An Analysis of Determinants of Construction Firm Performance: A New Zealand Perspective

A thesis submitted in partial fulfilment of

the requirements for the degree of

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Construction Management

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Statement of Originality

I hereby declare that the research presented herein has not been previously submitted for any academic qualification, nor has it been published in any form, whether in whole or in part apart from publication for this research only. All sources used in this thesis have been appropriately acknowledged and cited in accordance with the conventions of academic referencing and citation. Furthermore, I attest that the work presented in this thesis has not been plagiarized.

Abstract

This research explores the factors critical for the performance of construction firms. It explores Strategic Management principles in terms of Contingency Theory (CT) to understand construction firm performance. CT considers the interactions of Internal Organisational Attributes and contextual factors (business environment uncertainties) in explaining firm's performance. The rationale of the research comes from the lack of literature on the factors explaining the performance differentials for construction firms in New Zealand and within the field of Construction Management (CM) in general.

The critical identified Internal Organisation attributes are 'Dynamic Capabilities (DC)', 'Competitive Strategies (CS)', 'Organisation structure (OS)' and 'Resources and Capabilities (RC)'. The relationship between the internal attributes, their interaction with the business environment and the influence of such interactions on firm performance is the main aim of this research. The research uses a mixed-methods approach, including a questionnaire survey and three case studies, to examine the relationship between identified attributes and business environment. The findings of the study suggest that all the considered constructs are important in explaining firm performance. However, in most cases the relationship in not linear or direct. DC and CS have a significant impact on firm performance, and in an uncertain business environments firms equipped with DC will outperform those without DC. However, OS and RC do not have a direct effect on performance, rather an indirect effect. OS aids in successful pursuit of CS, which in turn leads to enhanced performance. Similarly, RC are necessary to support successful CS adoption, which in turn leads to superior performance.

The study contributes to the existing literature by presenting novel conceptual models and providing industry practitioners with an understanding of how to improve firm performance through validated conceptual models. It adds to theory by explaining the interaction of

organisational contingencies (DC, OS, CS), Business Environment Dynamism and Firm Performance. It also presents novel conceptual models for hypothesis testing, that explain the interaction of organisation internal attributes and external business environments, which have not been tested before.

Moreover, the research also gives industry practitioners an understanding of what is required to achieve sustained performance in uncertain business conditions in forms of validated models that formulate operational strategies which are effective. For industry professionals, the study establishes the importance of developing strong dynamic capabilities by construction firms, adopting multiple competitive strategies (Hybrid strategies), and an alignment of their Organisation Structure, Competitive Strategy and Resources to achieve some tangible results for performance enhancement. Neglecting such a strategic fit can significantly hinder the firm performance.

Dedication

This thesis is dedicated to the memory of my late beloved father, Dr. Muhammad Wahid as a tribute to his life and legacy, and as a testament to the values he instilled in me. His passing has left an irreplaceable void in my life.

I also dedicate this thesis to my wife Arousa Rashid as a tribute to her love, her dedication, and her unwavering support. Her presence in my life has made all the difference, and I am forever grateful for the love and partnership we share. May our journey continue to be filled with love, joy, and mutual support.

You have been my partner in every sense of the word and stood by me through the long hours of research and writing coupled with my full-time job in the field, provided invaluable feedback and insights, and offered unwavering emotional support when I needed it most. Thank you for understanding during the times when I couldn't be there for you due to work commitments. I know that it hasn't been easy for you, and there were times when I couldn't give you the time and attention you deserved. But even in those moments, you never once complained or made me feel guilty. Instead, you always stood by my side, supporting me through thick and thin.

Your own accomplishments in your career and dedication to well-being of our little angel Maryam is an inspiration to me, and I am in awe of your resilience and perseverance.

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To my dearest little girl Maryam, throughout this journey, you have been a constant source of love, joy, and inspiration. Your laughter and smiles have brightened even the darkest of days, and your presence has given me the strength to persevere through challenges. I hope that my achievement inspires you to dream big and work hard towards your own goals, and that it shows you the value of hard work and dedication. Always remember that you are capable of achieving anything you set your mind to. Thank you for being the light in my life, Maryam. I love you more than words can express.

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Finally, I would like to express my deep gratitude to all those who have contributed to this thesis, whether through their intellectual, emotional, or practical support. This thesis is a testament to your generosity, wisdom, and dedication, and I am honoured and humbled to have had your support on this journey.

List of Reviewed Publications

Journal Articles - (Published)

- Journal Paper#1: Wahid.I, Shahzad.W, Rasheed.N, and Rotimi, J.O.B. (2023). Analysis of theoretical viewpoints explaining the performance differentials of Construction Firms. *International Journal of Construction Education and Research. https://doi.org/10.1080/15578771.2023.2172108*

Journal Articles – (Submitted, Under review)

- Journal Paper#2: Wahid.I, Shahzad.W, and Rotimi, J.O.B. (2022). Impact of Dynamic Capabilities on Construction Firm Performance. The Moderating Role of Environmental Dynamism. *Management Decision*

- Journal Paper#3: Wahid.I, Shahzad.W, and Rotimi, J.O.B. (2022). The role of 'Organisation Structure' and 'Hybrid Strategy' on Construction firm performance. A Contingency Theory perspective. *Management Decision*

Conference Papers - (Published)

- Conference Paper#1: Rotimi, J.O.B, Wahid, I, and Shahzad, W. (2019). *Factors Limiting Performance of the Construction Industry: A New Zealand Perspective*. Paper presented at the 43rd Australasian Universities Building Education Association (AUBEA), Australia.

- Conference Paper#2: Wahid, I, Rotimi, J.O.B, Shahzad, W, and Rasheed, N. (2020). *Nature of New Zealand Construction Industry: An Exploratory Analysis of Performance Hindering Challenges*. Paper presented at the 6th New Zealand Built Environment Research Symposium (NZBERS), New Zealand.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

Building Research Association of New Zealand (BRANZ)

Competitive Strategies (CS)

Contingency Theory (CT)

Civil Contractors New Zealand (CCNZ)

Construction Management (CM)

Dynamic Capabilities (DC)

Dynamic Capabilities View (DCV)

Exploratory factor analysis (EFA)

New Zealand (NZ)

New Zealand Construction Industry Council (NZCIC)

New Zealand Green Building Council (NZGBC)

Organisation structure (OS)

Partial Least Square Structural Equation Modelling technique (PLS-SEM)

Resources and Capabilities (RC)

Resources Based View (RBV)

The New Zealand Institute of Building (NZIOB),

The New Zealand Institute of Quantity Surveyors (NZIQS)

1 Chapter 1: Introduction

1.1 Introduction:

The construction industry is of crucial importance to the economy of a country (Alaloul, Musarat, Liew, Qureshi, & Maqsoom, 2021) It contributes directly and indirectly to various other sectors, such as manufacturing and service industries, and it provides various employment opportunities. Timber, steel, cement, paint, bitumen, light and heavy machinery are some of the manufacturing industries that are related to construction. (Vogl & Abdel-Wahab, 2014) Similarly, import/export, material suppliers, recruitment agencies, project management companies, landscaping and horticulture companies are also influenced by the construction industry. A good-performing construction industry therefore translates into improved profit margins, higher wages, enhanced tax revenues, which benefits society as a whole (Kenny, 2007). The output from the construction industry can account for around 3-8% of national GDP (Alaloul, et al., 2021). Consequently, a good- or bad-performing construction sector can directly affect the socioeconomic development of a country. The end product of the construction industry is a built environment that can account for around 66-90% of the wealth of a nation (Pearce, 2003)

Therefore, a growing physical infrastructure including roads, commercial buildings, residential units, factories, ports and other large-scale projects can be a sign of the growing economy of a country; (Alaloul, et al., 2021). A sustained economic growth and development of infrastructure go hand in hand (Musarat, Alaloul, Liew, Maqsoom, & Qureshi, 2020) Furthermore, some non-tangible benefits of construction can be that improved housing sector can reduce overcrowding, hospitals can generate health benefits, a new road or transport infrastructure can reduce travel time and can also make travelling easier (Pearce, 2003), The

importance of the construction industry to the national economy has led to many research efforts directed at understanding the dynamic nature of this industry and, ultimately, improving its performance. In this regard, Sir John Egan's report "Rethinking Construction" and Sir Michael Latham's "Constructing The Team" (Egan, 1998; Latham, 1994) for improvement in UK's construction industry are two of the pioneering efforts in the construction management (CM) literature.

In New Zealand, the construction industry, more than any other industry, has a significant influence both directly and indirectly on the overall economy (PWC, 2020). The same report estimates that around 6% of New Zealand's GDP in 2020 came from the construction industry. If analysed from another perspective, the construction sector supports the largest number of jobs when compared to other top ten individual sectors by contribution (Ministry of Business Innovation and Employment, 2022). However, the same report notes that it is also a highly volatile industry in NZ. In last 20 years, the construction sector has shown both double digit growth and decline, a sign of a highly volatile industry, something not observed in other sectors. This is evident from the fact that recently a large number of high profile construction firm have gone into receivership/ bankruptcy, a situation that has a negative effect upon overall industry (Edmund, 2018). This research therefore explores the key determinants for performance of construction firms in NZ and how these determinants interact to influence that performance.

1.2 Research Background

Over time, due to increased competition, technological advancements, and the blurring of national boundaries for businesses, there has been an increased interest in the variables that have affected the performance of the construction industry in uncertain business environments. The researchers have increasingly tried to understand what these variables are and how they interact with each other, and the affect they have upon the performance of construction firms

(Cheah, Garvin, & Miller, 2004; Parsamehr, Perera, Dodanwala, Perera, & Ruparathna, 2023; Wahid, Shahzad, Rasheed, & Rotimi, 2023; Xue, Shen, & Ren, 2010).

This study intends to understand Firm Performance of the construction industry in NZ. The basic question of what makes a firm fail while others succeed has intrigued researchers in the field of business management, and the field of strategic management has emerged in order to understand the situation. This leads to the question what are the sources of performance differentials in organisations? (Bierman et al., 2014). The issues of firm performance in the CM literature have been explored from the perspective of strategic management. It has been argued that applying the tools and concepts of strategic management to any sector in any business sector would yield promising results for enhanced performance, and the same logic can be applied for the construction industry (Cheah et al., 2004; Parsamehr et al., 2023). Therefore, in the last two decades a number of studies have been conducted on the application of strategic management principles to construction industry (Chatterjee, Mikalef, Khorana, & Kizgin, 2022; Dikmen, Birgonul, & Kiziltas, 2005; Du et al., 2016; Price & Newson, 2003; Tripathi & Jha, 2017). Various schools of thought have evolved in the strategic management literature, e.g., Classical, Evolutionary, Processual and Systematic, each of which have different approaches to achieving sustained firm performance (Whittington, 2001). However, over time it has been realised that a universal formula of superior performance does not exist; rather superior performance depends upon a strategic fit between various organisational factors (Cheah & Garvin, 2004; Hu & Liu, 2018).

Based on an extensive review of the literature, Deng and Smyth (2013) concluded that researchers in Construction Management (CM) have tried to understand the construction firm performance from the perspective of conceptual framework (Kagioglou, Cooper, & Aouad, 2001), operational approach (Beatham, 2005), benchmarking perspective (El-Mashaleh, Edward Minchin Jr, & O'Brien, 2007) and a contingency-based approach (Kim & Arditi,

2010a). The authors concluded that a contingency-based approach is being increasingly used to understand the complex performance issues in the construction industry.

Contingency theory proposes that performance is a result of the fit between several factors, such as resources, environment and culture (Asamoah, Nuertey, Agyei-Owusu, & Acquah, 2022). The theory considers the interactions of organisational contingencies (strategic formulation, organisation structure, resources and capabilities) and contextual factors (business environment uncertainties) in explaining a firm's performance (T. Li, Li, & Cai, 2023). Contingency theory can also be loosely regarded as a concept of fit (Deng & Smyth, 2013). According to the concept of fit, the relationship between two variables, A and B, depends upon another factor X, thus the organisational contingencies can have a moderating and mediating effect upon the performance (Aguinis, Edwards, & Bradley, 2017).

A review of the existing literature on strategic management specifically in the construction industry reveals there are a few contingencies that may explain the performance differentials in a construction firm. These are the internal attributes of the organisation (Oyewobi, Windapo, & Rotimi, 2015) and the business environment (Ho, 2016; Şener, 2012). The relationship between the internal attributes of a construction organisation and the business environment and how they influence the organisation's performance are the main constructs of this research. These attributes will be discussed in detail in the following sections and in the next chapters as well.

Organisational internal attributes can be understood as the components of an organisation through which it performs its intended functions in order to meet its business objectives. These features originate from the management mode, structure of the organisation and from the strategies adopted by the organisation to achieve its intended objectives (Magnier-Watanabe & Senoo, 2008). Four main constructs are adopted to study the organisational internal attributes:

namely, Dynamic Capabilities (DC), Competitive Strategies (CS), Organisation structure (OS) and Resources and Capabilities (RC).

The first construct, DC, are a firm's ability to combine or recombine its resources base, as per market demands, thus resulting in performance improvement (Eisenhardt & Martin, 2000). DC are suitable for uncertain business environments that usually arise from innovative technological advancements, variations in the market demand cycles, and changing client requirements. (Ambrosini, Bowman, & Collier, 2009; Chatterjee et al., 2022; Teece, Pisano, & Shuen, 1997). Therefore, DC researchers claim that it is well suited to catering to the requirements of dynamic environments by advocating for changes to firms' resource base, processes or routines (Helfat & Peteraf, 2009).

The competitive strategies (CSs) pursued by an organisation is the second construct for this study. Chandler (1990, p. 13), defined strategy as determining the objectives of an organisation and implementing a course of action and resources to achieve those objectives. Porter (1985) narrowed the scope of the definition of strategy to a path followed by an organisation to gain competitive advantage. The concept of strategy was linked to competitiveness in a landmark work by Porter (1980), the concept gained a lot of attention from researchers after the study was published. Moreover, the application and suitability of each generic strategy depends upon the external business environment or target clients (Flanagan, Lu, Shen, & Jewell, 2007; Tripathi & Jha, 2019).

The third construct for the current study is Organisation Structure (OS). OS is a formally defined relational arrangement between different parts of a firm that define the power structure and task distribution within a firm (Greenberg, 2010). A suitable OS is linked to improved effectiveness of a firm and, therefore, its enhanced performance (Lu, Shen, & Yam, 2008; Tan,

Xue, & Cheung, 2017). Research on the impact of OS upon performance of construction firms is scarce as only a few studies have explored the role of OS in construction industry.

Resources and Capabilities (RCs) is the fourth main construct for the internal attribute. Resources are the inputs used during the production process, while capabilities are the ability of an organisation to combine the skills necessary to carry out a particular task or activity (Grant, 1991). Establishing long-term success in any organisation is dependent on the resources and capabilities that have accumulated over time and how effectively they are utilized (Phua, 2006). Organisational resources can be categorized into physical, financial, human, and technological resources (Chew, Yan, & Cheah, 2008; Oyewobi, Windapo, Jimoh, & Rotimi, 2019).

The internal factors deemed important for the firm performance were discussed in the preceding sections. For external factors, Business Environment Dynamism is selected as the main construct affecting firm performance. A firm does not operate in a vacuum but is affected by the nature of its business environment; therefore, it should align its attributes (contingencies) to the business environment in which it operates (Donaldson, 2001; T. Li et al., 2023). Business environment involves those physical and social factors outside the boundaries of an organisation that have an influence on its strategic decisions, and ultimately its performance (Alqudah, Poshdar, Oyewobi, Rotimi, & Tookey, 2021; Duncan, 1972).

Firm performance, considered as a dependent construct of this study, can be defined as a measurement of the efficiency and effectiveness of the different mechanisms of the organisation in terms of the output of those mechanisms (Hu & Liu, 2018; Laitinen, 2002).

Deng and Smyth (2013) argued that CM researchers are increasingly using the contingency-based approach to understand firm performance. This approach advocates that, for enhanced firm performance, there should be a co-alignment between the internal organisational and the

environmental factors rather than just a linear relationship between the two variables (Aguinis et al., 2017; Shirazi, Langford, & Rowlinson, 1996). Therefore, this approach to understand performance essentially promotes a cause-and-effect relationship between the two variables, and the strength of this causality can be moderated or mediated by a third relevant variable (T. Li et al., 2023). Within the scope of this study, the contingency approach is used to analyse how both the internal attributes of the organisation, and the business environment have an effect on the performance of the firm. At the same time, the study considers the possible moderating and mediating effects of these variables upon the firm performance.

1.3 Problem Statement

Construction firm performance is attracting greater attention by researchers due to the huge contribution of the construction industry to the national economy of a country. However, due to increasing competition, technological innovation and the large number of construction firms competing at international levels, there are number of challenges these organisations face in relation to the improvement of their performance and to their long-term survival. Therefore, considering the unique nature of the construction business, a holistic understanding of all the internal and external factors which may affect the performance of construction firm is necessary.

The factors affecting construction firms' performance also change from country to country, as each country has different social, economic and geographic conditions. Thus, the factors affecting the performance of a construction firm are different in different countries. This study, therefore, explores the factors affecting New Zealand's construction industry performance, which as yet have not been explored in any depth.

In New Zealand, the building and construction sector has lower research and development spending compared to other sectors—$12 million compared to $836 million for manufacturing,

and $258 million for wholesale trade. Additionally, the majority of businesses in the sector (93.4%) reported not making significant changes in technology (Ministry of Business Innovation and Employment, 2021). The construction industry contributed around 6% of GDP in 2020 and provided a significant number of job opportunities (PWC, 2020). Given the indirect effects of the industry, it can be seen that the construction industry is highly integrated with the overall economy. To explore this parameter, an economic indicator called the multiplier effect is used. This indicator measures the effect of investment in one sector on other upstream and downstream sectors. The higher the impact, the higher the multiplier effect. It is estimated that 1$ invested in the construction industry in New Zealand (NZ) results in around $2.51 to $3.11 of economic activity, which is quite high (PWC, 2016, 2020). This implies that a better performing construction industry has a carryover effect on other industries, for example, the mining, manufacturing sectors. This effect will become increasingly important because official statistics show a strong outlook for the industry. The National Construction Pipeline Report, an annual report released by the Ministry of Business, Innovation and Employment (MBIE), provides a projection of national building and construction activity in the coming years in order to help stakeholders better plan for the upcoming demands and to smooth the boom-bust cycle, a common problem in the construction industry. The report estimated a construction activity of over NZD $300 billion over the forecast period of six years from 2018- 2023 and a continuing trend for future as well (Ministry of Business Innovation and Employment, 2018). However, over the last 20 years, the construction sector in NZ has shown both double digit growth and decline, a sign of a highly volatile industry, something not observed in other sectors (PWC, 2016, 2020).

In the NZ context, as evident from preceding discussion, there are significant business opportunities and the future outlook for the industry in also good; however, at the same time, many high profile companies have gone into receivership (Edmund, 2018). The profit margin

for most of the firms operating in NZ is 2%, which is not a healthy return for a construction business (ANZ, 2017). Similarly, a large number of small firms are not making any profit at all (Curtis & Page, 2014). Other issues include unfair risk allocation with different stakeholders (Mbachu & Taylor, 2014), isolated geographical location and small population, all of which hinder large scale development opportunities. Consequently, it is difficult to achieve the economies of scale that come with large scale construction activities (PWC, 2016, 2020).

Considering these unique issues and the effect they have on a firm operating in the NZ business environment, it is imperative to study these issues through various tools and approaches extracted from the CM literature. Therefore, to understand the performance of the organisation this study explores the factors affecting the performance of construction firms in NZ using a contingency-based approach that considers the interaction of the internal attributes of organisation and the external business environment. This approach essentially optimises how an organisation can adapt to the business environment to enhance their performance and ensure their long-term survival.

1.4 Research Aim, Objectives, and Questions

The main aim of this study is *"to establish the factors critical for firm performance and make recommendations to improve the performance of construction firms in New Zealand".*

Based on this research aim the following specific research objectives are devised:

Research Objective 1: To gain a comprehensive understanding of the theoretical foundations of the variables involved and the nature of their relationship to firm performance for New Zealand construction industry.

Research Objective 2: To explore the relationship between the identified variables that could potentially explain the differences in performance among construction firms operating in NZ.

Research Objective 3: To gather and examine data from the construction firms operating in New Zealand Construction industry in order to investigate the relationships identified in the Research Objective 2.

Research Objective 4: To make recommendations for enhancing the performance of construction firms in New Zealand, based on the analysis of both the gathered data and the findings of the literature review.

Figure 1.1 shows the linkages of research question, methods findings and recommendations. Based on the above research objectives, this study addresses the following Research Questions.

Research Question 1: What is the nature of the relationship between a firm's internal attributes, i.e., Dynamic Capabilities and Firm Performance?

Research Question 2: What is the nature of the business environment in the industry, and does a moderating relationship between Dynamic Capabilities and Firm Performance exist?

Research Question 3: What is the nature of competitive strategy adoption in the construction industry, and how does it influence Firm Performance?

Research Question 4: How do Organisation Structure, Competitive Strategies and Organisation Resources and Capabilities interact, and what is influence of this interaction upon Firm Performance?

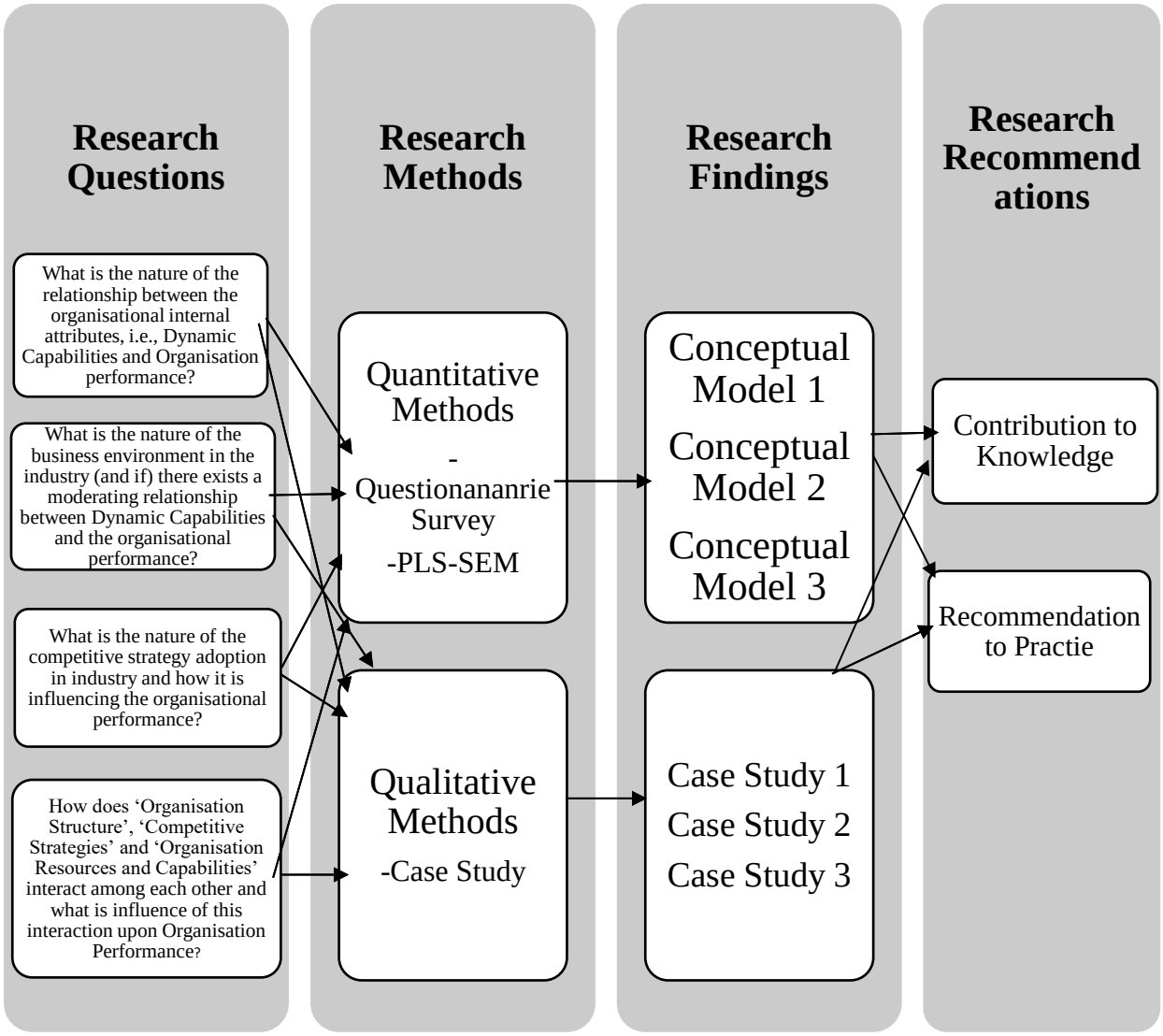

Figure 1.1: Interrelationship between research Question, Methods findings and recommendations

1.5 Scope of the study

This study focuses on performance determinants for middle and large size construction firms in NZ and investigates how their characteristics, strategies, resources and capabilities are used to achieve a 'strategic fit', for enhanced performance. Companies of this size are typically characterised by having a defined strategic aim as well as adequate technologies, organisation structures and resources to implement this strategy. The research was conducted in all the main geographical regions of NZ. Some of the companies had an overseas operation as well, but the

study only looked at their activities in NZ, as the business environment of NZ construction industry was main focus of the study.

1.6 Overview of Methodology:

A positivist philosophy and interactive-pragmatic approach was deemed beneficial to responding to the research questions of the study. Although the two approaches appear contradictory, they can be used in tandem to produce meaningful results (Teddlie & Tashakkori, 2011). In this regard, it is possible to combine elements of both approaches to ensure that the research objectives are effectively met. Therefore, for the purpose of these research questions, a mixed methods approach was deemed to be the most suitable. This is explained in detail in Section 4.1.2 Research Methodology. By collecting quantitative and qualitative data, mixed methods research helps to provide a solid foundation to the main research aim i.e., to provide convincing justification for identified variables for their role in performance enhancement for NZ construction firms. For the quantitative phase, a questionnaire survey was conducted, and the Partial Least Square Structural Equation Modelling technique (PLS-SEM) was applied to verify the hypotheses. Following this, three comprehensive case studies (detailed in Section 4.5 Qualitative Methods: Case Studies) were conducted to form contextual accounts for both proven and unproven hypotheses, and to further analyse the interaction between internal attributes, business environment and performance for NZ construction firms.

1.7 Contributions of this research

There are benefits of the study for both academics and construction professionals as it provides a comprehensive understanding of how organisation internal attributes and business environments interact to enhance or diminish organisational performance.

This study adds to existing theories and knowledge in the fields of management accounting, operations management and CM. It aids theory by explaining the interaction of organisational contingencies (DC, OS, CS), business environment dynamism and firm performance. It also presents novel conceptual models for hypothesis testing that explain the interaction between organisation internal attributes and external business environments. This is explained in Sections 3.2 and 3.3 of Chapter: Conceptual Models and Hypothesis Development.

Moreover, the research also gives industry practitioners, in form of validated models, an understanding of what is required to achieve sustained performance in uncertain business conditions. and allows practitioners to formulate effective operational strategies. (This is presented in Section 7.5: Recommendation to Practice:). It is also permits industry professionals to understand the importance of developing strong dynamic capabilities, adopt multiple competitive strategies (Hybrid strategies), and an align Organisation Structure, Competitive Strategy and Resources for tangible performance enhancement. Ignoring such ‘strategic fit’ will significantly hamper the performance of the organisation.

1.8 Thesis Outline

The thesis outline is presented in following flowchart (Figure 1.2):

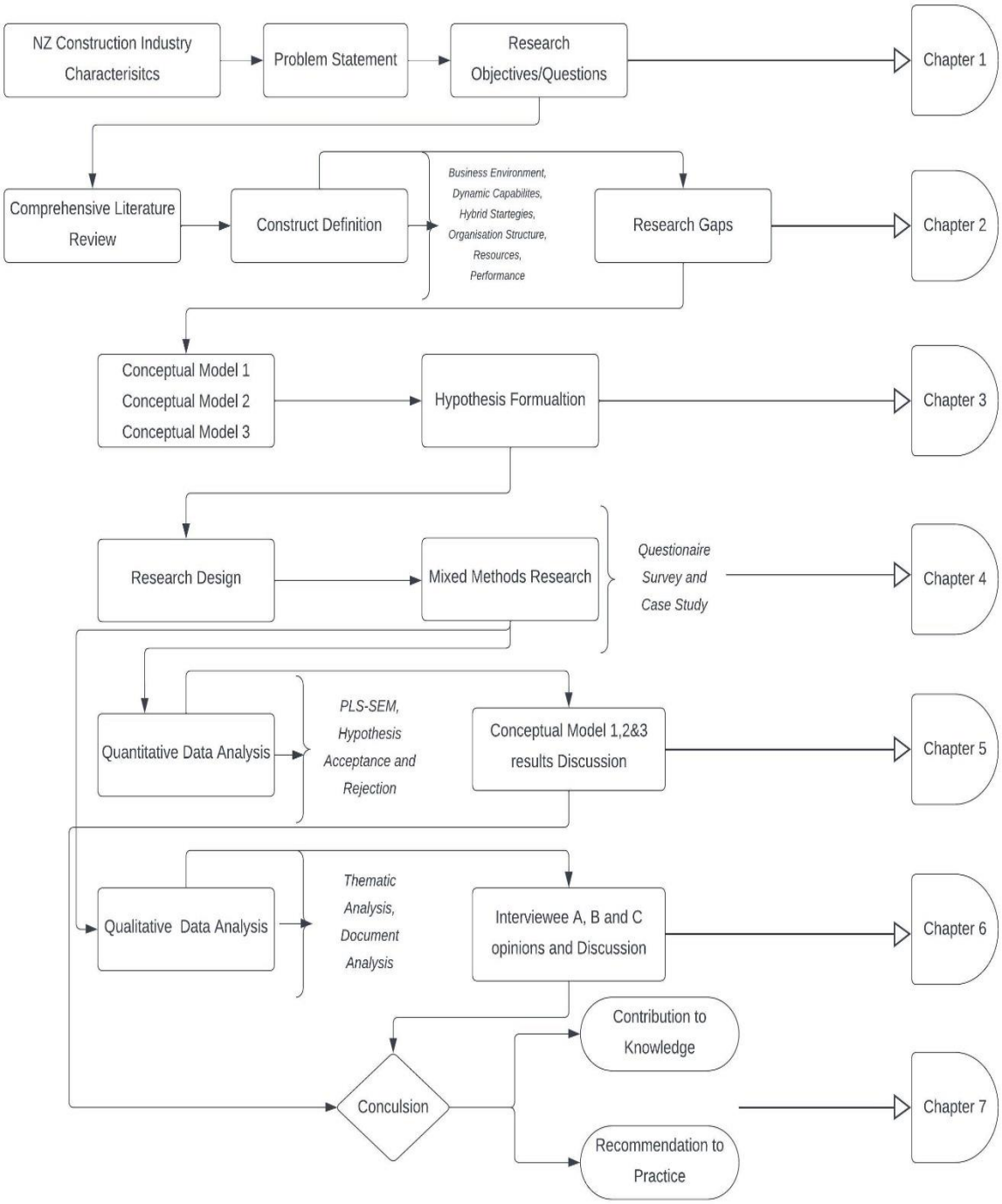

Figure 1.2: Thesis outline flowchart / thesis snapshot

The detailed thesis organisation is as follows:

Chapter 1 covers the background information, problem statement, defines research questions, objectives, scope, overview of methodologies and research contribution.

Chapter 2 provides a comprehensive review of literature, key theories and concepts of strategic management, which are relevant to the construction industry, and selection of key variables i.e., Dynamic Capabilities, Competitive Strategies, Organisational Structure, Resources and Capabilities, Business Environment Dynamism and Performance.

Based on the findings of Chapter 2, Journal Paper#1, Conference Paper#1 and *Conference Paper#2 were published.*

Chapter 3 covers the formulation of conceptual models for the variables presented in Chapter 2 and presents a justification for the hypothesis formulation.

Chapter 4 provides a comprehensive rationale for the research methodology in terms of research philosophies, epistemological view, mixed method research, data collection tools (questionnaire and interview) and data analysis tools (PLS-SEM and thematic analysis).

Chapter 5 covers the results of quantitative data collection. It presents the statistical results of the questionnaire survey data, patterns of relationship based on tested hypothesis for conceptual models, and interpretations and discussion based on existing literature.

Based on the findings of the Conceptual Model 1 in this chapter, Journal Article#2 was prepared and submitted for publication.

Based on the findings of the Conceptual Model 2 in this chapter Journal Article#3 was prepared and submitted for publication.

Chapter 6 presents the results of qualitative data collection. It presents the results of semi-structured interviews to form a cross-case analysis and builds on quantitative data results to develop casual inferences.

Chapter 7 presents overall conclusions drawn from the research and indicates whether or not the objectives of the study were met. The contribution to existing body of knowledge and implications for the industry professional are discussed. Limitations of this research and recommendations for future research direction are also given.

2 Chapter 2: Literature Review

In this Chapter, a thorough explanation of the current state of literature for the determinants of performance research and practice is presented in order to present a new research agenda being proposed for this study.

2.1 New Zealand Construction Industry Characteristics:

The report by PWC (2020) noted that in NZ the construction industry has a significant effect on the overall economy, more so than any other industry. It is estimated that the construction industry contributed around 6 % of GDP in 2020 to the NZ economy. The same reports estimated that NZD $1 invested in construction industry results in NZD $2.51 to NZD $3.11 worth of economic activity, which is relatively high compared to other industries in NZ. This implies that a better performing construction industry has a carryover effect on other industries, such as the mining and manufacturing sectors. However, the NZ construction industry is also a highly volatile one—in the last 20 years the construction sector has shown both a double-digit growth and decline. A similar phenomenon is not observed in other sectors of economy (PWC, 2016). Official statistics show a strong outlook for the industry, with construction activity of over NZD $300 billion, projected for up until 2023 and the trend continuing beyond as well (Ministry of Business Innovation and Employment, 2018, 2021).

Considering the enormous value of NZ construction industry, there is a need to understand the reasons for its high volatility and the various risks that are involved in the construction business, therefore, improvement in the performance of this sector offers a range of benefits to different stakeholders. For individual firms, this means better profitability for owners and more earning opportunities for the work force, and for end users this means lower construction costs, better quality in terms of the end product, fewer project delays and more value for money. However, recently, a large number of high-profile construction firms have gone bankrupt as

well, which has had a negative effect upon the overall industry (Edmund, 2018). It is therefore pertinent to explore the problems that the industry is currently facing. Some of these are discussed briefly below:

2.1.1 Labour and skill shortage

The construction industry in many countries, including in the UK (Dainty, Ison, & Briscoe, 2005), Northern Ireland (McGuinness & Bennett, 2006) and Australia (McGrath-Champ, Rosewarne, & Rittau, 2011), is dealing with labour and skill shortages, (McGrath-Champ et al., 2011) and the NZ construction industry is not an exception. (Chao, Ebun Rotimi, & Bamidele Rotimi, 2021). Results from a number of industry surveys highlight the issue of the unavailability of skilled labour as one of the main problems hindering the performance of the construction sector. Skill shortage is more pronounced for the design function and other areas requiring technical skills (PWC, 2016).

2.1.2 Unfair risk allocation

The construction business inherently involves more risk due to the involvement of many parties, including designers, consultants, engineers, contractors, and suppliers (El-Sayegh, 2008). Risk allocation is an important concern for the construction industry since there are generally no established rules for the allocation of the risks in the construction business, and unfair risk allocation has been cited as an important factor negatively affecting the construction industry (Lam, Wang, Lee, & Tsang, 2007). This means that the stakeholders who are most able to control the risk do not bear the consequences of this risk. Instead, the risk is transferred to some other stakeholder, who may not be in a best position to mitigate the risk. Generally, most of the risk is transferred to the contractor (Cheung, Ng, Wong, & Suen, 2003). However, the ability or inability of a stakeholder taking the risk to actually manage that risk affects the overall project performance (Roumboutsos & Anagnostopoulos, 2008). NZ construction

industry is also dealing with the problem of the unfair risk allocation to the different parties during the execution of the project (Mbachu & Taylor, 2014). The PWC 2016 report notes that in the NZ construction industry there is a trend towards passing most of the risk to the supplier/contractor through highly complex contracts (sometimes involving variations of over 100 pages to the standard contract), which leads to the increase in the overall cost of the construction as the supplier tends to include the costs of the risk, including associated legal costs, in the estimates. Moreover, unfair risk allocation is one major reason for the transformation agenda pushed by NZ government and industry stakeholders. ("The Industry Transformation Framework," 2019)

2.1.3 Sub-optimal procurement approaches

The AECOM (2019) report argues that the preference for the traditional procurement practices, for example lowest cost tender bidding, is a significant problem in NZ construction industry. There seems to be too much of a preference to the lowest price contracting method, without proper consideration of the quality or the life cycle costs. A trust deficit is also prevalent among the client and the contractor. The report also estimates that around NZD50 million per year is lost due to poor procurement practices, and potentially NZD525 million in cost savings can be achieved over a period of 15 years up to 2030 by using other innovative procurement approaches, such as design-build procurement methods.

