

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI
COLLEGE OF HUMANITIES AND SOCIAL SCIENCES SCHOOL
OF BUSINESS**

**INNOVATIVENESS ON SUPPLY CHAIN INTEGRATION AND PERFORMANCE
OF CONSTRUCTION FIRMS IN GHANA INVESTIGATING THE MODERATING
ROLE OF INSTITUTIONAL PRESSURES**

BY

FRANK OPPONG ADOMAKO

**BSC. BUSINESS ADMINISTRATION (LOGISTICS AND SUPPLY CHAIN
MANAGEMENT)**

A Thesis Submitted to the Department of Supply Chain and Information Systems, Kwame Nkrumah University of Science and Technology, Kumasi in partial fulfilment of the requirements for the award of the degree of

**MASTER OF SCIENCE IN PROCUREMENT AND SUPPLY CHAIN
MANAGEMENT**

November, 2023.

DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Kwame Nkrumah University of Science and Technology, Kumasi or any other educational institution, except where due acknowledgement is made in the thesis.

KNUST

Frank Oppong Adomako
Student Name
(PG 8293421)

.....
Signature

.....
Date

Certified By:
Prof. David Asamoah
Supervisor

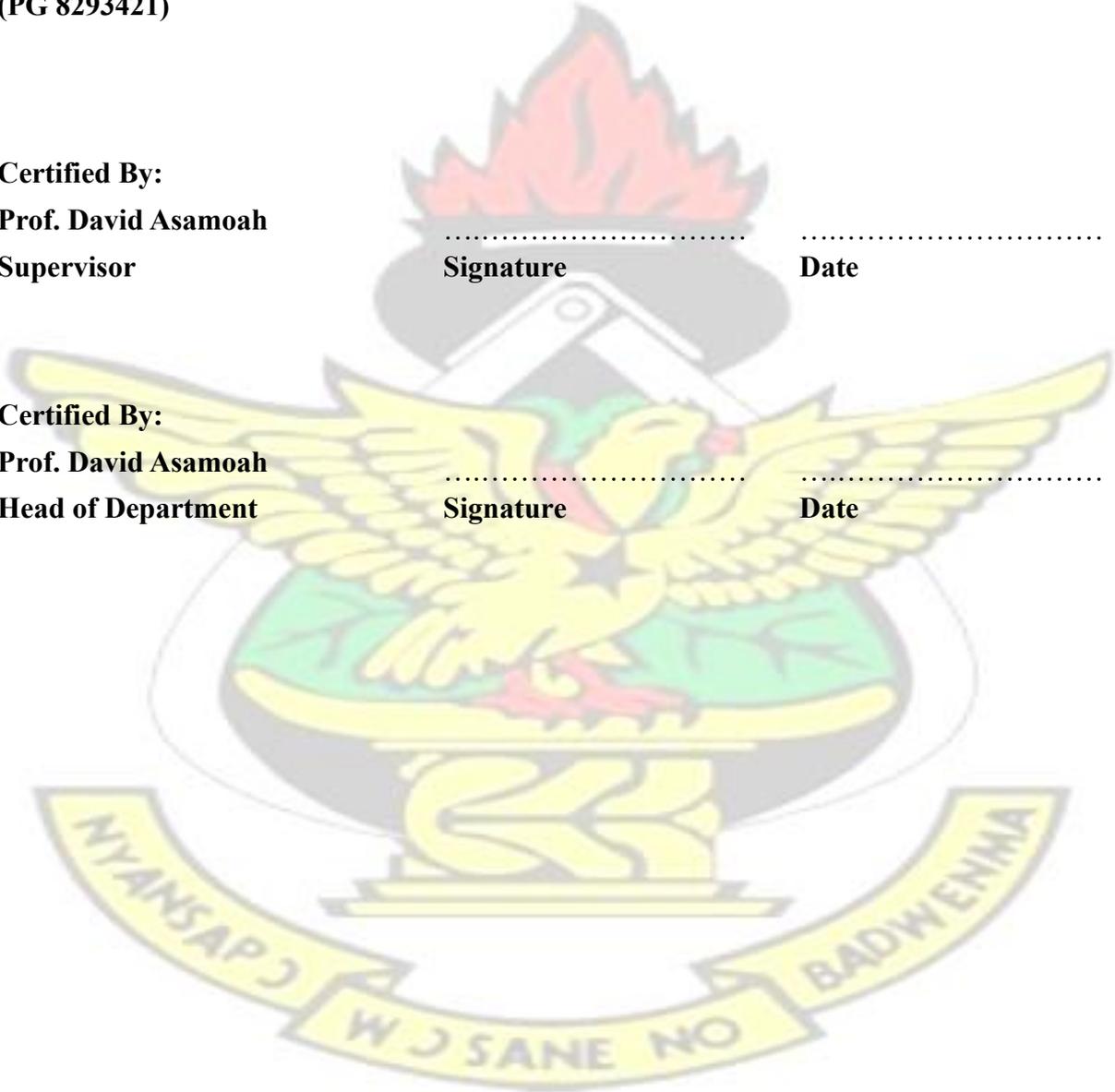
.....
Signature

.....
Date

Certified By:
Prof. David Asamoah
Head of Department

.....
Signature

.....
Date



DEDICATION

