107

Chams-Anturi, O., Moreno-Luzon, M. D., & Escorcia-Caballero, J. P. (2019). Linking organizational trust and performance through ambidexterity. *Personnel Review*, *49*(4), 956–973. https://doi.org/10.1108/PR-07-2018-0239

Cheese, P. (2016). Managing risk and building resilient organisations in a riskier world. *Journal of Organizational Effectiveness*, *3*(3), 323–331. https://doi.org/10.1108/JOEPP-07-2016-0044

Clément, V., & Rivera, J. (2017). From adaptation to transformation: An extended research agenda for organizational resilience to adversity in the natural environment. *Organization and Environment*, *30*(4), 346–365. https://doi.org/10.1177/1086026616658333

Conz, E., & Magnani, G. (2020). A dynamic perspective on the resilience of firms: A systematic literature review and a framework for future research. *European Management Journal*, *38*(3), 400–412. https://doi.org/10.1016/j.emj.2019.12.004

Creswell, J. W. (2015). *Educational research: Planning, conducting and evaluating quantitative and qualitative research* (5th ed.). Pearson Education.

Cummings, T., Worley, C. G., & Donovan, P. (2020). Chapter 5: Diagnosing. In *Organization development and change* (EMEA ed., pp. 82–97). Cengage Learning.

Daniel, J. (2012). *Sampling essentials: Practical guidelines for making sampling choices*. https://methods-sagepub-com.uplib.idm.oclc.org/Book/sampling-essentials

Deloitte. (2020). *Delve deeper into changing organisational culture and mindset: Learnings from COVID-19*. https://www2.deloitte.com/in/en/pages/human-capital/articles/delve-deeper-into-changing-organisational-culture-andmindset.%0Ahtml

DesJardine, M., Bansal, P., & Yang, Y. (2019). Bouncing back: Building resilience through social and environmental practices in the context of the 2008 global financial crisis. *Journal of Management*, *45*(4), 1434–1460. https://doi.org/10.1177/0149206317708854

Diesel, R., & Scheepers, C. B. (2019). Innovation climate mediating complexity leadership and ambidexterity. *Personnel Review*, *48*(7), 1782–1808. https://doi.org/10.1108/PR-11-2018-0445

Duchek, S. (2020). Organizational resilience : a capability-based conceptualization. *Business Research*, *13*, 215–246. https://doi.org/10.1007/s40685-019-0085-7

Duit, A. (2016). Resilience thinking: Lessons for public administration. *Public Administration*, *94*(2), 364–380. https://doi.org/10.1111/padm.12182

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (Fifth). SAGE edge.

Floyd, S. W., & Lane, P. I. (2000). Strategizing throughout the organization: Managing role conflict in strategic renewal. *Academy of Management Review*, *25*(l), 154–177. https://doi-org.uplib.idm.oclc.org/10.5465/AMR.2000.2791608

Ghoshal, S., & Bartlett, C. A. (1994). Linking organizational context and managerial action: The dimensions of quality of management. *Strategic Management Journal*, *15*, 91–112.

Gulati, R., & Puranam, P. (2009). Renewal through reorganization: The value of inconsistencies between formal and informal organization. *Organization Science*, *20*(2), 422–440. https://doi.org/10.1287/orsc.1090.0421

Gupta, A. K., Smith, K. G., & Shalley, C. E. (2006). The interplay between exploration and exploitation. *Academy of Management Journal*, *49*(4), 693–706.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.

Havermans, L. A., Hartog, D. N. D., Keegan, A., & Uhl-Bien, M. (2015). Exploring the role of leadership in enabling contextual ambidexterity. *Human Resource*

Management, *54*(S1), 179–200.

He, Z. L., & Wong, P. K. (2004). Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. *Organization Science*, *15*(4), 481–495. https://doi.org/10.1287/orsc.1040.0078

Hillmann, J., Duchek, S., Meyr, J., & Guenther, E. (2018). Educating future managers for developing resilient organizations: The role of scenario planning. In *Journal of Management Education* (Vol. 42, Issue 4). https://doi.org/10.1177/1052562918766350

Hillmann, J., & Guenther, E. (2021). Organizational resilience: A valuable construct for management research? *International Journal of Management Reviews*, *23*(1), 7–44. https://doi.org/10.1111/ijmr.12239

Iborra, M., Safón, V., & Dolz, C. (2020). What explains the resilience of SMEs? Ambidexterity capability and strategic consistency. *Long Range Planning*, *53*(6), 101947. https://doi.org/10.1016/j.lrp.2019.101947

Ismail, H. S., Poolton, J., & Sharifi, H. (2011). The role of agile strategic capabilities in achieving resilience in manufacturing-based small companies. *International Journal of Production Research*, *49*(18), 5469–5487. https://doi.org/10.1080/00207543.2011.563833

Jansen, J. J. P., Kostopoulos, K. C., Mihalache, O. R., & Papalexandris, A. (2016). A socio-psychological perspective on team ambidexterity: The contingency role of supportive leadership behaviours. *Journal of Management Studies*, *53*(6), 939–965. https://doi.org/10.1111/joms.12183

Junni, P., Sarala, R. M., Taras, V., & Tarba, S. Y. (2013). Organizational ambidexterity and performance: A meta-analysis. *Academy of Management Perspectives*, *27*(4), 299–312. https://doi.org/10.5465/amp.2012.0015

Kantur, D., & İserí Say, A. (2012). Organizational resilience: A conceptual integrative framework. *Journal of Management and Organization*, *18*(6), 762–773. https://doi.org/10.5172/jmo.2012.18.6.762

Kantur, D., & İşeri Say, A. (2015). Measuring organizational resilience: A scale development. *Journal of Business, Economics and Finance*, *4*(3), 456–472. https://doi.org/10.17261/pressacademia.2015313066

Kauppila, O. P., & Tempelaar, M. P. (2016). The social-cognitive underpinnings of employees' ambidextrous behaviour and the supportive role of group managers' leadership. *Journal of Management Studies*, *53*(6), 1019–1044. https://doi.org/10.1111/joms.12192

Kossek, E. E., & Perrigino, M. B. (2016). Resilience: A review using a grounded integrated occupational approach. *Academy of Management Annals*, *10*(1), 729–797. https://doi.org/10.1080/19416520.2016.1159878

Kumar, R. (2011). *Research methodology: A step-by-step guide for beginners* (3rd ed.). SAGE.