2.1.4 Economies of scale

The concept of the economies of scale imply that as the operational and production capacity of an organisation increases, its efficiency increases (Ambrose, Highfield, & Linneman, 2005; Annunen & Haapasalo, 2022). From the perspective of construction this means that as the volume of the construction work increases, a construction firm is able to deliver better quality products at a reduced price. The PWC 2016 report notes that due to NZ isolated geographic

location and small population, large scale development is often a challenge for its construction industry, and thus there is a difficulty in achieving economies of scale. In Australia, the workforce is 7.3 times larger than in NZ, so Australia is able to achieve much better economies of scale. This is especially true for the residential sector in NZ, where there is a huge demand, however there are fewer large-scale development opportunities.

2.1.5 Low-profit margins

Construction firms in NZ are facing the pressure of reduced profit margins (Edmund, 2018). Gross margins have reduced across sectors while worker's wages have been increased (Page & Norman, 2014a). The financial report by the Australia and New Zealand Banking Group estimated the profit after tax to be around 2 % for 2017 for construction firms in NZ, which is quite low (ANZ, 2017). In comparison construction companies in Australia are making around 4 % profit after tax (Balatbat, Lin, & Carmichael, 2010). Similarly, a large number of small firms were not making any profit at all in NZ (Curtis & Page, 2014). This is quite alarming and a possible predictor of bankruptcy for several firms currently operating in NZ.

2.2 Background and purpose of current research:

Considering multiple problems being faced currently in the industry, there is need to understand how construction firms can work on their internal organisational attributes to better align with the conditions of the industry. This study therefore performs an in-depth study to understand the unique determinants of performance for NZ construction firms.

The construction industry worldwide is progressing rapidly with ever evolving strategic viewpoints, project control and management tools. However, construction firms often fail, and why this is so has intrigued researchers in the business management field. Over the years, the field of Strategic Management (SM) emerged in order to understand the sources of performance differentials in firms (Pettigrew, Thomas, & Whittington, 2002; Wahid et al., 2023). It is

assumed that applying the tools and concepts of SM to any business domain yields promising results for performance enhancements, and the same is true for the construction industry (Cheah et al., 2004). One of the basic objectives of organisations is to achieve sustainable performance and long-term survival. In recent years, competition in the construction market has increased to a considerable extent; consequently, there have been more and more cases of bankruptcy by construction firms both in developing and developed countries (Kale & Arditi, 2002; Tan, Shen, & Langston, 2012). Therefore, in the last two decades several studies have been conducted on the application of strategic management principles in the construction industry (Chatterjee et al., 2022; Dikmen et al., 2005; Du et al., 2016; Price & Newson, 2003; Tripathi & Jha, 2017).

2.3 Brief History Strategic Management Application in Construction Industry

One of the earliest studies on strategic management in construction was carried out by Warszawski (1996) in which the authors advocated for strategic planning within considerations of the business environment. This emphasised the importance of adopting a systematic approach to strategic planning. A systematic procedure for effective strategic planning was also discussed. Chinowsky and Meredith (2000) further underscored the significance of integrating strategic management principles in construction management (CM) for long-term sustainability. They identified several areas, including resource allocation, goal setting, and strategic evaluation, where these principles could be effectively applied in construction firms. However, over time the focus of SM has changed from strategic planning to an overall complete management process that enables organisations to assess their current position and how they can change their position in order to meet the organisation's goals of enhanced performance.

Over time, the focus of strategic management has shifted from mere strategic planning to a more encompassing management process. This transition is reflected in studies by Bierman et al. (2014), Langford & Male (2001) and Price & Newson (2003) all of whom emphasised that

strategic management entails assessing an organization's current position and guiding efforts enhances performance. This holistic approach acknowledges the dynamic nature of organisations and their need to adapt and evolve within their environments.

However, it's notable that many of these studies are country-specific due to the diverse factors that influence firm performance across different geographical contexts. (Table 2.1). For instance, Kazaz and Ulubeyli (2009) studied the application of strategic management principles in the Turkish construction industry and found that SM principles were not adequately applied by these firms. Dikmen et al. (2005) examined the impact of organizational effectiveness on firms' performance in Turkey, identifying areas like firm capabilities and culture that significantly influenced performance outcomes. Pamulu (2010) developed a conceptual framework for strategic management practices specific to the Indonesian construction industry. Meanwhile, Cheah, Kang, and Chew (2007) applied strategic management principles to the Chinese construction industry, identifying factors that positively affected financial performance.

The scope of topic area extends to the United States, where studies like that of Kale & Arditi (2003) focused on understanding the impact of competitive and institutional forces on construction firms' performance. For United Kingdom construction industry, Price, Ganiev, and Newson (2003) explored the extent of strategic application of management principles, revealing informal adoption in larger organizations while highlighting the need for improvement in smaller ones. International studies also encompass Hong Kong (Tan et al., 2012) Malaysia (Chan, 2009) and Australia (Mbachu & Frei, 2011), thus underscoring the universality of strategic management's influence on construction industries across the globe.

Therefore, over time it is observed that researchers globally have investigated the potential benefits, challenges, and effects of strategic management, adapting their studies to the

specificities of regional contexts. The evolving discourse highlights the importance of strategic management principles in guiding construction firms towards enhanced performance.

Table 2.1: Strategic management application in construction in different countries

Country	**Application of SM**	**SM and Performance**	**SM and Strategy**
Turkey	Kazaz & Ulubeyli, (2009)	Dikmen et al., (2005)	
Indonesia			Pamulu, (2010)
China	Cheah, Kang, & Chew, (2007)	Cheah, Kang, & Chew, (2007)	
United Kingdom	Price, Ganiev, & Newson, (2003)		
United States of America		Kale & Arditi, (2003)	Kale & Arditi, (2003)
Hongkong	Tan et al., (2012)	Tan et al., (2012)	Tan et al., (2012)
Malaysia		Chan, (2009)	
Australia	Mbachu & Frei, (2011)		

2.3.1 Theoretical frameworks in strategic management:

The theoretical lenses in the strategic management field have varied over time during its development. The focus of finding the determinants of performance has swung between a firm's external environment to its internal factors (Hoskisson, Wan, Yiu, & Hitt, 1999). Over time, the focus from market-oriented attributes changed towards an emphasis on the efficiency of processes. The market-oriented focus was depicted in terms of Industrial Organisational (IO) theory and the strategic positioning school, which analysed a firm's strategic position in an industry. The efficiency perspective was represented by the Resource-Based View (RBV), core competence, and DC theory. These approaches emphasized the importance of a firm's internal strengths. CT advocates for the role of both firm internal and external factors. Literature points towards four main theoretical lens to understand firm performance in CM (Wahid et al., 2023).

This section presents a brief background of these dominant theoretical views in the strategic management literature.

2.3.1.1 Industrial Organisation (IO) theory and Strategic Positioning School

IO theory contends that the performance of an organisation is a function of the 'structure of the industry' in which it operates (Parnell, 2013). Therefore, the business must adapt to this industrial structure by adopting an appropriate strategic position (Cheah et al., 2007; Liu, Cao, Wu, Zhao, & Zuo, 2022). Assuming the importance of IO, Porter (1980) presented a 'five forces framework', which became popular as the Strategic Positioning School. This school viewed the market structure of the industry as a key determinant of a firm's performance. As per Porter (1991), a firm should adopt a single competitive strategy to enhance its performance. There are three competitive strategies available to the firm; namely, low cost, differentiation and focus. Low-cost strategy is to provide cheaper products and services than competitors, differentiation strategy is about offering unique and novel products and services, and focus strategy involves targeting a specific niche in the market.

IO and the strategic positioning school have been critiqued for their static nature as they consider the market nature to remain stable (Ibraimi, 2019; Prahalad & Hamel, 1994). Moreover, some researchers have also proved empirically that with regard to a firm's performance, its internal factors are more significant than industry-related effects. (Hawawini, Subramanian, & Verdin, 2003).

2.3.1.2 Resource-based view (RBV) and core competence approach

The RBV is one of the most commonly used theoretical foundations in the strategic management of a firm's performance. The RBV framework and core competence approach originated at almost the same time and are closely related. The underlying principle of RBV is that performance of a firm depends on its internal resources and its ability to utilize them effectively. In an industry, a resource base may be available to all firms equally, but the ability

and capacity to transform such resources may not be distributed uniformly. Therefore, multiple firms having the same resources can use those resources to create a variety of services (Voola, Casimir, Carlson, & Agnihotri, 2012). Hamel and Prahalad (1990) popularized the concept of 'core competence'. They proposed that in order to achieve sustained growth a firm should develop (1) unique resources and skills, which (2) add significant contribution to customer perceived value, and (3) can be applied to new products, services and markets.

Amit and Schoemaker (1993) categorised 'resources' as tangible assets, and 'capabilities' as intangible assets. Financial and human resources, physical resources like building, machinery, branding, patents are a few examples of tangible resources. Intangible resources (capabilities) include, among others, a firm's reputation, culture, experience, industry relationships with suppliers and stakeholders, A firm's ability to use its resources and capabilities with high tacitness, complexity, and specificity will lead to a higher firm performance (Voola et al., 2012).

However, the RBV has also been criticised due to its static nature, i.e., it does not take into account the process of resource development and updating of resource base by a firm over time (Choi, Cho, Han, Kwak, & Chih, 2018). Interestingly, the limitations of RBV are partly addressed by dynamic capability theory, which is discussed in the following section.

2.3.1.3 Dynamic Capabilities View (DCV)

The DCV literature argues that although resources are important, but they are inherently not a source of competitive advantage. The ability of a firm to combine and recombine the resources in a manner which satisfies the market demands, eventually leads to enhanced performance. Such capabilities are a firm's ability to read the changing business environment, capture opportunities and develop new ways to address threats and seize opportunities (Choi et al., 2018).

DCV is considered an extension of the RBV, and was developed to improve RBV's efficiency (Chryssochoidis, Dousios, & Tzokas, 2016). The focus of DC is to achieve enhanced performance in changing or unstable business environments. Such instability may come from new technologies, or change in market demands. (Teece et al., 1997). DCV is considered an extension of the RBV, developed to improve its efficiency (Chryssochoidis et al., 2016). The focus of DC is to achieve enhanced performance in changing or unstable business environments. Such instability may come from new technologies, change in market demands etc (Teece et al., 1997).

A pioneering work in the DC research area was conducted by Teece et al. (1997). The authors conceptualised a framework for firms' dynamic capabilities into three distinct categories: Sensing, Seizing, and Reconfiguration capabilities. The DC of 'sensing' pertain to a firm's ability to explore the markets for changing business needs; for example, maintaining close relationships with customers and suppliers. 'Seizing' DC are required to capture the identified opportunities in the market. Examples can be investments in emerging designs and technologies. 'Reconfiguring' is a firm's ability to change existing operational routines, or recombine resources and capabilities, to provide products and services that are aligned with market needs (Wilden, Gudergan, Nielsen, & Lings, 2013).

2.3.1.4 Contingency Theory (CT)

Contingency theory (CT) argues for the concept of 'fit' or match between a firm's attributes and the environment. CT states that for superior performance there should be an alignment of internal and external firm's attributes (Volberda, Weerdt, Verwaal, Stienstra, & Verdu, 2012) and there is no 'best way' of designing organisations because the optimum settings depend upon a set of contingency factors (Chatterjee et al., 2022; Donaldson, 2001). Hence, CT considers the influence of both internal and external factors on a firm's performance. Examples of internal attributes are organisational structure, culture, and use of technology; examples of

external factors are level of uncertainty in the market and new technological innovations (Volberda et al., 2012). The firm that develops the best fit with their environment achieves high performance (Parnell, 2013). This essentially means that an organisation identifies how their structure, strategies, and competencies are performing differently in different environments or varying situations because there is no one best way to achieve the best results.

CT has been critiqued because sometimes an ideal fit is not possible, such as when organisations change their attributes to fit with contingencies (environment, culture etc.) that are sometimes themselves changing. Consequently, organisational change may not result in enhanced performance. The upshot is that an ideal fit may be very difficult to obtain. However, to counter this criticism some CT researchers have presented the concept of 'quasi fit', i.e., instances where alignment or fit between an organization's strategies, structures, and the contingent factors is not perfect, but it is not entirely misaligned either. In other words, there might be elements of alignment that contribute to some level of effectiveness. This also suggests there might be instances where achieving a perfect fit is not realistic or necessary, and that some level of misalignment can be tolerated without significant negative consequences. (Donaldson, 2001; McAdam, Miller, & McSorley, 2019).

2.4 Linking Strategic Management in Construction and Contingency Theory

In an extensive literature review, Deng and Smyth (2013) concluded that researchers in CM have tried to understand the construction firm from the perspective of conceptual frameworks (Kagioglou et al., 2001), operational approach (Beatham, 2005), benchmarking perspective (El-Mashaleh et al., 2007) and the contingency based approach (Kim & Arditi, 2010a). Deng and Smyth (2013) concluded that the contingency-based approach is being increasingly used to understand the complex performance issues in the construction industry.

CT proposes that performance is a result of fit between several factors, e.g., resources, environment, culture and organisational internal strengths. The theory of contingency considers the interactions of organisational contingencies (resources, people, management style) and contextual factors (competitive environment) when explaining a firm's performance. Contingency theory can also be loosely regarded as a concept of fit (Asamoah et al., 2022; Deng & Smyth, 2013). According to the concept of fit, the relationship between the variables A and B depends upon another factor Z; thus, there could be more than one way to achieve the same results. This concept thus considers the relationship between the organisational context and its characteristics to understand performance outcomes. According to Venkatraman (1989), there are six different types of fit: moderation, mediation, matching, gestalts, profile deviation, and covariation. The types of fit validated in the CM literature are moderation and mediation types of 'fit' (Dikmen et al., 2005; Oyewobi, Windapo, & Rotimi, 2016b), and these are briefly explained below:

2.4.1 Moderation

The concept of moderation means that the magnitude of the effect of a variable A on B depends upon a third moderator variable C. Various authors in CM literature have identified different factors that act as moderators for construction firms' performance (Table 2.2). Wong and Cheung (2008) explored the relationship between organisational learning and performance. They argued that 'engagement in formal organisational learning', like development of project monitoring systems, enhanced (moderated) the relationship between organisational learning and performance. In a similar study, Wong, Cheung, and Leung (2008) established the role of 'organisational learning practice', as a moderator for the relationship between 'performance feedback' and overall performance of a firm. Oyewobi, Windapo, et al. (2016b); Oyewobi, Windapo, Rotimi, and Jimoh (2016) concluded that a firm's characteristics, like organisational structure and decision-making style, enhance (moderates) the relationship between competitive

strategy and a firm's performance. The authors maintained that mechanistic structures are more suitable when following a cost leadership strategy, and an organic structure is favourable when pursuing a differentiation strategy; hence, they advocated the need for strategic fit. Similarly, selection of a particular competitive strategy moderated the relation between industrial competitive forces and performance (Ho, 2016).

Table 2.2:Factors identified as 'Moderators' for CT in CM literature

Authors	**Moderator**	**Relationship**
(Deng & Smyth, 2013; Dikmen et al., 2005),	-	Strategic Fit
(Wong & Cheung, 2008)	Engagement in OL	OL- Performance
(Wong et al., 2008)	OL	Performance feedback – Performance
(Oyewobi, Windapo, Rotimi, et al., 2016),	Organisational Structure	Competitive Strategy-Performance
	Decision-making Style	Competitive Strategy-Performance
(Oyewobi, Windapo, et al., 2016b)	Decision-making Style	Competitive Strategy-Performance
(Ho, 2016)	Competitive strategies	Industrial Competitive forces- Performance

2.4.2 Mediation

The mediation type of 'fit' has also been validated in the CM literature (Table 2.3). In mediation, the effect of the independent variable(A) to the dependent variable(B) is transferred indirectly either in part or whole, through a mediator variable(C) (Figure 4.6) . Öztürk, Arditi, Günaydın, and Yitmen (2016) concluded that learning at the individual level influences learning at the project level, which improves learning at the firm levels. This ultimately leads to improved performance; thus, 'project level' and 'firm-level' learning act as mediators. Yang, Yu, and Zhu (2020) explored the role of knowledge management on project performance. The authors noted that efficient project planning leads to knowledge integration (e.g., coordination among different stakeholders, effective communication, and problem-

solving strategies), which ultimately leads to project success. Therefore, knowledge integration plays a mediating role in such a relationship. Mohamed (2003), in his analysis of the performance of International Joint Ventures (IJV), argued that the processes of partner selection influences venture formation processes, such as negotiations and risk-sharing agreements. This, in turn, influences the IJV performance; hence, there is an indirect role of the partner selection process on IJV performance. The author also noted that government policies were linked to business environment turbulence, which could negatively affect the overall performance of IJVs. Hence, an indirect link of government policies on IJV performance was established. In another study, Ozorhon, Arditi, Dikmen, and Birgonul (2010), found that compatibility between strategic goals leads to an improved inter-partner relationship (mediator), which further improves IJV performance. In addition, IJV performance is indirectly impacted by host country factors like political and economic dynamics through its effect on project-related factors (Ozorhon, Arditi, Dikmen, & Birgonul, 2007).

Isik, Arditi, Dikmen, and Birgonul (2009) noted that 'managerial capabilities' influences a firm's capabilities and resources allocation (mediator), which, in turn, affects a firm performance. Oyewobi, Windapo, et al. (2016b) established the role of competitive strategy as mediator in relation to decision making styles and performance. Teeratansirikool, Siengthai, Badir, and Charoenngam (2013) concluded that performance measurement mediates the relationship between a firm's competitive strategy and performance, which demonstrates the importance of appropriate performance measurement. Jimoh, Oyewobi, Isa, and Waziri (2019) argued that Total Quality Management (TQM) practices lead to improvements in Strategies of Continuous Improvement (SCI) which further leads to enhanced overall performance. Thus, SCI play a mediating role.

The focus of CT has been matching the attributes of the internal organisation to business environment requirements. Following a review of the literature on CT, Deng and Smyth (2013)

observed that most researchers had not explicitly mentioned the use of CT. The literature review for this current study confirms that only a small number of researchers mentioned the use of CT, which further points to a limited understanding of CT in CM. Moreover, most of the selected articles did not clearly mention or explain the approaches of 'fit', i.e., mediation and moderation. Similarly, some researchers who explored the mediation approach of 'fit' did not distinguish between partial mediation and full mediation models.

The body of research discussed in preceding sections significantly underscores the important 'moderating' and 'mediating' relationships highlighted in research which shape the complex interplay between diverse factors and the performance of construction firms. These studies collectively shed light on how such 'moderating' and 'mediating' variables function to define the relationships between key determinants and the overall performance outcomes of construction companies.

Table 2.3: Factors identified as 'Mediators' for CT in CM literature

Authors	**Mediator**	**Relationship**
(Öztürk et al., 2016)	Learning at Project and Firm level	Individual Learning and Firm Performance
(Yang et al., 2020)	Knowledge integration	Project planning – project performance
(Mohamed, 2003)	Venture formation	Partner Selection- IJV performance
	Uncertain business environment	Government Policies- IJV performance
(Ozorhon et al., 2007),	Project-related conditions	Host country conditions- IJV performance
(Ozorhon et al., 2010)	Inter-partner relationship	Compatibility in Strategic goals- Performance
(Isik et al., 2009)	Resources and Capabilities	Managerial capabilities- performance
(Oyewobi, Windapo, et al., 2016b)	Competitive strategies	Decision-making style and performance
(Jimoh et al., 2019)	SCI	TQM- performance

The existing literature on strategic management and more in the construction field management demonstrates that the main contingencies explaining the performance differentials in the construction firm are the organisational internal attributes (Castillo, Alarcon, & Pellicer, 2018; Oyewobi, Windapo, & Rotimi, 2016a) and the business environment (Şener, 2012). The relationship between the internal attributes of a construction organisation and the business environment, and how they interact 'interact' to influence the performance of the construction firm are the main constructs of this current research These parameters will be discussed in detail in the following sections.

2.5 Organisation Internal Attributes

Organisational internal attributes can be understood as the components of an organisation through which it performs its intended functions to meet its business objectives. These features

originate from the management mode, and the structure of the organisation and the strategies adopted by the organisation to achieve its intended objectives (Magnier-Watanabe & Senoo, 2008).

The components of the organisational attributes can have different meaning to different researchers and to the particular field of study. Such an understanding can depend upon the context in which the research is conducted (Magnier-Watanabe & Senoo, 2008). For example, organisational internal attributes were defined in terms of firm age, size, and ownership by Nguyen and Aoyama (2013) to study a firm's performance in the manufacturing sector, while Lowry, Morgan, and FitzGerald (1996) considered an organisation's size and resources among other aspects as the organisational attributes. Sanchez and McKinley (1998) used the production process flexibility as organisation's internal attributes for manufacturing industries.

Researchers in the construction industry have defined organisation attributes from the perspective of different approaches, such as the organisational mechanism of communication and information flows (Castillo et al., 2018; Chinowsky, Diekmann, & Galotti, 2008). Some researchers has considered internal attributes like the problem-solving and organisation structure as important for a construction firm's performance. Oyewobi, Windapo, et al. (2016b) studied the interaction between the business environment, competitive strategy, and organisational characteristics to analyse its effect on firm's performance and concluded that internal attributes had a direct influence on firm's performance. Similarly, DC have been linked to enhanced performance (Helfat & Winter, 2011).

This current study adopts this position to classify those organisation internal attributes that have an influence on the performance of the firm because such a stance has been validated in literature. Specifically, based upon the cited literature, dynamic capabilities (Wilden et al., 2013), competitive strategies (Ho, 2016), organisation structure (Claver-Cortés, Pertusa-

Ortega, & Molina-Azorín, 2012), and resources/capabilities are considered as the organisational internal attributes that may have an influence on firm performance. These variables were selected to create a comprehensive construct for organisational internal attributes in order to explore the relationship between these attributes and firm performance. The selected variables are discussed further in the following sections:

2.5.1 Dynamic Capabilities:

Traditionally, the 'resources and capabilities' of a firm were considered a source of superior performance and this came to be known as the Resource-Based View (RBV) (Wahid et al., 2023). However, over time it was felt that the RBV considers the business environment as stationary and thus the RBV is not a suitable response to environmental dynamism, i.e. when the market requirements are changing rapidly (Priem & Butler, 2001; C. L. Wang & Ahmed, 2007). As an extension of the RBV, the Dynamic Capability View (DCV) was proposed (Chryssochoidis et al., 2016; Eisenhardt & Martin, 2000) to address the limitations of RBV. The DCV emphasises the role of dynamism within the business environment and advocates that firms adjust their routines according to market needs. The construction business environment is also known to be highly volatile and often hypercompetitive. However, the implications of such dynamic business environments on the performance of construction firms have not been fully explored.

The DC literature contends that to achieve a competitive advantage, although resources play a significant role, but they do not fundamentally govern competitive advantage. On the contrary, a firm's capability to combine or recombine its resources base, as per market demands, will eventually result in performance improvement (Eisenhardt & Martin, 2000). The DCV emphasises the role of dynamism that could arise from innovative technological advancements, variations in the market demand cycles, and changing client requirements (Ambrosini et al.,

2009; Teece et al., 1997). Therefore, DC researchers claim that it is well suited to catering to the requirements of dynamic environments by advocating for changes to firms' resource base, processes or routines (Chatterjee et al., 2022; Helfat & Peteraf, 2009).

2.5.1.1 Dimensions of DC:

The work of Teece (2007) is considered pioneering in research related to DC. The author conceptualised the DC framework in three main dimensions of sensing, seizing, and reconfiguring (Teece, 2007). Sensing is a firm's capability to study and investigate the market in order to ascertain the market requirements and opportunities; e.g. keeping close relations with their stakeholders, and observing and learning industrial best practices (Wilden et al., 2013). A firm's seizing capability is about capturing identified opportunities; for instance, investments in innovative or future-driven technologies that align with market requirements (O'Reilly III & Tushman, 2008; Teece, 2007). Finally, reconfiguring capabilities refers to the ability to readjust operational routines pertaining to the usage and combination of resources and capabilities, and to align product-line or services with market requirements; for example, readjusting the firm's hierarchy to enhance efficiency and responsiveness to the market needs (Wilden et al., 2013).

Teece et al., (1997) also stressed the role of Path Dependency in DCV literature. The concept of Path Dependency states that a firm's past decision-making processes influence future decision-making processes. Therefore, to successfully apply a DCV framework any new strategic orientation in response to business environment requirements should consider the past decision making, obligations, and lessons learned.

2.5.2 DCV Application in CM:

The underlying theoretical underpinnings of the DCV are very much relevant to the construction industry due to its intrinsic intense competitive and dynamic nature. However, the concept of the DCV has yet to be explored fully in the construction sector.

DC allow for reading the changing business environment, capturing opportunities and developing new capabilities that address the threats and opportunities in the market (Choi et al., 2018). Although this concept has yet to be explored fully in the construction sector. Teece's (2007) framework of DC i.e., sensing, seizing, and reconfiguration capabilities holds relevance to the construction industry (Table 2.4).

Table 2.4:Dynamic Capabilities identified in CM literature

Framework	Dynamic Capabilities	Authors
Sensing	Collaborative working	(Adam & Lindahl, 2017; Davies et al., 2016; Too, 2012),
	Organisation Learning Ability	(C. Wang et al., 2019)
	Knowledge Management Capability	(L. Chen & Fong, 2013)
	Collaborative Learning	(Manley & Chen, 2017)
	Utilization of e-commerce platforms	(Gajendran, Brewer, & Marimuthu, 2013)
	Geographical & Business Models Diversification	(Choi et al., 2018),
	Technological & Innovation capabilities	(Choi et al., 2018),
	Learning from past experiences	(Davies et al., 2016)
Seizing	Enhanced project management capabilities Efficient decision making	(Davies et al., 2016) (Choi et al., 2018),
Reconfiguring	DC-Performance Technological use Integrating capabilities Organisation structure Efficient procurement methods	Handa and Adas (1996) (Too, 2012), (Adam & Lindahl, 2017; A. S. Li et al., 2015)
	Improvement in supply chain	(Choi et al., 2018),
	New services	(Choi et al., 2018),
	Improved assets/resource integration	(Choi et al., 2018),
	Tacit knowledge sharing	(Zhang et al., 2013)

The DC of ‘sensing’ are discussed in CEM literature in various terminologies. A firm’s scanning capability for threats is linked to performance enhancement (Dikmen et al., 2005). ‘Collaboration’, which enables firms to deal with threats and opportunities in the market, is another form of sensing capability. Collaboration among various stakeholders results in the discovery of potential opportunities in the market (Adam & Lindahl, 2017), improved project delivery (Davies, Dodgson, & Gann, 2016) and better risk management (Too, 2012). Seizing capabilities enable firms to grasp identified opportunities, e.g. changing the firm’s structure for efficient decision making where required (Choi et al., 2018) or changing project delivery methods (Davies et al., 2016). Similarly, a firm’s capability to reconfigure routines is linked to improved performance (Chatterjee et al., 2022; Handa & Adas, 1996). The reconfiguring of routines like changing procurement methods, flexible hierarchical structures could enhance the overall performance of constructions firms. (Adam & Lindahl, 2017).

Several studies in the CM literature have identified, often with different terminologies, the importance of ‘sensing’ capabilities in construction firms. Collaborative working has been linked with enhanced sensing capability for threats and opportunities in the environment. Adam and Lindahl (2017) noted that collaboration between public clients, e.g., different government bodies led to the identification of the opportunities available in the market and to better outcomes for public-private collaboration models. Similarly, having collaborative working routines with multiple stakeholders improved the delivery of complex projects with uncertain scope (Davies et al., 2016). For the management of transport infrastructure, such as rail, airports, and seaways, stakeholder collaboration improves risk assessment capability and information sharing, thus enabling a better understanding of the changing requirements of services (Too, 2012).

C. Wang, Loo, Yap, and Abdul-Rahman (2019) visualised organisational learning as a firm's sensing capability, which influenced its ability to handle the risks inherent in the international

construction market. The ability to learn from past experiences also improves the sensing capabilities required during uncertain project environments (Davies et al., 2016). Chen and Fong (2013) studied knowledge management capability, which over time enables a firm to modify its operational routines in response to the external environment to enhance its performance. Geographical diversification can also enable firms to improve their sensing capabilities as it allows them to explore various markets for business opportunities. Similarly, business model diversification also increases the sensing ability of construction firms (Choi et al., 2018).

Seizing dynamic capabilities are those which enables a firm to capture identified opportunities in the market. Firms can enhance its seizing capabilities by improving their decision-making styles to ensure prompt decision making in turbulent business environments, which in turn positively influences performance (Choi et al., 2018).

Reconfiguring a firm's ability is about changing existing operational routines or recombining resources and capabilities to provide product and services that are aligned with market needs. Handa and Adas (1996) concluded that organisation flexibility or reconfiguration capability are determinants of its performance. Technological capabilities, such as the use of IT and infrastructure asset management processes, enable firms to reconfigure routines for enhanced performance (Too, 2012). Adam and Lindahl (2017) noted that modifying procurement methods improved financial performance. Additionally, firms with a flexible organisational structure are more risk responsive and have fast decision-making abilities well-suited to shifting market demands suited to market demands (A. S. Li, Ling, Low, & Ofori, 2015). Zhang, He, and Zhou (2013) linked 'tacit knowledge sharing' to enhanced reconfiguration ability which improved the project delivery. Other reconfiguring capabilities found in literature are listed in Table 2.4

DC mainly focus on organisational routines and changing the redundant routines over time. However, most researchers who have utilised DC have not used it explicitly to understand its relationship to firm performance. Additionally, the concept of reconfiguring of firms' routine is more crucial in the construction industry, due to its intensely competitive and dynamic nature. However, little attention is paid to understanding how construction organisation routines can be modified in a turbulent business environment (Adam & Lindahl, 2017; Green, Larsen, & Kao, 2008).

2.5.3 Competitive Strategy:

The second organisation internal attribute selected for the study is the role of Competitive Strategy. The following sections gives a brief background on how competitive strategies and combination of strategies, or 'hybrid strategies', influence performance.

2.5.4 Strategy:

Strategy is the course of action through which a firm achieves business growth, satisfies its customers' needs and ultimately attains its objectives. Strategy formulation, while keeping in view the external business environment requirements and firm's internal resources, is linked to enhanced performance (Thompson, Strickland, & Gamble, 2006). Competitive strategy, put simply, involves the choices made by managers regarding the selection of markets to invest in and methods employed through which greater value creation for clients is achieved relative to competitors (Olson & Slater, 2002). Porter (1980) advocated that firms can achieve enhanced performance either through pursuing a cost leadership or a differentiation strategy.

2.5.4.1 Competitive Strategy Models

The competitive strategy view is mostly attributed to the work of Porter (1985). Porter's theory states that a firm achieves competitiveness by the application of a specific competitive strategy to counter threats or to exploit opportunities in an industry or environment. Because of its

simplicity (Alex Miller & Dess, 1993) and the strong theoretical background (White, 1986), Porter's competitive model has been used extensively for the formulation and application of competitive strategies that engender superior performance. A brief discussion of Porter's three generic competitive strategies is given below.

2.5.4.2 Porter's Generic Competitive Strategies Model

The application and suitability of each of the generic strategies depends upon the external business environment or the target clients (Murray, 1988). The main generic strategies in Porter's competitive strategies model include the cost leadership strategy and differentiation strategy.

2.5.4.3 Cost Leadership Strategy

This competitive strategy maintains that the firm can compete by lowering the price of its end product or service so it is less expensive than its competitors. Porter (1980) argues that as long as a firm can sustain its cost leadership strategy in the market, it will have superior performance. This competitive strategy usually involves minimizing overheads, reducing operational costs, and improving efficiency in production to achieve economies of scale, while at the same time maintaining quality and value for money (Ho, 2016). This strategy is already relevant to the construction industry as traditional procurement practices are aimed at the lowest cost bidding strategy (Eriksson, 2008; Tansey, Spillane, & Meng, 2014). In construction projects price is always an important parameter, either in the form of open tendering (single-stage or two-stage), selective tendering or serial tendering (Ho, 2016). However, utilising a low-cost strategy may not be always the best approach as sometimes it may lead to an adversarial relationship between the different stakeholders in construction, and with the traditional lowest cost bidding method, clients may not pay enough attention to the whole life costs of the project (Cheung et al., 2003).

2.5.4.4 Differentiation Strategy

In Differentiation Strategy, a firm distinguishes its products and services from its competitors by superior quality, the use of advanced technology or improved service. Cost reduction is not the prime target of the strategy (Ho, 2016). Cannon and Hillebrandt (1990) contended that a construction firm can achieve differentiated end products by offering different financial services to clients, project management services, and greater collaboration related to various functions and services; for example, design-build, build-operate-transfer types of procurements and facility management services. Cheah et al. (2007) concluded that the differentiation strategy has improved the financial performance of Chinese construction organisations; similarly, Dikmen, Birgonul, and Budayan (2009) demonstrated a positive relationship between the use of the differentiation strategy and firms' performance in the Turkish construction industry. Porter (1985) also argued that continued sustained differentiation leads to superior performance, thus enabling companies to charge a higher price for the product to recover the costs incurred in achieving that uniqueness (Tansey et al., 2014).

2.5.4.5 Stuck in Middle

Porter asserted that a cost leadership strategy and a differentiation strategy are incompatible and that organisations that want to enhance performance should do so by setting up distinct departments for each strategic pursual (Porter, 1980). By doing so, a business will be unlikely to be "stuck in middle". Critiques of Porter's model are that it does not address the internal mechanisms a firm uses to deal with environmental hostility (Lado, Boyd, & Wright, 1992) and its recommendation that one generic competitive strategy be used at a time, while for many organisations using different competitive strategies simultaneously is more feasible (Hambrick, 1983). A number of contemporary studies differ from Porter's view of 'stuck in middle' and advocate for a combination of multiple strategies or 'Hybrid Strategies'; for instance, Barney (2011); Parnell, Lester, & Menefee (2000). Barney (2011) argued that companies have been

successful in executing both cost leadership and differentiation strategies; for example, McDonalds combined both strategies to become a cost and market share leader in the fast-food industry. Similarly, Parnell (2013) proposed that businesses do not necessarily have to choose between differentiation and cost-based strategies—organisations can begin with differentiation and gradually incorporate a low cost strategy as the business expands.

2.5.4.6 Hybrid Strategy and Performance

The researchers have pointed out that a combination of cost leadership and differentiation or 'hybrid strategy' (HS) is more sustainable in comparison with pursuing a single strategy. (Acquaah & Yasai-Ardekani, 2008; Leitner & Güldenberg, 2010; Pertusa-Ortega, Molina-Azorín, & Claver-Cortés, 2009). Hybrid strategies adoption can benefit construction firms by improving their overall market position and by extension performance (Alqudah et al., 2021; Oyewobi, Windapo, et al., 2016b). The adoption of a hybrid strategy has a number of benefits over a single strategic pursuit. This is partly due the reason that, in addition to price, clients have become conscious of attributes like quality, reliability, and post-delivery service standards (Claver-Cortés et al., 2012). Therefore, those firms following a single strategic pursuit in such environments will have a diminished competitive advantage (Acquaah & Yasai-Ardekani, 2008). Similarly, firms pursuing a cost leadership strategy can focus on differentiation to minimise its dependence on costs only, and those pursuing a differentiation strategy can emphasize cost leadership by improving the efficiency in their operation, further improving the competitive advantages in the market. Moreover, hybrid strategies are difficult for competitors to imitate as the contain unique operational factors, thereby further improving the competitive edge of the firm (Booth & Philip, 1998; Claver-Cortés et al., 2012)

2.5.5 Organisational Structure:

The third organisation attribute selected in this study for its impact on firm performance is organisation structure.

