

1 **Managing Supply-Chain Disruptions in the Construction Industry:**
2 **An institutional approach**

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4 Muhammed Bolomope¹, Amarachukwu Nnadozie Nwadike², Itohan Esther Aigwi²

5 ¹*Real Estate Department, University of Aberdeen Business School, Aberdeen, United Kingdom*

6 ²*School of Future Environment, Auckland University of Technology, Auckland, New Zealand*

7
8 **Abstract**

9 **Purpose**– This study explores the institutional theory as a lens for investigating how
10 construction firms adapt to supply chain disruptions. Specifically, the paper evaluates the
11 interactions and interdependencies amongst various organizations, participants, and institutions
12 in the construction industry as a basis for a holistic, adaptive response strategy for managing
13 supply chain disruptions.

14 **Design/methodology/approach**– Following the tenets of relativist philosophy and qualitative
15 research methodology, this study explores the lived experiences of senior-level managers
16 across major construction firms in New Zealand through in-depth semi-structured interviews,
17 as a basis for understanding how their respective organizations adapt to supply chain
18 disruptions.

19 **Findings**– The research findings suggest that aside from the formal rules that guide the conduct
20 of construction firms as they adapt to supply chain disruptions, informal interactions that exist
21 amongst various organisations and players in the construction industry could also enhance the
22 development of innovative and practical response strategies to supply chain disruptions.

23 **Originality/value**– This study makes original empirical contributions to the supply chain
24 management literature by providing insights into how construction firms demonstrate
25 normative, coercive and mimetic isomorphic tendencies amidst the complexity of supply-chain
26 disruptions. Insights from this study could enhance the adaptive response of construction firms
27 to supply chain disruptions while also improving the overall resilience of the built environment.

28 **Keywords:** Supply Chain, Disruptions, Construction Industry, Institutions, Institutional theory

29 **Paper type** Research paper

30

1 Introduction

2 The construction industry has evolved as a major driver of socio-economic development
3 (Finkel, 2015). Over 100 million jobs are linked to the industry globally (i.e., 7% of the global
4 working population), with a contribution of about \$10 trillion (i.e., 13% of the global GDP) to
5 the world economy (Ajayi et al., 2016). According to the World Economic Forum, the
6 construction industry provides the premise for other industries to thrive and has continued to
7 advance through innovation and technology to improve trade, commerce and living conditions
8 globally (Finkel, 2015). However, in spite of its contribution to socio-economic development,
9 the construction industry has been criticised as ineffective in the management of resources
10 (Aloini et al., 2012), partly due to its fragmented practices (Vrijhoef and Koskela, 2000; Kissi
11 et al., 2021).

12

13 Although Tennant and Fernie (2014, pg. 56) argued that “*to describe construction as a laggard*
14 *is crude and ill-advised,*” the fragmented nature of the construction industry can be linked to
15 its multi-complex nature, wherein inputs from multiple stakeholders are required to achieve a
16 predefined project standard within a stipulated budget and allotted timeframe (Aloini et al.,
17 2012; Nguyen et al., 2018). According to Ajayi et al. (2016), a typical construction project may
18 require several drawings, material testing, supplies, waste management plans and safety
19 considerations, each of which is distinct in terms of the expertise required but interrelated in
20 ensuring the efficient delivery of the overall project (Aloini et al., 2012). As such, the
21 construction industry is comprised of multiple stakeholders with diverse beliefs, norms,
22 cultures, and experiences, whose coordination is essential in ensuring overall project success
23 (Panahi et al., 2017; Kissi et al., 2021). The need for the effective coordination of people,
24 processes and resources has led to the adoption of supply chain management (SCM) in the
25 construction industry (Aloini et al., 2012; Tennant and Fernie, 2014) as a mechanism for
26 enhancing project outcomes and best practices.

27

28 Whereas the significance of SCM to the construction industry has been well-researched
29 (Vrijhoef and Koskela, 2000; Hughes, 2009; Lu et al., 2021), its efficiency is widely adjudged
30 to linger behind other industry sectors (such as manufacturing, automobile, and information
31 technology) that have developed pre-defined processes to drive efficient SCM practices

1 (Johnson and Mena, 2008; Lahane et al., 2020). Hence, supply chain enthusiasts in the
2 construction industry remain circumspect about its adoption and implementation. For instance,
3 unlike the manufacturing or information technology industry which are premised on predefined
4 processes, with minimal disruption¹ and a logical estimate of the human and material resources
5 needed to deliver a finished good (Stadtler et al., 2015; Blanchard, 2021), the construction
6 industry is more complex as each project expectation and deliverable is prone to disruptions
7 and subject to variation. According to Abidin and Ingirige (2018), the supply chain in
8 construction firms is susceptible to various forms of disruptions because of the unique nature
9 of each construction project and the multiplicity of project participants involved. Consequently,
10 the consideration of supply chain disruptions makes it challenging for construction firms to
11 harmonize and replicate pre-defined, rational SCM practices across different project types.

12

13 Notwithstanding the potential impact of disruptions on predefined SCM practices in the
14 construction sector, existing debates on the subject are predominantly focused on rational
15 theories and processes. Notably, several studies have proposed different hierarchical practices
16 in managing risks (Xue et al. 2005; Tennant and Fernie 2014; Shojaei and Haeri, 2019) and
17 promoting efficiency, cost-effectiveness, and systematic coordination of construction projects
18 (O'Brien, 1999; Lu et al., 2021). For instance, Ju et al. (2017) proposed the use of a value
19 optimization strategy in eliminating supply chain-related conflicts in complex construction
20 projects, while Love et al., (2002) and Xue et al. (2005) clarify the significance of formal
21 relationships and objectives in the systemic coordination of diverse stakeholders in
22 construction supply chain management (CSCM). The adoption of rational, data-driven models
23 has also been integrated into CSCM to minimize waste, reduce delays, and maximize project
24 outcomes (Ju et al., 2017), while advanced technologies, such as Building Information
25 Modelling (BIM) have been introduced to CSCM to facilitate seamless communication and
26 coordination amongst diverse project stakeholders (Lu et al., 2021).