Lee, K., Woo, H. G., & Joshi, K. (2017). Pro-innovation culture, ambidexterity and new product development performance: Polynomial regression and response surface analysis. *European Management Journal*, *35*(2), 249–260. https://doi.org/10.1016/j.emj.2016.05.002

Lengnick-Hall, C. A., Beck, T. E., & Lengnick-Hall, M. L. (2011). Developing a capacity for organizational resilience through strategic human resource management. *Human Resource Management Review*, *21*(3), 243–255. https://doi.org/10.1016/j.hrmr.2010.07.001

Linnenluecke, M. K. (2017). Resilience in business and management research: A review of influential publications and a research agenda. *International Journal of Management Reviews*, *19*(1), 4–30. https://doi.org/10.1111/ijmr.12076

Lombard, M. (2017). *Environmental dynamism as a moderator of the relationship between complexity leadership and contextual ambidexterity* [MBA mini-dissertation, Gordon Institute of Business Science]. http://hdl.handle.net/2263/64866

Luger, J., Raisch, S., & Schimmer, M. (2018). Dynamic balancing of exploration and exploitation: The contingent benefits of ambidexterity. *Organization Science*, *29*(3), 449–470. https://doi.org/10.1287/orsc.2017.1189

Malik, A., Boyle, B., & Mitchell, R. (2017). Contextual ambidexterity and innovation in healthcare in India: The role of HRM. *Personnel Review*, *46*(7), 1358–1380. https://doi.org/10.1108/PR-06-2017-0194

Mamouni Limnios, E. A., Mazzarol, T., Ghadouani, A., & Schilizzi, S. G. M. (2014). The resilience architecture framework: Four organizational archetypes. *European Management Journal*, *32*(1), 104–116. https://doi.org/10.1016/j.emj.2012.11.007

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, *2*, 71–87.

Mithani, M. A. (2020). Adaptation in the face of the new normal. *Academy of Management Perspectives*, *34*(4), 508–530. https://doi.org/10.5465/AMP.2019.0054

Neuman, W. L. (2014). *Social research methods: Qualitative and quantitative approaches* (7th ed.). Pearson Education Limited.

O'Reilly, C. A., & Tushman, M. L. (1996). Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, *38*(4), 8–30.

O'Reilly, C. A., & Tushman, M. L. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior*, *28*, 185–206. https://doi.org/10.1016/j.riob.2008.06.002

Ortiz-de-Mandojana, N., & Bansal, P. (2016). The long-term benefits of organizational resilience through sustainable business practices. *Strategic Management Journal*, *37*, 1615–1631.

Pallant, J. (2016). *SPSS survival manual: a step by step guide to data analysis using SPSS* (6th ed.). McGraw-Hill Education.

Pearson, C. M., & Clair, J. A. (1998). Reframing crisis management. *Academy of Management Review*, *23*(1), 59–76. https://doi.org/10.5465/AMR.1998.192960

Peng, M. W., Wang, D. Y. L., & Jiang, Y. (2008). An institution-based view of international business strategy: A focus on emerging economies. *Journal of International Business Studies*, *39*(5), 920–936. https://doi.org/10.1057/palgrave.jibs.8400377

Porter, M. E. (2008). The five competitive forces that shape strategy. *Harvard Business Review*, *86*(1), 1–18.

Raisch, S., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. *Journal of Management*, *34*(3), 375–409. https://doi.org/10.1177/0149206308316058

Rice, V., & Liu, B. (2016). Personal resilience and coping with implications for work. Part I: A review. *Work*, *54*(2), 325–333. https://doi.org/10.3233/WOR-162300

Saunders, M., & Lewis, P. (2018). *Doing research in business and management* (2nd ed.). Pearson Education Limited.

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

Scott, W. R. (2008). Approaching adulthood: The maturing of institutional theory. *Theory and Society*, *37*(5), 427–442. https://doi.org/10.1007/s11186-008-9067-z

Simsek, Z., Heavey, C., Veiga, J. F., & Souder, D. (2009). A typology for aligning organizational ambidexterity's conceptualizations, antecedents, and outcomes. *Journal of Management Studies*, *46*(5), 864–894. https://doi.org/10.1111/j.1467-6486.2009.00841.x

Smith, W. K. (2014). Dynamic decision making: A model of senior leaders managing strategic paradoxes. *Academy of Management Journal*, *57*(6), 1592–1623.

Statistics South Africa. (n.d.). *Standard industrial classification of all economic activities (5th ed.)*. Statistics South Africa. https://www.statssa.gov.za/additional_services/sic/contents.htm

Sutcliffe, K. M., & Vogus, T. J. (2003). Organizing for resilience. In K. Cameron, J. E. Dutton, & R. E. Quinn (Eds.), *Positive organizational scholarship: Foundations of a new discipline* (pp. 94–110). Berrett-Kehler.

Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, *58*(4), 13–36.