Organisation Structure (OS) is a formally defined relational arrangement between different parts of a firm and determines the power structure and task distribution within the firm (Greenberg, 2010). A suitable OS is linked to improved effectiveness of the a firm and, therefore, its enhanced performance (Lu et al., 2008). Few studies have explored the role of a OS in the construction industry. Lansley (1994) explored different theories which could be valuable to a construction firm; however, the author did not identify what type of structures could be more suitable for construction firms. Shirazi et al. (1996) explored the impact of technological and environmental change on the OS of a construction firm. Anumba, Baugh, and Khalfan (2002) suggested different types of firm structure based on business environments. The authors also advocated the use of a matrix type of firm structure for a construction firm. Lu et al. (2008) found that reconfiguration of firm structure is critical for constriction firm performance.

There are a number of characteristics that could be used to conceptualise OS. Some commonly used measures based on organisation design and contingency theories are formalisation and complexity (Cosh, Fu, & Hughes, 2012).

Formalisation refers to formal rules, policies and procedures according to which decision making in a firm is carried out. It aids to the overall coordination and communication between various departments of a firm. Formalisation usually leads to clearly communicated and documented policies and organograms. Such documentation of rules further improves the information sharing and aids in creation of innovative ideas (Cohendet, Creplet, Diani, Dupouët, & Schenk, 2004; Pertusa-Ortega, Zaragoza-Sáez, & Claver-Cortés, 2010).

Complexity refers to numbers of different departments/operational units in a firm. It depicts the uniqueness of functional units on the basis of the nature of tasks performed and their specialization (Burton & Obel, 2004; Pertusa-Ortega et al., 2010).

However, the research on impact of OS upon performance of construction firms is scarce and is explored in this current study.

2.5.6 Resources and Capability

Establishing long-term success in any organisation is dependent on resources and capabilities it has accumulated over time and how effectively they are utilized (Phua, 2006). These resources and capabilities demonstrate the internal competitiveness of an organisation (Phua, 2006). These resources and capabilities demonstrate the internal competitiveness of an organisation. Resources are the inputs used during the production process, while capabilities are the ability of an organisation to combine the skills necessary to carry out a particular task or activity (Grant, 1991). Moreover, having a particular set of resources is not enough for superior performance; they must be organised into capabilities. The literature points that only those resources that are rare, cost-effective and inimitable due to their sophisticated use and efficient utilisation will enhance performance (Isik et al., 2009; Wahid et al., 2023).

The literature also demonstrates that a firm's ability to uniquely combine its internal resources or its resource-capability combination leads to superior performance (Newbert, 2008). In the domain of CEM, various studies have explored different resources and capabilities (Table 2.5). Many authors have pointed out that physical resources like materials, equipment and plant are critical for a firm's performance. Jang, Song, Park, and Ahn (2020) have identified and classified an international contractors' business models. Their classification is based on human, financial, and physical resources. The identified business models have different ratios of human, physical, and financial resources, among other factors, and thus different performance levels. The identified business models support the notion that resource configuration plays a vital role in determining the performance of the firm. In an extensive review of factors related to delays and cost overruns, Habibi and Kermanshachi (2018) concluded that the inability of a

firm to manage its physical resources was a leading cause of project delays and cost overruns. Similar conclusions were drawn by Phua (2006); Tripathi & Jha, (2019).

Table 2.5: RBV application in CM literature

Literature Articles	**Resources and Capabilities**
(Habibi & Kermanshachi, 2018; Isik et al., 2009; Jang et al., 2020; Phua, 2006; Tripathi & Jha, 2019)	Physical Resources (Material, Equipment, Plant)
(Deng, Liu, & Jin, 2013; Dikmen et al., 2009; Jang et al., 2020; Tripathi & Jha, 2017, 2018)	Human Resources
(Cheah et al., 2007; Dikmen et al., 2009; Jang et al., 2020)	Financial Resources
(Cheah et al., 2007; Dikmen et al., 2009; Horta, Camanho, & Da Costa, 2012; Kang, O'Brien, Thomas, & Chapman, 2008; Ling, Li, Low, & Ofori, 2012)	Technological Resources and Innovative Capabilities
(Cheah et al., 2004; Kale & Arditi, 2003)	Appropriate Resources to support strategy
(Cheah et al., 2007; Dikmen et al., 2009)	Client Relations
(Dikmen et al., 2009; Doloi, Iyer, & Sawhney, 2011; Lu et al., 2008)	Managerial Capabilities
(El-Mashaleh, O'Brien, & Minchin Jr, 2006; Kang et al., 2008)	IT Resources
(Dikmen et al., 2005; Green et al., 2008)	Firm Experience
(Tripathi & Jha, 2019)	
(Lu, Liu, Rowlinson, & Poon, 2013)	Procurement Strategies

Generally, Organisational Resources can be categorised into human, financial, and technological resources (Chew et al., 2008). These are briefly explained below:

2.5.6.1 Human resources

Human resources management is a crucial aspect of an organisation as it deals with major issues like personnel management, industrial relations, remuneration strategies, and restructuring. The main objective of human resources is to create and maintain a system that enables the recruitment, training, mobilisation and management of the human resources in order for the business to achieve its objectives (Cheah & Garvin, 2004). Since construction companies are project-based and require a lot of individuals to get the job done, human

resources can be seen as a critical component that can give an organisation an edge over its competitors. It is thus important to have an effective strategy for human resources management that will ensure a skilled workforce is available. A qualified management team has a strong influence on the management style of the firms, work ethics, and culture. Similarly, a skilled workforce has a strong influence on project performance, i.e., cost, quality, schedule, and health and safety, and by extension firm performance (Deng et al., 2013). Other researchers have drawn similar findings (Dikmen et al., 2009; Tripathi & Jha, 2017), where top management competence was linked directly to the performance of a firm (Table 2.5).

2.5.6.2 Financial resources

Financial resources are the accessible funds and lines of credit available to a firm so it can achieve its objectives. Cheah and Garvin (2004) contended it is hard for any business to perform without addressing to money-related issues. The financial resources can be studied in terms of an investment decisions system and a financial decision system. Investment decisions deal with allocation of money to different business areas to improve financial management. Financial decisions involve, among others, the capital structure for using equities and debt instruments to raise finances, surety bonds and insurance policies (Cheah & Garvin, 2004). Such resources are necessary to carry out project activities and to maintain an adequate cash flow for the project needs. These resources indicate the ability of a firm to obtain loans from banks, and to demonstrate its financial and risk management capabilities (Cheah et al., 2007; Dikmen et al., 2009; Jang et al., 2020)**.**

2.5.6.3 Technology resources

Technology resources are another important element for firm performance in ever-changing business landscapes, including the construction industry. Companies can utilise technology to gain an edge in the market by introducing new practices or methods of work that draw in customers or alter the competition (Andrew Miller, Radcliffe, & Isokangas, 2009). The uptake

of IT-based technologies, like software for project design, and management have been found to improve performance (El-Mashaleh et al., 2006; Kang et al., 2008).

It is observed in the CEM literature that researchers have not paid much attention to the development and upgrade of resource bases. Over time, due to changing product and service demands, a resource base may become inadequate for the business needs, and thus negatively influence business performance. The construction business environment is dynamic and hyper-competitive; therefore, it is imperative that construction firms develop their resource base to fit changing business environments.

2.5.7 Business Environment

The main theoretical lens for this research is the contingency theory, which advocates that organisations do not operate in a vacuum. Therefore an organisation should align its attributes (contingencies) to the Business Environment (BE) in which it operates (Donaldson, 2001; T. Li et al., 2023). Consequently, the other important construct of this research is the 'Business Environment' and how it interacts with an organisation's internal attributes to impact performance.

The business environment is sum of those physical and social factors, inside or outside an organisation, that influence the decision-making process of the organisation (Duncan, 1972). The business environment for any industry is the space in which the industry's transaction are carried out. The business environment has both tangible and intangible elements, and it has various structures and systems which influence the behaviours of those participating in an industry. A few of the constituents of the business environment can be government regulations and policies, procurement procedures, insurance options, tax regulations, banking and credit facilities, availability of equipment, manpower, dispute resolution mechanisms, cultural influences, and political and economic conditions (Aniekwu, 1995). Hence, the business

environment can be regarded as the sum of all of the forces and factors that affect the performance of an firm (Adidu & Olannye, 2006; Oyewobi, Windapo, et al., 2016a).

Some unique aspects of the construction business environment are related to the nature of its projects, which is often characterised by adversarial relationships, fragmented operations and the lack of a cooperative culture, and complexity during project execution (Alqudah et al., 2021; Cicmil & Marshall, 2005). Soeparto, Soepandji, Abidin, and Trigunarsyah (2007), separated the construction business environment into direct and in-direct environments. The direct environment comprises a transaction cost economy, regulations and barriers to entry into the business. The indirect environment encompasses such things as political conditions, transparency and control of corruption, and pro-business regulations. The authors also contended that the construction industry players take the direct and indirect business environment into consideration for their long-term strategy.

Researchers have analysed the impacts of the business environment in various ways. There are two main approaches to understand the impact of uncertainty in environment upon the organisations; i.e., simple-complex and static-dynamic (C.-J. Chen, 2003). The simple-complex scale examines the business environment in terms of whether the components in the environment are few or many and of the same or different nature. The static-dynamic scale examines the business environment in terms of whether the components in the environment remain the same over the time or if they are continuously changing. For the current study, a static-dynamic system environment definition of BE was adopted to understand the 'Business Environment Dynamism' relevant for construction firms' performance.

2.5.7.1 Environmental Dynamism

Dynamism can be characterized by speed by which environmental factors are changing, as well as the predictability or uncertainty of an environment (Gibbs, 1994; Nundakumar, Ghobadian, & O'Regan, 2010). Sources of dynamism can be economic, technological and political in

nature, and under such influences, it is difficult to make decisions (Dess & Beard, 1984; Nundakumar et al., 2010)

2.5.8 Firm Performance

In the previous sections, the independent constructs; namely, organisation internal attributes (Dynamic Capabilities, Competitive Strategies, Organisation Structure) and Business Environment Dynamism, were discussed. The section gives a brief background of dependent construct of this study, i.e., Firm Performance.

Performance is generally understood to be a measure of the ability of a process to achieve its goal. However, the conceptualization of "performance" is subjective and context dependent. Folan, Browne, and Jagdev (2007) explored the understanding of 'performance' in the literature, and discussed that, performance pertains to both the past and future of an organisation and can be defined as deployment and management of components of an organisation in order to achieve the objectives of the organisation in a timely manner. Additionally, performance can also be understood as processes related to economy, effectiveness, and efficiency. For Laitinen (2002) performance is the ability to produce results in a dimension determined a priori, in relation to a target. According to this definition, there should be a dimension and a target against which performance can be understood or measured.

In the business performance domain, Neely, Adams, and Kennerley (2002) argued that effectiveness and efficiency are important dimensions in understanding business performance. Effectiveness refers to the level of stakeholder satisfaction with the output of an organisation in regard to their requirements, while efficiency refers to how economically a firm meets the requirements of stakeholders. Thus a firm which better meets its objectives economically and efficiently can be considered to have superior performance in relation to its competitors (Neely, 1998). Hence by extension the 'performance enhancement' means improving how efficiently

a company operates and how effectively it achieves its goals. This eventually leads to a stronger competitive outputs compared to its competitors, while simultaneously making sure that customers and stakeholders are happy and using resources in a way that generates maximum returns on investments (Hu & Liu, 2018). The current research, therefore, conceptualises 'construction firm performance' as measure of the efficiency and effectiveness of the different mechanisms adopted to meet the stated objectives of an organisation. Some of the possible objectives of construction firms can, among others, be high quality, enhanced profit margins, satisfied customers.

In the CM literature, authors have used the terms like 'competitive advantage', 'critical success factors', 'performance enhancement' and 'sustained competitve advantage' interchangeably (Lu et al., 2008; Newbert, 2007; Oyewobi, Windapo, et al., 2016b). Therefore, this study also conceptualises these terms as same as 'organiational performance'.

Performance measurement is a complex construct, and researchers have taken different approaches to understand performance (Deng & Smyth, 2013). According to Kagioglou et al. (2001), performance measurement is the process of determining how successful organisations or individuals have been in attaining their objectives and strategies. However, irrespective of the method used, an applicable measurement system should encompass all the possible measurement indicators that are of relevance to a particular firm (Kaplan & Norton, 1996).

In the construction industry, traditional accounting and financial measures are used to measure firm performance (Hawawini et al., 2003; Hu & Liu, 2018). These measures include Return on Investment, Net Profit after Tax and Return on Capital Employed. However, these objective measures have been criticized by various researchers because they are lagging indicators, i.e., they tend to give information about the past rather give an indication of the future (Kagioglou et al., 2001). In an extensive literature review, Deng and Smyth (2013) identified four

approaches researchers in CM have taken to understand and measure firm performance in the construction industry. These are briefly discussed below:

2.5.8.1 Conceptual Approach

In this approach, researchers have tried to create conceptual frameworks based on some popular firm performance models, such as Balance Score Card, Key Performance Indicators and European Foundation for Quality Management to measure firm performance and to suggest areas of weakness (Bassioni, Price, & Hassan, 2005; Kagioglou et al., 2001). However, this approach has been criticised since such frameworks may not be compatible in specific industry contexts. This implies the conceptual approach may not comprehensively answer the questions around how different business environments and strategies impact upon a firm's performance.

2.5.8.2 Practical Perspective

This approach is based on the concept that the performance of a firm can be improved by continuous measurement. This process of measurement should be embedded in the internal management process and will result in superior performance (Beatham, 2005). However, which indicators should be measured for performance improvement needs to be developed further.

2.5.8.3 Benchmarking Perspective

The underlying philosophy behind this approach is that by comparing an firm's performance with their competitors or best practices identified in industry, effective improvements can be made in weak areas of the organisation (Horta, Camanho, & Da Costa, 2009). However, such performance measurements are comparative and provide little information for organisations that want to compete in the international market. Also, it may be a case that standards defined for a particular construction industry may not be the best. Benchmarking may thus prove to be inadequate.

2.5.8.4 Contingency Based approach/Empirical Perspective

The fundamental logic behind the Contingency theory is that a firm's performance cannot be understood using linear casual models. This means that in order to understand the performance of an organisation, there should be a coalignment between the organisational and environmental factors rather than just a linear relationship between the two variables (Shirazi et al., 1996). Therefore, this approach to performance measurement essentially advocates for a cause-and-effect relationship whereby the strength of such relationship is influenced by other relevant factors. Increasingly, this approach to performance measurement is attracting the attention of researchers in construction, and several studies have been conducted using this philosophy (Kim & Arditi, 2010b; T. Li et al., 2023; Phua, 2006).

This current research thus adopts a contingency perspective to understand construction firm performance. In the CM literature, authors have used the terms like 'competitive advantage', 'critical success factors' 'performance enhancement' and 'performance' interchangeably (Lu et al., 2008; Newbert, 2007; Oyewobi, Windapo, et al., 2016b). Therefore, this study also conceptualises these terms as 'organiational performance' in relation to construction firms.

2.6 Knowledge gaps and potential directions

From the review of the existing CM literature, a few research gaps have been identified; in particular, the relationship between organisational internal attributes and firm performance has not been explored empirically. As a result:

1. The relationship between Dynamic Capabilities and performance and its significance in turbulent business environments needs to be explored.
2. How construction firms in New Zealand are adopting different competitive strategies, or (if) adapting hybrid competitive strategies is unclear.
3. The nature of the construction business environment in New Zealand has also not been explored in depth, particularly how the business environment influences firm

performance. Similarly, it is also not clear if business environment dynamism is influencing the relationship between organisation internal attributes and performance.

4. The nature of Organisation Structure in New Zealand construction firms and its interaction with other internal attributes, such as competitive strategies, needs to be explored.
5. The significance of resource/capabilities for performance of New Zealand construction firms and its interaction with other internal attributes, such as competitive strategies, is not fully understood.

The next chapter builds on these knowledge gaps to define the conceptual models and formulates the specific hypothesis to be tested in this current study.

2.7 Summary

This chapter presented a theoretical foundation to answer the Research Questions stated in Chapter 1. A brief history of field of Strategic Management Management'(SM), its relevance and use in Construction Management (CM) was provided. The main theories of SM, namely Resource Based View (RBV), Dynamic Capabilities (DC) Theory and Contingency Theory (CT) were stated. Later, their application in the CM literature was also assessed.

The rational for selecting CT for this current study was provided based on its advocacy for a 'strategic fit' between 'Organisational Internal attributes', and external 'Business Environment'. The relevant organisational attributes for firm performance selected for this study are Dynamic Capabilities, Competitive Strategies, Organisation Structure and Resource/Capabilities. The literature for these selected internal attributes was synthesised and discussed. For uncertainty/turbulence in business environment, the concept of Business Environmental Dynamism was explained. Afterwards, the conceptualisation of 'Firm Performance' was provided.

There were identified a number of research gaps that need to be addressed. Firstly, there is a need to explore the relationship between dynamic capabilities and, briefly discussed, performance in a turbulent business environment. It is unclear how organisations with dynamic capabilities perform in such an environment and the significance of this relationship.

Secondly, it is crucial to investigate how construction firms in NZ are adopting different competitive strategies, including hybrid competitive strategies, to remain competitive.

Thirdly, there is a lack of in-depth research and the nature of the construction business environment in NZ and how it influences Firm Performance. It is also unclear how the dynamism of the business environment affects the relationship between organisational internal attributes and performance.

Fourthly, the nature of the organisation structure in NZ construction firms and its interaction with other internal attributes like competitive strategies requires exploration.

Finally, there is a need to fully understand the significance of resources/capabilities for the performance of NZ construction firms and their interaction with other internal attributes like competitive strategies.

Addressing these research gaps can provide a basis for valuable insights to enhance the performance and competitiveness of the construction industry in NZ.

Based on the above research gaps, the conceptual models and hypothesis formulated are presented in Chapter 3.

3 Chapter: Conceptual Models and Hypothesis Development

In Chapter 2, an extensive review of the literature was provided, and knowledge gaps were identified and discussed. This chapter creates a theoretical framework to address the knowledge gaps and seeks to answer the research questions and aims set out in Chapter 1. Three conceptual models are discussed to build up on theoretical perspectives explored for the main constructs of the study, and the boundaries of models are also explained. The framework builds on a logical deduction and justification of reviewed literature from various fields; for example, operations management, management accounting and CM. The justification of each hypothesised relationship in the conceptual models is explained. Based on the Conceptual Model 1, the Journal Paper #2 was drafted and submitted. Similarly Conceptual Model 2 formed the basis of Journal Paper 3 submission, as mentioned in Section: List of Reviewed Publications

3.1 Conceptual Model 1: Impact of Dynamic Capabilities on Performance

3.1.1 Dynamic Capabilities View (DCV):

The Dynamic Capability View (DCV) suggests that firms should continuously address the business environment requirements through adaptation, reconfiguration of operational routines and renewal of their resources (Teece, 2007). The DCV literature contends that although resources play a significant role, they do not fundamentally govern competitive advantage. On the contrary, a firm's ability to combine or recombine its resources base, as per market demands, will eventually result in performance improvement (Eisenhardt & Martin, 2000; Wahid et al., 2023). The DCV is considered an extension of the RBV and was developed to improve the efficiency of RBV (Chryssochoidis et al., 2016). The DCV emphasises the role of dynamism that could arise from innovative technological advancements, variations in the market demand cycles, and changing client requirements (Ambrosini et al., 2009; Teece et al.,

1997). Therefore, DC researchers claim that it is well suited to catering to dynamic environments' requirements by advocating for changes to firms' resource base, processes or routines (Chatterjee et al., 2022; Helfat & Peteraf, 2009).

3.1.2 Relationship between DC and performance

The DCV is considered an extension of the RBV, as DCV caters for changing market needs. Therefore, it could be argued that there is a positive relationship between DC and firm performance. DC aid in the selection of appropriate resources, developing capabilities and aligning resource bases to create routines as per market demands (Makadok, 2001; Teece et al., 1997). Similarly, they enhance firm responsiveness to market changes (Hitt, Bierman, Shimizu, & Kochhar, 2001), thus providing opportunities for revenue generation and cost cutting (Drnevich & Kriauciunas, 2011). DC enable firms to alter their resource base to create new capabilities that could satisfy changing market needs. (Helfat & Winter, 2011; Wilden et al., 2013).

Therefore, it is stated that:

Hypothesis 1 (H1): DC positively and significantly influence construction firm performance.

3.1.3 Application of contingency theory: The moderating role of environmental dynamism

Contingency theory maintains that firms do not operate in a vacuum, rather they are influenced by their business environment. Therefore, firms should align their attributes (contingencies) to the business environment in which they operate (Choi et al., 2018; Donaldson, 2001). The business environment is the sum of all of the forces and factors that affect the performance of firms in an environment (Ward, Duray, Leong, & Sum, 1995). Some unique aspects of the construction business environment are related to the nature of projects, which are often

characterized by adversarial relationships, fragmented operations, lack of cooperative culture, and complexity during project execution (Cicmil & Marshall, 2005; Rotimi & Ramanayaka, 2015). Contingency theory advocates that firms do not operate in a vacuum, rather are influenced by their business environment. Therefore firms should align their attributes (contingencies) to the business environment in which they operate (Chatterjee et al., 2022; Donaldson, 2001). The business environment is the sum of all of the forces and factors that affect the performance of firms in the environment (Ward et al., 1995). Some unique aspects of the construction business environment are related to the nature of projects which are often characterized by adversarial relationships, fragmented operations, lack of cooperative culture and complexity during project execution (Cicmil & Marshall, 2005; Rotimi & Ramanayaka, 2015).

Environmental Dynamism is the frequency environmental factors are changing and how unpredictable such changes are. Sources of dynamism could be economic, technological and political (Dess & Beard, 1984; Keats & Hitt, 1988; Wu, 2010). Environmental dynamism can negatively impact the performance of firms relying on a fixed resource base. (Oyewobi, Windapo, et al., 2016a). When there is dynamism, firms cannot rely on their previously used resources to have a competitive edge in the market. However, DC enable firms to integrate a resource base rapidly and create new knowledge that could help maintain their superior performance. DC could be considered as the major source for competitive advantages under environmental dynamism (Wu, 2010).

In stable environments, where there is a low level of competition, resources are abundant, and there is a high level of growth, business opportunities are abundant. In such environments, the role of DC may be insignificant or even negative (Wu, 2010). However, in the highly competitive environment, firms are required to carry out close surveillance of market volatility in terms of technological advancement, the threat of new entries into the market, and

knowledge of the underlying risks at the suppliers' end (D.-y. Li & Liu, 2014; Luo, 1999); these variable make the role of DC very important. Hence, it could be stated that when environment dynamism is high, the significance of DC is even more enhanced for maintaining or improving firm performance. The strength of the relationship between the DC and performance will be enhanced under environmental volatility, thus signifying the role of environmental dynamism as a 'moderator' (D.-y. Li & Liu, 2014). Therefore, it is stated that:

Hypothesis 2 (H2): Environmental Dynamism acts as a moderator in the relationship between DC and construction firms' performance.

The conceptual model of the study is shown in Figure 3.1, which depicts the two developed hypotheses, H1 and H2. The model simply shows that construction firms that possess dynamic capacities will most likely experience good business performance. However, the level of influence of their dynamic capacities on their performance is moderated by the level of dynamism that exist within their operating environments.

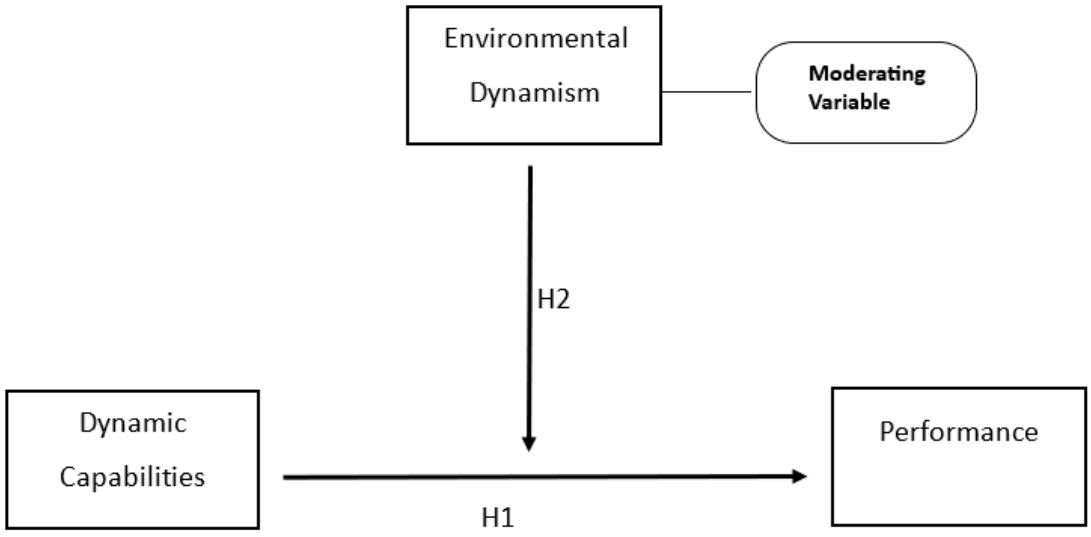

Figure 3.1: Conceptual Model 1: Dynamic Capabilities- Performance relationship

3.2 Conceptual Model 2: Interaction of Organisation Structure, Hybrid Strategies on Performance

3.2.1 Hybrid Strategy and Performance

The adoption of hybrid strategies can benefit a construction firm by improving its overall market position and, by extension, its performance (Allen & Helms, 2006). The adoption of a hybrid strategy has certain benefits over pursuing a single strategy. This is partly because, in addition to price, clients have become conscious of other attributes like quality, reliability, and post-delivery service standards (Claver-Cortés et al., 2012). Therefore, those firms pursuing a single strategy in such environments will have diminished competitive advantage (Acquaah & Yasai-Ardekani, 2008). However, a firm pursuing cost leadership strategy can focus on differentiation to minimise its dependence on cost only and those pursuing differentiation strategy can emphasise cost leadership by improving its efficiency in its operation, further improving competitive advantages in the market. Moreover, hybrid strategies are difficult to imitate as they combine several operational factors, thereby further improving the competitive edge of the firm (Alnoor, Khaw, Al-Abrrow, & Alharbi, 2022; Booth & Philip, 1998) (Figure 3.2).

Therefore, it is stated that:

Hypothesis (H3): Hybrid Strategy positively and significantly influences construction firm performance.

3.2.2 Interaction of Organisation Structure and Hybrid Strategies:

Organisation structure (OS) is a formally defined relational arrangement between different parts of a firm, and it defines the power structure and task distribution within a firm (Greenberg, 2010). Some commonly used measures based on organisation design and contingency theories to define OS are formalisation and complexity (Cosh et al., 2012)

Formalisation refers to formal rules, policies and procedures according to which decision making in a firm is carried out. It aids the overall coordination and communication between various departments of a firm and usually leads to clearly communicated and documented policies, and organograms. Such documentation of rules further improves information sharing and aids in the creation of innovative ideas (Cohendet et al., 2004). Complexity refers to the number of departments/operational units in a firm. It depicts the uniqueness of functional units on the basis of the tasks performed, and their specialisation (Burton & Obel, 2004).

The literature shows that there is a direct link between OS dimensions (Formalisation and Complexity) and hybrid strategies. Formalisation is linked to stability and efficiency for a firm's processes (Mintzberg, 1979; Moreno-Luzón & Begoña Lloria, 2008). The formally documented rules and policies aid in cost cutting and improves interaction and collaboration between employees, which in turn complements differentiation (Cordon-Pozo, Garcia-Morales, & Aragon-Correa, 2006). Formalisation aids in the creation of databases of a firm's experiences, which can be utilised to improve operational efficiency and innovative capabilities (Cohendet et al., 2004). This makes the pursuit of cost leadership and differentiation possible (Reynaud, 2005). Consequently, it can be inferred that formalisation supports cost leadership and differentiation simultaneously. Therefore: Figure 3.2.

Hypothesis (H4a): Formalisation positively and significantly influences hybrid strategy.

Complexity can also influence the adoption of hybrid strategies. It leads to employees with common skills/knowledge being grouped together to execute tasks. This ultimately aids in the creation of new technologies, methodologies and knowledge base. This could, in turn, promote cost cutting and supports the implementation of new technologies, ideas or methods (Pertusa-Ortega et al., 2010). Complexity complements creativity due to its relationship with depth and

diversification of experience and encourages the blending of multiple ideas to offer unique services. Consequently, complexity helps in pursuing a differentiation strategy (Damanpour, 1991, 1996; Damanpour & Schneider, 2006). Therefore: Figure 3.2

Hypothesis (H4b): Complexity is positively and significantly linked to the hybrid strategy.

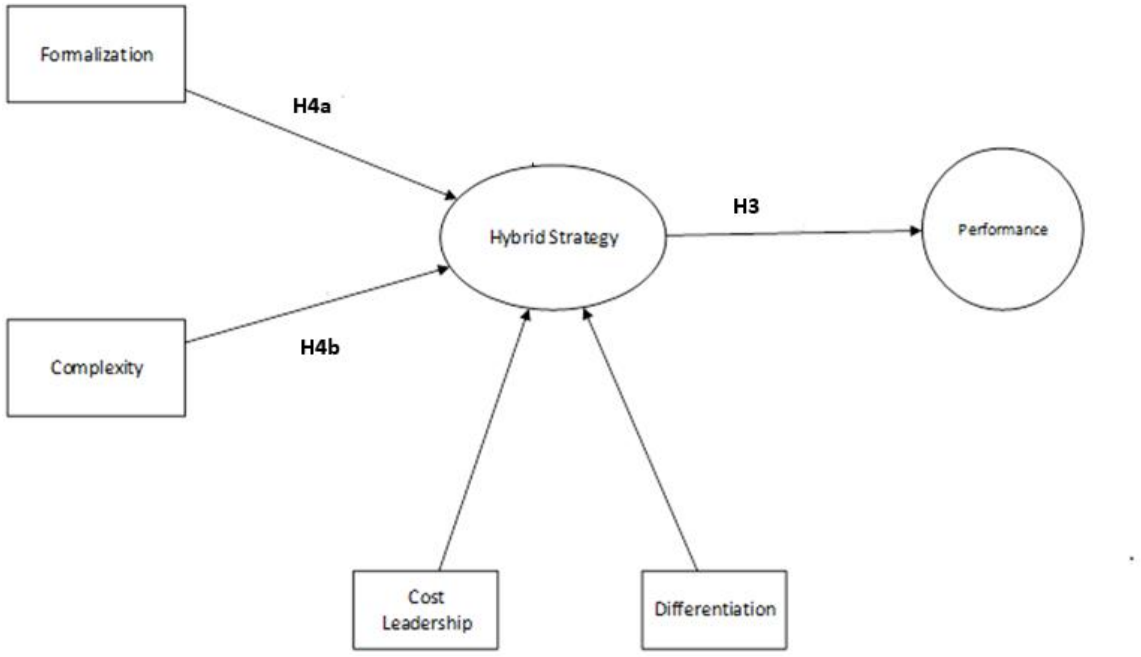

Figure 3.2: Conceptual Model 2: Interaction of Organisation Structure, Hybrid Strategy and Performance.

3.2.3 Hybrid Strategy as a mediating variable:

OS defines the responsibilities of employees, lines of communication and flow of information, thus creating an environment for collaboration and interaction amongst employees. Therefore, the characteristics of OS (formalisation and complexity) can aid or limit the pursuit of a specific strategic path by a firm. Therefore, it is likely that the presence of higher degrees of formalisation and complexity in a firm would make the pursuit of a hybrid strategy more

effective, which will ultimately lead to the improvement in the a firm's performance. (Edelman, Brush, & Manolova, 2005).

The attributes OS are not of much relevance in isolation (Claver-Cortés et al., 2012; Newbert, 2008). However, a highly functional OS is linked to a successful hybrid strategy, which results in enhanced a firm performance (Eriksen, 2006). Consequently, OS will likely have an indirect impact on performance of firm.

Therefore:

Hypothesis 5 (H5): OS is positively linked to Hybrid Strategy which is further linked to performance. Hence, hybrid strategy acts as a 'mediator' between OS and firm performance.

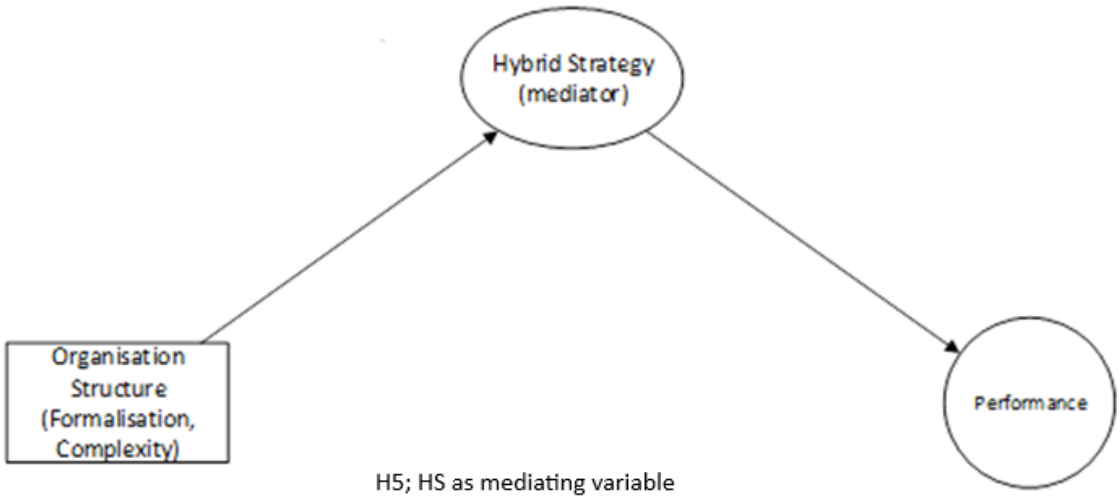

Figure 3.3: HS as mediating variable is OS-Performance relationship

The conceptual model is shown in Figure 3.2 and Figure 3.3, which show conceptualised relationships for H3, H4a and H4b, H5. The figures shows that Hybrid strategy (made up from Cost Leadership and Differentiation) has a direct influence on performance. Moreover,

Formalisation and Complexity are directly linked to hybrid strategy adaption, hence hypothesising the role of Hybrid Strategy as a ‘mediator’ in organisation structure to performance relationship.

3.3 Conceptual Model 3: Interaction of Resources and Capabilities, Competitive Strategies on Performance

3.3.1 Resources and Performance:

A number of researchers have concluded that the resources and capabilities, which are valuable, cannot be imitated and substituted are critical for sustained performance (Barney, 2001; Bridoux, 2004; Oyewobi et al., 2019). Additionally, other studies have revealed that resources and capabilities have a positive effect on the performance of an organisation in a number of ways; for example, synchronising the resource base with a fluctuating environment, and improving firm performance (Eisenhardt & Martin, 2000; Gudergan, Devinney, Richter, & Ellis, 2012). Although Hoopes, Madsen, and Walker (2003) argued that resources and capabilities are not enough to explain differences in performance, a number of studies have demonstrated the significance of capabilities/resources in the performance of a company (Oyewobi et al., 2019; Phua, 2006). Therefore, it is stated that:

Hypothesis 6: There is a significant and positive relationship between organisational capabilities/resources and performance.

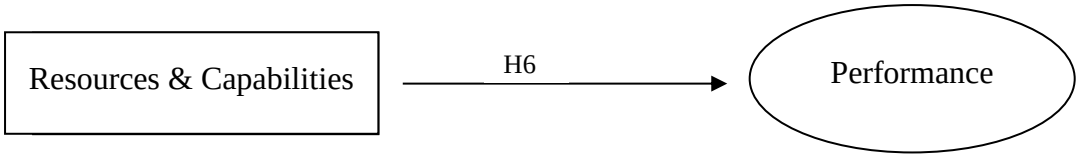

Figure 3.4: Resources/Capability and Performance relationship

3.3.2 Resources, Competitive Strategies and Performance; Mediating Role of Competitive Strategy

As stated earlier, some researchers have contended that resources and capabilities may not have a direct relationship to the firm performance, and there may be other organisational attributes

defining the relationship. For example, Chew et al. (2008) argued that there needs to be a proper alignment between a competitive strategy and core capability for achieving sustained performance. Hence, a firm may use the resources to formulate their competitive strategies to respond to business requirements, which will lead to enhanced performance.

Therefore, it is stated that:

Hypothesis 7: There is a significant relationship between organisational capabilities/resources and firm performance which is mediated by competitive strategies.

The conceptual model 3 is shown through Figure 3.4 and Figure 3.5, which show the hypothesised relationship of H6 and H7. It shows that Competitive strategies are directly linked to performance. Moreover, resources and capabilities influence performance, through their direct influence on competitive strategies.