27

28

29 In spite of the significance of the highlighted rational strategies in enhancing CSCM (Hughes,
30 2009; Fernie and Tennant, 2013), the sole reliance on the rational approach has been argued to
31 subvert novel, intuitive strategies that could enhance supply chain management in a dynamic
32 construction environment (Cox and Ireland, 2002; Green et al., 2005). Tennant and Fernie

¹ events that could hinder supply chain activities or cause deviation to pre-defined supply chain operations

1 (2014) stressed further that such significant oversight hinders the viability of CSCM and how
2 construction firms adapt to supply chain disruptions. This is because the rational view of CSCM
3 posits an ideal scenario, which is impracticable in a multi-complex construction environment
4 with diverse participants, working together amidst the possibility of disruptions. While CSCM
5 within a rational framework posits how construction projects should be procured, coordinated,
6 and delivered, the reality of how construction firms actually procure, coordinate and deliver
7 projects often negates the rational assumptions (Cox and Ireland, 2002; Green et al., 2005),
8 especially amidst the complexity of disruptions. Therefore, by recognizing the peculiarity of
9 construction firms, the dynamism of the construction environment and the possibility of
10 disruptions, this study explores CSCM within the context of a more expansive and robust
11 theoretical foundation. Specifically, this study leverages the institutional theory in evaluating
12 how construction firms adapt to supply chain disruptions.

13

14 In advancing the debate on SCM, the institutional theory recognizes both rational and intuitive
15 components involved in CSCM, the peculiarity of construction environments and the
16 uniqueness of each construction project. By acknowledging that the construction industry is a
17 complex and dynamic domain, comprising several distinct but interdependent organizations
18 and actors, the interactions amongst the various participants in the construction industry were
19 examined in this study as a basis for understanding the CSCM strategies of construction firms
20 amidst disruptions. Therefore, by focusing on the isomorphic tenets of the institutional theory,
21 this paper explores the significance of formal and informal interactions across different
22 stakeholders and processes in the construction sector with the view to elucidating robust
23 insights that could enhance the overall resilience of the construction industry amidst the
24 challenges of supply chain disruptions.

25

26 The next section provides a detailed literature review that establishes the context of this
27 research while also clarifying the relevance of the institutional framework and isomorphic
28 tendencies in evaluating this study. Subsequently, section 3.0 explains the methodological
29 approach adopted in this research. The research findings and discussion are highlighted in
30 section 4.0, and the final section presents the research conclusions and culminates the study.

31

32 **2.0 Supply Chain Management in the Construction Industry**

1 SCM originated from the manufacturing industry (Vrijhoef and Koskela, 2000), wherein a
2 system was created to control the flow of resources and competencies that are required in the
3 production of finished goods (Fernie and Tennant, 2013). It has since brought about efficiency
4 in the industry through reduction in time overrun (Abidin and Ingirige, 2018), greater synergy
5 (Aloini et al., 2012) and improved product quality (Vrijhoef and Koskela, 2000).
6 Consequently, SCM has been adopted across other industries, including construction, as a
7 resource management and quality assurance mechanism (Dubois and Gadde, 2002; Oyegoke
8 et al., 2023). Although evidence of SCM in the construction industry can be traced to the 1980s
9 (Vrijhoef and Koskela, 2000), its significance was emphasized earlier, through the reports of
10 Lathan and Egan, which described the construction industry as inefficient, adversarial and
11 fragmented (Latham, 1994; Egan, 1998) and subsequently advocated the need for partnering
12 and collaboration in the construction industry as a strategy for enhancing the quality of
13 construction projects.

14 According to Dainty et al. (2001), SCM in the construction industry is premised on the
15 relationship between clients, contractors and suppliers, as a means of driving value creation in
16 line with project objectives (Hughes, 2009). It can also be described as a strategy that leverages
17 systems and procedures in providing a holistic framework that matches resources with
18 competencies (Nguyen et al., 2018), by striking a balance between client requirements, cost,
19 and the timely delivery of construction projects (Quin and Papadonikolaki, 2021; Tennant and
20 Fernie, 2014; Cherian et al., 2023). Informed by the necessity for continuous improvement
21 through information and resource management, SCM in the construction industry aims to
22 integrate the different stakeholders and their diverse interests in the project delivery process,
23 as illustrated in Figure 1 below.

24

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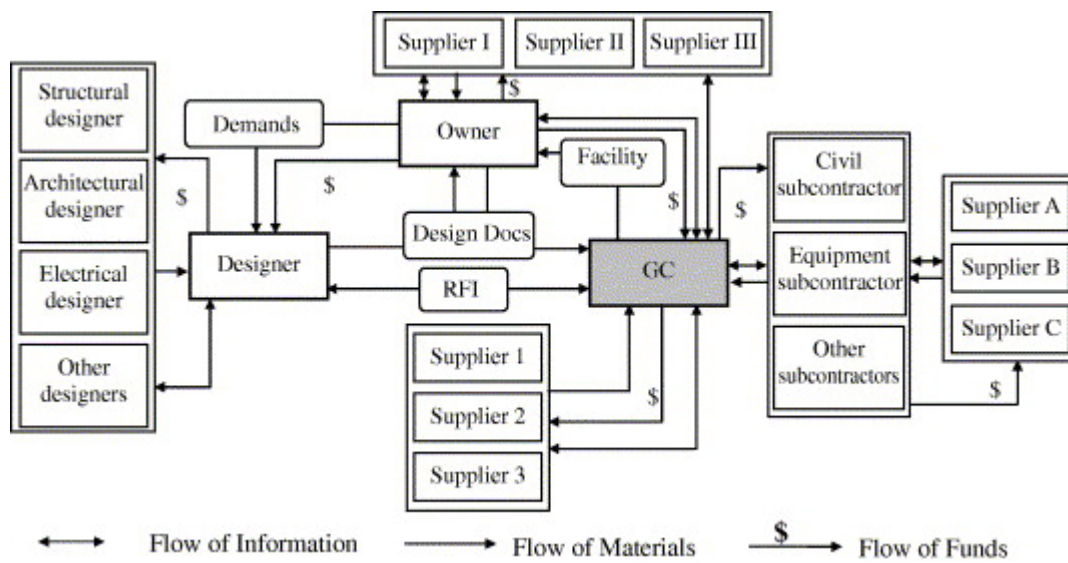
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2

3 **Source:** Xue et al. (2007)

4 **Figure 1:** Synergy between stakeholders with diverse interests and interdependent roles in
5 project delivery process.

6 Given the unique nature of each construction project and the need to coordinate information,
7 funds and materials within a multi-complex structure as illustrated in Figure 1, SCM in the
8 construction industry requires a detailed understanding and harmonization of factual
9 information across different individuals and organizations (Dubois et al., 2019). However, due to
10 the dynamic nature of the construction industry, access to factual information is
11 impracticable. This is because the multiplicity of construction management activities requires
12 inputs from different stakeholders (Oyegoke et al., 2023), whose opinions remain relative and
13 are often dependent on multiple considerations (Panahi et al., 2017). For instance, whereas an
14 architect may be interested in the aesthetics of a building project, a structural engineer is more
15 concerned about the building's safety and stability, with his opinion based on data relating to
16 geotechnical condition, proposed building use, regulatory requirements and availability of
17 materials, as provided by the geotechnical engineer, client, government agency and the
18 contractor. Consequently, several challenges associated with SCM have been identified in the
19 construction management literature. These challenges include the lack of coordination (Aloini
20 et al., 2012; Lahane et al., 2020), poor commitment and collaboration (Vrijhoef et al., 2001;
21 Panahi et al., 2017), knowledge gap (Dubois and Gadde, 2002; Dubois et al., 2019; Janne and
22 Fredriksson 2022), and inadequate performance management tools (Hughes, 2009). In their

1 study of supply chain management in the construction industry, Nguyen et al. (2018), also
2 identified seven limitations that impede CSCM, which are linked to the characteristics of the
3 construction industry, construction company's supply chain management capabilities, lack of
4 awareness and support from project stakeholders, inadequate project support systems, poor
5 relationship management, lack of innovation and experience, and inadequate information
6 technology.