Teixeira, E. D. O., & Werther, W. B. (2013). Resilience: Continuous renewal of competitive advantages. *Business Horizons*, *56*(3), 333–342. https://doi.org/10.1016/j.bushor.2013.01.009

Turner, N., Kutsch, E., Maylor, H., & Swart, J. (2020). Hits and (near) misses. Exploring managers' actions and their effects on localised resilience. *Long Range Planning*, *53*(3), 101944. https://doi.org/10.1016/j.lrp.2019.101944

Uhl-Bien, M., & Arena, M. (2017). Complexity leadership: Enabling people and organizations for adaptability. *Organizational Dynamics*, *46*(1), 9–20. https://doi.org/10.1016/j.orgdyn.2016.12.001

Uhl-Bien, M., Meyer, D., & Smith, J. (2020). Complexity leadership in the nursing context. *Nursing Administration Quarterly*, *44*(2), 109–116. https://doi.org/10.1097/NAQ.0000000000000407

United Nations. (2019). *Global assessment report on disaster risk reduction*. https://gar.undrr.org/sites/default/files/reports/2019-05/full_gar_report.pdf

van der Vegt, G., Essens, P., & Wahlström, M. (2015). Managing risk and resilience. *Academy of Management Journal*, *58*(4), 971–980. https://doi.org/http://dx.doi.org/10.5465/amj.2015.4004

van Woerkom, M., Bakker, A. B., & Nishii, L. H. (2016). Accumulative job demands and support for strength use: Fine-tuning the job demands-resources model using conservation of resources theory. *Journal of Applied Psychology*, *101*(1), 141–150. https://doi.org/10.1037/apl0000033

Vera, D., & Crossan, M. (2004). Strategic leadership and organizational learning. *Academy of Management Review*, *29*(2), 222–240. https://doi.org/10.5465/AMR.2004.12736080

Vrontis, D., Thrassou, A., Santoro, G., & Papa, A. (2017). Ambidexterity, external knowledge and performance in knowledge-intensive firms. *Journal of Technology Transfer*, *42*(2), 374–388. https://doi.org/10.1007/s10961-016-9502-7

Wang, C. L., & Rafiq, M. (2014). Ambidextrous organizational culture, contextual ambidexterity and new product innovation: A comparative study of UK and Chinese high-tech firms. *British Journal of Management*, *25*(1), 58–76. https://doi.org/10.1111/j.1467-8551.2012.00832.x

Wegner, T. (2016). *Applied business statistics* (4th ed.). Juta & Company Limited.

Weick, K. E. (1993). The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Science Quarterly*, *38*, 628–652.

Williams, T. A., Gruber, D. A., Sutcliffe, K. M., Shepherd, D. A., & Zhao, E. Y. (2017). Organizational response to adversity: Fusing crisis management and resilience research streams. *Academy of Management Annals*, *11*(2), 733–769. https://doi.org/10.5465/annals.2015.0134

Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2010). *Business research methods* (8th ed.). South-Western Cengage Learning.

Zimmermann, A., Raisch, S., & Cardinal, L. B. (2018). Managing persistent tensions on the frontline: A configurational perspective on ambidexterity. *Journal of Management Studies*, *55*(5), 739–769. https://doi.org/10.1111/joms.12311

APPENDICES

Appendix A Consent form and survey questionnaire

Dear respondent

I am currently a student at the University of Pretoria's Gordon Institute of Business Science and completing my research in partial fulfilment of a Masters in Business Administration. I am conducting research on the impact of disruptive events such as the COVID-19 pandemic on the performance of organisations. I would greatly appreciate it if you could complete this online survey to support my research in this area. This research will have a positive impact on society by contributing toward a better understanding of the organisational capabilities that will enable firms to better prepare and adapt to disruptive events. The completion of the survey should take no more than 20 minutes of your time. Your participation is voluntary, and you can withdraw at any time without penalty. Your participation is anonymous, and only aggregated data will be reported. By completing the survey, you indicate that you voluntarily participate in this research. If you have any concerns, please contact my supervisor or me. Our details are provided below.

Researcher email address: 20803304@mygibs.co.za
Research supervisor email address: anelrdsa@gmail.com

SECTION 1

The first section of the survey will consist of general and demographic questions, where you will be asked to select the most appropriate option per question. At the end of this section, based on your answers in Section 1, if you do not form part of the target population for this study, the survey will end, and your participation is greatly appreciated. If you do form part of the target population for this study, you will proceed to Section 2.

Q1: Are you currently employed at a for-profit company operating in South Africa? (screening question)

Yes

No

Q2: Does your current job fall within either of the following descriptions? (screening question)

a) Manager of any level such as a team leader, supervisor, line manager, functional manager, or departmental manager. OR
b) Knowledge worker, where you use existing or develop new knowledge to perform functional activities (e.g. accountant or sales representative or specialist role)

Yes

No

Q3: What type of industry do you work in? (Statistics South Africa, n.d.)

Agriculture, forestry and fishing

Mining and quarrying

Manufacturing industries such as oil & gas sector, food manufacturing, automotive industry, chemicals and textiles.

Pharmaceuticals and healthcare

Construction

Wholesale and retail trade

Hospitality and tourism including hotels and restaurants

Transportation, logistics and storage

Communication and information technology

Banking, financial services, insurance, real estate and business services

Community, social and personal services

Other activities (Free text comment box)

Q4: How many years have you been employed within this industry? (control variable)

0-2 years

3-5 years

6-10 years

11-20 years

More than 20 years

Q5: Approximately, how many employees does your organisation employ in South Africa? (control variable) (Republic of South Africa, 2019)

1-10

11-50

51-250

More than 250

Q6: What is the functional area of your current job?

Sales and marketing

Operations/manufacturing

Supply chain

Finance

Research and development

Customer services

Human resources

Information management

Procurement

Legal and regulatory services

Other (Free text comment box)

Q7: Taking a holistic perspective (including financial, customer, employee), how much of a direct impact has the COVID-19 pandemic had on your organisation? (control variable)

Little or no impact

Moderate impact

High or severe impact

SECTION 2

In the following section, for each statement, a 7-point Likert-scale is provided, ranging from "strongly disagree" to "strongly agree". Please select the option that matches your opinion the closest (Saunders & Lewis, 2018).