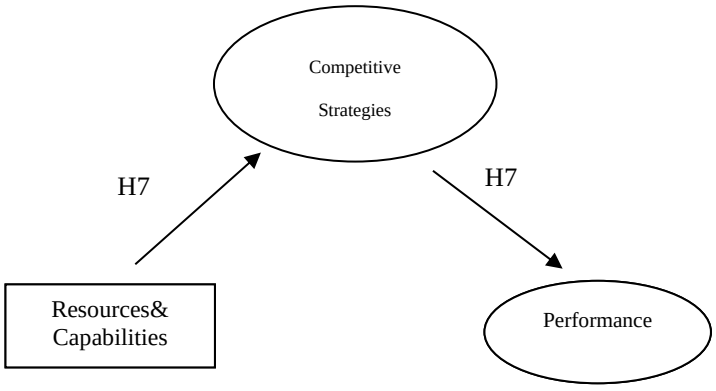

Figure 3.5: CS as mediating variable is RC-Performance relationship

3.4 Summary:

This chapter lays out the conceptual frameworks and research hypotheses. The theories and literature discussed in Chapter 2 provided the basis for the development of hypotheses and conceptual models. The research gaps in literature were identified and discussed as the basis

for formulation of conceptual models. At this stage of the research, the conceptual models are still in its formative state and have yet to be confirmed. As such, all effort was made to ensure all the constructs that may influence firm performance were examined and explained thoroughly based on existing literature. In conceptual model 1, the relationship between the dynamic capabilities, business environment dynamism (moderator variable) and performance was explained and hypothesised. Conceptual model 2 explored the interaction of organisation structure, hybrid competitive strategies and performance, where the role of 'hybrid strategies' were explored as a mediator variable. Finally, in conceptual model 3, the resources/capabilities, competitive strategies, and performance trilogy was examined, and a hypothesis stated. The next Chapter explains the process of research design, methodology selection and research tools used for the data collection and hypothesis testing.

4 Chapter: Methodology

This chapter discusses the methods used for data collection and analysis. The chapter explains the three critical components of research design i.e., epistemologies and how this research approached the epistemologies, specific research methods and tools and, afterwards, the methods of data collection and analysis are discussed. Finally, a justification for employing mixed method research has been provided.

4.1 Components of Research Design:

Research design is the process of choosing the type of data being collected, and the ways by which the data is collected. (Easterby-Smith, Thorpe, & Jackson, 2012). According to Creswell (2014), research design is divided into three components: (i) choosing a philosophical worldview (epistemology), (ii) selection of a methodology and (iii) selection of specific research tools. These three key components are described in the following subsections.

4.1.1 Choosing an epistemological view

The main research objective for this research study is to understand the factors of performance heterogeneity of construction firms in NZ. In order to understand these factors, different scientific tools needed to be selected. However, the selection of these tools depends upon the assumptions of the researcher's world view of reality. The understanding of the researcher about the nature of reality influences the selection of a methodology and its application. Therefore, a basic knowledge of research philosophies is essential before choosing the methodology for research. Such an understanding guides the researcher towards making a satisfactory choice as it relates to several tools that are available in order understand the nature of the problem (Greener, 2011).

A number of philosophies and methods in social research is shown in Figure 4.1 (adopted from (Saunders, Lewis, & Thornhill, 2009)) , which depicts the general research paradigm. From the

different research philosophies and methods shown, the approach adopted depends upon the nature of research question. Similarly, no research philosophy can be considered superior to another as all research philosophies have inherent advantages and disadvantages. (Bernard & Bernard, 2013). The important factor to consider is that the research philosophy and the methodologies selected are suitable to the research questions developed for a study (Amaratunga, Baldry, Sarshar, & Newton, 2002).

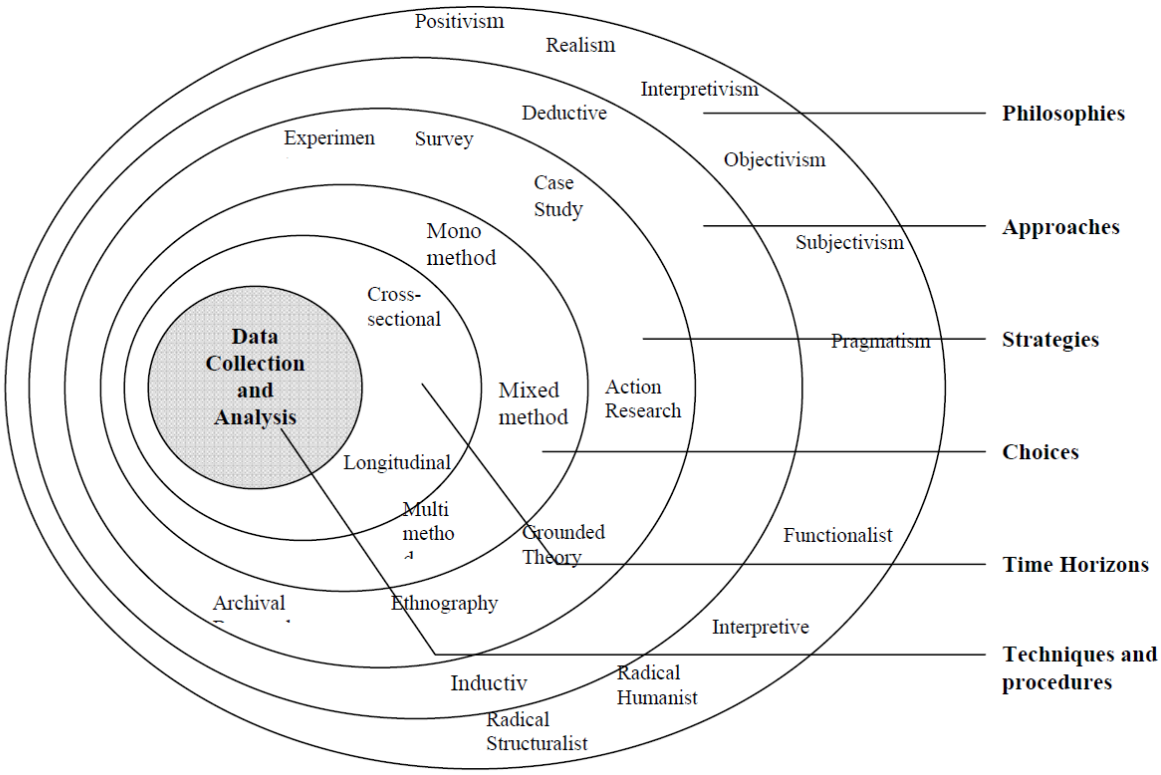

Figure 4.1: Typical Research onion used for research methodologies

4.1.1.1 Research Philosophies

The concepts of 'ontology' and 'epistemology' should be considered during the formulation of the research design. Ontology refers to the researcher's view about the nature of reality, while epistemology refers to researcher's beliefs around what is an acceptable knowledge and how to catch the reality. The two basic concepts of 'ontology' and 'epistemology' are briefly explained below:

4.1.1.2 Ontological Perspectives

Ontology can be defined as the assumptions of researcher concerning the nature of social reality. These assumptions are about what really exists, what it looks like, what is it made of and how its components interact with each other (Blaikie, 2000, p. 8). The importance of the ontological perspective can be understood by example of prisoners in cave: If some prisoners are kept in cave, and they only see the shadows of the real objects, they will think of such shadows as reality. However, if the same prisoners are brought out of the cave and then they see the real objects (rather than the shadows they thought were the reality), their definition of reality would be challenged (Plato & Waterfield, 1998, pp. 241-242). This shows that how our perception of reality can impact our understanding of 'what exists'. Objectivism and Constructionism are the two traditional ontological perspectives (Blaikie, 2000).

The ontological perspective of 'objectivism' considers reality as the tangible world and is independent of social actors. This means that the "social phenomena" (reality) is also external and independent of social actors. For example, the ontological perspective of objectivism can argue that the 'organisation' is a tangible object. The organisation is tangible from this perspective because it has rules and regulations; for example, the job description of workers and the standard operating procedures that have been developed so people know what is expected of them during performance of their duties. So, the social reality (organisation) is tangible; from the perspective of objectivism, the people working in the organisation are influenced by the organisation (they learn how to do the job, as per the rules and regulations) and not the other way around. Thus, in a sense, the social reality (organisation) is separate from the social actors (people working in the organisation) and has an almost tangible reality on its own.

The alternative ontological perspective is 'constructionism' which considers social reality to be 'subjective', something which is not entirely tangible and not independent of social actors

(Saunders et al., 2009). The ontological perspectives of 'constructionism' consider that the social actors are not external to the 'social phenomenon' (reality); they influence the social reality and hence should be understood. Considering an organisation from the constructionist perspective means that the rules and regulation are not exclusive, but rather they are the agreed upon patterns by those involved within an organisation. Such rules, regulations and roles are also subject to change by negotiation between the social actors (organisation stakeholders) (Schatzman & Strauss, 1973). Constructionism thus maintains that the reality of the social phenomenon is constructed through the interaction of the social actors.

Table 4.1 briefly explains the concepts of ontological approaches in respect to an organisation.

Table 4.1:Summary of ontological perspectives

	Objectivism	**Constructionism**
Nature of an organisation	Tangible object, independent of influence of employees	Interaction of individuals defines reality of organisation
Components of organisation	Set of rules, procedures, job descriptions	Evolving negotiated order, rules and procedures act as principles leading to a community of practice

4.1.1.3 Epistemological Perspectives

While ontology deals with 'what we may know', epistemology examines the question 'how we come to know what we know'. Epistemology addresses the issue of what should be regarded as acceptable knowledge. It deals with possible ways of gaining knowledge. Blaikie (2000, p. 8) simply defined it as 'how what is assumed to exist can be known'? Interpretivism and Positivism are the traditional epistemological perspectives.

Interpretivism believes that reality is continuously changing, and hence it is subjective. Therefore, reality should be obtained by interaction with the phenomenon. This epistemological view advocates that the social scientist should grasp the subjective meanings

of social action (Bryman, 2016, p. 13). This view also sees that the subject matter of the social sciences (people, organisations) is different from the natural sciences. Interpretivism aligns more with constructionist ontology. Interpretivism covers the contextual issue, which is often a critical requirement for project management research. (Smyth & Morris, 2007).

Positivism perspectives advocate the use of the methods of data collection from the natural sciences to study social reality. Such methods include measuring quantities, or objective data gathering. These are methods that can be applied universally. Positivism considers that observations should be made of the 'external' and 'tangible' world. Positivism is more aligned with objectivism. Positivism has an advantage: it is considered efficient and economical, which can aid in policy decision making provided that the findings are extracted from large population samples. (Easterby-Smith, Thorpe, & Lowe, 2002). However, such 'generalisations' come at a cost of considerations of the context of research, which is critical for the domains of project management (Smyth & Morris, 2007).

In the CM literature both the epistemological views of 'positivism' and 'interpretivism' are reported (Holt & Goulding, 2014). However, Dainty (2008), in an extensive review, concluded that the positivist approach is dominant in the CM literature. Table 4.2 shows the summary of these epistemological perspectives.

Table 4.2:Summary of epistemological perspective

	Positivism	**Interpretivism**
Basis	Natural Sciences	Interactions of social actors
Approach to social science	Explanation and generalisation of human behaviour	Causal explanation and interpretive understanding of human behaviour
Subject matter	Nature	Social reality
Data collection	Only observable phenomena can provide credible data, with an emphasis on causality and generalisation.	Comprehend the reality through the interaction with the reality of the social actors to find out what the reality is behind such interactions
Research & theory	Mostly deductive	Strong inductive leaning

Another school of thought, Pragmatism, was advocated by the social researchers Charles Peirce (1839-1914), William James (1842-1910), and John Dewey (1859-1952) (Creswell & Clark, 2011; Hjørland, Sundin, & Johannisson, 2005). Pragmatism emphasises the relationship between truth and action. It asserts that beliefs can only be considered as true if the believer acts upon those beliefs (Fendt, Kaminska-Labbé, & Sachs, 2008). Fendt et al. (2008) explained that pragmatism supports the connection between action and knowledge. Moreover, it deals with the creation of valuable of knowledge and the translation of the created knowledge into action.

Pragmatism is considered as a philosophical basis for mixed method research. The proponents of pragmatism argue that positivist and interpretive approaches can be combined (Denscombe, 2008; Teddlie & Tashakkori, 2011). Hence, pragmatists employ research methodologies that are a combination of qualitative and quantitative methods based on the concept of 'what works' (Johnson & Onwuegbuzie, 2004). Therefore, for this research a 'pragmatic' view was adopted to explore the research problem under study.

4.1.2 Research Methodology

Healy and Perry (2000) explained research methodology as a systematic examination of the research problem and question through a philosophical background and application of possible techniques. From the preceding discussion, it is evident that choosing between different ontological and epistemological views would lead researchers to a different data collection approach. Hence, once the appropriate ontological and epistemological perspectives are chosen, a satisfactory methodology can be designed to acquire the data. This interrelationship is shown in Figure 4.2,

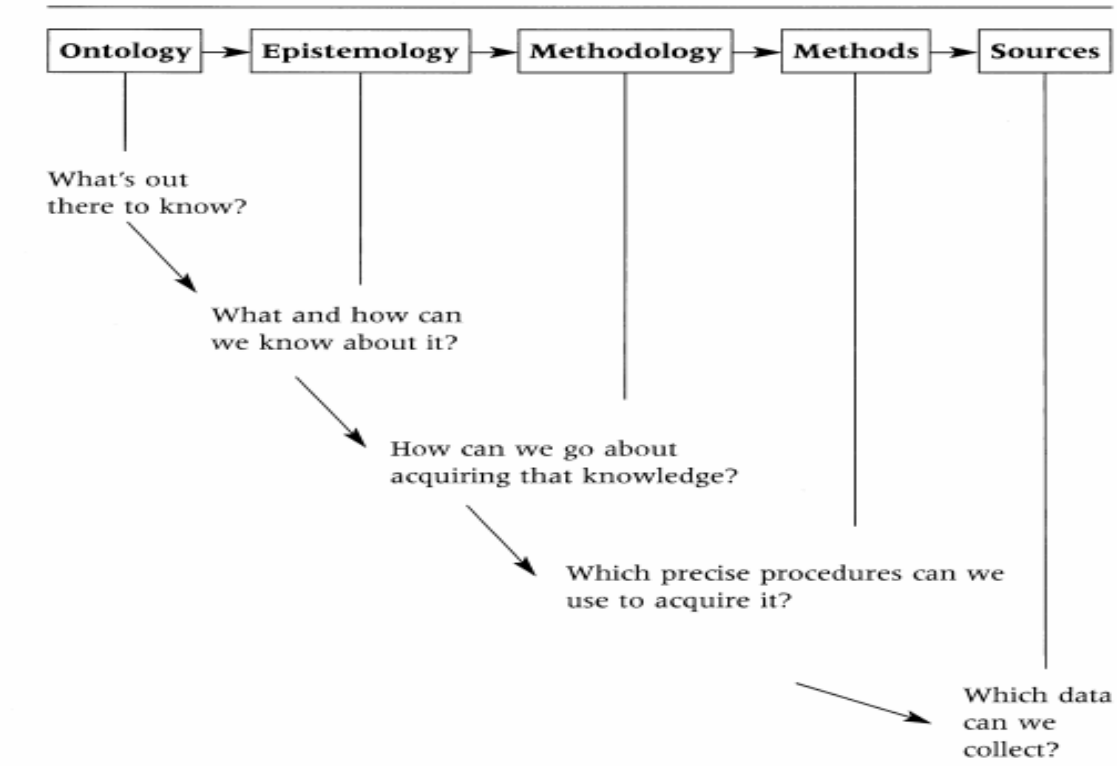

Figure 4.2: Relationship between research philosophy and methodology (adopted from Hay, 2002, p. 64).

There are three type of research methodologies; i.e., quantitative, qualitative, and mixed-methods research, the last being the one generally applied in social research (Creswell, 2014).

4.1.2.1 Quantitative Research Methodology

This methodology is more aligned to the positivist approach because it tends to capture data by different quantitative tools; for example, surveys and experiments. This data is then used to explain the social reality. Amaratunga et al. (2002) argue that the assumption of positivism is that human behaviour can be explained by certain facts, and such facts can be measured by various techniques based on deductive reasoning. The data generated from this approach can then be generalized to a larger sample of a population.

Quantitative research is primarily concerned with questions including 'how much' and 'how often' (Bernard & Bernard, 2013). The use of questionnaire surveys, testing the hypothesis and various statistical techniques for data analysis are types of quantitative research methods. A commonly adopted tool for quantitative research is the 'questionnaire survey'. In survey research, the researcher employs questionnaires in order to collect data to measure the numerical descriptions of social trends based on opinions of a sample of a population (Fowler, 2009b). Questionnaire survey can be both cross-sectional and longitudinal in nature.

However, this approach has been criticised since sometimes it gives a false sense of accuracy, and it also negates the role of people in the research phenomenon under consideration in social settings (Bell, Bryman, & Harley, 2018).

4.1.2.2 Qualitative Research Methodology

The basic rationale behind the qualitative methodologies is that reality can be accessed indirectly by studying the different social interactions of people. The qualitative approach is more aligned with interpretivism and constructionism (Greener, 2011). Qualitative researchers interact with people relevant to the research problem so as to understand the nature of the problem and to gain an in-depth understanding of the phenomenon that is the subject of the study (Bryman, 2007). Among the various 'tools' of qualitative research, some commonly used are based on 'grounded theory', (Glaser & Strauss, 1967), ethnography (Fetterman, 2010),

and case study (Yin, 2009). This approach generally is based on the inductive reasoning style, which highlights individual perceptions. Systematic literature reviews, focus group workshops, face-to-face interviews either semi- structured or structured are the common methods in qualitative research. However, qualitative methods are critiqued for their limited ability to generalise the research findings and observe phenomena in a 'simple' format, which may not always be the case in social research (Bell et al., 2018).

4.1.2.3 Mixed-Method Research Approach

Based on pragmatic school of philosophy, mixed-methods research involves combining the strengths of both quantitative and qualitative methods for data collection and analysis. The mixed-method approach allows for 'a more complete understanding of a research problem than either approach alone' (Creswell, 2014, p. 4). Mixed-methods researchers argue that the idea of separating positivism and interpretivism should be abandoned (Creswell & Clark, 2011) and that focus should be placed upon the type of research question., Table 4.3 highlights the links between different epistemologies, tools of data collection and research methods.

Table 4.3:Research methodology and epistemology linkage; adapted from Creswell (2014)

Elements	**Quantitative methods**	**Qualitative methods**	**Mixed methods**
Epistemology	Positivism	Interpretivism	Pragmatism
Strategies of inquiry	Surveys and experiments	Grounded theory, case study, ethnography etc.	Sequential, convergent, transformative
Methods	Closed-ended questions, predetermined approaches, numeric data	Open-ended questions, emerging approaches, text or image data	Both opened and closed-ended questions, both emerging and predetermined approaches, both qualitative and quantitative data and analysis
Role of the researcher	Tests or verifies theories or explanations; identifies variables to study; relates variables to questions and hypotheses; uses standards of validity and reliability; observes and measures information numerically; uses unbiased approaches; employs statistical procedures	Positions himself or herself; collects participant meaning; focuses on a single concept or phenomenon; brings personal values into the study; studies the context or settings of participants; validates the accuracy of findings; makes interpretation of data; creates an agenda for change or reform; collaborates with the participant	Collects both quantitative and qualitative data; develops a rationale for mixing; integrates the data at different stages of inquiry; presents visual pictures of the procedures in the study; employs the practices of both quantitative and qualitative research

4.1.3 Choosing specific research methods

The preceding discussion gave in insights into the pluralism of the methodological viewpoints in management research, The aim of this research is to explore the interaction between an

organisation's internal attributes like Dynamic capabilities, competitive strategies, structure, resources, business environment, and firm performance. In order to understand such a complex interaction, both qualitative and quantities research methods are required to understand the underlying interaction among the different constructs. The mixed-methods approach incorporates research paradigms and assumptions from different school of thoughts (Christ, 2009). Moreover, it is argued that CM is a discipline which incorporates the principles of both natural and social sciences; therefore, a mixed-methods approach is suited for research in this domain (Love, Holt, & Li, 2002). Therefore, a mixed-methods research methodology will be adopted for this research.

For the current study, both qualitative and quantitative methods are used independently. Similarly, both the methods receive equal priority so that a true triangulation can be achieved (Morgan, 1998). Moreover, this study adopts 'sequential timings': a quantitative phase of data collection was first performed, then qualitative strands were used to better explain the statistical results and triangulate the quantitative findings to reach a convergence. (Creswell & Clark, 2011). The rational for adopting this 'sequential timings' was based on number of factors (Creswell & Clark, 2017). First, quantitative analysis will help establish a solid foundation to fully understand the topic under study. Secondly, in the process the aim is to uncover common practices and patterns in the industry. This foundational understanding will further guide the design the qualitative phase of research; hence, the insights gained from the quantitative analysis will form a strong base to test the developed hypotheses, which will be further explored in the qualitative phase of the study. Finally, this sequence is considered both cost-effective and time-efficient, especially when dealing with the complex nature of constructs as is the case in this study. Figure 4.3 depicts the research design adopted for this study.

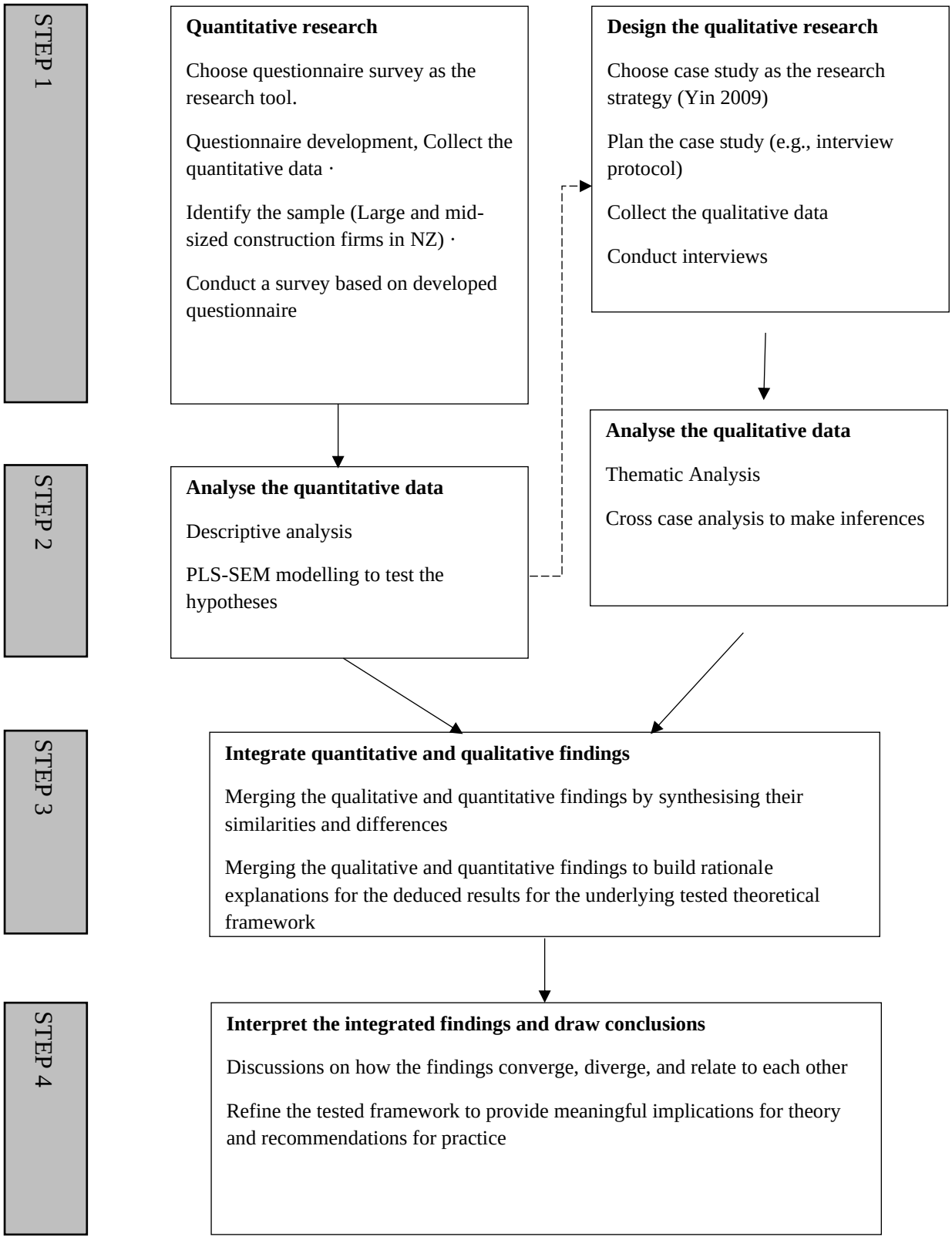

Figure 4.3: Research design for current study; adapted from Creswell & Clark (2011)

4.2 Data Collection

Data collection refers to the different tools and techniques, used to collect the data, that are relevant to the research aim, objectives and questions. In this research, mixed-methods research design is applied; hence, both qualitative and quantitative tools are used for the data collection.

4.2.1 Quantitative Method: Questionnaire Survey

For quantitative data collection, questionnaire surveys are used, which is a commonly utilised method in social research. (Blaxter, Hughes, & Tight, 2006). It is a research strategy that involves structured collection of data from a representative sample. (Saunders et al., 2009). The questionnaire design depends upon the way it is administered; for example, self-administered questionnaires are completed by the respondents. They usually have a low response rate but are comparatively cheap and allow for targeting a large population. On the other hand, face-to-face administered survey questionnaire have a better response rate and greater response accuracy, but they are very expensive and time consuming (Blaxter et al., 2006). For this study, useful information could be gathered about the NZ construction industry by asking industry participants the right questions. Generally, quantitative research by the survey involves three stages: designing the questionnaire items, choosing the target population, collecting responses from a representative sample of the population (Fowler, 2009b). These stages are discussed as below:

4.2.2 Designing a questionnaire survey

Surveys are a combination of different questions, and responses are collected from a selected population. Usually, the survey respondents are required to rate their responses on a numerical scale, which enables the researchers to quantify the data and explain the relationship between the different variables (Saunders et al., 2009). In this current research, survey questions were designed for each variable mentioned in the literature review chapter. For selected constructs

in the study, extensive literature reviews both inside and outside of the CM literature were done to find suitable measurement items. The measurement constructs along with the source literature are presented in Table 4.4. Furthermore, if no relevant measurement scale for selected construct was found, measurement items based on prior studies were developed and tested during the analysis part of the research. The following measurement items were developed from selected constructs:

4.2.2.1 Business Environment Dynamism:

Business Environment Dynamism refers to unpredictable changes faced by companies in the business environmental conditions. To measure Environment Dynamism, five items (given below) were devised based on the work of Chi (2009); Ward et al. (1995). The respondents were asked to rate their responses on a 5-point Likert Scale ranging from Strongly Agree (5) to Strongly Disagree (1). Another option of 'Don't Know' was provided so that if the respondent could not adequately answer the question, it could be skipped; any such responses could be discarded to improve the accuracy of the data (Cooper & Schindler, 2010, p. 296). All the measurement items start with a code that was used during analysis. For example, DYM1 means measurement item 1 for the construct of Dynamism.

Dynamism was measured by the following five items:

1. DYM1 Our products and services become outdated quickly.
2. DYM2 Innovation in our operational processes needs to be done frequently.
3. DYM3 Our customer needs do not change frequently.
4. DYM4 There are new challenges that keep emerging from our competitors.
5. DYM5 The rate of flow in information in our industry (e.g., related to new projects etc.) is relatively high.

4.2.2.2 Dynamic Capabilities

This research conceptualised Dynamic Capabilities as a second-order reflective formative construct. The three first-order dimensions of Sensing, Seizing and Reconfiguring form the second-order construct DC in line with the instrument developed by Wilden et al. (2013). The respondents were asked to rate their responses on a 5-point Likert Scale ranging from Strongly Agree (5) to Strongly Disagree (1). Another option of 'Don't Know' was provided, so that if the respondent could not adequately answer the question, it could be skipped; these responses could be discarded to improve the accuracy of the data.

- *Dynamic Capabilities (Second Order Construct)*: A firm's ability to reconfigure its operating routines to enable better responses to changing environments.
- *Sensing (First Order Construct):* This involves scanning, searching and exploring activities across markets for threats and opportunities.

It was measured by the following four items:

1. SEN1 Staff in our firm participate in professional development activities.
2. SEN2 We use established processes to identify target market segments, changing customer needs, and customer innovation.
3. SEN3 We do not seek best professional practice in our sector.
4. SEN4 We track economic information on our operations and operational environment.

- *Seizing:* This involves possible investments in relevant technologies that are most likely to achieve market competitiveness.

It was measured by the following four items:

1. SEZ1 We invest in finding solutions for our customers.
2. SEZ2 We adopt the best professional practices in our sector.

3. SEZ3 We respond to defects pointed out by employees.
4. SEZ4 We do not review our practices based on customer feedback.

- *Reconfiguring:* This involves recombining resources and operating capabilities to avail new opportunities.

It was measured by the following four items:

1. REC1 We implement new management strategies.
2. REC2 We implement new kinds of marketing strategies/methods.
3. REC3 We implement new type of business processes.
4. REC4 We implement new ways of achieving our firm targets.

4.2.2.3 Competitive strategy:

This study conceptualised competitive strategy as second-order reflective formative construct 'Hybrid Strategy'. Two first-order constructs, Cost Leadership and Differentiation, form the second-order construct Hybrid Strategy. Cost Leadership and Differentiation were measured using the work of Tan et al. (2012). The respondents were asked to rate their response on a 5-point Likert Scale ranging from Strongly Agree (5) to Strongly Disagree (1). Another option of 'Don't Know' was provided, so that if the respondent could not adequately answer the question, it could be skipped these responses could be discarded to improve the accuracy of the data.

- *Cost leadership*: This strategy involves providing product/services at a lower cost than competitors.

It was measured by the following four items:

1. CL1 We focus on cost reduction e.g., standardisation and economies of scale.
2. CL2 We focus on superior training of personnel.
3. CL3 We control quantity and price of labour and material.

4. CL4 We do not carefully select subcontractors and suppliers.
5. CL5 We give incentives for resource-saving.
6. CL6 We adopt technological advancements to reduce overall product price.

- *Differentiation*: This strategy involves providing product/services of better quality compared to competitors.

It was measured by the following six items:

1. DF1 We offer higher quality products compared to our competitors.
2. DF2 We offer innovative financing for faster project completion.
3. DF3 We DO NOT offer innovative procurement methods for projects (e.g. Design/Build).
4. DF4 We focus on environmentally sustainable and socially responsible practices.
5. DF5 We offer more services to our clients than our competitors.
6. DF6 Company's reputation is important to us.

4.2.2.4 Organisation Structure

For organisation structure, the dimensions of formalisation and complexity were measured using the instruments employed by Claver-Cortés et al. (2012). The respondents were asked to rate their response on a 5-point Likert Scale ranging from Strongly Agree (5) to Strongly Disagree (1). Another option of 'Don't Know' was provided, so that if the respondent could not adequately answer the question, it could be skipped any such responses could be discarded to improve the accuracy of the data.

Formalization is the degree to which formal rules and procedures govern decisions and working relationships.

It was measured by the following six items:

1. FOR1 Our firm has clearly defined rules and regulations.

2. FOR2 Our employees have documented job descriptions.
3. FOR3 Our firm is capable of ensuring compliance with rules.
4. FOR4 We have systems for evaluating our employees' performance.
5. FOR5 A code of conduct exists for our firm's employees.
6. FOR6 Our firm has no criteria for monitoring work progress.

Complexity refers to the degree of different departments/ units that exists within a firm.

It was measured by the following three items:

1. COM1 Our firm has several functional units/departments.
2. COM2 We have a number of sub-units within our main functional units/departments/ hierarchies.
3. COM3 Cross-departmental meetings are held frequently.

4.2.2.5 Resources And Capabilities

The construct of resources and capabilities was measured using human resources, financial resources and technological resources. The measurement items for these were developed using the contributions from Cheah et al. (2007); Oyewobi et al. (2019); Rush, Bessant and Hobday (2007). The respondents were asked to rate their response on a 5-point Likert Scale ranging from Strongly Agree (5) to Strongly Disagree (1). Another option of 'Don't Know' was provided, so that if the respondent could not adequately answer the question, it could be skipped; any such responses could be discarded to improve the accuracy of the data.

Financial Resources: This pertains to financial health of a firm.

It was measured by the following three items:

1. FN1 Our firm has the ability to use its own finances.
2. FN2 Our firm can secure loans to fund expansion, improve profit ratio and improve cash flow.

3. FN3 Our firm DOES NOT have the ability to secure a surety bond or insurance policy.

The human resources dimension pertains to the workforce of a firm.

They were measured using following six items:

1. HR1 Our firm has structured recruitment and job placement procedures.
2. HR2 We offer reward and offer recognition to motivate our staff.
3. HR3 We proactively develop the talents of staff in key strategic areas.
4. HR4 We try to a maintain good working relationship with trade unions.
5. HR5 In our firm, top managers and technical personnel participate in firm development activities.
6. HR6 We provide an enabling working environment to reduce employee turnover and absenteeism.

The technological dimension explores the technical resources of the firm and was measured by five following items:

1. TCH1 We carry out effective assessment of technological opportunities and market threats.
2. TCH2 Our firm invests in R & D.
3. TCH3 We integrate new technologies in our business system and processes.
4. TCH4 Our workplace environment encourages creativity and innovation.
5. TCH5 Technology is critical to our firms' business.

4.2.2.6 Firm Performance:

In the construction industry, traditional accounting and financial measures are commonly used to measure firm performance (Hawawini et al., 2003). However, these objective measures have been criticized by researchers, as they are identified as lagging indicators, i.e. they tend to give historical rather than future performance information (Kagioglou et al., 2001). Therefore, using

the contributions of Kale and Arditi (2003); Oyewobi, Windapo, Rotimi, et al. (2016); Tan et al. (2012), this study measures firms' performance using three subjective indicators, i.e., profitability, growth in market share and growth in revenue. The respondents were asked to rate their responses to the following three items on a 5-point Likert Scale.

1. PF1: How do you think your firm's profits would compare with your competitors' profits during the past three years.
2. PF2: How do you think your firm's market growth would compare with your competitors' growth during the past three years.
3. PF3: How do you think your firm's revenue would compare with your competitors during the past three years.

A total of 55 measurement items were initially selected for a pilot interview to judge their suitability for data collection in NZ construction industry.

Table 4.4:Measurement constructs and source literature

Constructs	**Literature Source**
Business Environment Dynamism	(Chi, 2009; Ward et al., 1995).
Dynamic Capabilities	(Wilden et al., 2013).
Competitive strategy:	(Tan et al., 2012)
Organisation Structure	(Claver-Cortés et al., 2012
Resources And Capabilities	(Cheah et al., 2007; Oyewobi et al., 2019; Rush et al., 2007)
Firm Performance:	(Kale & Arditi, 2003; Oyewobi, Windapo, Rotimi, et al., 2016; Tan et al., 2012),

4.2.3 Higher-order Constructs

A construct is an image or abstract idea specifically invented for a given research and/or theory-building purpose. We build constructs by combining the simpler, more concrete concepts, especially when the idea or image we intend to convey is not subject to direct observation (Cooper & Schindler, 2010, p. 55). A Higher Order Construct (HOC) is an additional level of abstraction created by combining a number of lower order constructs (LOC).

A HOC, also called a second order construct or multidimensional construct, refers to an underlying construct that is conceptualised as an abstraction of number of inter-related dimensions. HOC is generic construct that measures a higher level of abstraction and simultaneously includes several subcomponents of lower order constructs (LOC). The conceptualisation of HOC is done based upon in-depth research and literature review. Depending upon the conceptualisation by the researchers of the relation between LOC and HOC, there are four types of HOC; reflective-reflective, reflective-formative, formative-reflective, and formative-formative (Sarstedt, Hair, Cheah, Becker, & Ringle, 2019). HOCs are helpful for measuring a complex model by reducing model complexity and tackling multicollinearity issues. A number of researchers have successfully modelled and empirically tested HOCs using PLS-SEM (Becker, Klein, & Wetzels, 2012; Wetzels, Odekerken-Schröder, & Van Oppen, 2009).

This current research conceptualises both 'Dynamic Capabilities' and 'Hybrid Strategy' constructs as a second-order reflective-formative construct in line with the research objectives of the study. For the reflective-formative constructs, the LOCs that form the HOC are reflective, so the HOC (DC and HS) is formative.