7 Further to the highlighted limitations, scholars have also proffered solutions that could mitigate
8 supply chain challenges in the construction industry. For instance, Dainty et al. (2001),
9 advocated the need to drive integration in SCM through partnerships between small and
10 medium-sized enterprises (SMEs), contractors and client organizations. The need for an
11 effective coordination mechanism to facilitate reliable CSCM has also been proposed (Dubois
12 et al., 2019; Janne and Fredriksson, 2022; Morledge et al., 2009), as Aloini et al. (2012)
13 classified and analyzed the different risk factors that contribute to the ineffectiveness of CSCM
14 and suggested the need to recognize contractors as the responsible project participant that
15 should coordinate the planning and implementation of CSCM practices. The role of technology
16 in fostering the effective implementation of CSCM has equally been proposed (Cherian et al.,
17 2023; Okanlawon et al., 2023). According to Irizarry et al. (2013), technologies like building
18 information modelling (BIM) and geographic information systems (GIS) could minimize
19 CSCM challenges by improving the visual monitoring and tracking of CSCM practices.
20 Similarly, the use of blockchain technology in data tracking, contracting and resource
21 allocation has been suggested to improve coordination and enhance CSCM (Qian and
22 Papadonikolaki, 2021; Okanlawon et al., 2023). However, despite the innovative
23 recommendations that have emanated from the plethora of studies that have explored CSCM
24 practices, recent studies have continued to report the impact of uncertainties as major
25 hindrances to the effectiveness of CSCM practices (Hussein et al., Cherian et al., 2023; Janne
26 and Fredriksson, 2022; Cherian et al., 2023). Thus, suggesting a gap between existing research
27 recommendations and the reality of CSCM practices.

28 Most of the existing strategies for mitigating the challenges of CSCM are premised on the
29 assumption that the construction industry is ideal, with rational processes (Qian and
30 Papadonikolaki, 2021), where stakeholders have access to the information they require to
31 function effectively (Panahi et al., 2017; Lu et al., 2021). However, the reality of the
32 construction environment negates the rational assumption (Aloini et al., 2012; Fernie and

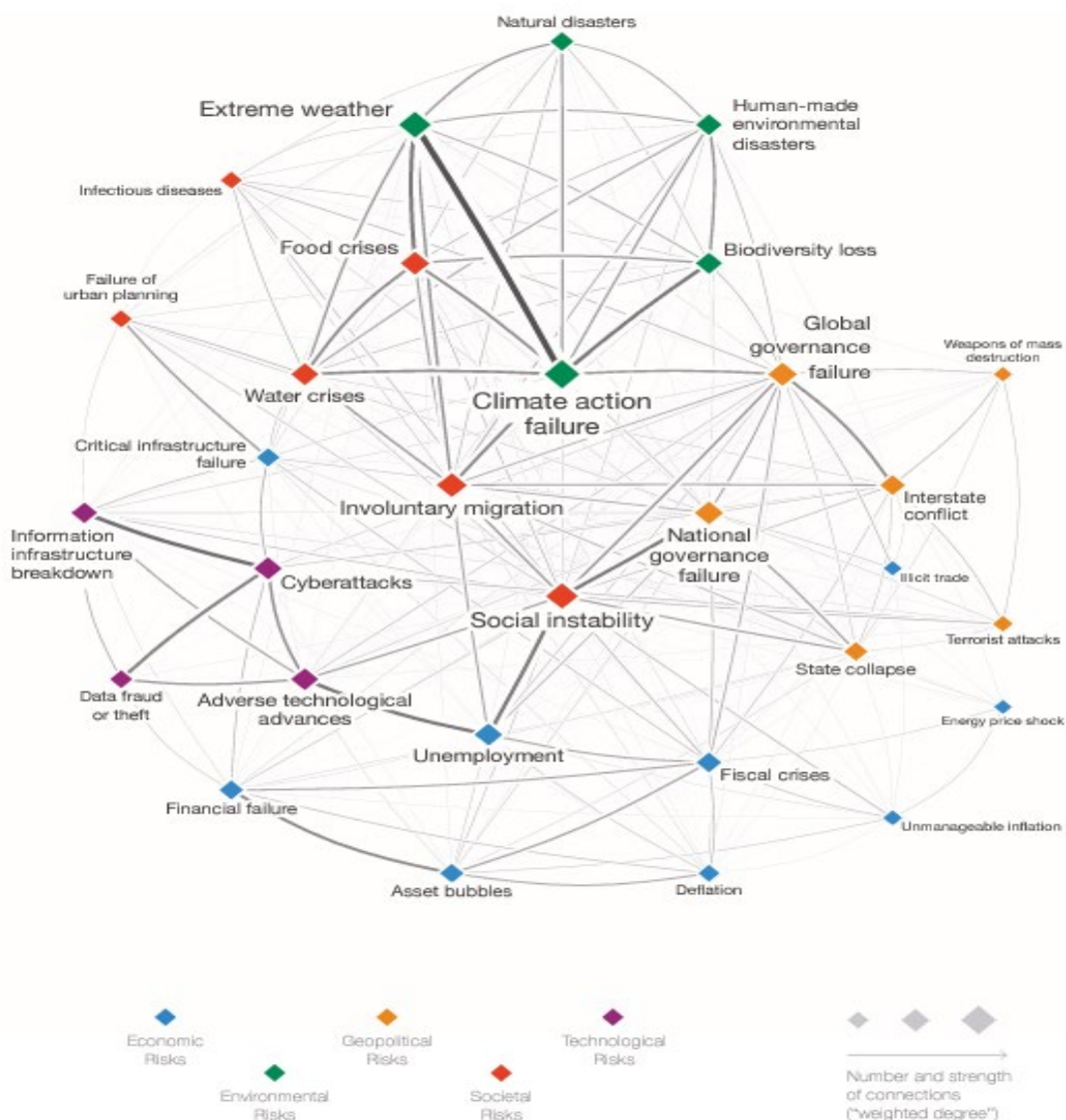
1 Tennant, 2013) and necessitates a more in-depth, interpretivist approach that recognizes the
2 dynamism of the construction environment and its constituent participants. According to Cox
3 and Ireland (2002), construction stakeholders should think beyond what can be achieved in an
4 ideal position, as the true effectiveness of CSCM is dependent on how well strategies align
5 with the reality of uncertainties that often disrupt the construction environment (Abidin and
6 Ingirige, 2018; Oyegoke et al., 2023). Therefore, in order to advance the current debate on
7 CSCM, this study explores CSCM holistically by recognizing the dynamism of the
8 construction industry and its participants as well as their susceptibility to disruptions. The next
9 section explores supply chain disruptions in the construction industry.