ORGANISATIONAL RESILIENCE:

Organisational resilience refers to the ability of organisations "to cope with stressful conditions, preserve its position and benefit from unfavourable conditions" (Kantur & İşeri Say, 2015, p.457). It also refers to the ability of organisations to bounce back and adapt to challenges (Mithani, 2020). Looking back to your organisation's response to the COVID-19 pandemic and your organisations resilience in this regard, to what extent do you agree with the following statements:

Q8: My organisation stands straight and preserves its strategic position in the business environment (Kantur & İşeri Say, 2015)

Q9: "My organisation is successful in generating diverse solutions" (Kantur & İşeri Say, 2015, p.466)

Q10: "My organisation rapidly takes action" (Kantur & İşeri Say, 2015, p.466)

Q11: "My organisation develops alternatives to benefit from negative circumstances" (Kantur & İşeri Say, 2015, p.466)

Q12: "My organisation is agile in taking action when needed" (Kantur & İşeri Say, 2015, p.466)

Q13: "My organisation is a place where all the employees are engaged to do what is required from them" (Kantur & İşeri Say, 2015, p.466)

Q14: My organisation is successful in acting in a manner that is aligned with the views of all of its employees (Kantur & İşeri Say, 2015)

Q15: My organisation displays enduring resistance in order to maintain its market position (Kantur & İşeri Say, 2015)

Q16: "My organisation does not give up and continues its path" (Kantur & İşeri Say, 2015, p.466)

FIRM PERFORMANCE:

Looking back to your organisation's financial performance following the occurrence of the COVID-19 pandemic, to what extent do you agree with the following statements:

Q17: "Our current sales have increased compared with previous years" (Chams-Anturi et al., 2019, p.962)

Q18: "Our market share has increased relative to previous years" (Chams-Anturi et al., 2019, p.962)

Q19: "Our return on investment has increased compared with previous years" (Chams-Anturi et al., 2019, p.962)

AMBIDEXTERITY:

Ambidexterity refers to the ability of organisations to balance the efficient operation of today's business through evolutional change while at the same time being able to adapt to changes in the business environment through revolutionary change (O'Reilly & Tushman, 1996). Looking back at the past three years, to what extent do you agree with the following statements with regard to innovation and efficiency improvements in your organisation:

Q20: "My organisation has acquired new technologies and entirely new skills" (Wang & Rafiq, 2014, p.73)

Q21: "My organisation has learned product development skills and processes entirely new to the industry (e.g. product design, prototyping new products, timing of new product introductions and customizing products for local markets)" (Wang & Rafiq, 2014, p.73)

Q22: “My organisation has acquired entirely new managerial and organisational skills that are important for innovation (e.g. forecasting technological and customer trends; identifying emerging markets and technologies or integrating research & development, marketing, manufacturing and other functions)” (Wang & Rafiq, 2014, p.73)

Q23: “My organisation has learned new skills for the first time (e.g. funding new technology, staffing research & development function, training and development of research & development and engineering personnel).” (Wang & Rafiq, 2014, p.73)

Q24: My organisation has developed innovation skills in areas where it had no prior experience (Wang & Rafiq, 2014)

Q25: “My organisation has upgraded current knowledge and skills for familiar products and technologies” (Wang & Rafiq, 2014, p.73)

Q26: My organisation has enhanced skills in applying well-established technologies that improve productivity of current innovation operations (Wang & Rafiq, 2014)

Q27: “My organisation has enhanced competences, in searching for solutions to customer problems, that are close to established solutions, rather than completely new solutions” (Wang & Rafiq, 2014, p.73)

Q28: “My organisation has upgraded skills in product development processes in which the business unit already possessed significant experience” (Wang & Rafiq, 2014, p.73)

Q29: “My organisation has strengthened our knowledge and skills for projects that improve efficiency of existing innovation activities” (Wang & Rafiq, 2014, p.73)

Appendix B Ethical clearance letter

Gordon Institute of Business Science
University of Pretoria

Abinash Ramasary <20803304@mygibs.co.za>

Ethical Clearance Approved
1 message

Masters Research <MastersResearch@gibs.co.za> 16 August 2021 at 14:45
To: "20803304@mygibs.co.za" <20803304@mygibs.co.za>
Cc: Masters Research <MastersResearch@gibs.co.za>

Gordon Institute of Business Science
University of Pretoria

Ethical Clearance Approved

Dear Abinash Ramasary,

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

Ethical Clearance Form

Kind Regards

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

Masters Research

Gordon Institute of Business Science, University of Pretoria

Main Tel: +27 11 771 4000
Direct Tel:

Email: mastersresearch@gibs.co.za
Web: www.gibs.co.za.
Physical Address: 26 Melville Road, Illovo, Johannesburg