4.2.3.1 Unit of Analysis:

Unit of analysis is a basic element about which the research is focused for investigation of a causal relationship (Teddlie & Tashakkori, 2009). The current study is focused upon the relationship between different organisational contingencies and the performance of construction firms in NZ. Therefore, the unit of analysis for this research is dynamic capabilities, competitive strategies, organisation structure, resources/capabilities and business environments.

4.2.3.2 Pretesting the developed questionnaire:

Pretesting was carried out to refine the questionnaire and to remove any issues for the respondents in terms of clarity, ambiguities, or questionnaire items showing double meanings. This further helps with improving the chances of internal validity and reliability of the collected data (Saunders et al., 2009). Therefore, a pilot study was conducted to pre-test the developed questionnaire. All the participants who participated in the pilot study were construction industry professionals with a minimum experience of 15 years or more (Table 4.5) and working in mid- to senior- management level positions.

Table 4.5:Interview respondents' profile

Interviewee	**Role in organisation**	**Years of experience**
A	CEO	20
B	CEO	20
C	Principle quantity surveyor	15
D	Project manager	20
E	Project manager	15

The following feedback was received for the developed questionnaire:

- Questionnaire is lengthy in terms of both i.e., number of questions and time required to complete it. Moreover, a few items need clarity/removal to better fit to the intended meaning of the constructs.
- Some of questionnaire related to large scale companies only and may not be suitable for the respondents of the small/mid-scale companies.
- Redundancy could be reduced by coupling a few of the questionnaire items.

Following the recommendation of the industry experts, all the items were rephrased during an iterative process of revising and getting feedback, until all the interviewees were satisfied with the items of the questionnaire. After a lengthy iterative process, seven items were removed from the final questionnaire (DF6, HR5, HR6, TCH4, TCH5, FOR5, FOR6). The final

questionnaire consisted of 48 items as per Appendix A[1] . Table 4.6 show number of measurement item selected after pilot interviews.

Table 4.6:Final questionnaire items

Constructs	**No. of Items**
Business Environment Dynamism	5
Dynamic Capabilities -Sensing	4
Dynamic Capabilities -Seizing	4
Dynamic Capabilities -Sensing	4
Competitive Strategy- Cost Leadership	6
Competitive Strategy- Differentiation	5
Financial Resources	3
Human Resources	4
Technical Resources	3
Organisation Structure- Formalization	4
Organisation Structure- Complexity	3
Performance	3
Deleted Items=7	Total=48

4.2.4 Data Collection:

There are multiple ways by which data can be collected for questionnaire surveys: sending the questionnaire by post, face-to-face interaction, over the phone, and using a web-based format (Fowler, 2009a). For the current study, an internet-based questionnaire survey platform – Qualtrics—was used to distribute the survey to a large target population working in construction.

The next step after finalising of the survey was to identify the target population and determine a sample size that could be considered acceptable for use in statistical software analysis. Since this study explores the relationship between multiple complex organisational variables, only large and medium size companies were considered for this research (Hoque & James, 2000).

[1] The strike through items in Appendix A represent the deleted measurement item after the pilot interview.

For this study the target companies were organised by considering how many people each company employed. This was as per recommendations of company size by Ministry of Business Innovation and Employment (2021); Page and Norman, (2014b). This method of classification led to the creation of three distinct groups:

1. **Small Companies:** These were companies with a relatively low number of employees; between 1-5 employees were categorized as "small" due to their limited workforce size.
2. **Medium-Sized Companies:** The next category comprised companies that employed between 6-20 employees. This range was termed "medium-sized" and accounted for about 34% of the total companies in the sample size.
3. **Large Companies:** The final classification included companies with a substantial workforce of over twenty employees. These were referred to as "large" companies and constituted around 65% of the companies in the dataset.

In essence, the research team classified the selected companies into these three groups based on the number of people they employed. This categorization helped researchers analyse and compare companies of different sizes and understand how they operate within the context of the study.

The target respondents were selected from the databases of the various construction industry-related platforms in New Zealand, including Master Builders (MB), The New Zealand Institute of Building (NZIOB), The New Zealand Institute of Quantity Surveyors (NZIQS), New Zealand Construction Industry Council (NZCIC), BRANZ, New Zealand Green Building Council (NZGBC), and Civil Contractors New Zealand (CCNZ). A random sampling technique was employed (Blair, Czaja, & Blair, 2013). Since it was difficult to access the size of company from these databases, a control variable, company size, was used in the

questionnaire in order to remove data collected from small size companies, if any data were collected for these firms.

After creating a database of the target population, a URL link for the survey was sent via email along with a cover letter to explain the purpose of survey in a simple language and how to complete the survey (Appendix-A). As per the Massey University Ethics committee approval No.4000021438, all the responses were collected anonymously thus ensuring no data could identify respondents or their respective companies. In the first phase of data collection around 250 emails were sent to construction firms registered in the database. Out of these 250, around 60 emails were not delivered owing to incorrect email addresses. Two reminders were sent after a gap of four weeks to encourage further participation. In addition to sending out emails, the office administration staff of NZIOB, NZIQS, NZCIC, and CCNZ were contacted. They were requested to distribute the research questionnaire survey link among their registered members. The survey link was disseminated by the administrative staff to members either directly or added to their respective websites. This approach ensured that exhaustive efforts were employed to reach the entire target population.

Initially, a total of 145 responses were received. However, only 52 responses were completed 100%; the rest of the responses were discarded. The number of responses (52) was not deemed adequate based on similar studies in CM literature (Deng & Smyth, 2013) ; therefore, the offices of construction firms were located, and the hard copies of survey were dropped off to offices based in Auckland or posted to companies outside Auckland. This exercise proved to very valuable and a further 22 responses were received. Out of those received, 10 were not complete and were discarded, thus leaving the final sample of 64 (52+12).

During the data collection process, every possible effort was made to attain the maximum participation from the target population. However, due to the relatively modest scale of the

construction industry in New Zealand and the imposition of COVID-19 restrictions during the data collection phase, achieving a substantial sample size remained unattainable. To address this limitation, the data analysis technique Partial Least Squares Structural Equation Modelling (PLS-SEM) was adopted, as elaborated further in Section 4.4.1. PLS-SEM is particularly well-suited for smaller sample sizes. Therefore, considering the small sample size (64) in the current study, PLS-SEM was deemed appropriate.

4.3 Examining the Data set

4.3.1.1 Normality Test

The normal distribution of data is a common assumption for various statistical methods employed and can influence the choice of methods that can be used for data analysis. Data normality can be tested by checking value for $z_{skewness}$ or $z_{kurtosis}$, which should be lower than 2.65 and statistically significant ($p<0.05$) (Hair, Hult, Ringle, & Sarstedt, 2016). These values were checked using the popular statistical analysis software 'SPSS' for the collected dataset.

4.3.1.2 Exploratory Factor Analysis (EFA)

To test the suitability of the data for further analysis Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy test, Bartlett's Test of Sphericity, and Exploratory Factor Analysis (EFA) are recommended (Hair, Anderson, Babin, & Black, 2010), Furthermore, Cronbach's α value of 0.7 and greater was used as a threshold to determine the instrument. KMO value of 0.5 and above is considered satisfactory, and Bartlett's Test of Sphericity needs to be statistically significant. For EFA, this research utilized Principal Component Analysis (PFA) and Varimax Rotations methods to extract factors during EFA. In order for the collected data to be suitable for further analysis, the item loading on a specific factor should be more than 0.5 and not show significant cross loading. If an item did not meet these criteria, it needs to be deleted and an iterative process continued, until there are no issues of cross loading. These were checked by using software 'SPSS'.

4.3.1.3 Control Variable:

The company demographics variables were controlled for firm size (based on No. of employees [Q1b]; Business Area [Q1c] and international business operations [Q1e]) as per the research objective stated in Chapter 2; i.e., analysis for construction firms mid-to large size, operating in NZ only and involved in core construction businesses only.

4.4 Data Analysis Methods:

4.4.1 Hypothesis Testing – PLS SEM

This research was carried out with the objective of inferring the casual relationship between a number of organisational contingencies upon the firm performance. Hence, a suitable data analysis method is required to test the hypothesised relationships. Generally, the two main hypothesis testing methods are Multiple Regression Analysis (MRA) and Structural Equation Modelling (SEM). MRA is a first generation of multivariate statistical method for analysis of multiple variables, but it has limited application in this research context due to its limitation for modelling complex relationships and constructs (e.g., second order constructs of DC and HS) and an inability to provide estimates of measurement models. The alternative, SEM, which offers a number of applications, was used in this research.

As the current study involves variables that are complex and hierarchical in nature, it is important to meet the requirements of validity and reliability before any conclusions can be drawn from the results. SEM is able to analyse complex relationships between underlying variables and its observable items through providing structural path models and measurement models. SEM combines features of factor analysis and regression analysis (Hair, Sarstedt, Pieper, & Ringle, 2012). SEM techniques are of two types: covariance-based structural equation modelling (CB-SEM) (Hair et al., 2010), and partial least squares structural equation modelling (PLS-SEM); (Chin, 2001; Hair, Hult, Ringle, & Sarstedt, 2014; Hair, Ringle, & Sarstedt, 2011).

CB-SEM works on the principles of a covariance matrix formed for constructs to minimise the differences between the observed covariance matrix (practical model) and model-implied covariance matrix (theoretical model). CB-SEM is predominantly a tool for testing theories, i.e., confirming or rejecting the theoretical models based on actual observations. Alternatively, PLS-SEM is based on the principles of variance, with the goal of maximising variance (values of R^2) of dependent constructs (endogenous constructs) as explained by independent constructs (exogenous variables). It is therefore a predictions-based tool. (Hair, Ringle, & Sarstedt, 2012).

This current study is focused on to determinants of organisational contingencies upon the firm performance; therefore, the exploratory, predictive technique PLS-SEM was deemed suitable for this research (Sarstedt, Ringle, Henseler, & Hair, 2014). Moreover, CB-SEM has a requirement of a large sample size (more than 100) for simple structural models and up to 500 for complex structural models (Hair et al., 2010). However, PLS-SEM is suitable for small sample sizes and complex models (Sarstedt et al., 2014). Therefore, considering the small sample size (64) in the current study, PLS-SEM was considered more suitable. Another reason for selecting PLS-SEM is its ability to handle both reflective and formative constructs in the same structural model and higher order constructs (HOC) (Sarstedt et al., 2019). This research involves HOCs as well as both reflective and formative constructs. Finally, considering some issues for non-normality for the data set, PLS-SEM was deemed suitable as it employs non-parametric methods like bootstrapping for model estimation and works well with non-normal distributed data as well (Chin, 2001; Hair et al., 2011).

4.4.2 PLS-SEM Working and Bootstrapping Methodology:

PLS-SEM is a prediction based, variance-oriented multivariate technique assuming flexible distributions of normality, and employing a series of Ordinary Least Square regressions suitable for small sample size (Hair, Sarstedt, et al., 2012). PLS-SEM works in two stages. In

the first stage, the latent variable (LV) score is determined through iterative estimation, and afterwards the ordinary least squares (OLS) method is employed for each regression in order to estimate the path coefficient (Hair, Hult, et al., 2014; Lee, Petter, Fayard, & Robinson, 2011). The LV score is estimated using an iterative process, where proxy values of LV in the model are calculated using original values of observed items. These proxy values are then used to determine path coefficient among LVs using regression or correlations (called inner weights). Using these inner weights, or path coefficients, new proxies of LV scores are determined using a linear combination of initial proxies of LVs. In the second stage, the loading between each LV and observable indicators (called outer weights) are calculated by utilising proxies of LV scores through regression or correlation. This continues as an iterative process, which continues until the sum of outer weights between two iterations is at a range of 10^{-5} (Hair et al., 2011). The final LV score in the last iterative process is used to perform the partial OLS regression to determine the final path coefficient or outer loads.

The algorithm explained above produces two separate models or set of values called the measurement model and structural model. The measurement model, also called the outer model, depicts the relationship between LVs and their observable items or indicators. The values from measurement models are used to analyse construct reliability and validity. The structural model, or inner model or path model, determines the path coefficients of hypothesised relationships between LVs, and the values of path coefficient show the predictive strength of exogenous constructs.

In addition to values of path coefficients, the significance of these paths is also critical, which is estimated through a non-parametric procedure called bootstrapping (Efron, 1979). In bootstrapping a large number of subsamples are randomly drawn from the original sample to create multiple simulated samples. The same PLS algorithm estimates the parameter of each drawn sample to create distribution for each model parameter. Student t-test is usually applied

to measure significance of the path coefficient and to check the confidence interval. The bootstrapping algorithm therefore can also efficiently handle a non-normally distributed database.

The software package, ‘Smart PLS’, was used to apply PLS-SEM techniques to test the hypothesized causal relationships in Chapter 3 (Ringle, Wende, & Becker, 2015). A two-step procedure was adopted in Smart PLS for validating the hypothesised models. First, the measurement model was checked for the validity and reliability of the constructs. Afterwards, the structural model (path coefficients) was analysed for hypotheses validation. The path models as per Hypothesis for conceptual models formulated for this study, were created using Smart PLS to connect the indicators, LOC and HOC, as per the logic already discussed in previous chapters.

4.4.2.1 Measurement Model Assessment:

There are generally two types of constructs, Formative constructs and Reflective constructs, and associated measurement models. For a reflective construct and measurement model, the observable items depict the effects of underlying latent variables. In order words, the LV is manifested in the form of associated observable indicators. In contrast, in the formative measurement model, the observable indicators form the underlying construct. Table 4.7 briefly explains the difference between the types of constructs.

Table 4.7:Reflective and Formative Measurement Model; adapted from Hair, Hult, et al. (2014)

Features	**Reflective construct**	**Formative construct**
Concept	The underlying construct causes observable items or indicators	Observable items or indicators formatively cause the underlying construct
Measurement Models Assessments in PLS-SEM	Composite Reliability • Indicator reliability: *loadings* • Convergent validity: average variance extracted (AVE) • Discriminant validity: Fornell-Larcker criterion; cross-loadings	Convergent validity: • Redundancy analysis • Multicollinearity: value inflation factor (VIF) • Significance and relevance of *weights*

The choice of conceptualising a construct as reflective or formative depends upon the researcher and the type of Latent Variable. For the current study, all first order constructs were conceptualised as reflective constructs. In order to validate reflective construct reliability and validity, the literature suggests tests for indicator reliability, internal consistency, convergent validity and discriminant validity (Straub, Boudreau, & Gefen, 2004).

1. Indicator Reliability captures how much is common among the observable indicators, which represent the underlying constructs (Hair, Hult, Ringle, & Sarstedt, 2021; Urbach & Ahlemann, 2010). The factor loadings of indicators determine indicator reliability on the associated construct. A value of 0.5-0.7 is considered to be satisfactory (Hair et al., 2021).
2. The internal consistency gauges the degree to which the observable indicators measure the underlying construct, in line with the objective of the research (Urbach & Ahlemann, 2010). Composite reliability (CR) and Cronbach's alpha are used in the literature to measure the internal constituency of the constructs. However, CR provides more efficient results, as it

takes care of different outer weights and considers the reliabilities of indicators without underestimation (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). Acceptable values for CR range between 0.6 to 0.7 for explanatory studies (Hair et al., 2021).

3. Convergent validity determines the level of convergence of indicators onto a single construct. It is estimated by using Average Variance Extracted (AVE) (Gregory, 2004). AVE shows the amount of variance a construct obtains from its indicators compared to variance from the measurement error (Fornell & Larcker, 1981; Urbach & Ahlemann, 2010). AVE is the mean value of squared loadings of indicators onto the construct. AVE value 0.5 (50% variance extracted) and higher is regarded as satisfactory (Fornell & Larcker, 1981).
4. Discriminant validity measures the degree of dissimilarity between different constructs in the model (Hair et al., 2021). The most commonly used measures of discriminant validity are cross-loading and Fornell-Larcker's criterion (Hair et al., 2021). When applying the cross-loading criteria, the main loading of an indicator on the associated construct should be higher than all of its cross-loadings on other constructs. Fornell-Larcker's criterion states that the square root of the AVE of a construct should be higher than its correlation with other latent constructs (Fornell & Larcker, 1981).

When all these criteria are met, the measurement model is deemed as reliable and valid.

The formative measurement model is as per the following criteria (Hair, Hult, et al., 2014):

- The degree to which measurement items are collinear. Value Inflation Factor (VIF) should be less than 5.
- The path coefficient from observable item to main construct is relevant and significant ($p<0.05$).
- Convergent Validity by redundancy analysis.

4.4.2.2 Assessment of Structural Model

After the validation of the measurement model, analysis of structural model is carried out. The structural model can be examined using following approach (Hair, Hult, et al., 2014):

1. Depending on the number of exogenous constructs, collinearity of the model needs to be determined. This is usually done by checking the value inflation factor (VIF). Value of VIF above 5.0 is an indication of collinearity; therefore, a VIF value of less than 5 is preferred.
2. Afterwards, the 'significance' of path coefficient between the hypothesised paths in models is checked. A value of the path coefficient of at least 0.1 and ($p<0.05$) is recommended to impact the models under consideration (Hair et al., 2011; Wetzels et al., 2009).
3. PLS-SEM maximises the variance of endogenous constructs, explained by exogenous constructs; therefore, the value of the coefficient of determination (R^2) estimates the predictive accuracy of the model.

The software package 'Smart PLS' was used to apply PLS-SEM techniques to test the hypothesised causal relationships (Ringle et al., 2015). A two-step procedure was adopted in Smart PLS for validating the hypothesised models. First, the measurement model was checked for the validity and reliability of the constructs. Subsequently, the Structural model (path coefficients) was analysed for hypotheses validation.

4.4.3 Moderation and Mediation

The concept of moderation is that the magnitude of the effect of variable A on B depends upon a third moderator variable (C) as depicted in Figure 4.4 and Figure 4.5 (Aguinis et al., 2017). In the context of this research, this means that how strongly organisational internal attributes influence firm performance depends upon (or not) on a third variable (business dynamism).

A moderation test was run using Smart PLS software. PLS-SEM analyses moderation effects by creating a new interaction term between variables under analysis and after that, estimating the statistical significance of the path coefficient of the interaction term on the dependent variable (Hair, Matthews, Matthews, & Sarstedt, 2017).

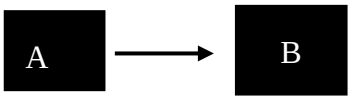

Figure 4.4:No Moderation

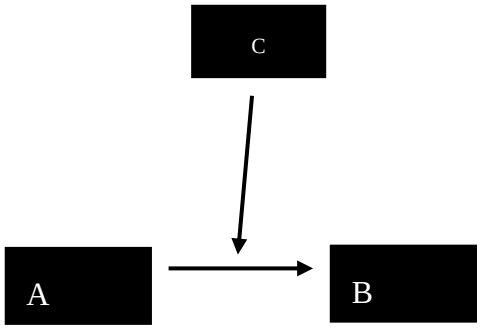

Figure 4.5: Moderation

The mediation property of a variable means that it transmits the effect of the antecedent variable and its consequent variable either in part or whole. This is shown in Figure 4.6. A is affecting B directly through path a' and indirectly through mediating variable C, through paths a and b. The magnitude of this indirect effect is the product of a and b, of A on B. When a*b ≠ 0 and a'=0, it is termed a full mediated model, while when ab ≠ 0 and a'≠0, it is understood to be partial mediation (Aguinis et al., 2017).

For analysing the mediating role of 'Hybrid Strategy' in relation between Organisation Structure and Performance, an 'extended repeated indicator approach', was adopted to analyse the mediating role of second order constructs (Sarstedt et al., 2019).

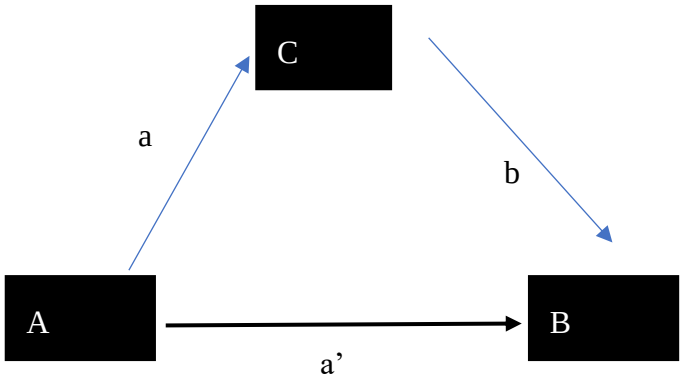

Figure 4.6:Mediation

4.4.4 Limitations of PLS-SEM:

PLS-SEM has several advantages, but with some accompanying limitations as well:

1. As it is statistical predictive tool, omission of any other potential predictive variable may reduce the predictive power of the model.
2. It cannot model a circular relationship of variables; hence, the cause-and-effect relationships tested are based on researcher reasoning of the theoretical model and rationalisation.
3. It has limited application to theory testing (Sarstedt et al., 2014).

Therefore, other research methodologies needed to be applied in addition to PLS-SEM to determine the causality of including field studies, interviews, etc to further complement the

findings of PLS-SEM. The next section explains the qualitative methods adopted to complement the findings of PLS-SEM.

4.5 Qualitative Methods: Case Studies

In order to complement the results from quantitative data analysis, a qualitative approach was also adopted. This involved three case studies for construction firms operating in NZ. This section explains the design of the case studies, data collection and analysis.

4.5.1 Case Study Design:

There are certain factors that need to considered when designing a case study, mainly defining the boundary and unit of analysis of the studies (Yin, 2009). For the current research, the boundaries of the case studies considered lies within the conceptual models described in Chapter 3.

Three case studies were considered adequate to validate the findings from the quantitative data, and to give further context for the results obtained from the quantitative data, thus aiding in providing a more robust explanation of the results (Eisenhardt & Graebner, 2007). The main criteria for sampling the case study were (1) medium- to large- sized company (2) have a formal organisation structure, vision and strategic vision. Access to potential case study companies was done through contacts and references developed during data collection from the questionnaire survey. Two sources of data were considered for the case studies (1) semi-structured interview, (2) document analysis. This ensures that there exists converging lines of evidence (Yin, 2009).

Among the identified senior managers of the potential companies, ten senior managers were contacted; however, only three agreed to an interview. All the three interviewees were working in a top management position dealing with strategic decision making within the firms. Moreover, each of these interviewees was either CEO of the firm or independently heading a

separate business unit within a firm. Taking into account the profile of the interview respondents and the nature of their job descriptions, as well as the inclusion of sensitive questions such as inquiries about financial performance and business strategies of a firm, it was considered appropriate to conduct interviews with one respondent per organisation. Therefore, considering the small size of NZ construction industry, three case studies were deemed satisfactory for the current study. The potential interviewees met the theoretical sampling criteria of Yin (2009) as the organisational contexts of the selected firms were different. Company A is large international contractor, Company B is national contractor working in NZ only and Company C is a mid-level regional contractor. Details of each company are shown in Table 4.8

Table 4.8:Case study firm's profile

Organisation's Code	Nature of Organisation	Number of years in	Number Employees	Position of the Interviewee	Business Area
A	National	40	2100	Senior Structural Engineer'	Contractor: Infrastructure
B	National	30	1000	Principal Partner (Technical)	Contractor: Transportation, Wastewater
C	Regional	15	290	Chief Executive Officer	Contractor: Residential and social housing

4.5.2 Data Collection-Case Study:

Semi-structured face-to-face interviews and document analysis were performed to obtain relevant data from the target organisations. An interview template was designed (Appendix-B) to be followed through. The interview questions allowed for open-ended responses. This style of interview allows respondents to contribute detailed information and provides the researcher with the opportunity to ask probing questions for follow-up and clarity (Turner, 2010). The main challenge of working with semi-structured interviews is coding the data; however, the advantages outweigh the disadvantages.

The main objective of this phase was to achieve an in-depth knowledge of the workings of organisational internal attributes, the business environment and influence on the firm's performance. Interview questions were designed to ensure the respondents were asked the same basic questions. Three interviews were conducted, each taking an average of 45 minutes. The questionnaire consisted of four sections. The first part asked the interviewee about their background information, their firm and other relevant data of interest to the researcher. The other sections asked specific questions as per the research objectives (Appendix-B). All the interviews were anonymously recorded and were later transcribed. The transcriptions were then

used to identify the main themes and sub-themes. A codebook was used for transcript analysis. Microsoft Excel was used to assist in coding and unifying the main themes and sub-themes.

4.5.3 Document analysis

To further strengthen the results of case study, document analysis of each selected firm was performed. Documents analysed for the case studies included organisation mission statements, and annual reports. Financial information was also sought but could not be obtained due to company's confidentiality requirements. However, upon condition of confidentiality, strategic documents like firms' objectives, strategic plans, organisation structures and decision-making structures were provided and were analysed. This study therefore relied on this internal documentation, and face-to-face interviews for case study analysis.

4.6 Qualitative Data Analysis:

Madill and Gough (2008) suggested techniques for qualitative data analysis: discursive, thematic, structured, and instrumental. This study used thematic analysis which consists of five steps or phases; namely, bracketing and phenomenological reduction; delineating units of meaning; clustering together units of meaning to form themes; summarising each interview, validating and if necessary, modifying it with thematic analysis; and extracting general and unique themes from the interviews and finally making a composite summary. Microsoft Excel was used as a qualitative data analysis tool as it is capable of handling large amounts of data, meaningful organisation of data, and allows for a variety of display techniques (Meyer & Avery, 2009). The interview transcripts were coded using Excel with each row defining a codable unit and each column defining an attribute of that unit. Coding provides the interpretation of the issues to be derived from the interviews (Blismas & Dainty, 2003), which was goal of this process.

In analysing qualitative data, a balance needs to be achieved between being immersed in the complexity of data on the one hand and indulging in the tactical reduction of data on the other hand (Richards, 1999). Therefore, after initial coding further themes were explored. The identified themes were then reviewed, described, and named following Bowen, Edwards and Cattell (2012). The final thematic framework is shown in Table 6.1.

4.7 Validity and reliability of this study

Generally, there are four criteria for verifying research validity and reliability (Jack & Raturi, 2006; Modell, 2005; Scandura & Williams, 2000).

1. Construct Validity, which refers to whether the operational definitions clearly express the theoretical conceptualisation and measures of empirical phenomenon.
2. Internal Validity, which confirms whether or not the causal relationships between the independent and dependent variables are credible.
3. External Validity, which refers to the degree to which a study can be generalised over a large population.
4. Reliability refers to the extent similar results can be obtained if the same research procedures are repeated.

The first three criteria are crucial for overall qualitative and quantitative research, as highlighted by Jack and Raturi (2006); Modell, (2005), while reliability is particularly important for case studies (Yin, 2009).

Table 4.9 illustrates the strategies adopted to ensure the validity and reliability of results for the study.

Table 4.9:Validity and Reliability Criteria

Criteria	**Questionnaire survey**	**Multiple-case study**
Construct validity (and reliability)	Development of constructs based on literature. Adaptation of prior measurement scales. Pretesting the questionnaire. Internal consistency, reliability tests and other validity tests as suggested in the literature	Collect multiple sources of data. Establish a chain of evidence
Internal validity	Theory-driven explanation of results of hypotheses	Do pattern matching. Do explanation building.
External validity (generalisation of findings)	Random sampling.	Compare and contrast cases (replication)
Reliability (trustworthiness of methodology)	Not Applicable	Use case study protocol. Develop case study database

As explained previous sections, multiple strategies were adopted for construct reliability and validity:

- All constructs were conceptualised from the existing literature.
- All measurement scales were adopted from prior studies.
- In the pilot testing phase, expert opinion was sought to ensure relevance to the construction industry.
- Statistical tests like internal consistency tests, reliability test, convergent validity test and discriminant validity test were performed on the collected data. (Sections 4.4.2.1 and 4.4.2.2).
- The results obtained were explained to form holistic reasoning based on prior literature and theories ensuring the internal validity. From example the basis of Conceptual Model 1 was from Dynamic Capability View theory (explained in Section 2.3.1.3) and the results

of structural model were explained based on prior literature as detailed in Section 5.2.3. A similar approach was followed for other conceptual models and case study analysis.

- Random sampling was performed to ensure external validity by sending out questionnaire surveys randomly to construction firms in NZ.

For the qualitative phase, the recommendations of Yin (2009) were adopted for validity and reliability. Internal validity, pattern matching, and explanation building were adopted as the main techniques for analysis. For external validity, the case study results were tabulated, compared and differences in patterns were explained for the generalisation of the findings.

Given the extensive efforts applied for validity and reliability of both quantitative and qualitative methods, it is reasonably assumed that the mixed-method research design has satisfied the validity and reliability criteria; hence, the conclusions drawn can be considered valid and reliable.

4.8 Chapter summary

This chapter explained the research design adopted for this study. The major components starting from epistemologies, methodological approaches and research methods were explained in depth. It was stated that the research questions should dictate the selection of appropriate research methods as advocated by pragmatism epistemology. Given the complexity of the phenomenon under study, a mixed method of research was adopted (Creswell & Clark, 2011; Morgan, 2007). It was therefore assumed that both qualitative and quantitative data methods using triangulation, explanation, theoretical rationalisation of the results obtained would help answer the research questions. Rationale for quantitative research design, which encompassed design of the questionnaire survey, pilot testing, construct formulation, data collection and selection of PLS-SEM for data analysis was provided. For the qualitative approach, the research design of multiple case studies, data collection and analysis were explained.

Additionally, the strategies to maintain validity and reliability of the study were explained and justified.

5 Chapter 5: Results and Discussion

This chapter covers the results for the analysis of the quantitative research based on the data coming from the questionnaire survey undertaken for the NZ construction industry. The initial analysis of the data (Normality, Reliability Tests and Exploratory Factor Analysis) is presented to check the quality of data for final hypothesis testing. Afterwards, the results from the three structural models in PLS-SEM for the conceptual models stated in Chapter 3 are presented. These cover the (i) Influence of Dynamic Capabilities on Performance and the role of Business Dynamism, (ii) Impact of the Organisation Structure' and 'Hybrid strategies' on Performance and (iii) Interaction of Resources & Capabilities, Competitive Strategies and Performance. The findings are rationalised and discussed in light of the existing literature, and, finally, practical implications are presented.

5.1 Examining the Data set

5.1.1 Normality Test

Out of 48 survey items, the data for 7 items, amounting to 14.5% of data (Table 5.1), showed a non-normal distribution with $z_{skewness}$ or $z_{kurtosis}$ values higher than 2.65 ($p<0.05$) (Hair et al., 2010),. Therefore, it is assumed that the collected data do not have a major issue of non-normality and could be further used for analysis.

Table 5.1:Normality test results

Constructs	**Total Item**
Environmental Dynamism	2
Cost Leadership	1
Differentiation	1
Technological Resources	2
Formalisation	1
Total	7
Total Survey Items	48
Non-Normal Item Percentage	(7/48*100) = 14.5%

5.1.2 Exploratory factor analysis (EFA)

5.1.3 Business Environment Dynamism

For Business Environmental Dynamism, the initial EFA showed that DYM5 significantly cross loaded on DYM2 and DYM3, so it was deleted. Afterwards, EFA analysis of remaining items did not show any significant cross loading. KMO Measure of Sampling Adequacy is acceptable (=0.51), and Bartlett's Test is statistically significant (p=0.003) (Table 5.2). Cronbach'α is 0.859, showing satisfactory internal consistency. Hence, DYM1, DYM2, DYM3 and DYM4 were retained for final analysis.

Table 5.2:EFA values for Business Environment Dynamism

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.51
DYM1	0.888		Bartlett's Test Significance	0.003
DYM2	0.873	0.11	Cronbach's Alpha	0.745
DYM3	0.837			
DYM4	0.739	0.39		

5.1.4 Dynamic Capabilities

This research conceptualised Dynamic Capabilities as a second-order reflective formative construct. Three first-order dimensions of Sensing, Seizing and Reconfiguring form the second-order construct of DC.

The EFA showed satisfactory loading for the 'Sensing' dimension with no significant cross loading. KMO Measure of Sampling Adequacy is acceptable (=0.629), and Bartlett's Test is statistically significant (p=0.092). Cronbach'α is 0.702, showing satisfactory internal consistency. SEN1, SEN2, SEM3, and SEN4 were retained for final analysis. (Table 5.3)

Table 5.3: EFA values for Sensing

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.629
SEN1	0.753		Bartlett's Test Significance	0.092
SEN2	0.726		Cronbach's Alpha	0.702
SEN3	0.633			
SEN4	0.785			

The EFA showed satisfactory loading for the Seizing dimension with no significant cross loading. KMO Measure of Sampling Adequacy is acceptable (=0.573), and Bartlett's Test is statistically significant (p=0.001). Cronbach'α is 0.822, showing satisfactory internal consistency. SEN1, SEN2, SEM3, and SEN4 were retained for final analysis.

Table 5.4: EFA values for Seizing

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.573
SZE1	0.952	-	Bartlett's Test Significance	0.001
SZE2	0.863	-	Cronbach's Alpha	0.822
SZE3	0.942	0.193		
SZE4	0.96	0.106		

The EFA showed satisfactory loading for the Reconfiguring dimensions with no significant cross loading. KMO Measure of Sampling Adequacy is acceptable (=0.545), and Bartlett's Test is statistically significant (p=0.0). Cronbach'α is 0.911, showing satisfactory internal consistency. REC1, REC2, REC3, and REC4 were retained for final analysis.

Table 5.5:EFA value for Reconfiguring

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.545
REC1	0.909	-	Bartlett's Test Significance	0.00
REC2	0.845	-	Cronbach's Alpha	0.911
REC3	0.934	-		
REC4	0.915	-		

5.1.5 Competitive Strategy

This study conceptualised competitive strategy as second-order reflective formative construct 'Hybrid Strategy. Two first-order constructs i.e., Cost Leadership and Differentiation form the second-order construct of Hybrid Strategy.

For 'Cost Leadership', the initial EFA showed that CL5 significantly cross loaded on CL3, CL1 and CL6 and Cronbach's α was 0.389. Hence, CL5 was deleted. Afterwards, EFA analysis of remaining items did not show any significant cross loading. KMO Measure of Sampling Adequacy is acceptable (0.501), and Bartlett's Test is statistically significant (p=0.001). Cronbach'α is 0.771, showing satisfactory internal consistency. CL1, CL2, CL3, CL4 and CL6 were retained for final analysis.

Table 5.6: EFA values for Cost Leadership

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.501
CL1	0.917		Bartlett's Test Significance	0.001
CL2	0.904	0.209	Cronbach's Alpha	0.771
CL3	0.867	0.324		
CL4	0.707	0.227		
CL6	0.799			

For 'Differentiation', the initial EFA showed that DF5 significantly cross loaded on all other items and Cronbach's α was 0.58. Hence DF5 was deleted. Afterwards EFA analysis of

remaining items did not show any significant cross loading. KMO Measure of Sampling Adequacy is acceptable (=0.575), and Bartlett's Test is statistically significant (p=0.057). Cronbach'α is 0.694 (although slightly low, it is still acceptable considering other parameters), showing satisfactory internal consistency. DF1, DF2, DF3 and DF4 were retained for final analysis.

Table 5.7: EFA values for Differentiation

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.575
DF1	0.901		Bartlett's Test Significance	0.057
DF2	0.821	0.314	Cronbach's Alpha	0.694
DF3	0.879			
DF4	0.78			

5.1.6 Organisation Structure

For organisation structure, the dimensions of Formalisation and Complexity were used. For Formalisation, the initial EFA showed that FOR3 significantly cross loaded on FOR1 and FOR4, so it was deleted. Afterwards, EFA analysis of remaining items did not show any significant cross loading. KMO Measure of Sampling Adequacy is acceptable (=0.636), and Bartlett's Test is statistically significant (p=0.003). Cronbach'α is 0.808, showing satisfactory internal consistency. FOR1, FOR2, and FOR4 were retained for final analysis.

Table 5.8: EFA value for Formalisation

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.636
FOR1	0.695		Bartlett's Test Significance	0.003
FOR2	0.84		Cronbach's Alpha	0.808
FOR4	0.73			

For Complexity, the EFA showed satisfactory loading for the Complexity dimensions with no significant cross loading. KMO Measure of Sampling Adequacy is acceptable (=0.515), and Bartlett's Test is statistically significant (p=0). Cronbach'α is 0.774, showing satisfactory internal consistency. COM1, COM2, and COM3 were retained for final analysis.

Table 5.9: EFA values for Complexity

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.515
COM1	0.937		Bartlett's Test Significance	0.00
COM2	0.963		Cronbach's Alpha	
COM3	0.53			0.774

5.1.7 Resources And Capabilities

The construct Of Resources and Capabilities were measured using Human Resources, Financial Resources and Technological Resources.