10 **2.1 Supply Chain Disruptions in the Construction Industry**

11 The conceptualization of disruption in the construction industry remains dynamic, due to its
12 multiple interpretations, having been described by several scholars as ‘risks’ (Lahane et al.,
13 2020), ‘disturbances’ (Hussein et al., 2021), ‘errors’ (Lu et al., 2021) or ‘uncertainties’ (Stadtler
14 et al., 2015) that are capable of distorting established practices and procedures. Although
15 disruptions are generally defined as events that alter predefined operational guidelines and
16 procedures (Bolomope et al., 2021), Abidin and Ingirige (2018, p 468) describe supply chain
17 disruption in the construction industry as “*an event that can affect the performance of the
18 supply chain causing deviation of their operation from meeting the project objectives.*”
19 Material and skills shortages (Kissi et al., 2021), financial crisis (Abidin and Ingirige, 2018),
20 technological advancement (Lu et al., 2021; Okanlawon et al., 2023), regulatory fluctuations
21 (Abidin and Ingirige, 2018), climate change (Ghadge et al., 2020) and the recent Covid 19
22 pandemic (Oyegoke et al., 2023), are typical examples of events that have disrupted CSCM
23 practices in recent years. Construction supply chain disruptions could also evolve from
24 geopolitical events such as trade disputes, political instability or warfare (Blanchard, 2021)
25 which may hinder the timely and cost-effective procurement of human and material resources
26 (Stadtler et al., 2015; Abidin and Ingirige 2018). Intrinsic factors emanating from industrial
27 disputes, equipment failure and scheduling conflicts have also been reported as major
28 disruptions of predefined construction activities (Kissi et al., 2021; Shojaei and Haeri 2019).
29 Indeed, scholars have argued the need to understand the diverse and multi-complex nature of
30 disruptions in order to develop robust CSCM practices.

31 Whereas other industries have streamlined the process of managing supply chain disruptions
32 (Lahane et al., 2020; Stadtler et al., 2015), the fragmented nature of the construction industry

1 and the interconnected risks that emanate from different stakeholders are often beyond the
 2 control of a single organization or entity (Oyegoke et al., 2023), which makes supply chain
 3 coordination and management more difficult amidst disruption (Dubois et al., 2019). For
 4 instance, despite the applaudable recommendation of Aloini et al. (2012), that contractors
 5 should lead the coordination of CSCM practices, a contractor’s inability to access funds as at
 6 when due could quickly escalate out of control, creating huge uncertainty to existing strategies
 7 and overall project success, due to the interrelated responsibilities of other project stakeholders.
 8 Figure 2 illustrates the interrelated nature of risks that trigger disruptions in the built
 9 environment and the complexity of managing these risks solely from a specific viewpoint.



10

11 *Source: World Economic Forum (2020).*

12 **Figure 2:** Risk map in the built environment.

1 Indeed, the complexity of supply chain disruption transcends the pre-construction, construction
2 and post-construction phases (Vrijhoef and Koskela, 2000; Cherian et al., 2023) and could
3 emerge from any of the organizations or entities connected to the construction activity (Abidin
4 and Ingirige, 2018; Kissi et al., 2021). Whereas it is unrealistic for construction firms to
5 eliminate all the highlighted risks in Figure 2 as they attempt to manage supply chain
6 disruptions, there is a need for construction firms to continuously develop mitigation and
7 adaptation strategies that would enable them to minimize their vulnerability to supply chain
8 disruptions and consequently improve overall project outcome (Dubois and Gadde, 2002;
9 Abidin and Ingirige, 2018). While conventional studies on CSCM have proposed rational, pre-
10 defined strategies to manage supply chain challenges as discussed in section 2.0, the
11 consequential impact of these strategies is limited in practice. According to Abidin and Ingirige
12 (2018), the construction industry requires a more detailed and robust approach that necessitates
13 firms to consider the interests of other entities alongside their own, in order to effectively
14 manage supply chain disruptions. Managing supply chain disruptions in the construction
15 industry, therefore requires more in-depth approaches that recognize both the obvious and rare
16 influences that contribute to the dynamism and multi-complex nature of the industry, as being
17 explored in this study through the tenets of the institutional theory.

18

19 **2.2 Institutional theory in context**

20 The institutional theory emerged through the ingenious works of scholars such as Coase (1937)
21 and Williamson (1975), which evaluates the principles of organizational behaviour and
22 highlights the need to understand the intrinsic and extrinsic components of organisational
23 practices when evaluating how decisions are made, communicated, and adapted. According to
24 Meyer and Rowan (1977), the primary principle of the institutional theory is premised on
25 deducing how organizations attain legitimacy and survival amidst the complexity of formal
26 rules (such as legislations, certifications and accreditations) and informal rules (such as cultural
27 ethics, traditional values and belief) that influence the realization of their goals. In making
28 sense of a phenomenon, the institutional theory provides the framework for evaluating the
29 impact of both rational and intuitive interactions on organizational structure and processes
30 (Bolompe et al., 2021). It establishes the uniqueness and significance of “*institutions*”² and
31 the institutional environment as major determinants of organizational behaviour (North, 1990;

² The rules of the game in society or the humanly devised constraints that shape human interaction (North, 1990)

1 Scott, 2008) and therefore clarifies that institutions emanate from three distinct but interrelated
2 elements [*regulative (rule-setting and sanctioning activities), normative (prescriptive,*
3 *evaluative and obligatory activities) and cultural–cognitive (shared conceptions of social*
4 *reality)*] (Scott, 2014 p. 27)] that are useful in making sense of the world as a social construct,
5 comprising numerous participants³ that constantly interact and negotiate in their quest for
6 legitimacy and survival (Bolomope et al., 2021).