Appendix C Statistical analysis results

Tests for normality for linear regression

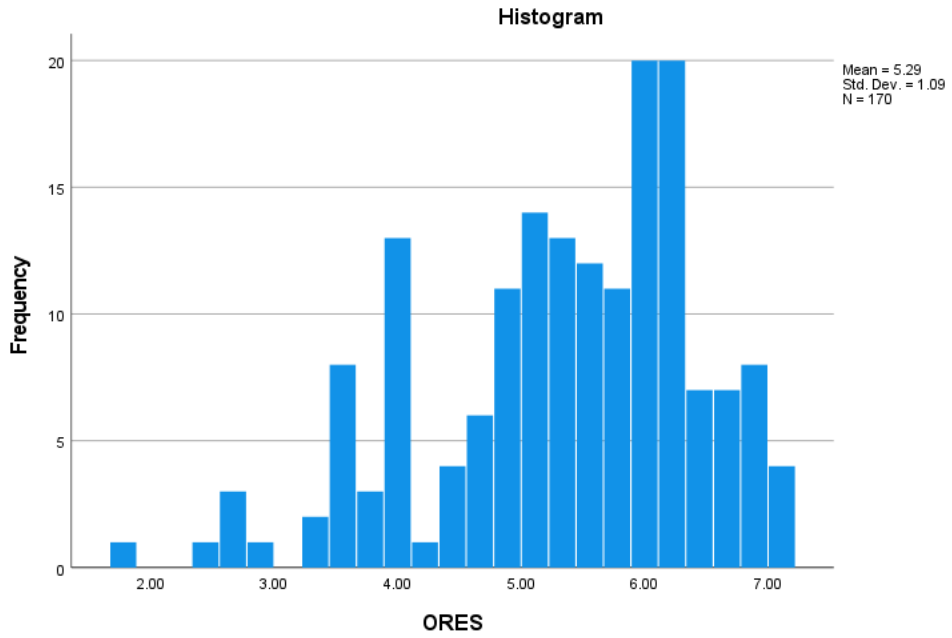

Figure 14 Histogram for organisational resilience

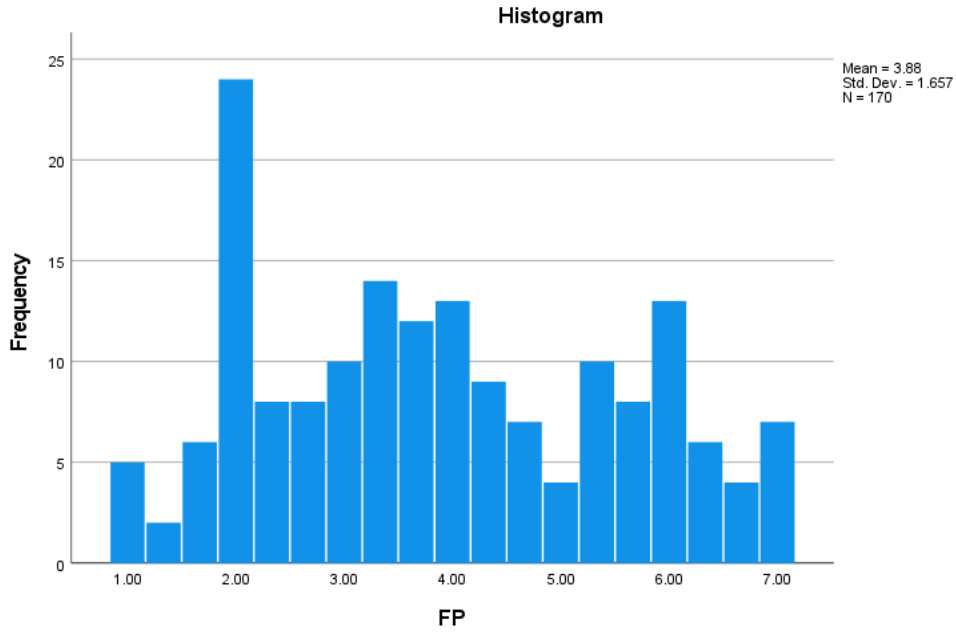

Figure 15 Histogram for firm performance

Table 29 Skewness and kurtosis for organisational resilience and firm performance

Construct	Skewness	Kurtosis	Z-value for Kurtosis
Organisational resilience	-0.710	0.053	0.141
Firm performance	0.213	-1.052	-2.800

Verification of assumptions for multiple linear regression

Hypothesis 2a

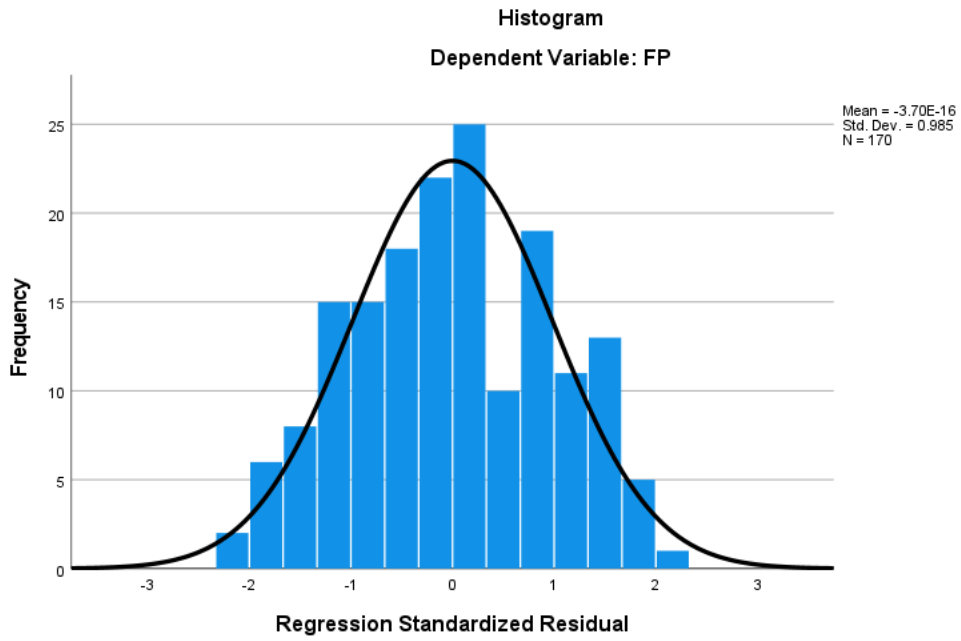

Figure 16 Histogram of regression standardised residual (Hypothesis 2a)

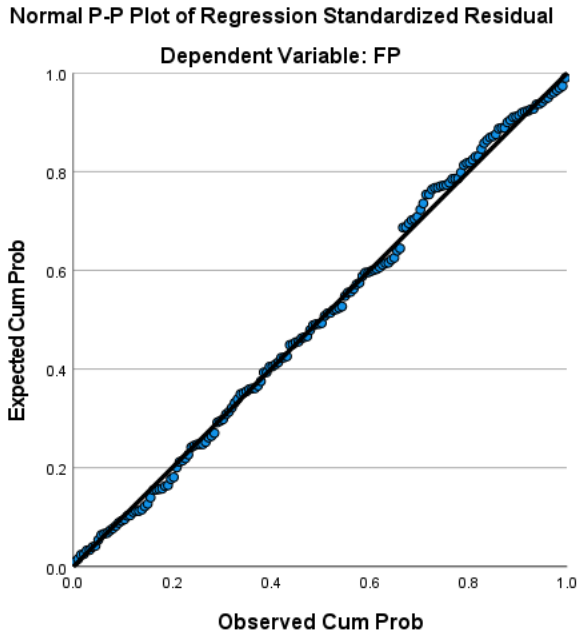

Figure 17 Normal P-P plot of regression standardised residual (Hypothesis 2a)