The EFA showed satisfactory loading for the Financial Resource, with no significant cross loading. KMO Measure of Sampling Adequacy is acceptable (=0.546), and Bartlett's Test is statistically significant (p=0.01). Cronbach'α is 0.718, showing satisfactory internal consistency. FN1, FN2, and FN3 were retained for final analysis.

Table 5.10: EFA Values for Financial Resources

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.546
FN1	0.916		Bartlett's Test Significance	0.01
FN2	0.812		Cronbach's Alpha	
FN3	0.696			
				0.718

The EFA showed satisfactory loading for the Human Resources dimensions with no significant cross loading. Although HR2 was slightly cross loaded, it was still the retained considering other parameters were satisfied. KMO Measure of Sampling Adequacy is acceptable (=0.55), and Bartlett's Test is statistically significant (p=0.0). Cronbach'α is 0.723, showing satisfactory internal consistency. HR1, HR2, HR3, and HR4 were retained for final analysis.

Table 5.11: EFA values for Human Resources

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.55
HR1	0.929		Bartlett's Test Significance	0.0
HR2	0.807	0.496	Cronbach's Alpha	0.723
HR3	0.672	0.277		
HR4	0.963	0.124		

The EFA showed satisfactory loading for the Technological Resources dimensions with no significant cross loading. KMO Measure of Sampling Adequacy is acceptable (=0.645), and Bartlett's Test is statistically significant (p=0.0). Cronbach'α is 0.734, showing satisfactory internal consistency. TCH1, TCH2 and TCH3 were retained for final analysis.

Table 5.12: EFA values for Technological resource

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.645
TCH1	0.771	0.423	Bartlett's Test Significance	0.0
TCH2	0.841	0.185	Cronbach's Alpha	0.734
TCH3	0.848	0.183		

5.1.8 Firm Performance:

The EFA showed satisfactory loading for the Performance Construct with no significant cross loading. KMO Measure of Sampling Adequacy is acceptable (=0.782), and Bartlett's Test is

statistically significant (p=0.03). Cronbach'α is 0.866, showing satisfactory internal consistency. PF1, PF2 and PF3 were retained for final analysis.

Table 5.13: EFA values for Performance

Items	Loadings			
	Component 1	Component 2	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	0.782
PF1	0.584	-	Bartlett's Test Significance	0.03
PF2	0.772	-	Cronbach's Alpha	0.866
PF3	0.782	0.12		

A total of 4 items, (DYM5, CL5, DF5, FOR3) were deleted during this step. Hence a total of 44 measurement items were retained for final analysis.

5.2 Conceptual Model 1: Impact of Dynamic Capabilities on Construction Firm Performance. The Moderating Role of Environmental Dynamism

This section presents the results and discussion on role of Dynamic Capabilities (DC) and performance, and testing the 'moderating role' of Environmental Dynamism as per the hypotheses stated in Chapter 3:

H1: DC positively and significantly influences construction firm performance.

H2: Environmental Dynamism acts as a moderator in the relationship between DC and construction firms' performance.

Partial Least Squares – Structural Equation Modelling (PLS-SEM) technique was selected for the current study. The statistical software, Smart PLS, was used to apply PLS-SEM techniques to test the hypothesised causal relationships in the research model (Ringle et al., 2015) A two-step procedure was adopted in Smart PLS for evaluating and validating the hypothesised models. First, the measurement model was validated to check for the validity and reliability of the constructs. Second, the Structural model was analysed for hypotheses testing. A moderation test was also run using Smart PLS software.

5.2.1 Results and Analysis

5.2.1.1 Construct Reliability and Validity:

To validate the measurement model, construct reliability and validity was conducted using tests for indicator reliability, internal consistency, convergent validity and discriminant validity (Straub et al., 2004). Indicator Reliability captures how much is common among the observable indicators, which represent the underlying constructs (Hair et al., 2021; Urbach & Ahlemann, 2010). The factor loadings of indicators determine indicator reliability on the associated construct. A value of 0.5-0.7 and higher is considered satisfactory (Hair et al., 2021). The value of factor loadings of all measurement items is in the range of 0.712 to 0.929 (Table 5.14), indicating satisfactory indicator reliability.

Internal consistency gauges the degree to which the observable indicators measure the underlying construct, in line with the objective of the research (Urbach & Ahlemann, 2010). Composite reliability (CR) and Cronbach's alpha are used in the literature to measure the internal constituency of constructs. However, CR provides more efficient results, as it takes care of different outer weights and considers the reliabilities of indicators without underestimation (Hair, Sarstedt, et al., 2014). Acceptable values for CR range between 0.6 to 0.7 for explanatory studies (Hair et al., 2021). All of the values of CR for the current study are in the range of 0.872 - 0.946 (Table 5.14), indicating high internal consistency.

Convergent validity determines the level of convergence of indicators into a single construct. It is estimated by using Average Variance Extracted (AVE) (Gregory, 2004). AVE shows the amount of variance a construct obtains from its indicators compared to variance from the measurement error (Fornell & Larcker, 1981; Urbach & Ahlemann, 2010). AVE is the mean value of squared loadings of indicators onto the construct. AVE value 0.5 (50% variance extracted) and higher is regarded as satisfactory (Fornell & Larcker, 1981). The AVE of all

the constructs is in the range of 0.631 to 0.853 (Table 5.14), therefore convergent validity of the model is satisfactory.

Table 5.14: Conceptual Model 1 - Construct Reliability and Validity values

Items	**Factor Loadings**	**Composite Reliability (CR)**	**Average Variance Extracted (AVE)**
Sensing (reflective)		0.913	0.724
SEN1	0.821		
SEN2	0.862		
SEN3	0.843		
SEN4	0.877		
Seizing (reflective)		0.922	0.747
SZE1	0.84		
SZE2	0.811		
SZE3	0.882		
SZE4	0.92		
Reconfiguring (reflective)		0.891	0.673
REC1	0.803		
REC2	0.712		
REC3	0.873		
REC4	0.882		
Environmental Dynamism		0.872	0.631
DYM1	0.852		
DYM2	0.766		
DYM3	0.748		
DYM4	0.806		
Performance (In past three years)		0.946	0.853
PRF1	0.929		
PRF2	0.928		
PRF3	0.914		

Discriminant validity measures the degree of dissimilarity between different constructs in the model (Hair et al., 2021). The most commonly used measures of discriminant validity are i)- cross-loading and ii)- Fornell-Larcker's criterion (Hair et al., 2021). When applying the cross-loading criteria, the main loading of an indicator on the associated construct should be higher than all of its cross-loadings on other constructs. This is satisfied for the current study, as there are no issues of high cross-loadings (Table 5.15)

Table 5.15: Conceptual Model1- Discriminant Validity results

	Sensing	**Seizing**	**Reconfiguring**	**Environment Dynamism**	**Performance**
SEN1	**0.821**	0.05	0.594	0.159	0.086
SEN2	**0.862**	0.193	0.586	-0.004	0.037
SEN3	**0.843**	0.132	0.602	-0.01	0.168
SEN4	**0.877**	0.383	0.673	-0.089	0.267
SZE1	0.19	**0.84**	0.264	0.111	0.112
SZE2	0.218	**0.811**	0.266	0.053	0.082
SZE3	0.177	**0.882**	0.421	0.061	0.274
SZE4	0.229	**0.92**	0.396	0.166	0.22
REC1	0.487	0.246	**0.803**	-0.126	0.573
REC2	0.518	0.249	**0.712**	0.21	0.349
REC3	0.649	0.357	**0.873**	-0.1	0.449
REC4	0.697	0.421	**0.882**	-0.144	0.43
DYM1	0.01	0.123	-0.048	**0.852**	-0.372
DYM2	0.046	0.088	-0.023	**0.766**	-0.314
DYM3	-0.026	0.163	-0.039	**0.748**	-0.222
DYM4	-0.01	0.03	-0.073	**0.806**	-0.415
PRF1	0.168	0.153	0.502	-0.421	**0.929**
PRF2	0.144	0.16	0.501	-0.42	**0.928**
PRF3	0.161	0.256	0.51	-0.359	**0.914**

Fornell-Larcker's criterion states that the square root of the AVE of a construct should be higher than its correlation with other latent constructs (Fornell & Larcker, 1981). All the constructs fulfil the criteria, as the value of all the diagonal elements (square root of AVE) in Table 5.16 is higher than off-diagonal values, showing there is satisfactory discriminant validity.

Table 5.16: Conceptual Model 1- Fornell-Larcker's results

	AVE	Environment Dynamism	Performance	Reconfiguring	Seizing	Sensing
Environment Dynamism	0.631	**0.794**				
Performance	0.853	-0.434	**0.924**			
	AVE	**Environment Dynamism**	**Performance**	**Reconfiguring**	**Seizing**	**Sensing**
Reconfiguring	0.673	-0.06	0.546	**0.82**		
Seizing	0.747	0.115	0.205	0.395	**0.864**	
Sensing	0.724	0.008	0.171	0.723	0.235	**0.851**

5.2.2 Structural Model Analysis

After the validation of the measurement model, the next step is the evaluation of the structural model, which is done by checking the value of path coefficients. A value of path coefficient of at least 0.1 is recommended to impact the models under consideration (Hair et al., 2011; Wetzels et al., 2009).

All values of first-order construct i.e., sensing ($p=0.449$, ß<0.05), Seizing ($p=0.386$, ß<0.05), and Reconfiguring ($p=0.411$, ß<0.05) to the second-order construct, i.e., DC, are positive and significant. (Table 5.17). This shows that the conceptualisation of DC as a second-order construct is justified (Wilden et al., 2013).

Table 5.17 :Conceptual Model 1- Path coefficients for Higher Order construct DC

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Value
Sensing -> Dynamic Capabilities	0.449	0.442	0.069	6.502	0.00
Seizing -> Dynamic Capabilities	0.386	0.365	0.092	4.187	0.00
Reconfiguring -> Dynamic Capabilities	0.411	0.415	0.051	8.064	0.00

The path coefficient of DC to performance is positive and significant (p=0.295, ß<0.05), thus giving support to the H1 that DC have a positive and significant impact on a firm's performance (*Figure 5.1*) Moreover, the 'environmental dynamism' role as a moderator is positive and significant (p=0.234, ß<0.05), supporting H2 that environmental dynamism acts as a moderator in the relationship between DC and performance (Table 5.18)

Table 5.18: Conceptual Model1- path coefficients for Structural Model

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Dynamic Capabilities -> Performance	0.295	0.309	0.085	3.463	0.001
Moderating Effect -> Performance	0.234	0.229	0.111	2.11	0.035

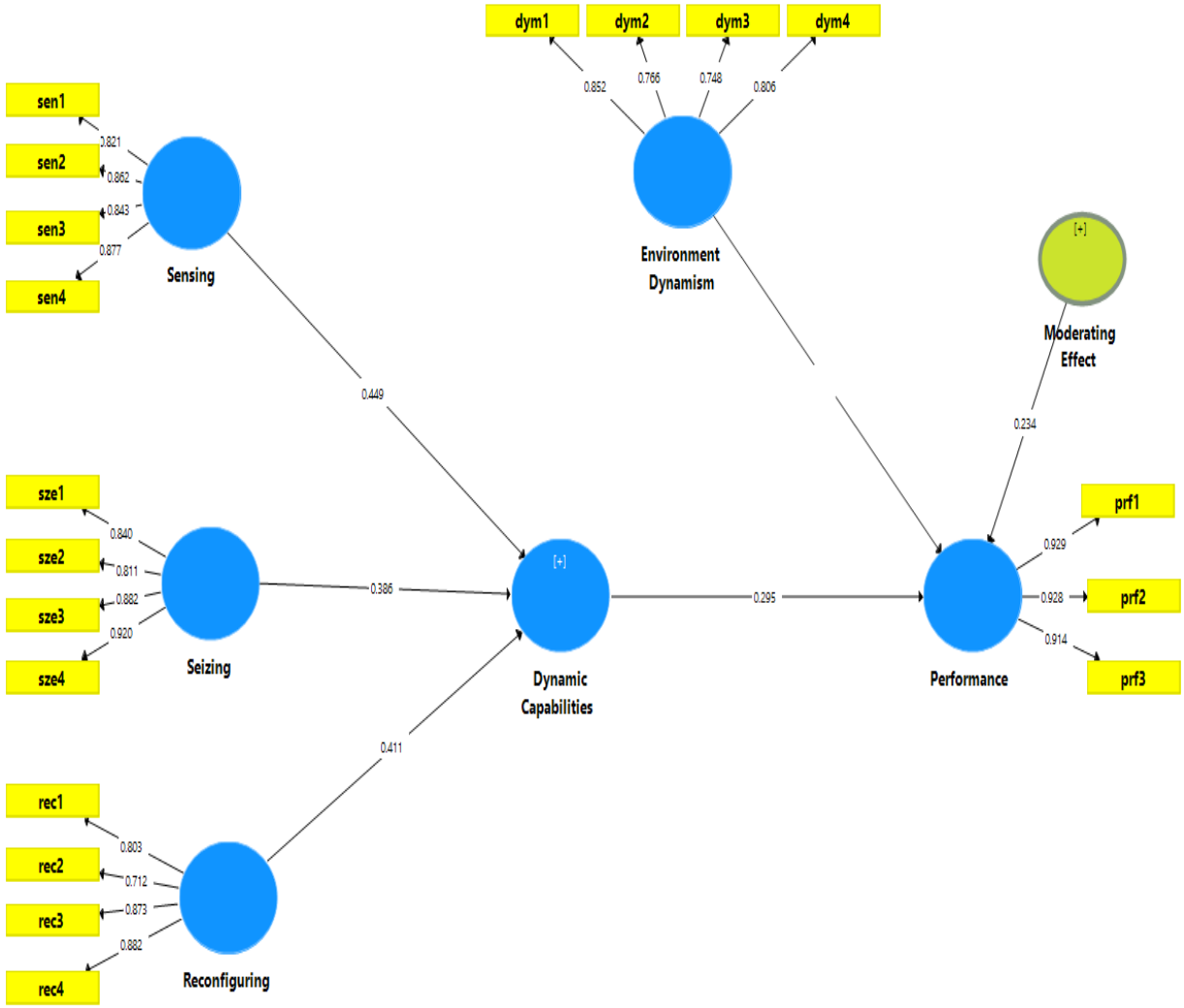

Figure 5.1: Conceptual Model 1- PLS-SEM Structural Model results

5.2.3 Discussion

The results show that DC lead to improved performance and thus enhanced competitive advantage for construction firms operating within NZ. This finding aligns closely with Sun Tzu's (famous war strategist) postulations in his book 'The Art of War' that "rapidity is the essence of war" (Ling et al., 2012). In other words, in highly competitive business environments, sensing opportunities and threats and acting accordingly is vital for a construction firm's performance. For example, suppose some drastic upsurge in demand or some novel ideas/technologies emerge, construction firms that have DC are better suited to grasp such opportunities (D.-y. Li & Liu, 2014) and ultimately improve their performance.

DC enable firms to adopt new strategies and adjust their resource base to new operating environments (Choi et al., 2018; Newey & Zahra, 2009). Furthermore, DC enable construction businesses to integrate their resources more effectively and rapidly and create new knowledge to enhance their performance in the volatile construction business environment (Wu, 2010). In turbulent environments, resources are difficult to obtain. Consequently, efficient observations, prompt adjustments, and the timely implementation of newly devised strategies are the different ways organisations could enhance their performance (Chatterjee et al., 2022; D'Aveni, Dagnino, & Smith, 2010). Participants in the current study have indicated that sensing, seizing and reconfiguration capabilities have benefited their organisations immensely. This means that DC create new decision-making options for those firms, leading to improved performance levels. The findings from these NZ organisations align with the conclusions of Teece (2007) that DC make the firm utilize their resources to generate the new resources and develop new competencies. It can be articulated that DC enable construction firms to gain a competitive advantage by creating new knowledge, products, and internal processes. Thus, in NZ

construction organisations' context, their DC positively improved their performance. Hence, H1 is supported.

Schreyögg and Kliesch-Eberl (2007) explained that due to maintenance costs the development of DC is likely to be expensive when the environment is comparatively stable with little technological progress or when clients' preferences remain unchanged. In stable environments, the relationship between DC and performance can become weaker. However, when there is environmental turbulence or constant threat from close competitors, competitive advantage is altered, and the potential value of current capabilities diminishes. This usually forces firms to make frequent and complex changes (Choi et al., 2018; D.-y. Li & Liu, 2014). Therefore, in a rapidly changing environment, DC play the vital and thus environmental dynamism act as a positive moderator (Drnevich & Kriauciunas, 2011; D.-y. Li & Liu, 2014; Zhou & Wu, 2010). Moreover, considering the nature of the construction business environment in NZ (complex, dynamic, uncertain and unique), the relationship between DC and performance is significantly enhanced. Therefore, the conclusion from H2 that environmental dynamism has a positive moderating impact on the relationship between dynamic capabilities and performance is also in line with the literature.

Based on the findings of the Conceptual Model 1 in this chapter, Journal Article#2 was prepared and submitted for publication (As mentioned in Section: List of Reviewed Publications- Page ix)

5.3 Conceptual Model 2: The role of 'Organisation Structure' on Construction firm performance. The 'mediating' role of 'Hybrid Strategy'

This section presents the results and discussion for Conceptual Model 2 presented in Chapter 3, for the interaction of 'organisation structure', 'hybrid strategy' and 'performance'. The following hypothesis were tested:

Hypothesis (H3): Hybrid Strategy positively and significantly influences construction firm performance.

Hypothesis (H4a): Formalisation positively and significantly influences hybrid strategy.

Hypothesis (H4b): Complexity is positively and significantly linked to the hybrid strategy.

Hypothesis 5 (H5): OS is positively linked to Hybrid Strategy which is further linked to performance. Hence hybrid strategy acts as a 'mediator' between OS and firm performance.

5.3.1 Analysis and Results for Conceptual Model 2:

5.3.1.1 Construct Reliability and Validity:

- For the current study values of CR for all indicators are in the range of 0.730 - 0.946, thus meeting the required internal consistency criteria. (Table 5.19)
- The AVE of most of constructs is greater than 0.5 (Table 5.19). However, the value of AVE for Differentiation is 0.475, which slightly less than 0.5. Literature suggests that an AVE value of up to 0.4 can be accepted, if the CR value for the same construct is higher than 0.6. CR for the differentiation 0.73, hence its AVE value is still acceptable (Fornell & Larcker, 1981).

Table 5.19:Conceptual Model 2 - Construct Reliability and Validity values

Items	**Factor Loadings**	**Composite Reliability (CR)**	**Average Variance Extracted (AVE)**
Formalisation		0.866	0.683
FORM1	0.868		
FORM2	0.744		
FORM3	0.862		
Complexity		0.814	0.598
COMP1	0.614		
COMP2	0.787		
COMP3	0.893		
Hybrid Strategy as second order construct			
Cost Leadership		0.808	0.514
CL1	0.614		
CL2	0.787		
CL3	0.893		
CL4	0.614		
Differentiation		0.73	0.475
DF1	0.728		
DF2	0.686		
DF3	0.651		
Performance (In past three years)		0.946	0.853
PRF1	0.935		
PRF2	0.908		
PRF3	0.927		

No issues of high cross-loadings are noticed for model of the current study, so Discriminant Validity criteria are met as shown in Table 5.20

Table 5.20: Conceptual Model 2- Cross Loading results

Items	Cost Leadership	Complexity	Differentiation	Formalisation	Performance
CL1	0.643	0.263	0.004	0.075	0.513
CL2	0.672	0.301	0.27	0.328	0.624
CL3	0.771	0.137	0.129	0.06	0.401
CL4	0.774	0.211	0.048	-0.037	0.408
CMP1	0.09	0.614	0.025	-0.013	0.089
CMP2	0.238	0.787	-0.015	-0.029	0.195
CMP3	0.329	0.893	-0.001	0.103	0.273
DFF1	-0.02	-0.168	0.728	0.292	0.226
DFF2	0.196	-0.025	0.686	0.256	0.199
DFF3	0.143	0.154	0.651	0.291	0.301
FOR1	0.148	0.084	0.406	0.868	0.32
FOR2	0.117	-0.011	0.127	0.744	0.132
FOR3	0.13	0.015	0.376	0.862	0.219
PRF1	0.682	0.322	0.34	0.279	0.935
PRF2	0.569	0.265	0.317	0.22	0.908
PRF3	0.639	0.148	0.324	0.309	0.927

Fornell-Larcker's criterion is also satisfied for the current study as diagonal elements values (square root of AVE) in Table 5.21are higher than off-diagonal values.

Table 5.21: Conceptual Model 2: Fornell-Larcker's Test results

Variables	AVE	Complexity	Cost Leadership	Differentiation	Formalization	Performance
Complexity	**0.598**	**0.773**				
Cost Leadership	0.514	0.321	**0.717**			
Differentiation	0.475	-0.002	0.17	**0.689**		
Formalisation	0.683	0.048	0.161	0.407	**0.827**	
Performance	0.853	0.268	0.685	0.354	0.293	**0.923**

5.3.2 Structural Model Analysis

In order to check for collinearity issues, Value Inflation Factor (VIF) values were analysed. A VIF value above 5.0 is an indication of multi-collinearity, which could be a cause of concern and can give unrealistic estimation of path coefficients (Diamantopoulos & Winklhofer, 2001). All the value of VIF for the constructs in the current study are less than 5.0 (Table 5.22), meaning there are no issues of multi-collinearity among the constructs.

Table 5.22: Conceptual Model 2- VIF values

Variables	**Complexity**	**Cost Leadership**	**Differentiation**	**Formalisation**	**Performance**
Complexity		1.002	1.002		1.089
Cost Leadership					
Differentiation					
Formalisation		1.002	1.002		1.101
Hybrid Strategies					1.194

All values of first-order construct to the second order constructs i.e., cost leadership (ß=0.857, $p<0.05$), and differentiation (ß=0.38, $p<0.05$) are positive and significant (Table 5.23). This shows that the conceptualisation of Hybrid strategies as a second-order construct is justified (Figure 5.2). (Claver-Cortés et al., 2012).

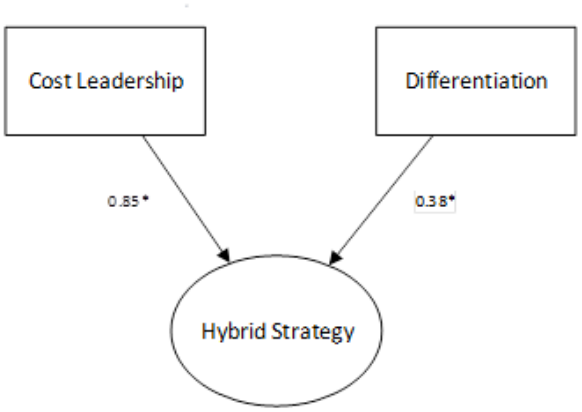

Figure 5.2: Hybrid Strategy path coefficients results

Table 5.23: Conceptual Model 2- path coefficients for Higher Order construct

Paths Hypothesised	**Original Sample (O)**	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P Values**
Cost Leadership -> Hybrid Strategies	0.857	0.826	0.087	9.865	0.00
Differentiation -> Hybrid Strategies	0.38	0.337	0.212	1.795	0.04

The path coefficient of Hybrid Strategy (ß=0.688, $p<0.05$) to performance is significant and positive, giving support to H1. The total effect of formalisation (ß=0.288, $p<0.1$), and complexity (ß=0.269, $p<0.1$) to the hybrid strategy are positive and significant, thus giving support to H2a and H2b. H3 is also supported as OS dimensions are directly linked to hybrid strategy which is further directly linked to performance (Table5.24). Hence, 'hybrid strategy' is mediating the relationship between OS and performance.

*Table 5.24: Conceptual Model2- path coefficients for Structural Model- * Total Effects*

Paths Hypothesised	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Formalisation -> Performance	0.083	0.113	0.125	0.664	0.25
Complexity -> Performance	0.069	0.075	0.089	0.771	0.22
Formalisation -> Hybrid Strategies	0.288*	0.267	0.181	1.593	0.05
Complexity -> Hybrid Strategies	0.269*	0.298	0.182	1.476	0.07
Hybrid Strategies -> Performance	0.688	0.652	0.119	5.786	0.00

In order to differentiate between a full and partial mediated model, the direct impact of OS dimension upon performance was also analysed. The direct impact of OS i.e., formalisation (ß=0.083, p>0.1), and complexity (ß=0.069, p>0.1) on performance is insignificant. Therefore, it seems that OS does not directly impact the performance and its influence is indirect, confirming a full mediating role of 'hybrid strategy' on OS and performance relationship (Figure 5.3)

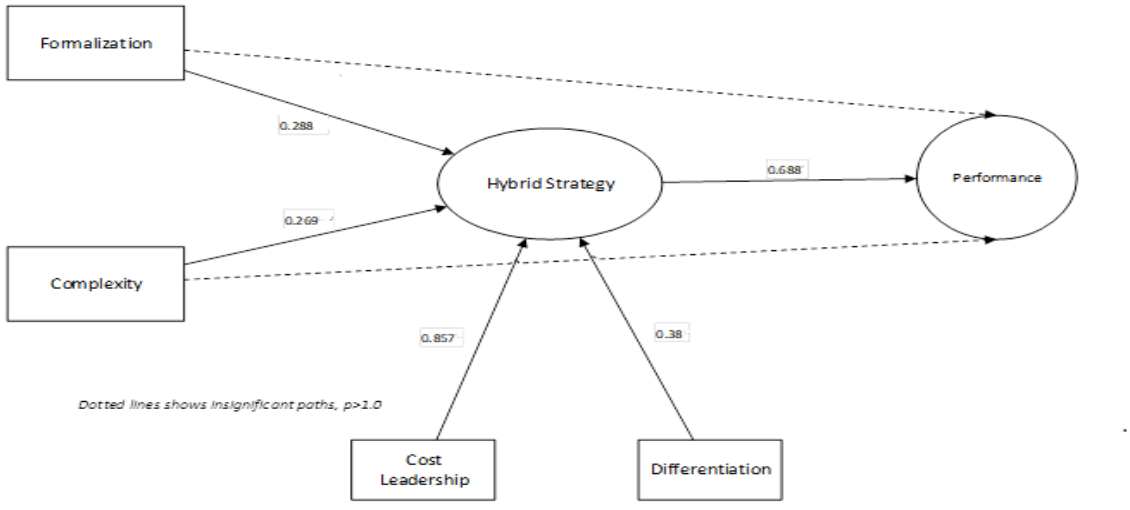

Figure 5.3: Conceptual Model 2- PLS-SEM Structural Model results

5.3.3 Discussion:

The result of the structural model gives support to H3, H4a, H4b and H5. H3 states that hybrid strategies have a positive and significant impact upon a firm performance within the context of NZ. The use of hybrid strategies plays an important role in tackling the challenges caused by an uncertain business environment, which is usually the case for the construction industry in NZ (Oyewobi, Windapo, & Rotimi, 2017).

Firms pursuing a 'hybrid strategy' have improved competitive advantage. This is partly due the reason that with more information available, clients are aware about the services offered by a firm's domestic and international markets. Clients want to achieve good value of money, rather getting services that are cheap but of poor quality or those without any flexibility (Claver-Cortés et al., 2012). Similarly, a firm's product/service must satisfy a wide range of customer requirements like quality, reliability, novelty, convenience and should have a reasonable price (D. Miller, 1992). This could be easily overlooked when a firm pursues a single strategy resulting in a decline in its customer base. A single strategic pursuit also hampers a firm's responsiveness to the turbulent market conditions, and it is more vulnerable to new challenges. In contrast, a hybrid strategy enables a firm to expand their products and services because it offers improved flexibility and responsiveness to the market demands, thereby positively impacting a firm's performance (Leitner & Güldenberg, 2010). A single strategic pursuit could be beneficial only when there exists a high price sensitivity among the customers (Parnell, 2013), which is not always true in the construction industry. Therefore, firms combining cost leadership and differentiation will outperform their competitors and would have enhanced performance in NZ. Hence, the results of the current study are in line with the literature that pursuing a hybrid strategy has a positive and significant impact on the firm performance.

The results pertaining to H4a indicate that 'Formalisation' has a positive impact on the adaption of the hybrid strategies. A firm with high degrees of formalisation has clear set rules and procedures. Such rules are procedures are usually enacted after learning best practices of industry. This therefore reduces ambiguity during operational activities, making processes efficient, which results in cost cuttings. Moreover, the structured rules that guide how employees and different parts of the company work together are crucial. This structured way of working not only encourages new and creative ideas but also helps companies effectively follow strategies that make them stand out from others. So, having clear rules aids firms come up with innovative ways of doing things that give them an edge which makes the pursuit of differentiation strategy more effective (Asamoah et al., 2022; Cordon-Pozo et al., 2006). In the absence of such well-structured rules that encourage coordination between departments, the process of adopting a differentiation strategy could prove to be quite challenging. Hence, formalisation also influences the adoption of a differentiation strategy. Furthermore, the creation of suitable formal rules can enhance organisational interactions, making them more efficient and seamless. This, in turn, contributes to reducing tensions and striking a balance between formalisation and flexibility. This equilibrium leads to an enhancement in the firm's differentiation capabilities (Mattes, 2014). Consequently, possessing clear and well-defined rules supports firms in devising inventive methods that provide them with a competitive advantage. This, in turn, renders the pursuit of a differentiation strategy more effective (Claver-Cortés et al., 2012).

The results for H5b show that higher complexity is also positively linked to the adoption of hybrid strategies. A crucial aspect of this connection lies in the fact that higher complexity within a firm creates an environment where employees can tap into the wide range of experiences held by their colleagues in different departments. This collaboration among employees plays a central role in generating new knowledge and skills that are crucial for

creating distinctive products and services that stand out in a competitive market. This ultimately results in creation of new knowledge and skills that are essential to offering differentiated products and services and improving efficiency, which leads to cost cutting and development of economies of scale (Claver-Cortés et al., 2012; Cosh et al., 2012).

The results for H6 depict that OS dimensions do not directly influence the firm's performance. The dimension of OS aids in devising and pursuing hybrid strategies, which ultimately impacts performance. This shows that hybrid strategy acts as a 'mediator' between OS and performance. These results point to an important and previously unknown interaction between OS, hybrid strategy and performance, which could have some practical implications for sustained performance of construction firms in NZ. Therefore, managers should take into account the characteristics of OS during the development and execution of the hybrid strategies as they would further influence a construction firm's performance.

Based on the findings of the Conceptual Model 2 in this chapter, Journal Article#3 was prepared and submitted for publication (as mentioned in Section: List of Reviewed Publications- Page ix)

5.4 Conceptual Model 3: Interaction of Resources and Capabilities, Competitive Strategies on Performance

This section presents the results and discussion for the impact of Resources and Capabilities, and performance, and tests the 'mediating effect' of 'Competitive strategies' as per the hypothesis stated in Chapter 3

H6: There is a significant and positive relationship between organisational capabilities/resources and performance.

H7: There is a significant relationship between organisational capabilities/resources and firm performance which is mediated by competitive strategies.

5.4.1 Results and Analysis

5.4.1.1 Construct Reliability and Validity:

- All of the values of CR for the model are in the range of 0.728- 0.946 (Table 5.25), indicating high internal consistency.
- For the convergent validity, the AVE value of most of the constructs are in the range of 0.51 to 0.853 (Table 5.25), However, Differentiation shows an AVE of 0.475, slightly less than 0.5, but can be accepted considering the overall convergent validity of other constructs; therefore, convergent validity of the model is deemed satisfactory.

Table 5.25: Conceptual Model 3 - Construct Reliability and Validity values

Items	Factor Loadings	Composite Reliability (CR)	Average Variance Extracted (AVE)
Cost Leadership		0.806	0.51
CL1	0.655		
CL2	0.702		
CL3	0.729		
CL4	0.765		
Differentiation		0.728	0.475
DFF1	0.77		
DFF2	0.564		
DFF3	0.717		
Financial		0.806	0.58
FNC1	0.781		
FNC2	0.78	0.891	0.673
FNC3	0.723		
Human Resources		0.893	0.676
HR1	0.867		
HR2	0.844		
HR3	0.812		
HR4	0.761		
Technical Resources		0.909	0.768
TCH1	0.862		
TCH2	0.892		
TCH3	0.875		
Performance		0.946	0.853
PR1	0.935		
PR2	0.908		
PR3	0.927		

- For Discriminant validity no issues of high cross-loadings (Table 5.26) were observed.

Table 5.26: Conceptual Model3- Cross Loading results

	Cost Leadership	Differentiation	Financial Resources	Human Resources	Technical Resources	Performance
CL1	**0.655**	0.022	-0.303	0.031	0.051	0.312
CL2	**0.702**	0.243	-0.312	-0.073	0.368	0.323
CL3	**0.729**	0.108	-0.215	-0.121	0.274	0.301
CL4	**0.765**	0.016	-0.364	-0.127	0.331	0.208
DFF1	-0.012	**0.77**	0.242	0.349	0.176	0.227
DFF2	0.196	**0.564**	0.048	0.276	0.198	0.199
DFF3	0.144	**0.717**	0.408	0.324	0.184	0.3
FNC1	-0.328	0.324	**0.781**	0.323	-0.263	-0.107
FNC2	-0.336	0.313	**0.78**	0.35	-0.249	-0.175
FNC3	-0.31	0.191	**0.723**	0.429	-0.221	-0.149
HR1	-0.05	0.473	0.426	**0.867**	-0.235	0.04
HR2	-0.06	0.358	0.393	**0.844**	-0.258	0.03
HR3	-0.21	0.37	0.49	**0.812**	-0.355	-0.081
HR4	0.031	0.263	0.175	**0.761**	-0.205	0.017
TCH1	0.096	0.249	-0.164	-0.292	**0.862**	-0.228
TCH2	0.361	0.287	-0.275	-0.189	**0.892**	0.088
TCH3	0.407	0.17	-0.354	-0.383	**0.875**	0.102
PRF3	0.452	0.33	-0.139	0.056	0.04	**0.929**
PRF1	0.48	0.34	-0.185	-0.037	0.054	**0.934**
PRF2	0.374	0.32	-0.197	-0.016	-0.004	**0.908**

- All the constructs fulfil Fornell-Larcker's criterion, as the value of all the diagonal elements (square root of AVE) in (Table 5.27) is higher than off-diagonal values, meaning there is satisfactory discriminant validity.

Table 5.27: Conceptual Model3: Fornell-Larcker's Test results

	AVE	**Cost Leadership**	**Differentiation**	**Financial Resources**	**Human Resources**	**Performance**	**Technical Resources**
Cost Leadership	0.51	**0.714**					
Differentiation	0.475	0.151	**0.689**				
Financial Resources	0.58	-0.426	0.37	**0.762**			
Human Resources	0.676	-0.1	0.46	0.475	**0.822**		
Performance	0.853	0.702	0.358	-0.188	0.001	**0.923**	
Technical Resources	0.768	0.371	0.266	-0.322	-0.323	0.034	**0.876**

5.4.2 Structural Model Analysis

5.4.3 Direct Impact of Resources on Performance:

In order to test H6, the structural model evaluation was done to check the direct impact of resources/capability upon performance. All values of for the model were found to be insignificant as shown in Figure 5.4. This shows that direct impact of Resources on Performance in not significant; therefore, H6 could not be justified (Table 5.28)

Table 5.28: Path coefficients for Structural Model- Resource-Performance interaction

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Financial Resources -> Performance	-0.113	-0.169	0.116	0.969	0.333
Human Resources -> Performance	0.116	0.038	0.187	0.621	0.535
Technical Resources -> Performance	-0.468	-0.062	0.407	1.15	0.25

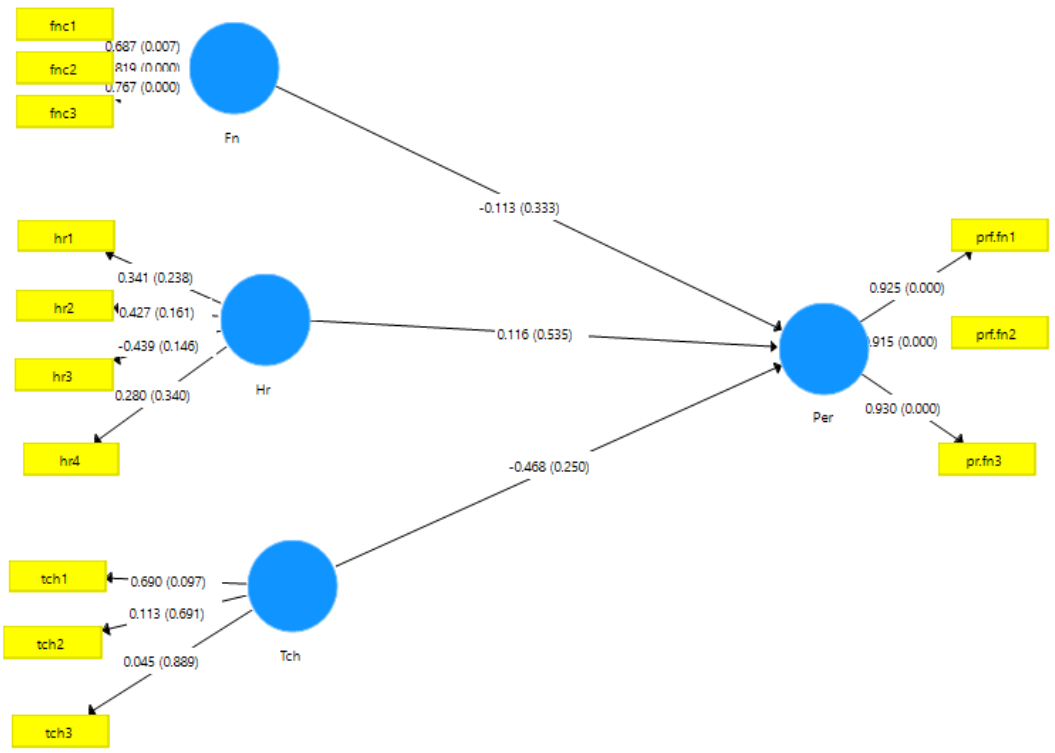

Figure 5.4: Conceptual Model 3- PLS-SEM structural model results

5.4.4 Resources/Capability, Mediating role of Competitive Strategies and Performance:

In order to check for collinearity issues, Value Inflation Factor (VIF) values were analysed. A VIF value above 5.0 is an indication of multi-collinearity. (Diamantopoulos & Winklhofer, 2001). All the value of VIF for the constructs in the current study are less than 5 (Table 5.29), so there are no issues of multi collinearity among the constructs.