7 According to Meyer and Rowan (2006), as similar organizations within an institutional
8 environment strive to survive and attain legitimacy in spite of similar limitations, they
9 gradually develop comparable operational tendencies, known as isomorphism. Isomorphism
10 clarifies how organizational structures become homogeneous over time, through “*a*
11 *constraining process that forces one unit in a population to resemble other units that face the*
12 *same set of environmental conditions*” (DiMaggio and Powell, 1983, p. 149). Indeed,
13 isomorphic tendencies can be discussed under three main categories of normative, coercive and
14 mimetic (DiMaggio and Powell, 1983), and several studies have suggested the need to observe
15 and understand these tendencies within an institutional environment in order to comprehend
16 the root causes of organizational change and adaptive practices (Yang and Hyland, 2012; Cao
17 et al., 2014). The different categorizations of isomorphic tendencies are discussed below;

- 18 • *Normative Isomorphism:* This refers to the pressures exerted on organizations to adhere
19 strictly to professional standards and conventions within a particular field, in order to
20 be considered as legitimate (DiMaggio and Powell 1983). It clarifies the homogeneity
21 in the operational practices of organizations that have been endorsed, certified or
22 accredited to perform a certain task by a professional association or group (Burdon and
23 Sorour, 2020). For instance, normative tendencies could emerge from the stipulated
24 guidelines of the Institute for Supply Management (ISM), which requires all certified
25 construction firms to tackle supply chain challenges in a certain way. The expectation
26 that professionals will consistently abide by the ethical codes of their profession is also
27 a trigger of normative isomorphism. According to Mizruchi and Fein (1999),
28 socialization within a discipline or trade improves normative isomorphism as it
29 encourages the diffusion of ideas and best practices across organizational networks.

30

³ Individuals and organizations

- 1 • *Coercive Isomorphism:* This is informed by formal and informal pressures that are
2 imposed on organizations by the government and the wider society in order to enforce
3 certain practices (Cao et al., 2014). Coercive isomorphism is conveyed through
4 principles, regulations, societal norms and cultural expectations (Mizruchi and Fein,
5 1999), and it reveals the extent of organizational compliance and alignment with certain
6 practices that affirm their legitimacy and survival (DiMaggio and Powell, 1983). In
7 demonstrating the significance of coercive isomorphism, Burdon and Sorour (2020)
8 argued that the legitimacy of an organization can be scrutinized if it fails to act in
9 accordance with the laws and guidelines within its field, while Escobar and Vredenburg
10 (2011) posits that societal expectations create the need for organizations to conform
11 with cultural ethics in order to survive. Coercive pressures could manifest in the form
12 of standard material requirements as stipulated by regulatory agencies or customers'
13 expectations of service or finished product. Coercive isomorphism, therefore, clarifies
14 the extent of compliance with regulations and societal expectations within an
15 organizational field (Mizruchi and Fein, 1999).
16
- 17 • *Mimetic Isomorphism:* This describes the tendency of an organization to replicate the
18 actions of similar organizations that are perceived to be more informed and legitimate
19 when responding to uncertainties (DiMaggio and Powell, 1983). Mimetic pressures are
20 exerted as a consequence of unclear organizational strategies that do not pre-empt the
21 possibility of adversity (Cao et al., 2014). According to Yang and Hyland (2012), it is
22 observable when organizations are motivated by the actions of their peers in such a way
23 that '*novices*' are obliged to '*follow the leader*' when faced with uncertainties. Amongst
24 other benefits, mimetic isomorphism offers a timely and cost-effective response to
25 uncertainties within an institutional environment (Mizruchi and Fein, 1999) because it
26 provides an avenue for less experienced organizations to imitate the readily available
27 strategies of experienced organizations in their pursuit of workable, legitimate solutions
28 to similar challenges (Yang and Hyland, 2012; Dua, 2022).
29

30 As a tenet of institutional theory, the viability of isomorphic tendencies as a mechanism for
31 managing uncertainties has been explored across several firms and agencies. For instance, it
32 has been adopted in resource management and reporting in the oil and gas industry (Escobar
33 and Vredenburg, 2011) performance management and disclosures in the financial industry

1 (Burdon and Sorour, 2020) as well as safety and conflict management practices in the
2 construction industry (Cao et al., 2014). However, despite its relevance in evaluating
3 organizational efficiency amidst the complexity of numerous project participants that are
4 governed by formal and informal rules in a rapidly changing institutional environment that is
5 prone to disruptions, there is a dearth of evidence on the application of the institutional theory
6 as a basis for understanding the adaptive response of construction firms to supply chain
7 disruptions.

8 This study is, therefore, timely, as it adopts an institutional approach in evaluating how
9 construction firms adapt to the challenges posed by the highly fragmented construction
10 environment amidst the complexity of supply chain disruptions.

11 12 **3.0 Methodology**

13 In line with the philosophical assumptions of relativist ontology and interpretivist
14 epistemology, a qualitative research strategy was adopted in this study. According to Creswell
15 (2013), qualitative research is driven by the view that individuals and groups are capable of
16 constructing their own version of reality, and therefore rejects the notion of absolute truth. It
17 entails the investigation of issues in their natural, contextual state, while recognizing that
18 knowledge is derived from the divergent and multiple beliefs that exist within a social construct
19 (Braun and Clarke, 2006). Qualitative strategy, therefore, provides a premise for an in-depth
20 exploration of the adaptive response of construction firms to supply chain disruptions because
21 it recognizes that various organizations and individuals within the construction industry are
22 interrelated and subject to several rules, norms, traditions, beliefs and values that impact their
23 behaviour.

24 Amongst the various forms of qualitative research such as grounded theory, case studies,
25 ethnography, narrative and phenomenology (Creswell, 2013), this study adopts a
26 phenomenological approach as it seeks to gain a holistic understanding of this research from
27 the perspectives of construction managers. According to Polkinghorne (1989), phenomenology
28 focuses on the fundamental, undiluted forms of human experiences that are yet to be put
29 through any form of scrutiny or speculation. As such, it provides the premise for clarifying
30 misconceptions about complex issues, through the interpretation of different perceptions
31 regarding a phenomenon (Creswell, 2013). Phenomenology has been extensively used in
32 exploratory and interpretivist contexts to conduct organizational research across different
33 disciplines (Ajayi et al., 2016; Bolomope et al., 2021), and it is considered suitable for this

1 study due to its ability to reveal unexpected intra and inter-organizational behaviours that could
2 hinder or enhance organizational value, culture and process. Therefore, in advancing the
3 theoretical premise of this study, the phenomenological approach is useful in evaluating both
4 rational and intuitive adaptive strategies of construction firms to supply chain disruptions.

5
6 As illustrated in Table 1, sixteen experienced professionals across the major construction firms
7 in New Zealand participated in this study. In the context of this study, major construction firms
8 are the construction companies that are involved in the provision and maintenance of social
9 and economic infrastructures and are listed in the New Zealand stock exchange market. The
10 research participants have direct engagements with listed construction and development firms
11 in New Zealand and they were purposively engaged because they have the requisite expertise
12 and knowledge to evaluate the research problem, having lived through different forms of
13 supply chain disruptions. As illustrated in *Table 1*, the respondents emerged from different
14 backgrounds, and they have primary decision-making responsibilities in their respective firms,
15 either as directors, CEOs or consultants. Unlike small and medium-scale firms, this study is
16 more focused on major construction firms because of their pre-defined corporate governance
17 structure (*i.e., rules, practices and processes by which decisions including CSCM decisions*
18 *should be made*) which presupposes a logical way of making decisions, with limited
19 consideration for intuitive, behavioural inputs (Chang et al., 2006).