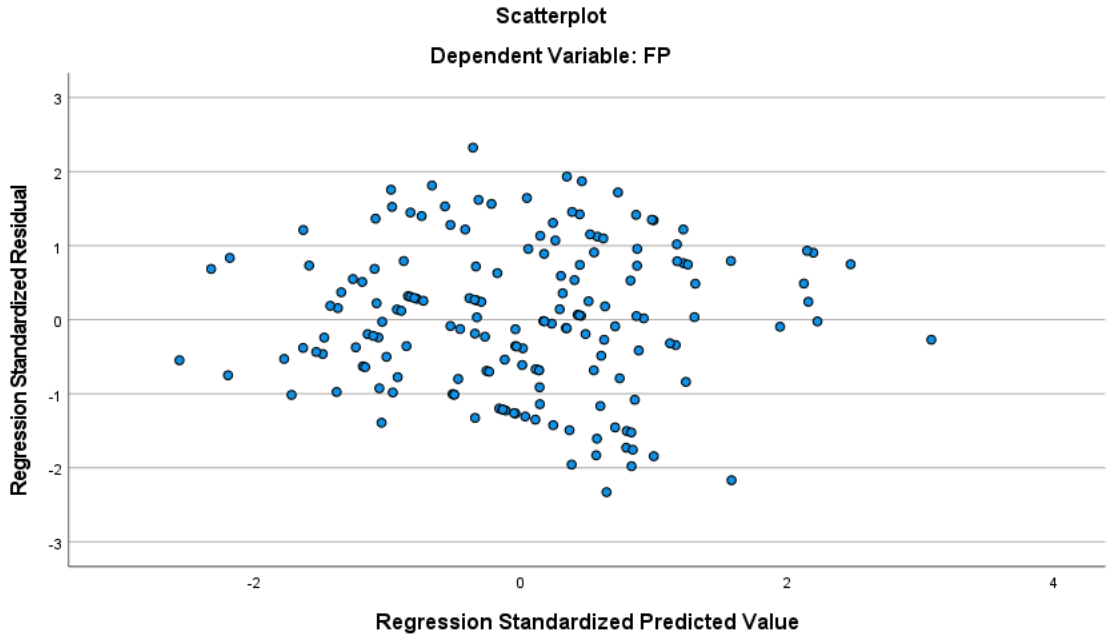

Figure 18 Scatter plot of regression standardised residual (Hypothesis 2a)

Hypothesis 2b

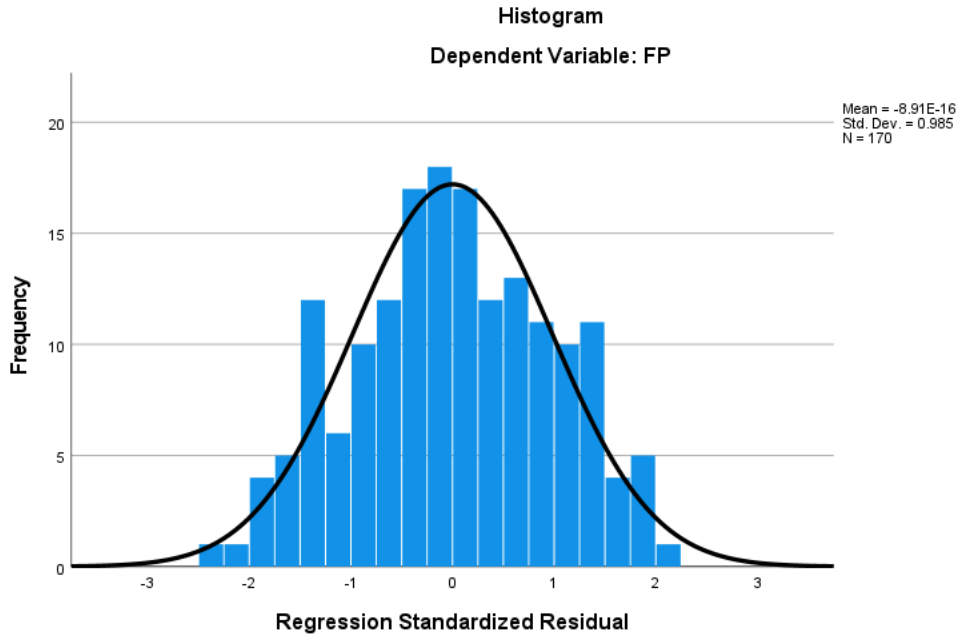

Figure 19 Histogram of regression standardised residual (Hypothesis 2b)

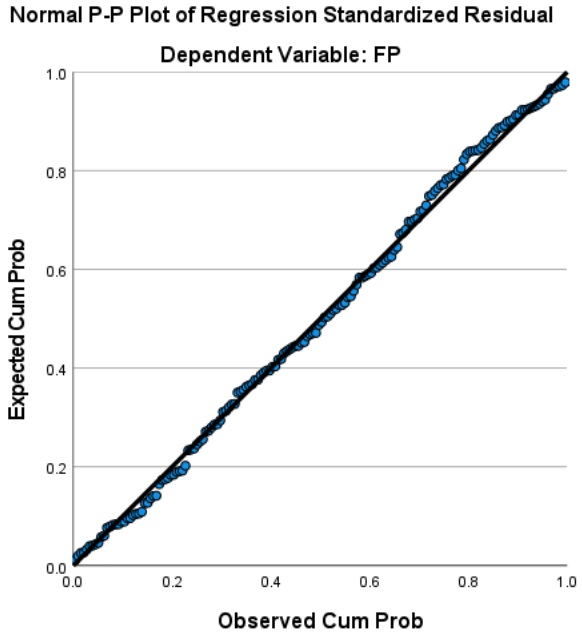

Figure 20 Normal P-P plot of regression standardised residual (Hypothesis 2b)