Table 5.29: Conceptual Model 3- VIF values

Variables	Cost Leadership	Differentiation	Financial Resources	Human Resources	Performance	Technical Resources
Cost Leadership					1.023	
Differentiation					1.023	
Financial Resources	1.346	1.346				
Human Resources	1.347	1.347				
Performance						
Technical Resources	1.164	1.164				

Most of the path coefficients for Resources and Capabilities to Cost Leadership and Differentiation are positive and significant. However, the path coefficient from Human Resources to Cost Leadership is positive but not significant (p=0.198, ß>0.05).

The path coefficient for competitive strategies to performance are positive and significant (Table 5.30). Cost Leadership (p=0.663, ß<0.05), and Differentiation (p=0.258, ß<0.05). The results give partial support to H7 that Resources/ Capability are directly linked to competitive strategies which are further directly linked to performance as shown in Figure 5.5. Hence,

'competitive strategies' are mediating the relationship between Resource/Capability and Performance.

Table 5.30: Conceptual Model3- path coefficients for Structural Model

	Original Sample (O)	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P Values**
Financial Resources -> Cost Leadership	-0.424	-0.426	0.08	5.269	0.0000
Financial Resources -> Differentiation	0.308	0.303	0.104	2.963	0.0030
Human Resources -> Cost Leadership	0.198	0.211	0.13	1.527	0.1270
Human Resources -> Differentiation	0.483	0.479	0.104	4.631	0.0000
Technical Resources -> Cost Leadership	0.298	0.323	0.104	2.868	0.0040
Technical Resources -> Differentiation	0.522	0.507	0.133	3.931	0.0000
Cost Leadership -> Performance	0.663	0.658	0.076	8.678	0.0000
Differentiation -> Performance	0.258	0.26	0.1	2.583	0.0100

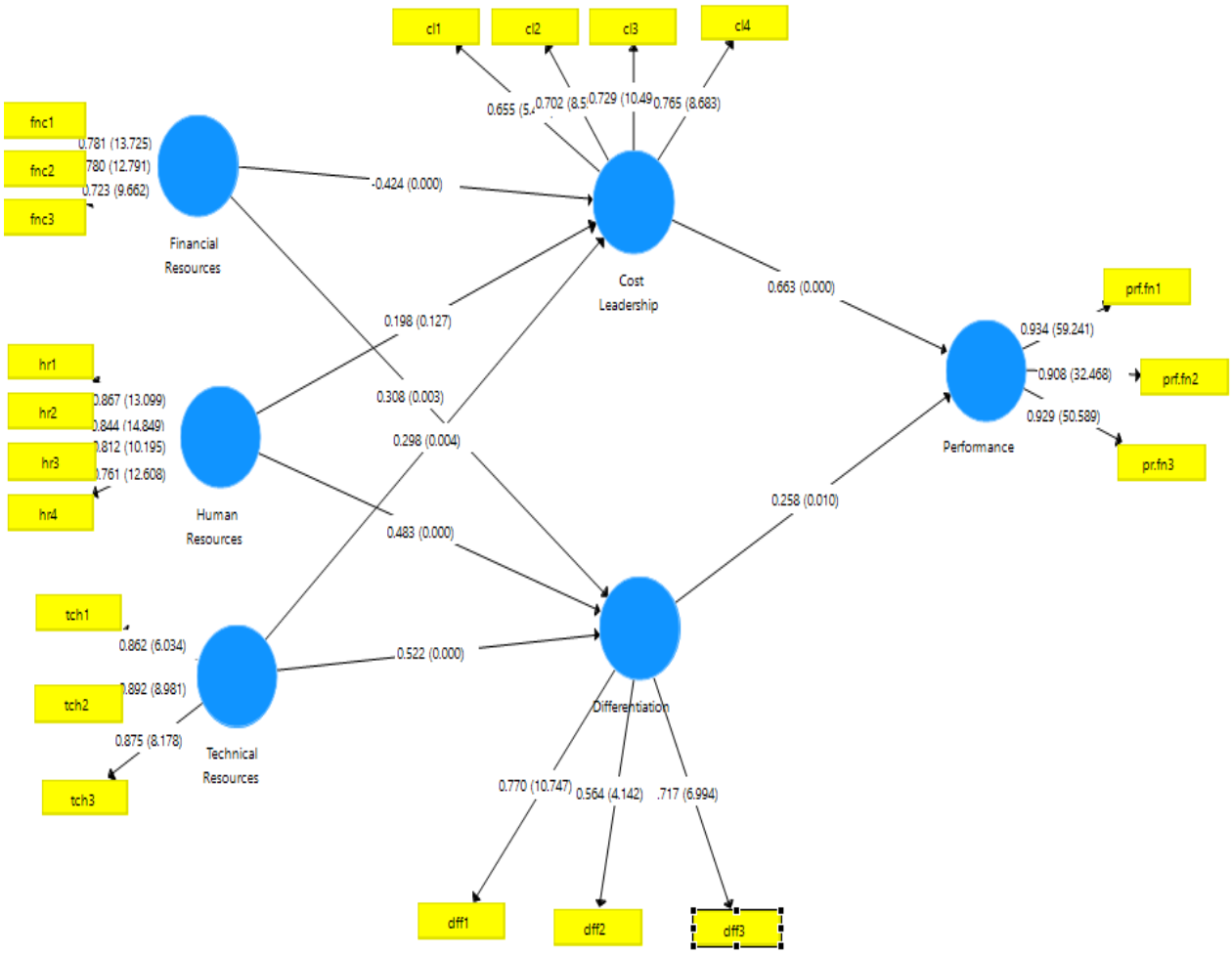

Figure 5.5: Conceptual Model 3- PLS-SEM Structural Model results

5.4.5 Discussion

This model tested both the direct and indirect effect of Resource/Capabilities on Competitive Strategy and Performance. The results show that the Resource/Capabilities do not directly impact firm performance in NZ, suggesting that Resource/Capabilities alone cannot guarantee

enhanced competitive advantage and that there is a need to consider other factors. This is in disagreement with RBV researchers who contend Resources/Capabilities alone can be a source of competitive advantage/performance.

The results give a partial support to H7 and indicate that competitive strategy mediates the relationship between resources and capabilities and firm performance, but that only a 'differentiation' strategy fully mediates this relationship.

The results for H7 are in line with Alqudah et al. (2021); Chew et al. (2008) who contended that resources/capabilities needs alignment with a chosen competitive strategy for enhanced performance. According to Isik et al. (2009), human resources can be a source of competitive advantage, while Andrew Miller et al. (2009); Oyewobi et al. (2017) argued that companies in the construction sector must use new technologies to remain competitive. In the construction sector, firms use different approaches to win bids and secure contracts; therefore, firms adopting any competitive strategy need appropriate assets and capabilities. For example, a cost-leader firm will likely attain cost savings through organisational learning and developing economies of scale (Kale & Arditi, 2003). This can be attained by implementing systems, technological tools and processes that will increase direct managerial control over workers' behaviour, efficient contract management, site management, and by limiting chances for individual skills variations that might have an effect on production (Alqudah et al., 2021; Kale & Arditi, 2003). However, a direct link between Cost Leadership and Human Resources could not be established within the context of NZ construction firms. A possible reason for this could be that the strategies focused on cost saving sometimes results in less remunerations and other social benefits life work-life balance programmes which may negatively hinder the retention of skilled human resource (J. Wang & Verma, 2012).

On the contrary, firms implementing a differentiation strategy need to focus on innovation, which could be achieved through a competent and motivated workforce. To achieve this, strong financial and technological resources are necessary, along with significant investment in human resources through training and induction (Habibi & Kermanshachi, 2018). Offering 'differentiated' products and services, which customers deem superior, allows construction businesses to charge a higher price. Porter (1985) claimed that if a business is able to maintain their differentiation strategy, it could result in above average performance, allowing them to charge a premium price to cover the cost of achieving uniqueness. Moreover, firms adopt a differentiation strategy to gain market share thus enhancing their performance. Therefore, by extension it could be concluded that construction firms in NZ strive to achieve Cost Leadership and Differentiation with the appropriate Human, Financial and Technological resources, which leads to improvement in performance. (Habibi & Kermanshachi, 2018; Tripathi & Jha, 2017).

Therefore, the results of the model along with the discussed literature make it evident that a firm will not be able to obtain a competitive edge based on its resource base alone in the NZ construction industry. It has to align the resources with an appropriate competitive strategy to form a strategic fit for enhanced performance.

5.5 Chapter Summary

This chapter presented the results and discussion of the quantitative data analysis. First, the quality and reliability of data was checked using Normality Test and Exploratory Factor Analysis (EFA). Based on the results, four measurement items were further dropped from the final analysis. Afterwards, the hypothesis stated for Conceptual Models 1, 2 and 3 in Chapter 3 were tested using the PLS-SEM technique. Measurement and Structural Models were checked and validated for the all the models.

From the results of Conceptual Model 1, H1 and H2 were validated, implying Dynamic Capabilities (DC) have a direct influence on a firm's performance and Environmental Dynamism moderates the relationship between DC and Performance within the context of the NZ construction industry. Therefore, it was concluded that DC lead to improved performance. Moreover, the construction business environment in NZ was found to be complex and dynamic, so the significance of DC was found be further enhanced for performance. Hence, it was concluded that in dynamic and turbulent business environments, as is the situation the in NZ construction industry, firms equipped with DC will significantly outperform those without any such capabilities.

Based on findings on Conceptual Model 2, H3, H4a, H4b, and H5 were validated. The results implied that following a 'Hybrid Strategy' has a positive impact on firm performance. Furthermore, the dimensions of Organisation Structure (OS) aids to more a successful pursuit of a 'hybrid strategy' as both the dimension of OS (Formalisation and Complexity) were linked for Hybrid strategy. Moreover, no direct influence of dimension of OS on performance was noted. This pointed to the dimension of OS aiding in devising and pursuing hybrid strategies, which ultimately impacts the performance. This demonstrates the role of hybrid strategy as a 'mediator' of the OS to performance relationship; an interaction which was previously unknown in NZ construction industry.

The result of Conceptual Models 3 nullified H6 and gave partial support of H7. The results show that Resource/Capabilities alone cannot guarantee enhanced performance but need to align with a chosen competitive strategy for enhanced performance. This finding indicates that Competitive Strategy acts as a mediating variable in the relationship between resource/capability and firm performance for construction firms operating in NZ.

6 Chapter 6: Qualitative Data Results and Discussion

This chapter presents the analysis of qualitative data obtained from case studies of construction firms selected. The data were analysed using techniques mentioned in the Methodology Chapter (Section 4.5) in order provide a deeper understanding of the findings obtained from quantitative data analysis and to triangulate the quantitative and qualitative findings to make more robust statements about the study.

6.1 Case Study Results:

Qualitative data analysis was done to gain insights into the reasons for variations in performance among construction firms. Chapter 3 examined and defined the key relationships that were believed to influence performance. The interrelationships between these key constructs were tested in Chapter 5 using quantitative data from a survey of construction company employees. The qualitative data presented in this chapter serves to further clarify how these factors impact performance, adding additional perspective to the quantitative data analysis using previously established knowledge.

The qualitative findings of the study were analysed by comparing the data from the three cases in a systematic manner. This approach allowed for the identification of areas of convergence and discrepancy among the cases (Creswell & Clark, 2011). The cross-case comparison was structured using four main themes, which were derived from the theoretical deductions of the study. These themes are Business Environment Dynamism, Competitive Strategy adaption, Organisation Structure, and Resources. In addition to the main themes, sub-themes were also identified; however, they varied across the cases. Themes and sub-themes are presented in Table 6.1. The comparison of the cases is discussed in relation to these themes and sub-themes, which allows for the examination of the similarities and differences among the cases and the identification of key factors that affected performance.

The systematic comparison of the cases, using themes and sub-themes, facilitated the interpretation of the qualitative findings and their relation to the research questions of the study. This approach allowed for a more in-depth understanding of the factors that affected performance among the construction firms studied and provided a comprehensive interpretation of the data.

Table 6.1: Themes and Sub-themes from Case Studies

	Company		
Theme	**A**	**B**	**C**
Business Environment Dynamism	Perceived Turbulent Business Environment,	Evolving Business environment, where customer demands are changing	Staying relevant in industry is challenging
Subtheme			
Challenges	Maintaining current business size and growth, thin profit margins	Limited clients could be a risk	Renewal of internal processes due to client requirements
Theme			
Dynamic Capabilities	Sensing and Reconfiguring capabilities	Sensing, Seizing and reconfiguring capabilities	Did not use/possess dynamic capabilities
Subtheme			
Operationalisation of DC	Research customer preference and analyse industry trends	Introduce innovative products and industry wide networking	-
Theme			
Competitive Strategy	Use Hybrid Competitive strategy	Not clear on use of Hybrid Strategy but agreed Cost Leadership is not sustainable	Use Hybrid Competitive strategy
Sub Theme			
Business Strategy	Formal Policies: Holding regular meetings to evaluate and update established policies	To be competitive in market; informal approach to strategy formulation	family-run business that does not have a traditional, written business plan

Sub Theme			
Operational Policy	Quality; Cost-leadership	Secured long term contracts	Rely on industrial relationships/ networking; Cost-leadership
Theme			
Organisation Structure	Existence of Formalisation and Complexity	Existence of Formalisation and Complexity	Existence of Formalisation and Complexity
	Alignment of Organisation Structure and Hybrid Strategy	Alignment of Organisation Structure and Hybrid Strategy	Alignment of Organisation Structure and Hybrid Strategy
Theme			
Resources and Capability	Resource & Strategy coalignment	Resource & Strategy coalignment	No clear view of Resource & Strategy coalignment

6.2 Company A:

6.2.1 Background Information

Company A provides services for the construction, and maintenance of buildings and infrastructure, and operates in various sectors, such as education, health, prisons, water, power, waste, transport infrastructure, and commercial. The company employs 2100 personnel. In 2022, the company was still facing a competitive and rapidly changing business environment. It has the goal of maintaining their current business size and controlled growth (extracted from mission statement, year 2022). The senior management believes that thin profit margins were inevitable (Annual Report 2022). As a result, proactively addressing environmental uncertainties, changes, and turbulences was a motivating factor for company's strategic pursuits (extracted from mission statement, year 2022). Interviewee A held the position of 'Senior Structural Engineer' and was involved in top management decision-making in the firm. The interviewee has been in the industry for 25 years.

6.2.2 Business Environment Dynamism and Influence of Dynamic Capabilities:

In order to understand the nature of the business environment, and its interaction with Dynamic Capabilities, the interview was asked about these factors (as per interview template Appendix-B)

The Interviewee A explained that there was a constant demand for new and innovative products and services and as such, it is important for businesses to be proactive in identifying and addressing changing customer needs in order to stay competitive. This requires ongoing research and analysis of customer preferences and behaviours, as well as the ability to adapt and innovate in response to changing market conditions.

"I've definitely noticed that customer needs change frequently. It seems like after some time probably 6 months to a year there is something new that customers are looking for, whether it's a new type of finish, architecture, a different service, or a unique experience. It can be tough to keep up with all of these changes, but it's important to do so if we want to stay competitive".

When asked about the importance of dynamic capabilities for performance, the interviewee stated it was important and that there was an interaction between dynamic capability and performance.

"One way that we try to stay responsive to changing customer needs is through ongoing research and analysis. This might involve conducting surveys, or other forms of feedback[s] to get a better understanding of what customers are looking for. It's also important to pay attention to industry trends and changes in the market, as these can indicate shifts in customer needs and preferences."

This pointed to a possible interaction of dynamic capabilities and performance.

6.2.3 Competitive Strategy:

Interviewee A was asked whether pursuing a single strategy was a viable option for long term business sustainability; thus, pointing towards the use of 'Hybrid Strategies'.

"However, simply offering lowest prices isn't enough to ensure long-term success. We always find ways to stand out from the competition by offering something unique or valuable to customers sometime by offering innovative solutions to problems, and always try to provide exceptional customer service".

This showed that 'Hybrid Strategic/ pursuit was desirable according to interviewee A

I have also started holding regular meetings to evaluate and update our established policies. It's important to ensure that our policies remain relevant and effective in light of any changes in the business environment. I'll make sure to communicate the details of the policy to my team and encourage everyone to actively participate in the meetings and provide feedback. By doing so, we can continue to improve our policies and better support our employees and customers.

Therefore, this additionally depicted that Company A was continuously updating their competitive strategies.

6.2.4 Organisation Structure and Competitive Strategy interaction:

The discussion with interviewee A pointed towards a degree of formalisation and complexity:

"We have clear job descriptions which helps employees to have a clear understanding of their roles and responsibilities. This can help to reduce confusion and improve efficiency, as employees know exactly what is expected of them".

In response to the question asked about the complexity of organisation structure, the interviewee expressed his views as: For complexity the response was:

"*I believe having specialized departments has served us well as it allows us to have experts in each area who are focused on their specific tasks. This can help to improve efficiency and ensure that we are providing the highest level of service to our clients.*

Interviewee A also pointed out the importance of aligning Organisation Structure and Competitive Strategy:

"My overall experience tells me that if an organisation has a clear chain of command and well-defined roles and responsibilities, it can be easier for employees to know who to go to for different tasks and decisions. This can help to reduce confusion and improve efficiency."

6.2.5 Resources/Capability, Competitive Strategy and Performance:

Interviewee A was pointed towards the importance of Financial, Human and Technical resources:

"...Having a strong financial foundation allows us to take on larger and more complex projects, which can lead to increased revenue and growth for our firm."

.... "We need our staff to be equipped with the latest knowledge and skills in order to stay competitive in our field, and to ensure that we can deliver high-quality work to our clients".

"Having skilled and motivated workforce is important, but we also need to have a clear strategy in place for how to use their talents and skills to gain a competitive edge".

Therefore, it was clearly stated that it is a resource/capability and strategy combination that leads to business performance improvement.

6.3 Company B:

6.3.1 Background Information

Company B is a national construction company with about 1,000 employees, operating mainly in commercial, education (higher education), and retirement villages. The company's profitability has been steadily increasing (based on internal discussion with the head of Finance). One of the main reasons for this success is previously secured frameworks and the continued success of these large framework agreements. These agreements helped Company B maintain growth in a turbulent market. Despite its growth and profitability, it sees the external environment as "challenging" (Based on 2022 internal outlook report). The heavy reliance on a limited number of public clients and framework agreements creates significant pressures on

the business, pushing Company B to improve its structure and implement programs to improve time, cost predictability and client satisfaction (based on Milestones set for 2023). Interviewee B is 'Principal Partner (technical)' of the company, with over 35 years of experience.

6.3.2 Business Environment Dynamism and Influence of Dynamic Capabilities:

The discussion with Interviewee B also pointed to a highly dynamic business environment in NZ:

"In New Zealand, as in many countries around the world, the business landscapes are constantly evolving as client needs and preferences are always shifting, and it's up to contractors to keep up with these changes in order to remain relevant and successful".

Similarly, Interviewee B strongly agreed about the importance of dynamic capabilities for dynamic business environment.

"It is important for us to be proactive in addressing changing customer needs. This usually involve[s] introducing new products or services in market. For example, we noticed that there was a lot of growing interest in eco-friendly products, so we added some sustainable and eco-friendly options to our services and material we use".

"Another important way of identifying business opportunities is networking. We make an effort to attend industry events and to build relationships with other professionals in the field. This helps us to stay informed about what's going on in the industry and have [has] often led to new business opportunities".

6.3.3 Competitive Strategy:

Interviewee B also expressed that a single competitive strategy may not be sufficient for long-term business sustainability, and implicitly pointed towards use of hybrid strategy for enhanced performance.

"I would argue that planning to stay competitive merely in terms of low pricing is not a definitive guarantee for long-term survivability. It's a complex issue that needs further discussion[s] but there are

other factors at play. I think acquiring a specific area of expertise, or presenting unconventional answers to challenges being faced in projects make[s] a lot of difference".

The discussion also revealed an informal component of strategy formulation in the Company B

"I also believe that sometimes the best ideas come from informal conversations and brainstorming sessions. So, in addition to the formal meetings, I encourage my team to share their ideas and feedback with me on an ongoing basis. This way, we can be more agile and adapt to changes in the business environment as they arise".

6.3.4 Organisation Structure and Competitive Strategy interaction:

From Interviewee B's perspective, there exists a reasonable degree of formalisation and complexity within the firm:

"Yes definitely; clearly defined rules and processes help to create a sense of fairness and consistency within the company. Employees know how their performance will be evaluated, which in [the] bigger scheme of things helps a sense of responsibility".

For complexity the response was:

"*Yes, our firm has specified departments for different functions such as bidding, project delivery, HR, and quality control; this helps with better allocation of resources and ensure[s] that we are using our time and resources effectively".*

The discussion with interviewee B also highlighted the significance of the alignment between organisational structure and competitive strategy:

"When an organisation has a clear strategic vision, strategy and a supportive organisation structure which can align[s] the effort of employees with the overall goals and objectives of the organisation; that's a sure way of succeeding; however, that easy being [that's easier] said than getting it done right."

6.3.5 Resources/Capability, Competitive Strategy and Performance:

Interviewee B agreed with the notion that there is a resource-capability and competitive strategy alignment for enhanced performance.

"…You cannot run a company without a strong financial backing. A project needs liquidity to cover the costs of materials, equipment, and labour; without adequate financial resources, you will go bust sooner or later".

"I believe that investing in the upskilling and development of our staff is essential for the success of our company".

"We use much software like 3D modelling, AutoCAD, GIS, Project management software etc. to make our work process more efficient, and it makes it easier to share and exchange information with clients and team members".

"*But overall speaking, while human capital, technology, financial liquidity or equipment play a vital role in the operations and efficiency of our business, it also depends how we manage them in a way that allows us to reach our strategic goals".*

6.4 Company C:

6.4.1 Background Information

Company C is a family-owned company that specialises in general construction services. The company employs around 290 people. Its services include redevelopment of estates, urban infrastructure renovation, new construction, high-rise buildings and mixed-income housing, The company achieved significant growth over last 10 years (based on annual reports). Company C perceives that the external business environment has undergone significant changes in the past decade. They believe their clients are increasingly demanding more value, which puts pressure on cost control and the reliance on competitive bidding. Additionally, the business models of Company C's clients, i.e., local council authority's contracts, have shifted

as well. They used to primarily focus on providing affordable housing, but now they tend to also develop private housing in partnership with open market schemes. This means Company C had to adapt its previous model of building houses to accommodate the design and quality preferences of private buyers. As a result, Company C faces many challenges in renewing its internal processes for construction. Interviewee C is CEO of the company, with over 15 years of experience in the industry.

6.4.2 Business Environment Dynamism and Influence of Dynamic Capabilities:

Interviewee C also agreed with continuously changing nature of the NZ business environment:

"As a business owner, I've definitely noticed that it is a challenge to keep our services up-to-date and relevant in today's fast-paced world. It seems like there is always something new on the horizon, whether it's a new technology, a changing market trend, or a new competitor. These constant changes can make it difficult to maintain a competitive edge, and it's important for us to stay on top of things in order to stay relevant".

Interviewee C did not clearly point to the use of dynamic capability or significance of dynamic capabilities in uncertain business environment, but still implied agreement with the notion.

"One issue that we've encountered is that our services can become outdated over a few year [times], especially when the technology is rapidly evolving, and new technologies or approaches are being introduced all the time. In order to keep up with these changes, we need to be proactive in updating and improving our services. This might involve investing in new equipment or training, or hiring highly qualified and motivated staff, which again comes at a price".

6.4.3 Competitive Strategy:

Interviewee C explicitly conveyed that utilizing only one competitive strategy may not be adequate for achieving long-term sustainability within the business, however at the same time pointed towards need of industrial linkages.

"Ultimately, I believe that both by offering competitive prices and unique value to customers, we can differentiate ourselves from the competition and stand out in the market. Of course, it's still important to have a strong proposal and pricing strategy, but I believe that our industrial relationships and networking efforts can give us a competitive edge and help us win contracts that might otherwise go to our competitors.

6.4.4 Organisation Structure and Competitive Strategy interaction:

From Interviewee C's perspective, there existed a reasonable degree of formalisation and complexity in her firm:

"Yes, our firm has clearly defined rules, job descriptions, and processes for employee evaluations. We believe that having these things in place is important for creating a positive and successful work environment".

For complexity the response was:

"*Having dedicated subdivisions helps to create clear lines of communication and accountability within the company. Employees know who to go to for different issues, and there is a clear chain of command for decision-making"?*

Interviewee C also emphasised that there exists an important correlation between the alignment of the organisational structure and the competitive strategy.

"I always emphasise that a well-designed company management structure can help to streamline processes and improve efficiency. This facilitates effective communication within the company. For example, if there are clear lines of communication and a system in place for sharing information, it can be easier for employees to stay informed and to collaborate with one another. In the larger scheme of things, this enables [us] to materialise short- and long-term plans and with improving our profits".

6.4.5 Resources/Capability, Competitive Strategy and Performance:

Interviewee C did not have a clear view on the resource-capability and competitive strategy alignment, rather just emphasised human and technical resource importance.

"...I also make sure that our IT systems and software are up-to-date, and we have proper IT support team in-place to ensure that there is minimal disruption of work. I also invest in new technologies like BIM (Building Information Modelling), and virtual reality to enhance design and construction process."

"I believe that investing in the upskilling and development of our staff is essential for the success of our company".

"We do regular in-house trainings, and I also encourage and sponsor certifications and trainings for the staff. Also, I take time to understand the skills and growth needs of each employee and create customised plans for the same. This not only improves the skills of our staff, but also helps to foster a positive and motivated work culture".

6.5 Discussion on Case Studies:

Based on the thematic analysis of the above discussed case studies, the identified themes (Table 6.1) and discussion on the identified themes is presented in the following sections:

6.5.1 Business Environment Dynamism and Influence of Dynamic Capabilities:

The aim of this theme was to understand the nature of business environment in NZ, and whether construction firms actively develop their dynamic capabilities to face challenges arising due to business environment uncertainty. The results for quantitative analysis noted that the business environment in NZ construction industry is highly dynamic, which acted a moderator in the relationship between DC and performance, meaning the significance of DC is enhanced even more in such a business environment.

From the findings of the qualitative study, a similar observation was made that the key to staying competitive in NZ business environment is to be constantly attuned to changing customer needs and to be proactive in finding ways to meet those needs. By staying informed and adapting to change, construction firms in NZ can ensure that they remain relevant and successful in the long term. However, being able to adapt and innovate in response to changing customer needs does not come without risk. It requires a certain level of agility and flexibility, as well as the ability to take calculated risks. Nevertheless, for businesses that are able to successfully navigate these changes, the rewards can be significant. One way that businesses can stay attuned to changing customer needs is through ongoing research and analysis. The qualitative study findings also revealed that construction firms are constantly trying to understand customer preferences (developing DC) by conducting surveys, obtaining customer feedback, networking and other forms of market research to get a better understanding of what customers are looking for. Moreover, it is also important to pay attention to industry trends and changes in the market, as these can indicate shifts in customer needs and preferences.

Therefore, based on results from the mixed-method research, it is concluded that NZ business environment is highly dynamic, and it is a challenge to keep up with business requirements. But by being proactive in updating and improving services, and by finding new and innovative ways to stand out from the competition, construction firms can remain relevant and successful in the long term.

6.5.2 Organisation Structure, Hybrid Strategies, and their interaction:

The aim of this theme was to understand what the dominant competitive strategies in NZ construction industry were, and their interaction with organisation structure. Quantitative data results revealed that NZ construction businesses were using ‘Hybrid Strategies” that were supported by an organisation structure with high degree of formalisation and complexity.

The findings of the qualitative phase revealed that simultaneous pursuit of both cost leadership and differentiation strategies are prevalent in the industry and are deemed necessary for successful business performance. Construction firms are using Cost Leadership to streamline processes, reduce waste, or negotiate better rates with suppliers. This enables them to offer competitive prices to clients. In parallel, the businesses are also trying to improve their competitive advantage by differentiation, through offering innovative solutions to problems, providing exceptional customer service or developing specialised expertise in a particular area. Therefore, combining the findings from qualitative and quantities data, it can be ascertained that 'Hybrid Strategies' are prevalent in the industry and have a direct link to performance enhancement.

The qualitative phase analysis also revealed the interaction of 'Organisation structure' and 'Hybrid Strategies'. High degree of 'Formalisation' and 'Complexity' was found to be prevalent in the firms' Organisation Structure. Overall, 'Formalisation' was linked to having clearly defined rules, job descriptions, and processes for employee evaluation, which resulted in creating a positive work environment. Similarly, 'complexity' was linked to the recruitment of experts within separate areas, thereby promoting efficiency and development of expertise, which enhances the level of service provided to clients.

Therefore, it is concluded that organisational structure plays a crucial role in aligning the actions and efforts of employees with the overarching strategic pursuits of the firms. This alignment is achieved by improved communication and employees understanding the correlation between their individual roles and the organisation's objectives. Additionally, a supportive organisational structure also encourages collaboration and teamwork, which can further enhance the strategic objective.

Summing up, the results of the qualitative phase aligned with the findings from the quantitative data that Hybrid Strategies have a strong influence on Performance and a supportive Organisation Structure results in the successful pursuit of 'hybrid strategies' which further results in enhanced performance for construction firms in NZ.

6.5.3 Resources/Capability, Competitive Strategy and Performance:

The goal of this theme was to understand the significance of resources/capabilities for Firm Performance and how they are linked to competitive strategies that result in construction firm performance. The quantitative results pointed to an alignment of Resources/Capabilities and Competitive Strategies for enhanced performance.

The findings of the Qualitative Phase indicate that human, financial, and technical resources are not the only sources of competitive advantage but must be paired with effective competitive strategies to truly enhance business performance in the NZ construction business environment. For example, the acquisition of skilled and motivated employees is essential for the success of an organisation. However, it is also crucial to have a clear strategy in place for utilising their talents and skills to gain a competitive advantage. Similarly, the availability of financial resources is a fundamental requirement; however, it must be supplemented with a strategy for their effective utilisation to increase revenue and profitability. Additionally, while access to the latest technology can provide advantages, it is not sufficient on its own. Instead, it must be integrated with a plan for leveraging this technology to enhance the organisation's services. In conclusion, a co-alignment of resources/capabilities and competitive strategy leads to enhanced firm performance.

6.6 Chapter Summary:

This chapter analyses qualitative data from case studies of construction firms for the themes of business environment, dynamic capabilities, competitive strategies, resources and capabilities,

and how their interaction influences the firms' performance. The purpose of the qualitative data analysis was to provide a deeper understanding of the findings from the quantitative data and to gain insight into the reasons for performance heterogeneity. The findings of the study were analysed by comparing the data from three case studies. The study findings noted that the NZ business environment is uncertain, but construction firms can remain successful by proactively updating and improving their services and by finding new and innovative ways to stand out from the competition in NZ; in other words, by actively developing dynamic capabilities (DC). Findings from the qualitative phase additionally indicated that the decisions to adapt and innovate to changing customer needs comes with risks. It requires a certain level of agility and flexibility, as well as the ability to take calculated risks; however, businesses in NZ that are able to navigate these changes can successfully reap significant rewards. Furthermore, to stay attuned to changing customer needs, businesses should conduct research on customer preferences and analyse industry trends.

The results also showed that both cost leadership and differentiation strategies are prevalent in the construction industry and are necessary for successful business performance in NZ. In order to offer competitive prices to clients, cost leadership strategies are used for streamlining processes, reducing waste, and negotiating better rates with suppliers. At the same time, businesses are also working to improve their competitive advantage by differentiation, i.e., by offering innovative solutions, providing exceptional customer service, or developing specialised expertise. Hence, a combination of Cost leadership and Differentiation, also called hybrid strategies, is prevalent in NZ construction industry and has a direct link to improved performance. Moreover, a dimension of organisational structure (formalisation and complexity) promotes collaboration, teamwork, innovation, which enhances the company's hybrid strategic pursuit capabilities.

Similarly, it is also concluded that human, financial, and technical resources alone are not enough to give a competitive advantage, but rather must be paired with effective competitive strategies to truly enhance business performance in the context of NZ construction industry. The conclusion is that aligning resources and capabilities with competitive strategies leads to improved firm performance.

7 Chapter 7: Conclusion

This study aimed to investigate firm performance within the construction industry in NZ. The main research aim centred on identifying the factors that contribute to the success or failure of NZ construction firms. This chapter presents the main conclusions of the study and how are they linked to the research aims and questions. The chapter also presents the study's contributions to current knowledge, its practical applications, the limitations of the research, and future research directions.

7.1 Research Aim, Objectives and Questions

The main aim of the study was to explore factors which could aid in *improvement in the performance of construction firms in New Zealand* (Section 1.4)

Based on research aim, the following Research Questions were framed:

Research Question 1: What is the nature of the relationship between a firm's internal attributes, i.e., Dynamic Capabilities and Firm Performance?

Research Question 2: What is the nature of the business environment in the industry, and does a moderating relationship between Dynamic Capabilities and Firm Performance exist?

Research Question 3: What is the nature of competitive strategy adoption in the construction industry, and how does it influence Firm Performance?

Research Question 4: How do 'Organisation Structure', 'Competitive Strategies' and 'Organisation Resources and Capabilities' interact, and what is influence of this interaction upon Firm Performance?

The following section explains, how these research questions were answered.

7.2 Summary of Research Findings

The conclusions and discussions presented in the chapters 5 and 6 can be divided into three parts, based on devised conceptual models and themes identified from case studies.

7.2.1 Findings for interaction of Dynamic Capabilities on Construction Firm Performance and the Role of Environmental Dynamism

It was hypothesised that Dynamic Capabilities (DC) have a direct influence on construction firm performance (H1). This research conceptualised (DC) Dynamic Capabilities as a second-order reflective formative construct. Three first-order dimensions of Sensing, Seizing and Reconfiguring form the second-order construct of DC, as shown in Figure 3.1

Environmental Dynamism refers to the frequency by which business operating environment is changing and how unpredictable such changes are. It was conceptualised that the strength of the relationship between the DC and performance will be enhanced under environmental volatility, signifying the role of environmental dynamism as a 'moderator' (H2)

The results validated the conceptualisation of DC as a second order construct. Moreover, the study findings show that DC lead to improved performance and thus enhanced competitive advantage for construction firms operating within New Zealand.