20
21 Based on the pre-approved consent of the respondents, the interviews were conducted at
22 locations specified by them and each interview lasted for about 60 minutes. Also, the interviews
23 were recorded to ensure a comprehensive data collection and transcription process and the
24 respondents were assured of their confidentiality and anonymity. Data saturation was reached
25 at the end of the fourteenth interview and the overall sample size in this study conforms to the
26 recommendations⁴ of Polkinghorne (1989) and Creswell (2013). Details of the respondents are
27 summarized in *Table 1*.

⁴ between five and twenty-five

1 **Table 1.** Overview of the research participants.

2

Respondent	Respondents' Background	Qualification	Designation	Years of Experience	Firm Specialization
R1	Property Management	B.Prop	Chief Executive Officer	29	Real Estate Development
R2	Project Consultancy	PhD	Project Consultant	20	Construction and Contracting
R3	Construction Management	B.Sc.	Executive Director	18	Infrastructure Development
R4	Consultancy	M.Sc.	Project Consultant	25	General Construction
R5	Construction Management	B.Sc.	Project Director	32	Construction Project Management
R6	Property Management	B.Sc.	Chief Executive Officer	28	Real Estate Development
R7	Architecture	B.Arch.	Managing Director	16	General Construction
R8	Civil Engineering	M.Sc.	Project Consultant	19	Construction Project Management
R9	Project Management	B.Sc. RICS	Chief Executive Officer	21	Real Estate Development
R10	Construction Management	B.Sc.	Chief Executive Officer	18	Infrastructure Development
R11	Facilities Management	B.Prop	Managing Director	21	Building Maintenance and Repair
R12	Civil Engineering	B.Tech	Project Director	30	General Construction
R13	Property Development	B. Comm	Chief Executive Officer	19	Construction and Contracting
R14	Civil Engineering	B.Sc.	Project Director	25	General Construction
R15	Civil Engineering	BSc	Project Consultant	20	Building Maintenance and Repair
R16	Architecture	B.Arch.	Executive Director	27	General Construction

3 *Source: Authors own work*

4

5

1 **Data Collection and Analysis**

2 The data collated through the semi-structured interviews were subsequently transcribed and
3 analysed for themes. According to Braun and Clarke (2006, p.79), “*thematic analysis is a*
4 *method used for identifying, analysing, and reporting patterns (themes) within the data*”. This
5 form of analysis is capable of revealing implicit and explicit insights regarding the research
6 problem (Creswell, 2013) and is suitable for evaluating multiple opinions or perceptions
7 regarding a phenomenon (Ajayi et al., 2016; Dubois et al., 2019). Although thematic analysis
8 can be carried out with or without software applications (Bolomope et al., 2021), this study
9 combined the manual identification of themes with the use of NVivo 12 plus software to ensure
10 a thorough analytical process.

11

12 Following the stages of thematic analysis outlined in Braun and Clarke (2006), the transcribed
13 data was read several times to deduce the common keywords⁵ expressed by the research
14 respondents. Also, NVivo 12 plus software was used to ensure a more detailed search for
15 keywords. Consequently, the keywords were sorted into codes⁶ to reflect the respondents'
16 submissions. Further, the codes were reviewed and paraphrased to develop the initial set of
17 themes. The consistency and appropriateness of the initial themes were further evaluated across
18 respondents to ascertain their validity and consistency. As a result, some initial themes were
19 merged to develop a robust “final theme” while others were discarded because they did not
20 reflect the focus of this study. Figure 3 illustrates the analytical process, from the identification
21 of keywords to the establishment of themes, as data saturation⁷ was reached after the conduct
22 and analysis of the fourteenth interview.

⁵ Main words or phrases that describe the essence of participants' opinion

⁶ Expressions that connote the relationship between keywords and used to organize, summarise and report issues that emanate from the interview transcripts

⁷ A point where additional data is redundant as no new information is observed (Creswell, 2013)

1

	Code	Initial Theme	Final Theme	Research Participants																
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Coercive	Government Legislations	Standard practices	Adherence to relevant legislations and guidelines	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	Code Compliance			✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Contracts and Agreements	Managing contractual liabilities		X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Clients' Requirements			✓	✓	X	✓	✓	✓	X	✓	✓	X	✓	X	✓	✓	✓	X	
	End-user expectations	Consideration of unwritten rules		Integrating diverse stakeholder perspectives	✓	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	X	✓	✓
	Societal Norm				✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Principles and Values	Organizational Values	✓	X		✓	✓	✓	✓	✓	✓	X	✓	✓	✓	X	✓	✓	✓		
Normative	Certification considerations	Acknowledging best practices	Consistent Capacity Management		X	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	X	✓	✓	X	✓
	Professional Accreditation				✓	X	✓	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓
	Expert Consultation	Networking			X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Partnership and Alliances			✓	✓	✓	✓	✓	X	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓
	Peer Deliberations	Drive awareness and engagement		Innovative practices and Advocacy	✓	✓	X	✓	✓	✓	✓	X	✓	✓	X	✓	✓	X	✓	✓
	Feedback Mechanism				✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓
Interdisciplinary Briefing	Information Sharing	✓	✓		✓	✓	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	
Perception and belief		✓	✓		X	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	
Mimetic	Following the Leader	Replicating established strategies	Peer Observation and Group Action		✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓
	Observing Competitors				✓	X	✓	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓
	Imitation of ideas			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Sudden Disruptions	Fast track approach to managing uncertainties		✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	X	✓	✓	
	Time Constraints			X	✓	✓	✓	✓	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓
	Cost management			✓	✓	✓	X	✓	✓	X	✓	X	✓	✓	✓	✓	✓	✓	X	✓

2 *Source: Authors own work*

3 **Figure 3:** Managing supply chain disruption in the New Zealand construction industry

1 **4.0 Findings and Discussion**

2 The outcome of the data analysis suggests that construction firms in New Zealand demonstrate
3 normative, coercive and mimetic isomorphic tendencies as they adapt to supply chain
4 disruptions. These isomorphic tendencies and the associated practices deduced from the
5 thematic analysis are highlighted below;

6 1. Coercive Tendencies:

- 7 i. Adherence to relevant legislations and guidelines
- 8 ii. Integrating diverse stakeholder perspectives

9 2. Normative Tendencies:

- 10 i. Consistent Capacity Management Mechanism
- 11 ii. Innovative Practices and Advocacy

12 3. Mimetic Tendency

- 13 i. Peer Observation and Group Action

14 These practices are discussed accordingly within the context of respondents' opinions and the
15 institutional framework. Relevant excerpts from the transcribed data were also used to
16 corroborate respondents' assertions in line with the various forms of isomorphic tendencies.