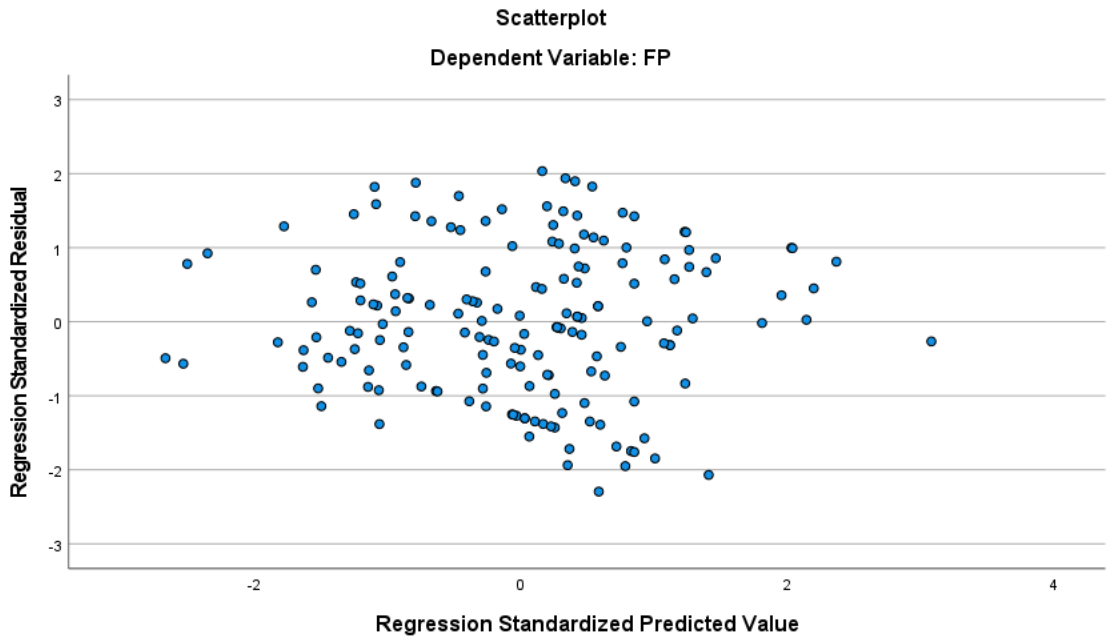

Figure 21 Scatter plot of regression standardised residual (Hypothesis 2b)

Hypothesis 2c

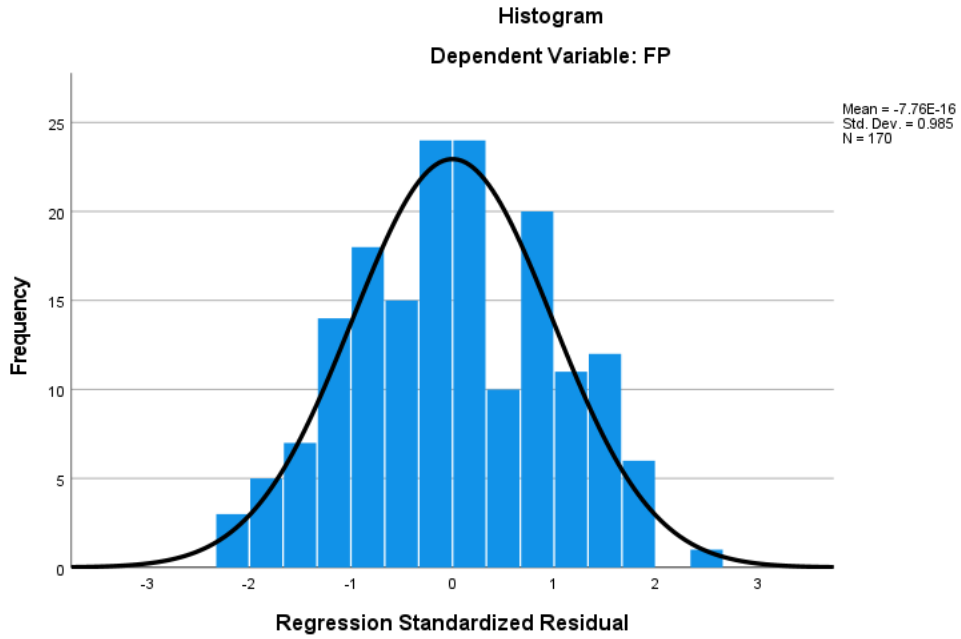

Figure 22 Histogram of regression standardised residual (Hypothesis 2c)

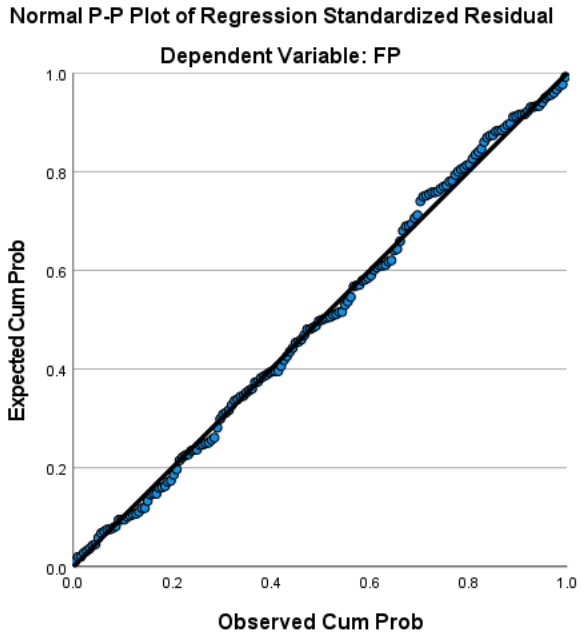

Figure 23 Normal P-P plot of regression standardised residual (Hypothesis 2c)