A similar observation was made from results of case studies as well: the key to staying competitive in NZ business environment is to be constantly attuned to changing customer needs and to be proactive in finding ways to meet those needs. By staying informed and adapting to change, construction firms in NZ can ensure that they remain relevant and successful in the long term. Moreover, being able to adapt and innovate in response to changing customer needs does not come without risk. It requires a certain level of agility and flexibility, as well as the ability to take calculated risks. However, for businesses that are able to successfully navigate these changes, the rewards can be significant. Therefore, in highly competitive business

settings, it is crucial for a construction company to be able to identify opportunities and potential threats and respond accordingly in order to enhance performance. DC enabled construction firms to gain a competitive advantage by creating new knowledge, products, and efficient internal processes. Thus, in NZ construction firms' context, their DC positively improved their performance.

Moreover, it was found that the strength of the relationship between the DC and performance is enhanced under environmental dynamism, which signified its 'moderator' role. When there is a high degree of Environment Dynamism, firms are required to carry out close surveillance of market volatility in terms of technological advancement. In addition, the threat of new entries to the market and knowledge of the underlying risks at the suppliers' end making the role of DC very important. Therefore, the key to staying competitive in NZ business environment is to be constantly attuned to changing customer needs and to be proactive in finding ways to meet those needs. By staying informed and adapting to change, construction firms in NZ can ensure that they remain relevant and successful in the long term.

The findings of this section addressed Research Question 1, 2 as depicted in Table 7.1

7.2.2 Findings for interaction of Organisation Structure and Hybrid Strategies on Performance

It was hypothesised that Hybrid strategies adoption can benefit construction a firm in improving their overall market position and by extension its performance (H3), as shown in Figure 3.2 and Figure 3.3. This study conceptualised 'Hybrid Strategy' as second-order reflective formative construct. Two first-order constructs, Cost Leadership and Differentiation, form the second-order construct Hybrid Strategy. All values of the second order constructs were significant showing that conceptualisation of Hybrid strategies as a second-order construct is justified. Similarly, it was found the Hybrid Strategies have a direct influence on

firm performance within the context of the NZ construction industry. Hybrid strategies have advantages over single strategic pursuits because clients have become more concerned with attributes like quality, reliability, and post-delivery service standards. Firms that only focus on one strategy in these environments will have a weaker competitive advantage. By combining cost leadership and differentiation strategies, a firm can reduce its dependence on cost alone and improve its competitive edge in the market. These strategies are also harder to imitate as they involve multiple operational factors. Therefore, it is suggested that hybrid strategies can improve a NZ construction firm's competitive advantage.

For interaction of Organisation Structure (OS) and Hybrid Strategy, the OS were conceptualised using dimensions of Formalisation and Complexity. A direct link between OS and HS was conceptualised (H4a and H4b). The results showed that OS dimensions had a direct link to Hybrid Strategy adoption. Having formally documented rules and policies helps reduce costs and enhance communication and teamwork among employees, and improves efficiency, which supports the Cost Leadership and Differentiation strategy. Similarly, Complexity aids in pursuit of 'hybrid strategies' by bringing employees with similar skills and knowledge together to complete specific tasks, which leads to the development of new technologies, methodologies, and knowledge. This further helps with cutting costs and facilitating the adoption of new technologies, ideas, or methods, thus supporting the Cost Leadership and Differentiation strategy.

Finally, it was concluded that 'Hybrid Strategy' is a mediating variable between Organisation Structure and Firm Performance (H5), as no direct link between OS and Firm Performance could be established. Therefore, it was concluded that the attributes OS are not of much relevance in isolation, but the OS dimension led to a successful hybrid strategy adoption, which results in enhanced a Firm Performance for NZ construction firms. Therefore, OS had an indirect impact on performance of a firm, through Hybrid Strategy.

The findings from the case studies also revealed that the simultaneous pursuit of both Cost Leadership and Differentiation strategies were prevalent in the NZ construction industry and were deemed necessary for successful business performance. Construction firms were using Cost Leadership to find ways to streamline processes, reduce waste, or negotiate better rates with suppliers. This enabled them to offer competitive prices to clients. In parallel the businesses are also trying to improve the competitive advantage by Differentiation by offering innovative solutions to problems, providing exceptional customer service or developing specialised expertise in a particular area. Moreover, Organisational Structure played a crucial role in aligning the actions and efforts of employees with the overarching strategic pursuits of the firms. This alignment was achieved by improved communication and employees understanding of correlation between their individual roles and the organisation's objectives. Additionally, a supportive organisational structure also encouraged collaboration and teamwork, which can further enhance the strategic objective.

These findings of this section addressed Research Questions 3 and 4 as depicted in Table 7.1

7.2.3 Findings for Interaction of Resources and Capabilities, Competitive Strategies on Performance:

It was hypothesised that there is a direct relationship between resources/capabilities and Firm Performance (H6), as shown in Figure 3.4 and Figure 3.5. Resources and Capabilities were measured using Human, Financial, and Technological Resources. However, contrary to the predominant belief, a direct relationship between resources and performance could not be established. This suggests that just having sufficient resources and capabilities alone is not enough to ensure competitive advantage in the NZ construction industry and that other factors must also be considered. This contradicts the viewpoint of RBV theorists who argue that resources and capabilities are the sole source of firm performance.

Thereafter, it was conceptualised that capabilities/resources had an indirect relationship with firm performance which was mediated by competitive strategies (H7). The findings suggested that only few dimensions of resources and capabilities to competitive strategy were found significant. For human resources (dimension of resource/capability) and cost leadership, a direct relationship could not be established. A possible reason for this could be that strategies focused on cost saving result sometimes in less remunerations and other social benefits life work-life balance programmes, which may negatively hinder the retention of skilled human resource for construction businesses in NZ. This, therefore, leads to partial support to H7 that Resources/ Capability are directly linked to competitive strategies, which are further directly linked to performance. Hence competitive strategies are mediating the relationship between Resource/Capability and Performance. It is concluded that resources such as human capital, financial resources, and technology alone is not enough to gain a competitive advantage; it is necessary to have a strategy in place for utilising these resources effectively in order to improve business performance of NZ construction firms. For example, having financial resources is necessary, but it must be combined with a strategy for increasing revenue and profitability.

The findings from the case studies noted that human, financial, and technical resources are not the only sources of competitive advantage but must be paired with effective competitive strategies in order to truly enhance business performance. For example, the acquisition of skilled and motivated employees is essential for the success of an organisation. However, it is also crucial to have a clear strategy in place for utilising their talents and skills to gain a competitive advantage. Similarly, the availability of financial resources is a fundamental requirement; however, it must be supplemented with a strategy for their effective utilisation to increase revenue and profitability. Additionally, while access to the latest technology can provide advantages, it is not sufficient on its own; it must be integrated with a plan for leveraging this technology to enhance the organisation's services. In conclusion, it was noted

that a co-alignment of resources/capabilities and competitive strategy leads to enhanced firm performance in NZ construction industry. The findings of this section addressed Research Question 4 as depicted together with other questions in Table 7.1

Table 7.1: Linkage of Research Findings and Research Question

	RQ1	**RQ2**	**RQ3**	**RQ4**
Conceptual Model 1	✓	✓		
Conceptual Model 2			✓	✓
Conceptual Model 3				✓
Case Studies 1,2 and 3	✓	✓	✓	✓

By addressing the Research Questions, the Research Objectives set out in Section 1.4 were also met as depicted in Table 7.2.

Table 7.2: Linkage of Research Findings and Research Objectives

	Chapter 2: Literature Review	**Chapter: Conceptual Models and Hypothesis Development**	**Chapter 5: Results and Discussion**	**Chapter 6: Qualitative Data Results and Discussion**	**Chapter 7: Conclusion**
Objective 1	✓	✓			
Objective 2		✓			
Objective 3			✓	✓	
Objective 4			✓	✓	✓

By addressing the research questions and meeting the research objective, the main research aim (Section 1.4) *"to establish the factors critical for firm performance and make recommendations*

to improve the performance of the construction firms in New Zealand." has been successfully achieved.

7.3 Research Limitation:

This research has four main limitations. The first limitation is that the sample size (64) for the survey is small, which may limit the generalisability of the findings. The small sample size was expected from similar types of studies, so to address this PLS-SEM was used, which is better suited for small sample sizes and complex research models.

The second limitation is that while the three case studies represented NZ construction firms, variations in firm size and management practices may limit the generalisability of the findings across the cases. More cases of similar firm size would strengthen the generalisability of the findings, and cases from different sized main contractors and subcontractors may also yield new findings and insights.

The third limitation is that statistical analyses using cross-sectional survey data cannot sufficiently support causal inference, but only reflect correlation rather than causation. PLS-SEM also has limitations in testing circular/casual loops relationships. To address these limitations, this study adopted two strategies: building a theoretical model and relying on field studies. However, a longitudinal survey design would greatly enhance causal inference.

The final limitation is that the survey design used only one respondent per organisation, which may cause bias in the obtained data. The study would be improved by surveying multiple respondents at various hierarchical levels in an organisation.

It is also worth highlighting that the data collection was done before the onset of the COVID-19 pandemic, specifically in 2019 and 2020. This information was clearly communicated in the survey, where participants were asked to share their views based on the industry conditions prior to COVID-19. As a result, it is important to approach the findings with caution,

recognising that there could have been shifts in how the industry functions in the aftermath of the pandemic. Nonetheless, documenting and analysing such changes occurring before and after COVID-19 are not within the scope of this research.

7.4 Contribution to Knowledge:

This study applied principles of Strategic Management to understand Construction Firm Performance; however, compared to previous studies on strategic management in construction, this study offers a more comprehensive understanding of mechanism through the application of Contingency Theory for construction firm performance. Additionally, this study was conducted for the construction firms operating in NZ which has unique business environment and market factors due to the country's small size, geographical isolation, and a small population of just over 5 million.

This study provides a comprehensive understanding of performance differentials factors for construction firms in NZ. The theoretical lens of Contingency Theory was used to examine the relationships between Dynamic Capabilities, Hybrid Strategy, Business Environment Dynamism, Organisation Structure, Resources/Capabilities and Firm Performance. These relationships were framed in three conceptual models for hypothesis testing and discussion. This offers a broader view of how organisational internal attributes and business environments interact to affect performance compared to previous studies on construction firm performance, which usually assume a liner relationship between such attributes.

The mixed-methods approach used in this study allowed for the collection and analysis of both quantitative and qualitative data, which provides a more complete picture of the research question. This approach is particularly useful where the phenomenon being studied is complex and multidimensional (Hair et al., 2016), such as the case in the current study.

The study used a statistical technique called PLS-SEM (Partial Least Squares Structural Equation Modelling) to analyse the developed conceptual models for hypothesis testing. PLS-SEM is a multivariate method of analysis that is well-suited to the study of complex and multi-dimensional phenomena, such as firm performance. It allows for modelling the complex inter-relationships between variables, which can be useful in understanding the underlying mechanisms that drive performance, suitable for small sample size as well, as is the case in this research.

Only a few studies in the CEM literature have examined the concept of Dynamic Capabilities (DC) for construction firms and only limited studies empirically explored the role of DC on performance from the contingency theory perspective. DC emphasise the role of dynamism within the business environment and advocate that firms adjust their routines to market needs. The construction business environment is known to be highly volatile and often hypercompetitive. However, the implications of such dynamic business environments on the performance of construction firms have not been fully explored previously. This study contributes towards filling this gap and establishes a direct positive relationship between DC and construction firm performance. Additionally, it was found that environmental dynamism acts as a 'moderator' in the relationship between the DC and performance. This implies that when the construction business environment is volatile and market needs are constantly changing, those firms equipped with DC will outperform those without such capabilities.

This study explored the adoption of both cost leadership and differentiation strategies simultaneously for superior performance, as there is limited understanding in CM literature on the development and successful application of this hybrid strategy and its impact on performance. Moreover, to successfully pursue a hybrid strategy, an appropriate organisation Structure (OS) should be in place. Therefore, this study contributed by exploring the dimensions of OS (formalisation and complexity) which can aid in hybrid strategy

development and successful application, which would then result in enhanced performance. It was empirically proved that the simultaneous adoption of cost leadership and differentiation, or 'Hybrid Strategy', leads to high levels of performance. This also means that cost leadership and differentiation strategic pursuit seems to complement rather contradict each other, as was thought previously. Hence, construction firms can enhance their performance by adapting a hybrid strategy. As stated above, to effectively pursue a hybrid strategy, an appropriate OS needs to be in place. This study also empirically proved that a high degree of formalisation and complexity are needed for successful implantation of a hybrid strategy. The results also show that OS does not directly influence a firm's performance. However, it does influence the development and adoption of a 'hybrid strategy', which upon successful realisation results in enhanced performance levels, thus demonstrating the mediating properties of 'hybrid strategy'.

Furthermore, it was also empirically shown that resources and capabilities alone are not enough to ensure improved performance. Instead, the results indicate that aligning resources and capabilities with a competitive strategy leads to improved firm performance.

The study's findings provide valuable insights for construction firm performance by pointing to the fact that development of DC, adoption of hybrid strategies along with appropriate decision-making structures, and aligning a resource base with strategic pursuit will help a construction firm achieve sustainable performance. The findings from these empirically tested relationships could be used by construction firms to improve their performance, increase competitiveness, and ultimately achieve better outcomes.

7.5 Recommendation to Practice:

Based on the findings of the research, following recommendations to the construction professionals in New Zealand construction industry are made:

1. Managers need to continuously scan their environments for their client's changing requirements or for any new technologies which may alter their competitive advantage. This includes monitoring market trends, keeping an eye on their competitors, and identifying new opportunities. By continuously scanning the environment, managers can anticipate changes in the market and adapt their strategies accordingly. This proactive approach is critical for maintaining a competitive edge in the industry. In addition, it is also important to be aware of any new technologies that may disrupt the industry. This can include new materials, construction techniques, or even digital tools that can improve efficiency and productivity. By staying abreast of these developments, managers can take advantage of new opportunities and stay ahead of the competition.
2. Efforts and resources should be directed at developing and improving the sensing, seizing and reconfiguring capabilities, as such capabilities would give a competitive edge to the construction firms during times of environment volatility. "Sensing" refers to the ability to detect changes in the external environment, "seizing" refers to the ability to take advantage of opportunities, and "reconfiguring" refers to the ability to adapt and change in response to changes in the environment. Actions could include investing in market research, organising and attending networking events, implementing novel project management methods, or training employees on new technologies and techniques. By developing these capabilities, construction firms can improve their ability to react quickly to market changes and maintain a competitive edge in a volatile environment.
3. It is recommended that managers should focus on both adopting the hybrid strategy of simultaneously pursuing both cost leadership and differentiation, because it has shown that these elements complement rather than contradict each other, as was previously thought. By combining these two strategies, firms can expect to see an improvement in overall performance. The cost leadership strategy aims at offering products or services at a lower

price than competitors, while the differentiation strategy aims at offering unique and superior products or services that are not easily replicated by competitors. A hybrid strategy combines these two strategies by offering a good balance between cost and differentiation. This approach is beneficial for construction firms because it allows them to compete on both price and quality, thus providing them with multiple ways to attract and retain customers. Additionally, by implementing a hybrid strategy, firms can also increase their market share and reduce the risk of being dependent on a single market segment.

4. It is important to note that the implementation of a hybrid strategy requires a well thought out and carefully planned approach. It is recommended that for the successful implementation of a hybrid strategy, an appropriate organisational structure must be in place. For construction firms in NZ, a high degree of formalisation and complexity was found to be important for successful implementation of a hybrid strategy. Consequently, the decision makers should give due diligence to the nature of organisation structure in their firms, as it has an indirect influence upon the firm performance.
5. It is evident that a firm will not be able to obtain a competitive edge based on its resource base alone. Instead, it is the firm's resources and capabilities that enable the successful pursuit of a competitive strategy, thus forming a strategic fit for enhanced performance. Furthermore, it is important to note that the alignment of resources and capabilities with the competitive strategy is not a one-time process but an ongoing one. The market and the firm's resources and capabilities are constantly changing, and a firm needs to continuously monitor and adjust its strategy to maintain its competitive advantage.

7.6 Directions for future research

In addition to the research endeavours required to address the limitations identified earlier (see section 7.3), there are a number of valuable directions for future research.

1. An important aspect of Dynamic Capability (DC) development is the role of path dependency. The concept of path dependency is related reliance of a firm on the long-term strategic decisions in its path. Hence the research on 'path dependency' warrants a longitudinal study for the construction firms with DC and its impact on firm performance.
2. The current study was conducted for the NZ construction industry, which is a comparatively small one marked by geographic isolation and high volatility. Similar studies conducted in the other countries construction business environment would provide more fascinating insights into the research area.
3. The current study looked at overall picture of different industry players to understand the importance of DC for performance. However, future research should be carried out to understand the impact of DC individually for various industry players, i.e., contractor, consultant, clients and public sector firms, to ascertain the relevance and importance for DC for different stakeholders.
4. One potential area for further research is to explore the impact of different organisational structures on the implementation of a hybrid strategy. This could involve studying how different types of organisational structures affect the ability of firms to pursue both cost leadership and differentiation strategies. For example, research could explore whether a more centralised organisational structure is better suited to implementing a hybrid strategy in a volatile environment or whether a more decentralised structure is more effective.
5. Investigation regarding how cultural factors influence the adoption and implementation of a hybrid strategy may yield interesting results. Additionally, future research could focus on how firms can effectively manage the trade-offs that come with a hybrid strategy, such as balancing the need to reduce costs while also investing in differentiating features.
6. Future research could focus on specific industries within the construction sector and examine how the hybrid strategy applies to them. For example, research could be

conducted on how the hybrid strategy applies to the residential construction, commercial construction, or infrastructure construction sector. Furthermore, future research could focus on the implementation of a hybrid strategy in different countries and regions, in order to gain a better understanding of the cultural and economic factors that influence the success of this strategy.

7. The role of business environment volatility in the application of hybrid strategies and how organisational structure dimensions and hybrid strategies are interlinked in such business environments is another potential future research area. Volatility in the business environment can have a significant impact on the success of a hybrid strategy. Research in this area could explore how different levels of volatility in the business environment affect the ability of firms to implement and sustain a hybrid strategy. Moreover, such research could also look at how the interplay between organisational structure dimensions and hybrid strategies can affect the performance of firms in volatile business environments.
8. A comprehensive examination of how resources impact firm performance is necessary and should consider additional factors such as physical resources. Additionally, it should explore the interactions and dependencies between these different types of resources, as well as how they are allocated and managed within a firm. The use of multiple variables will provide a more complete understanding of the relationship between resources and firm performance.
9. Another interesting research area could be assessing the performance of construction firms before and after the imposition of COVID-19 restrictions, along with their strategies for mitigating these disruptions. Specifically, there is potential to explore the efficacy of Dynamic Capabilities View (DCV) in navigating such challenges, alongside other relevant factors.

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Appendix A- Survey Invitation Letter

Construction Firms Performance in New Zealand

This survey is being conducted for a Ph.D. research project at the School of Built Environment, Massey University, Auckland, New Zealand.

Survey Objectives:

To investigate

- Different determinants of performance of construction firms in New Zealand.
- How these determinants are different from international construction markets.
- How these unique determinants, jointly influence and define the construction industry Business and Operational Performance in New Zealand.

Benefits of Participation:

You are requested to participate in the survey because you have been identified an expert in your field.

- The survey will aid to your understanding of recent developments in international construction industry performance variables.
- In addition, the different factors by which international construction companies are analysing and improving their performance.

An understanding of such factors will further help the overall New Zealand construction industry.

Confidentiality Statement

Massey University Research Ethics Committee has approved this project. The information provided will be used for research purposes only. All the information will remain confidential, and any distribution and publication of information collected in the survey will be in aggregate form and will not identify any individual contribution.

The questionnaire should take about 15 - 20 minutes. Please feel free to contact Israr Wahid or supervisory team for any further queries.

*** Please note that all the survey seeks responses considering the pre-CoVid-19 scenario**

Contact Information

Israr Wahid: i.wahid@massey.ac.nz (Cell #: 02108192526)

Dr. James O. B. Rotimi: j.rotimi@massey.ac.nz

Dr. Wajiha Shahzad: w.m.shahzad@massey.ac.nz

The survey is structured into six main sections:

Section 1: Business Environment
Section 2: Dynamic capabilities
Section 3: Competitive Strategies
Section 4: Resources and Capabilities
Section 5: Organisation Structure
Section 6: Performance Measurement

There are no ‘CORRECT’ or ‘INCORRECT’ answers, just your candid opinions

You can also take this survey online Via below QR Code:

Appendix B- Questionnaire Survey

Demographic Information:

This section seeks general information about your firm.

a. How many years is your firm involved in the construction industry?

- Less than 5 years,
- 5 to 10 years,
- 11 to 20 years,
- 20 to 30 years,
- More than 30 years

For how many years have you been involved in the construction industry?

- Less than 5 years,
- 5 to 10 years,
- 11 to 20 years,
- 20 to 30 years,
- More than 30 years

b. The number of full-time employees at your firm?

- 0-5 employees,
- 6-20 employees,
- 21-50 employees,
- 50-100 employees,
- Over 100 employees

c. Please select the main business area(s) operated by your company…

- Construction of buildings,
- Civil engineering (roads, railways, utility projects etc.),
- Specialized construction (demolition and site preparation, electrical, plumbing etc.,
- Property development (commercial, industrial, etc.),
- Support services (maintenance, facility management etc.),
- Professional services (project management, design, planning, consultancy etc.)
- Public-private partnership investments
- Others ……..

d. Please select the main geographical regions inside New Zealand in which your company operates

- Auckland,
- Canterbury
- Wellington,
- other

e. Please specify the main market(s) in other countries (outside NZ) in which your company operates

……..

Section 1: Business Environment:

This section measures the business environment in which your firm is operating. The business environment consists of the number of forces that are beyond the control of management, and thus pose threats as well as opportunities to companies. It is measured by various dimension as below

Please indicate by choosing an appropriate choice that best defines your firm's business environment

Statement	Strongly Disagree (5)	Disagree (4)	Neutral (3)	Agree (2)	Strongly Disagree (1)	Don't know (0)
Dynamism (refers to unpredictable changes in the environmental conditions faced by companies)						
1. Our products and services become outdated quickly						
2. Innovation in our operational processes need to be done frequently						
3. Our customer needs change frequently						
4. There are new challenges that keep emerging from our competitors						
5. The rate of flow in information in our industry (e.g., related to new projects etc.) is relatively high						

Section 2: Dynamic capabilities:

This section measures the Dynamic capabilities of your firm. It could be understood as a firm's ability to reconfigure its operating routines to enable better responses to changing environments.

Please indicate by choosing an appropriate choice that best defines your firm's dynamic capabilities

Statement	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Disagree**	**Don't know**
Sensing: It involves scanning, searches and exploration activities across markets for threats and opportunities						

1. Staff in our firm participate in professional development activities.						
2. We use established processes to identify target market segments, changing customer needs, and customer innovation.						
3. We seek best professional practice in our sector						
4. We track economic information on our operations and operational environment.						
Seizing: It involves possible investments in relevant technologies that are most likely to achieve market competitiveness						
1. We invest in finding solutions for our customers						
2. We adopt the best professional practices in our sector.						
3. We respond to defects pointed out by employees.						
4. We review our practices based on customer feedback						
Reconfiguring: In involves recombining resources and operating capabilities to avail new opportunities						
1. We implement new management strategies						
2. We implement new kinds of marketing strategies/ methods						
3. We implement new type of business processes						
4. We implement new ways of achieving our firm targets						

Section 3: Competitive Strategies:

This section measures the Competitive Strategies of your firm. Competitive strategy is "management's game plan for growing the business, attracting customers, and being competitive.

[2]Please indicate by choosing an appropriate choice that best defines your firm's adopted competitive strategies

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Disagree	Don't know
Cost leadership: This strategy involves providing product/services at a lower cost as compared to competitors						
1. We focus on cost reduction e.g., standardization and economies of scale						
2. We focus on superior training of personnel						
3. We control quantity and price of labour and material						
4. We carefully select subcontractors and suppliers						
5. We give incentives for resource-saving						
6. We adopt technological advancements to reduce overall product price						
Differentiation: This strategy involves providing product/services of better quality as compared to competitors						
1. We offer higher quality product compared to our competitors						
2. We offer innovative financing for faster project completion						
3. We offer innovative procurement methods for projects (e.g Design/Build etc)						
4. We focus on environmentally sustainable and socially responsible practices						

[2] The strike through items in Appendix A represent the deleted measurement item after the pilot interview.

5. We offer additional services to the clients than our competitors						
~~6. Company's reputation is important for us~~						

Section 4: Organisational Structure:

This section measures the Organisational Structure of your firm. Organisational structure refers to ways of distribution of tasks and activities, and coordination mechanisms within a firm.

Please indicate by choosing an appropriate choice that best defines your firm's organisational structure:

Statement	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Disagree**	**Don't know**
Formalization (The degree to which formal rules and procedures govern decisions and working relationships)						
1. Our firm has clearly defined rules and regulations						
2. Our employees have documented job descriptions						
3. Our firm can ensure compliance with rules						
4. We have systems for evaluating our employees' performance						
~~5. A code of conduct exists for our firm's employees~~						
~~6. Our firm has no criteria for monitoring work progress~~						
Complexity (The degree of different departments/ units that exists within a firm)						
1. Our firm has several functional units/departments						
2. We have a number of sub-units within our main functional units/departments/ hierarchies						

3. Cross departmental meetings [3]are held frequently						

Section 5: Resources and Capabilities:

This section measures the Resources and Capabilities of your firm. They are tangible and intangible assets, which help firms achieve superior performance.

Please indicate by choosing an appropriate choice that best defines your firm's resources and capabilities:

Statement	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Disagree**	**Don't know**
Financial (This pertains to finical health of a firm)						
1. Our firm has the ability to use their own finances						
2. Our firm can secure loan to fund expansion, improve profit ratio and improve cash flow						
3. Our firm can secure a surety bond or insurance policy						
Human resources (This pertains to human resources of a firm)						
1. Our firm has structured recruitment and job placement procedures						
2. We offer reward & recognition to motivate our staffs						
3. We proactively develop capacity of staff in key strategic areas						
4. We try to maintain good working relationship with trade unions.						
5. ~~In our firm top managers & technical personnel participate in firm development activities~~						

[3] The strike through items in Appendix A represent the deleted measurement item after the pilot interview.

6. ~~We provide enabling working environment to reduce employee turnover and absenteeism~~						
Technological (This section explores the technological use of a firm)						
1. We carry out effective assessment of technological opportunities and market threats						
2. Our firm invests in R & D						
3. We integrate new technologies in our business system and processes						
~~4. Our workplace environment encourages creativity and innovation~~						
~~5. Technology is critical to our firms' business~~						

Section 6: Firm Performance:

This section measures the Firm's Performance. Performance is measured in various areas of the firm's operations like financial, customer satisfaction, internal business process, learning and growth, safety, quality.

Please indicate by choosing an appropriate choice that best defines your firm's performance

1. What do you think how your Firm's Profits would compare with your competitor[4]s' profits in the past three years	• Not profitable (1) • Below (2) • Same (3) • Better (4) • Extremely profitable (5)
2. What do you think how your Firm's Market Growth would compare with your competitors' growth in the past three years	• Not profitable (1) • Below (2) • Same (3) • Better (4) • Extremely profitable (5)
3. What do you think how your Firm's Revenue would compare with your competitors in the past three years	• Not profitable (1) • Below (2)

[4] The strike through items in Appendix A represent the deleted measurement item after the pilot interview.

	• Same (3) • Better (4) • Extremely profitable (5)

Appendix C- Interview Question Template

Confidentiality Statement

Massey University Research Ethics Committee has approved this project. The information provided will be used for research purposes only. All the information will remain confidential, and any distribution and publication of information collected in the interview will be in aggregate form and will not identify any individual contribution.

You agree that this interview will be recorded for transcription purposes: Yes / No

Name of the organisation:

Interviewee's position in the organisation:

Location of Interview:

Date:

SECTION A

Formal Introduction, Research Background and Aims to be briefly explained to interviewee

Demographics

- How many years have you worked in the organisation?
- How many employees do you have in your organisation?
- Main Area of Business

SECTION B

Business Environment Dynamism:

I am trying to the understand the business environment in which your firm is operating,

- Do you think that your customer needs have changed frequently?
- Could we suggest that your firm's services become outdated quickly and there are new challenges that keep emerging from our competitors
- Do you continuously need to innovate

Dynamic capabilities:

I am keen to understand how to respond to changing business environment, by adjusting your operational activities to enable better responses to changing environments:

- Do you have some established processes to identify business opportunities?
- Do you have budget for investing in finding solution for customer needs or to capture new opportunities

- Do you think these activities are needed in your business environment?

Competitive Strategy:

Now I want to understand the process of competition in the industry and what type of strategies are followed:

- Do you try to secure business by being lowest bidder or try to use your other characteristics like quality record, reputation, innovative project delivery or financing methods along as well to secure contracts?

Organisational Structure:

I want to understand the structure of your organisation as well in terms of how authority and responsibilities are distributed.

- Does you firm have clearly defined rules, job descriptions and processes for employee evaluations
- Does you firm have specified department for different functions like bidding, project delivery, HR, quality control etc
- Do you believe these characteristics are required for successfully achieving your strategies and goals?

Resources and Capabilities:

I am keen to know about your organisation resources ad capabilities specifically the importance of financial, human, and technical resources.

- How important you think finical resources are critical for you firm?
- Do you invest in upskilling your staff to improve their capabilities?
- Do you try to incorporate new technologies like IT systems etc to enhance your business efficiency?
- How important you think it is to match your resources with your strategic pursuits?

Ending Notes

Appendix D- Ethics Approval Notification

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

Date: 18 July 2019

Dear Israr Wahid

Re: Ethics Notification - **4000021438 - Determinants of Construction Industry Performance in New Zealand**

Thank you for your notification which you have assessed as Low Risk.

Your project has been recorded in our system which is reported in the Annual Report of the Massey University Human Ethics Committee.

The low risk notification for this project is valid for a maximum of three years.

If situations subsequently occur which cause you to reconsider your ethical analysis, please contact a Research Ethics Administrator.

Please note that travel undertaken by students must be approved by the supervisor and the relevant Pro Vice-Chancellor and be in accordance with the Policy and Procedures for Course-Related Student Travel Overseas. In addition, the supervisor must advise the University's Insurance Officer.

A reminder to include the following statement on all public documents:
"This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director - Ethics, telephone 06 3569099 ext 85271, email humanethics@massey.ac.nz."

Please note, if a sponsoring organisation, funding authority or a journal in which you wish to publish requires evidence of committee approval (with an approval number), you will have to complete the application form again, answering "yes" to the publication question to provide more information for one of the University's Human Ethics Committees. You should also note that such an approval can only be provided prior to the commencement of the research.

Yours sincerely

Research Ethics Office, Research and Enterprise
Massey University, Private Bag 11 222, Palmerston North, 4442, New Zealand **T** 06 350 5573; 06 350 5575 **F** 06 355 7973
E humanethics@massey.ac.nz **W** http://humanethics.massey.ac.nz

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Human Ethics Low Risk notification

Professor Craig Johnson
Chair. Human Ethics Chairs' Committee and Director (Research Ethics)

Appendix E-Statements of Contributions

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

GRADUATE RESEARCH SCHOOL

STATEMENT OF CONTRIBUTION
DOCTORATE WITH PUBLICATIONS/MANUSCRIPTS

We, the student and the student's main supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the student's contribution as indicated below in the Statement of Originality.

Student name:	Israr Wahid
Name and title of main supervisor:	Professor James Olabode Bamidele Rotimi
In which chapter is the manuscript/published work?	Chapter 5
What percentage of the manuscript/published work was contributed by the student?	80

Describe the contribution that the student has made to the manuscript/published work:

Literature Review, data collection, data analysis, drafting

Please select one of the following three options:

(●) **The manuscript/published work is published or in press**

Please provide the full reference of the research output:

Wahid, I., Shahzad, W., Rasheed, N., & Rotimi, J. O. B. (2023). Analysis of Theoretical Viewpoints Explaining the Performance Differentials of Construction Firms. International Journal of Construction Education and Research, 1-24. doi:10.1080/15578771.2023.2172108

( ) **The manuscript is currently under review for publication**

Please provide the name of the journal:

( ) **It is intended that the manuscript will be published, but it has not yet been submitted to a journal**

Student's signature:	israr wahid Digitally signed by israr wahid DN: CN=israr wahid, OU=link alliance, E=israr.wahid@linkalliance.co.nz, C=US Reason: I am the author of this document Location: Date: 2023.03.17 21:22:03+13'00' Foxit PDF Reader Version: 12.1.1	Main supervisor's signature:	James Olabode Bamidele Rotimi Digitally signed by James Olabode Bamidele Rotimi DN: cn=James Olabode Bamidele Rotimi, c=NZ, o=Massey University, ou=School of Built Environment, email=j.rotimi@massey.ac.nz Date: 2023.03.17 22:03:41 +13'00'

This form should appear at the end of each thesis chapter/section/appendix submitted as a manuscript/ publication or collected as an appendix at the end of the thesis.

MASSEY UNIVERSITY
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UNIVERSITY OF NEW ZEALAND

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What percentage of the manuscript/published work was contributed by the student?	80

Describe the contribution that the student has made to the manuscript/published work:
Literature Review, data collection, data analysis, drafting

Please select one of the following three options:

○ **The manuscript/published work is published or in press**

Please provide the full reference of the research output:

◉ **The manuscript is currently under review for publication**

Please provide the name of the journal:
Title: Impact of Dynamic Capabilities on Construction Firm Performance. The Moderating Role of Environmental Dynamism. Management Decision
Journal: Management Decision

○ **It is intended that the manuscript will be published, but it has not yet been submitted to a journal**

Student's signature:	israr wahid Digitally signed by israr wahid DN: CN=israr wahid, OU=linkalliance, E=israr.wahid@linkalliance.co.nz, C=US Reason: I am the author of this document Location: Date: 2023.03.17 21:21:50+13'00' Foxit PDF Reader Version: 12.1.1	Main supervisor's signature:	James Olabode Bamidele Rotimi Digitally signed by James Olabode Bamidele Rotimi DN: cn=James Olabode Bamidele Rotimi, c=NZ, o=Massey University, ou=School of Built Environment, email=j.rotimi@massey.ac.nz Date: 2023.03.17 22:05:08 +13'00'

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Name and title of main supervisor:	Professor James Olabode Bamidele Rotimi
In which chapter is the manuscript/published work?	Chapter 5
What percentage of the manuscript/published work was contributed by the student?	80

Describe the contribution that the student has made to the manuscript/published work:

Literature Review, data collection, data analysis, drafting

Please select one of the following three options:

- ○ **The manuscript/published work is published or in press**
  Please provide the full reference of the research output:
- ◉ **The manuscript is currently under review for publication**
  Please provide the name of the journal:
  Title:The role of 'Organisation Structure' and 'Hybrid Strategy' on Construction firm performance. A Contingency Theory perspective / Journal: Management Decision
- ○ **It is intended that the manuscript will be published, but it has not yet been submitted to a journal**

Student's signature:	israr wahid Digitally signed by israr wahid DN: CN=israr wahid, OU=linkalliance, E=israr.wahid@linkalliance.co.nz, C=US Reason: I am the author of this document Location: Date: 2023.03.17 21:21:38+13'00' Foxit PDF Reader Version: 12.1.1	Main supervisor's signature:	James Olabode Bamidele Rotimi Digitally signed by James Olabode Bamidele Rotimi DN: cn=James Olabode Bamidele Rotimi, c=NZ, o=Massey University, ou=School of Built Environment, email=j.rotimi@massey.ac.nz Date: 2023.03.17 22:05:26 +13'00'

This form should appear at the end of each thesis chapter/section/appendix submitted as a manuscript/ publication or collected as an appendix at the end of the thesis.

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

GRADUATE RESEARCH SCHOOL

STATEMENT OF CONTRIBUTION
DOCTORATE WITH PUBLICATIONS/MANUSCRIPTS

We, the student and the student's main supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the student's contribution as indicated below in the Statement of Originality.

Student name:	Israr Wahid
Name and title of main supervisor:	Professor James Olabode Bamidele Rotimi
In which chapter is the manuscript/published work?	Chapter 2
What percentage of the manuscript/published work was contributed by the student?	80

Describe the contribution that the student has made to the manuscript/published work:

Literature Review, data collection, drafting

Please select one of the following three options:

- (●) **The manuscript/published work is published or in press**

  Please provide the full reference of the research output:

  Rotimi, J. O. B., Wahid, I., & Shahzad, W. (2019). FACTORS LIMITING PERFORMANCE OF THE CONSTRUCTION INDUSTRY: A NEW ZEALAND PERSPECTIVE. Paper presented at the 43rd Australasian Universities Building Education Association, Australia.

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Student name:	Israr Wahid
Name and title of main supervisor:	Professor James Olabode Bamidele Rotimi
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