17

18 **Coercive Tendencies**

19 *i. Adherence to relevant legislations and guidelines*

20 According to all the respondents, CSCM⁸ necessitates the adherence to clearly defined
21 regulatory compliance expectations across different project participants and processes.
22 Irrespective of disruptions, the respondents argued that their adherence to regulatory guidelines
23 and procedures often manifests in the form of their submission to precautionary measures or
24 risk management strategies that are enforced by the government or designated authorities. For
25 instance, in adhering to stipulated regulatory guidelines as a way of minimizing supply chain
26 disruption, construction firms are often compelled to appoint experienced consultants or
27 specialists that are certified as experts in their field of operation. According to the respondents,
28 such strategy of recognizing capacity based on certification and affiliation provides some

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1 certainty on construction firm’s capacity to manage unexpected fluctuations that could impact
2 predefined construction management processes. R4 stated that.

3 “... you can only offer what you have. By putting the right pole in the right hole, you would
4 have minimized the consequential impact of unsystematic disruptions. Companies that adhere
5 to standard practice of getting the right people involved are better at managing disruptions”
6 R4

7 In line with the submission of Cao et al. (2014), the respondents also argued that the legitimacy
8 of their respective firms is tied to the rule of law. As such, they are generally obliged to adhere
9 to government policies and procedures on CSCM amidst the complexity of disruptions, even
10 when they hold a contrary view. According to R15,

11 “Disruption does not take away our compliance obligations as an organization. Rather, it
12 strengthens it ..., and that is why our adaptive strategies are developed with full consideration
13 of relevant laws and standards” R15

14 Although these submissions advance the views from similar studies such as Fernie and Tennant
15 (2013) and Xie et al. (2022), the research respondents noted that adherence to regulatory
16 guidelines will not solely minimize the impact of disruption in CSCM. Rather regulatory
17 compliance should be complemented by the consideration of informal rules that emerge from
18 the project environment and constituent participants.

19

20 **ii. Integrating Diverse Stakeholder Perspectives**

21 The research respondents also noted that integrating the diverse perspectives of stakeholders
22 involved in construction management is essential in effectively managing supply chain
23 disruptions in the construction industry. According to them, the “legitimacy” of stakeholders,
24 which has been described by Suchman (1995, p. 574) as “a generalized perception or
25 assumption that the actions of an entity are desirable, proper, or appropriate within some
26 socially constructed system of norms, values, beliefs, and definitions”, is vital in ensuring the
27 realization of optimum and generally acceptable solutions to supply chain challenges in the
28 construction industry. Despite acknowledging the diverse interests and perceptions of
29 stakeholders, about 80% of the research respondents argue that deliberate efforts, aimed at
30 fostering collaboration amongst stakeholders could significantly enhance CSCM practices
31 amidst disruptions. For instance, R7 and R10 reported thus;

1 “Some team members are more concerned than others. Some are rigid with their craft and
2 schedule, while some could be flexible and more engaging. I think managers need to identify
3 each team member and their traits without necessarily judging them, but thinking of how they
4 can be coordinated to ensure the realization of desired project outcome” R7

5 “Working together with the government and contractors to identify alternative in-house
6 sources for construction supplies is an alternative that a lot of companies are adopting to
7 minimise supply chain challenges. Apart from providing incentives to local producers, it also
8 generates jobs for the locals. Some firms are pushing this through their sustainable goals, and
9 I think that strategy is here to stay.” R10

10 Indeed, the integration of diverse stakeholder perspectives in managing supply chain
11 disruptions highlights the complementary roles of formal and informal rules that exist in the
12 construction environment as expressed by the various stakeholders involved in the construction
13 supply chain.

14

15 **Normative Tendencies**

16 ***i. Consistent Capacity Management Mechanism***

17 According to 82% of the respondents, the dynamic nature of project information and
18 expectations in the contemporary construction environment could significantly impact pre-
19 defined construction supply chain processes amidst the complexity of disruptions. They,
20 therefore, noted that as a proactive measure, deliberate attempts should be made towards
21 developing and retaining construction teams and engagement processes that will transcend
22 multiple projects. By streamlining the process of project participation and interaction across
23 relevant stakeholders, the respondents argued that information coordination and dissemination
24 would be more effective in minimizing the potential impact of supply chain disruptions in the
25 construction industry. For instance, R12 stated that:

26 “With the current pace of technological advancement, firms should actually be thinking of
27 disruption before it strikes. Instead of assembling your team for every given project, People
28 should go the way of something like SPV⁹ even if it takes lobbying because once you have a

⁹ Special Purpose Vehicle (legal entities that are established to isolate risk)

1 *committed and focused team with good synergy, you would definitely be better off at managing*
2 *surprises compared to a situation where everyone is isolated and sceptical” R12*

3 According to R3, the same principle applied to managing material shortage amidst the Covid
4 19 pandemic. In his words, R3 mentioned that.

5 *“Before covid, we never really had to worry about getting the needed manpower or expertise*
6 *just as we didn’t worry about where our materials were coming from. But the covid change*
7 *has been phenomenal considering that no one can specifically be blamed for this; we have been*
8 *able to work through the implications of the material delay as a team based on the capacity*
9 *and relationship that we have jointly developed over the years” R3*

10 Although most of the respondents linked capacity management to normative practices that
11 could arise from networking or alliances, as previously mentioned by DiMaggio and Powell
12 (1983), they also acknowledged the need to deliberately leverage established *best practices* in
13 the construction industry (e.g., sustainability principles, collaboration and technological
14 innovations) towards enhancing capacity amidst the complexity of supply chain disruptions.