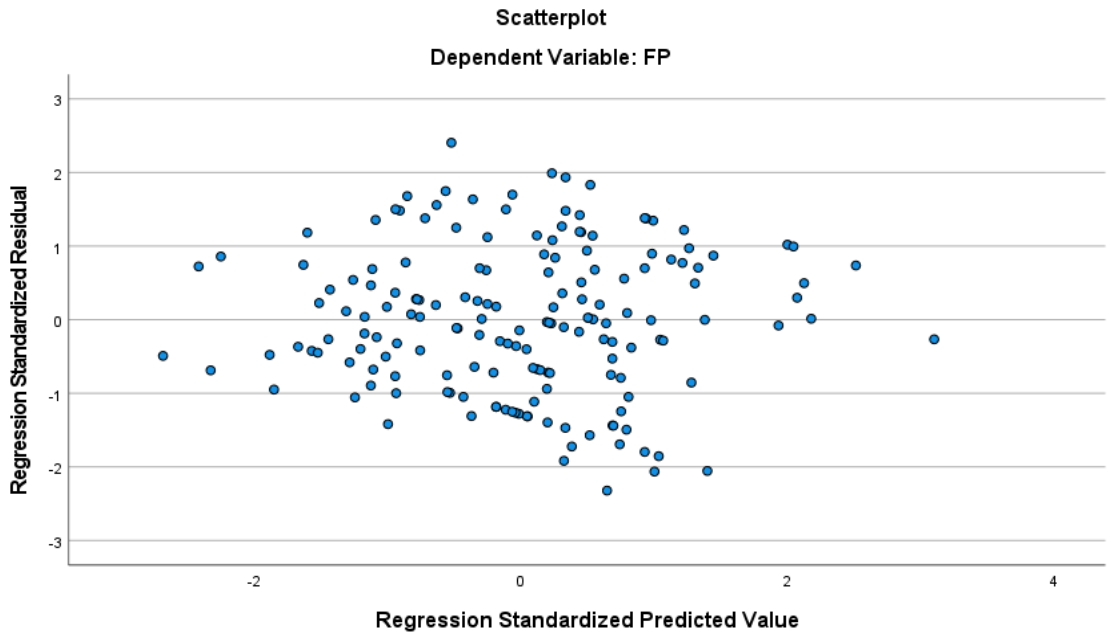

Figure 24 Scatter plot of regression standardised residual (Hypothesis 2c)

Appendix D Consistency matrix

Table 30 Consistency matrix

Hypotheses	Literature review	Data collection tool	Data analysis
H1: There is a significant positive relationship between organisational resilience and firm performance.	Ortiz-de-Mandojana & Bansal, 2016; DesJardine et al., 2019	Survey questionnaire questions: Resilience: Q8-16 Firm performance: Q17-19	Simple linear regression will be utilised to evaluate the relationship between organisational resilience and firm performance. A scatter plot diagram will be utilised to depict the relationship visually. The strength of the relationship will be assessed based on the r^2 Coefficient and the statistical significance. A Spearman's test will be utilised to measure the degree of correlation between the constructs.
H2a: Contextual ambidexterity has a positive moderating effect on the relationship between organisational resilience and firm performance.	Birkinshaw & Gibson, 2004; Mamouni Limnios et al., 2014; Iborra et al., 2020; Lengnick-Hall et al., 2011	Survey questionnaire questions: Resilience: Q8-16 Firm performance: Q17-19 Contextual ambidexterity (calculated	Multiple linear regression will be utilised where the effect of each independent variable (contextual ambidexterity & organisational resilience) on the dependent variable (firm performance) will be evaluated.

		from exploration and exploitation): Q20-29	
H2b: Exploitation has a moderating effect on the relationship between organisational resilience and firm performance.	Birkinshaw & Gibson, 2004; Mamouni Limnios et al., 2014	Survey questionnaire questions: Resilience: Q8-16 Firm performance: Q17-19 Exploitation: Q25-29	Multiple linear regression will be utilised where the effect of each independent variable (exploitation & organisational resilience) on the dependent variable (firm performance) will be evaluated.
H2c: Exploration has a moderating effect on the relationship between organisational resilience and firm performance.	Birkinshaw & Gibson, 2004; Mamouni Limnios et al., 2014	Survey questionnaire questions: Resilience: Q8-16 Firm performance: Q17-19 Exploration: Q20-24	Multiple linear regression will be utilised where the effect of each independent variable (exploration & organisational resilience) on the dependent variable (firm performance) will be evaluated.

Appendix E Code book

Questions	Coding
1	Yes = 1; No = 0
2	Yes = 1; No = 0
3	Agriculture, forestry and fishing = 0; Mining and quarrying = 1; Manufacturing industries such as oil & gas sector, food manufacturing, automotive industry, chemicals and textiles = 2; Pharmaceuticals and healthcare = 3; Construction = 4; Wholesale and retail trade = 5; Hospitality and tourism including hotels and restaurants = 6; Transportation, logistics and storage = 7; Communication and information technology = 8; Banking, financial services, insurance, real estate and business services = 9; Community, social and personal services = 10; Other activities = 11
4	0-2 years = 0; 3-5 years = 1; 6-10 years = 2; 11-20 years = 3; More than 20 years = 4
5	1-10 = 0; 11-50 = 1; 51-250 = 2; More than 250 = 3
6	Sales and marketing = 0; Operations/manufacturing = 1; Supply chain = 2; Finance = 3; Research and development = 4; Customer services = 5; Human resources = 6; Information management = 7; Procurement = 8; Legal and regulatory services = 9; Other = 10
7	Little or no impact = 0; Moderate impact = 1; High or severe impact = 2

8 to 29	1 = Strongly disagree 2 = Disagree 3 = Somewhat disagree 4 = Neither agree nor disagree 5 = Somewhat agree 6 = Agree 7 = Strongly agree