To my dear father, Mr James Akwasi Adomako (Nana Adomako), who passed away on April 20th, 2022. Your guidance and love have been an unwavering source of strength for me. Though

you are no longer here to share this moment with me, your memory and teachings have been my constant companion throughout this journey. You have taught me to never give up on my dreams, even in the face of adversity. This thesis is dedicated to you, with love and eternal gratitude for all that you have been to me and will always be.

KNUST



ACKNOWLEDGMENTS

I would like to express my deepest appreciation and gratitude to the Centre for Applied Research in Supply Chain in Africa (CARISCA) for providing me with the scholarship that made this research possible. Your generous support has been instrumental in allowing me to delve deep into my field of study and to produce this thesis.

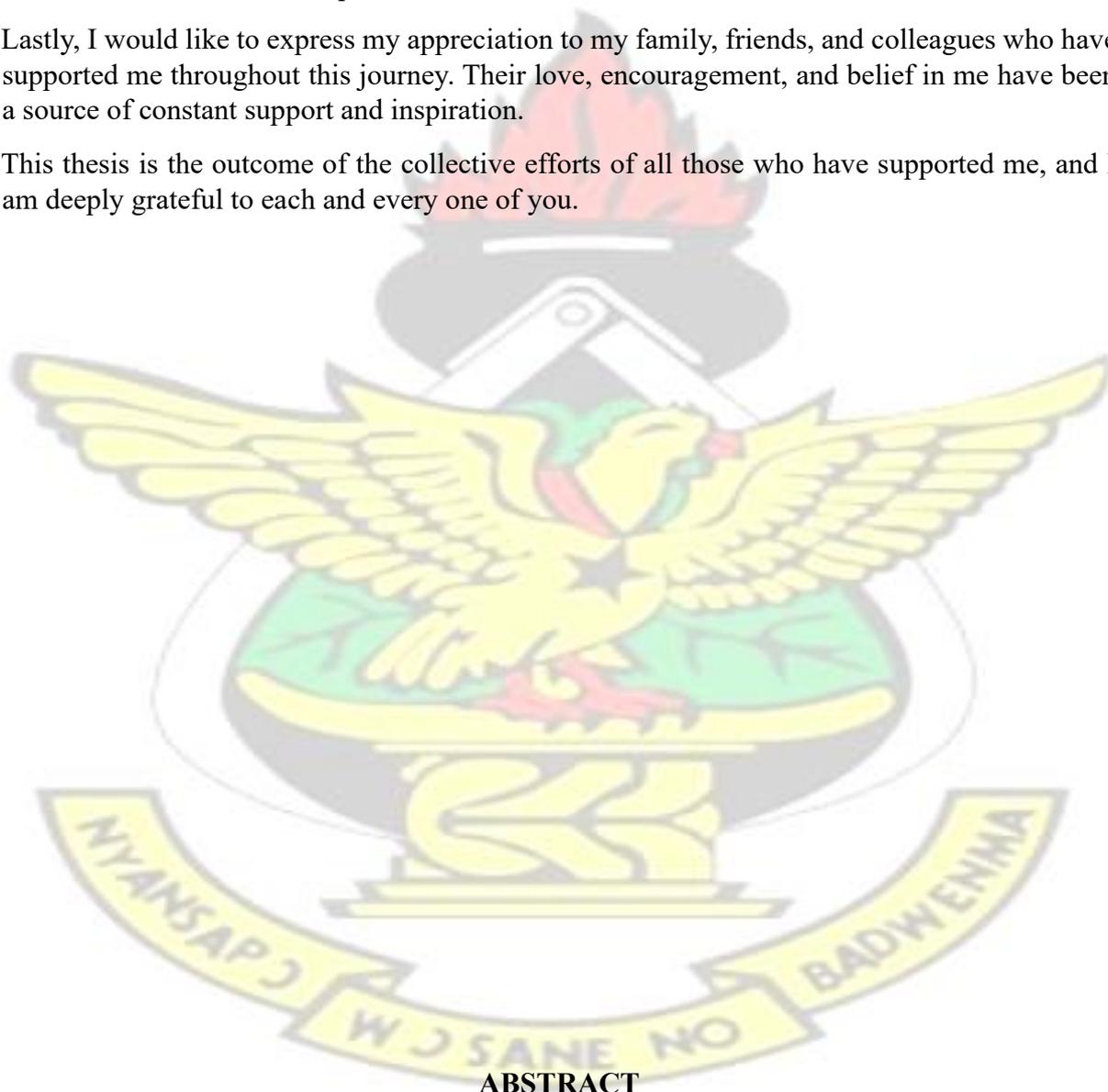
I would also like to extend my heartfelt thanks to my research supervisor, Prof. David Asamoah, for your guidance, encouragement, and invaluable support throughout this journey. Your expertise and knowledge have been an invaluable resource, and I couldn't have completed this thesis without your help.