15

16 ***ii. Innovative Practices and Advocacy***

17 The research outcome also revealed that supply chain disruptions give rise to innovative
18 practices across construction firms as decision-makers interpret and make sense of the changes
19 occasioned by the disruption through deliberate subjective and intuitive reasoning that often
20 result in a clearer conceptualization of the disruption and its resultant implications. According
21 to 81% of the respondents, the significance of innovation in developing adaptive responses to
22 supply chain disruptions cannot be over-emphasized due to the distinct nature of construction
23 projects, the dynamic nature of disruptions and the diverse but interrelated nature of project
24 participants. This finding corroborates the submission of Fernie and Tennant (2013), that
25 formal regulations and standards should not dominate informal strategic thinking, as the
26 respondents noted that construction firms should be able to develop in-house adaptive
27 strategies to supply chain disruptions through unconventional strategies. To clarify their views,
28 R1 and R8 stated that;

29 *“policies may minimize the impact of certain disruptions but they don’t necessarily provide a*
30 *lasting solution. I believe that we should be allowed to take the lead in developing our own*
31 *management approach, which could then be ratified by the council. After all, we have more*

1 *stake in the overall impact of disruptions on the supply chain. We need to be more involved*
2 *than we currently are” R1*

3 *“... not all disruptions can be managed. Long ago, we envisaged a situation where we might*
4 *have to renegotiate contracts if uncertainties get overwhelming. As a result, we introduced a*
5 *paragraph that clarifies this in our contract with clients over the years. Although it also has*
6 *its complications, I can tell you that it’s a reasonable way of managing supply chain risks” R8*

7 Based on the principle of normative isomorphism, over 80% of the respondents argued further
8 that innovative adaptive strategies to supply chain disruptions require the adherence of
9 construction firms to societal and professional dictates, which is often practised through the
10 diffusion of ideas and best practices across project participants involved in the supply chain.
11 According to R16,

12 *“The magic is usually in those simple ideas from peer deliberations. We encourage people to*
13 *come up with their ideas and perceptions during our weekly meetings, irrespective of their*
14 *viewpoints. We understand that simple, innovative suggestions could solve complex problems,*
15 *and we don’t joke with that” R16*

16 While justifying the significance of innovation in driving ethical practices such as sustainability
17 as a means of adapting to supply chain disruption, R5 also noted that;

18 *“... sustainable practices such as local sourcing of materials and material recycling could*
19 *minimize the impact of disruptions in construction supply chain management significantly” R5*

20

21 **Mimetic Tendency**

22 ***i. Peer Observation and Group Action***

23 Most of the research respondents also stated that they observe and replicate the strategies of
24 experienced construction firms that have lived through various forms of supply chain
25 disruptions. According to them, such strategies are more pronounced amongst nascent
26 construction firms as they follow established patterns of developed firms in their quest for
27 survival amidst the complexity of supply chain disruptions. Widely described as *herd instinct*
28 in the extant literature on organizational behaviour, scholars have argued that this practice
29 involves following group action in an organizational field based on the perception that the
30 group cannot be wrong, even at the expense of a contrary individual opinion (Ordanini and

1 Rubera, 2008; Dua, 2022). More than 80% of the respondents noted that peer observation is
2 usually adopted by construction firms in an attempt to minimize the cost and time associated
3 with processing diverse information amidst the complexity of supply chain disruptions. They
4 also noted that group action is noticeable across construction firms as they adapt to sudden
5 supply chain challenges that require urgent responses. According to R9;

6 *“Stockpiling inventory suddenly became a common approach that was observable during the*
7 *supply shortfall. Major companies like XXXX and YYYY, with enough storage capacity, started*
8 *the practice and others followed suit. Smaller firms have also developed their storage capacity*
9 *and as I speak, a lot of firms have now adopted material stockpiling as a contingency plan for*
10 *managing supply chain disruptions” R9*

11 R11 also mentioned that;

12 *“Many firms have now abandoned their ingenious strategies to leverage the automation of*
13 *construction processes through different technological tools that have provided a very efficient*
14 *avenue to monitor, predict and adjust to disruptions in well-established construction firms.*
15 *Most of the firms that have now keyed into the technological sensation simply followed the laid*
16 *down practices of experienced firms. They didn’t have to invest as much resources as the*
17 *earlier firms did to effectively manage supply chain uncertainties. R11*

18 While recognizing that supply chain disruptions often emerge without prior indications, the
19 research respondents argued that construction firms align with group action as they adapt to
20 supply chain disruptions in order to be perceived as legitimate. In line with the tenets of
21 mimetic isomorphism, the respondents argued that although “group action” may not
22 necessarily be the optimum strategic response to supply chain disruptions, construction firms
23 demonstrate group action because they do not want to be left behind. According to R2,

24 *“It is not only easier for construction companies to replicate what is emerging or has been*
25 *established as a form of best practice in the sector, most of the companies jump on the*
26 *bandwagon out of the fear of missing out from the benefit of group decision without necessarily*
27 *considering the associated limitations.” R2*

28 Therefore, while peer observation and group action may not guarantee an optimum response
29 to supply chain disruptions, they clarify the basis for replicative actions and the resultant
30 homogeneity amongst construction firms as they respond to supply chain disruptions.

1

2 **5.0 Conclusion**

3 This study advances the rational, predefined conception of CSCM practices by exploring the
4 institutional theory in evaluating the significance of formal and informal rules in CSCM
5 practices amidst disruptions. Having highlighted the dynamism of the construction
6 environment and its participants, this study leveraged the lived experience of senior-level
7 decision-makers across major construction firms in New Zealand to understand how their
8 respective firms strive to gain legitimacy and survival amidst the complexity of supply chain
9 disruptions. Consistent with the tenets of isomorphism, evidence from this study, suggests that
10 construction firms demonstrate normative, coercive and mimetic isomorphic tendencies as they
11 adapt to supply chain disruptions. Specifically, the firms adhere to governmental rules and
12 regulations, accreditation and certification relevant to their practice as well as societal rules
13 and norms. The study also revealed that less experienced firms look up to experienced ones as
14 they respond and adapt to supply chain disruptions.

15

16 Apart from making a theoretical contribution to the construction management literature, the
17 study findings provide a basis for construction firms to evaluate their existing supply chain
18 resilience plan with the view to ensuring that they survive, thrive and adapt in the face of supply
19 chain disruptions. The research findings, therefore, provide a deeper understanding of how
20 construction firms could tackle the complexity of supply chain disruptions by highlighting both
21 rare and obvious practices that could enhance the supply chain management process. Further
22 to providing robust insights that could assist construction firms and practitioners in adapting to
23 supply chain challenges, the research findings also clarify the need for existing policies on
24 CSCM to recognize the uniqueness of construction projects, the dynamic nature of the
25 construction environment and the subjective tendencies of project participants.

26

27 Whereas this study offers novel insights into how construction supply chain disruptions can be
28 managed, the data that informed the research findings were limited to the New Zealand
29 construction environment. Therefore, consistent with the institutional framework and the
30 qualitative methodology adopted in this study, the generalizability of the research findings
31 across other construction environments may be hindered by possible variations in regulations,
32 norms, tradition and culture. Consequently, by leveraging the institutional framework, future

1 studies should explore the management of construction supply chain disruption in different
2 environmental contexts (e.g., developing countries) as a basis for deepening the understanding
3 of CSCM amidst disruption in a diverse but interrelated global environment. Future studies
4 could also explore the subject in the context of specific disruptions, using a quantitative
5 approach that will accommodate large, medium and small construction firms.

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