My research assistants, Karim Yakubu, Theophilus Wuniah, Seth Adjabeng and Chantele Kyei-Amoakohene, also deserve a special mention for their hard work, dedication, and support. Your contributions have been invaluable, and I am forever grateful for the time and energy you put into this research.

I am also grateful to my supervisor, coordinator, and manager at Contracta Construction UK Ltd for their support and encouragement. Their belief in me and my research has been a constant source of motivation and inspiration.

Lastly, I would like to express my appreciation to my family, friends, and colleagues who have supported me throughout this journey. Their love, encouragement, and belief in me have been a source of constant support and inspiration.

This thesis is the outcome of the collective efforts of all those who have supported me, and I am deeply grateful to each and every one of you.



ABSTRACT

This research investigates the complex interactions among innovation, SC integration, institutional pressures, and SC performance in the burgeoning Ghanaian construction industry. Specifically, it aims to: 1) Examine the relationship between SC Innovativeness and SC Performance, 2) Assess the mediating role of SC Integration in the relationship between SC

Innovativeness and SC Performance, and 3) Evaluate the moderating effect of Institutional Pressures on the relationship between SC Integration and SC Performance.

A quantitative research approach was employed, focusing on Ghana's construction sector. Data was collected through questionnaires distributed to 400 respondents from 100 construction firms. Statistical analyses, including mediation and moderation tests, were conducted using SPSS version 25.

This study makes significant contributions to existing knowledge. Firstly, it affirms that Supply Chain Innovativeness (SCI) positively influences Supply Chain Performance (SCP) in the construction sector, highlighting the importance of innovative approaches in enhancing SCP. Secondly, it establishes the mediating role of Supply Chain Integration (SCI) in the relationship between SCI and SCP, underscoring the significance of integration as a catalyst for improving SCP. Thirdly, it demonstrates the moderating effect of Institutional Pressures (IP) on the association between Supply Chain Integration (SCI) and Supply Chain Performance (SCP), emphasizing the nuanced dynamics of external and internal pressures in shaping integration practices.

The findings have several implications. Construction firms in Ghana should prioritize fostering a culture of innovation within their supply chain operations to enhance performance. Sustainability should be seamlessly integrated into supply chain practices, considering its impact on long-term competitiveness and environmental aspects. Firms should strategically embrace supply chain integration with suppliers, customers, and internal functions. Furthermore, firms must navigate and respond to institutional pressures strategically, considering coercive, mimetic, and normative influences. Policymakers in Ghana should also consider the role of institutional pressures in shaping supply chain integration and performance, thereby promoting collaboration, innovation, and sustainable practices within the construction sector.

This research enriches supply chain literature, offering valuable insights for industry practitioners and policymakers. It provides actionable knowledge to enhance supply chain management practices, ultimately fostering a more competitive construction sector in Ghana. The incorporation of sustainability metrics and exploration of innovation's impact on supply chain integration elevate the scholarly discourse on supply chain performance.

Future research should expand the sample size and involve supply chain partner firms for a more comprehensive understanding of supply chain integration dynamics. Additionally, exploring additional moderating variables can deepen our understanding of these intricate dynamics in the construction industry.

In conclusion, this study advances our understanding of the multifaceted interactions within supply chain dynamics, emphasizing the pivotal roles played by innovation, integration, and institutional pressures. Its implications span academia, industry, and policy circles, collectively contributing to the optimization of supply chain management practices in the construction domain of Ghana.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGMENTS	iv
ABSTRACT	v
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xi
CHAPTER ONE	
1 INTRODUCTION	
1	
1.1 Background of the study	1
1.2 Problem Statement	2
1.3 Objective of the Study	3
1.4 Research Questions.....	3
1.5 Significance of the Study	3
1.6 Brief Methodology	4
1.7 Scope of the Study	5
1.8 Limitations of the Study	5
1.9 Organisation of the Study	5
CHAPTER TWO	
7 LITERATURE REVIEW	
7	
2.1 Introduction	7
2.2 Conceptual Review	7
2.2.1 SC Innovativeness	7
2.2.2 SC Integration (SCI)	9
2.2.3 SC Performance	10
2.2.4 Institutional Pressure (IP)	11
2.2.5 Construction Supply Chain Management (CSCM)	12
2.3 Theoretical Review	13
2.3.1 Stakeholder Theory	13
2.3.2 Institutional Theory	14
2.3.3 Theoretical Review Conclusion	14
2.4 Empirical Review	15
2.5 Conceptual Framework and Hypotheses Development	18
2.5.1 SC Innovativeness and SC performance of a firm	18
2.5.2 SC integration and its Relationships	19

2.5.3	Moderating role of Institutional Pressures (IP)	20
CHAPTER THREE		23
APPROACH AND METHODOLOGY		23
3.1	Introduction	23
3.2	Research Design	23
3.3	Research Approach	24
3.4	Population of the Study	25
3.5	Sampling and Sampling Techniques	25
3.6	Data Collection Method	27
3.7	Validity and Reliability	29
3.8	Data Analysis	30
3.9	Ethical Issues	31
3.10	Unit of Analysis	31
CHAPTER 4		33
DATA ANALYSIS, INTERPRETATION OF RESULTS AND DISCUSSION		33
4.1	Introduction	33
4.2	Background Profile Information	33
4.2.1	Response Analysis	33
4.2.2	Non-Response Bias	33
4.2.3	Demographic Characteristics	35
4.3	Descriptive Statistics	41
4.3.1	Extent of Supply Chain Innovativeness	41
4.3.2	Extent of Supply Chain Integration	42
4.3.2.1	Extent of Internal Integration	42
4.3.2.2	Extent of Supplier Integration	44
4.3.2.3	Extent of Customer Integration	45
4.3.2.4	Extent of External Integration Orientation (EIO)	46
4.3.3	Extent Institutional Pressure	47
4.3.4	Extent of Supply Chain Performance	48
4.3.4.1	Extent of Operational Performance	48
4.3.4.2	Extent of Financial Performance	50
4.3.4.3	Extent Sustainability Performance	51
4.4	Model Testing and Hypotheses Evaluation	51
4.4.1	Reliability and Validity	52
4.4.2	Common Method Bias (CMB) Analysis	55

4.4.3	Inter-Construct Correlation and Descriptive Analysis	56
4.4.4	Model Assessment Results	57
4.5	Discussion of Results.....	61
4.5.1	SC Innovativeness and SCP	61
4.5.2	SC Integration and its Relationships	63
4.5.3	Institutional Pressures and Moderation	64
CHAPTER 5		66
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS		66
5.1	Introduction	66
5.2	Summary of findings	66
5.2.1	SC Innovativeness and SCP	66
5.2.2	SC Integration and its Relationships	67
5.2.3	Institutional Pressures and Moderation	68
5.3	Conclusion	69
5.4	Recommendations	70
5.4.1	Enhancing Supply Chain Innovativeness	70
5.4.2	Prioritizing Sustainable Practices and Long-Term Perspective:	70
5.4.3	Strategic Supply Chain Integration:	71
5.4.4	Navigating Institutional Pressures:.....	71
5.4.5	Policy Implications:	71
5.5	Recommendations for Future Studies.....	71
REFERENCES		73
APPENDIX		85

LIST OF TABLES

Table No.	Title	Page
Table 3.1.	Measurement Constructs	28
Table 4.1.	Non-Response Bias Analysis	34
Table 4.2.	Demographic Information	35
Table 4.3.	Supply Chain Innovativeness	41
Table 4.4.	Extent of Internal Integration	43
Table 4.5.	Extent of Supplier Integration	44
Table 4.6.	Extent of Customer Integration	45
Table 4.7.	Extent of External Integration Orientation (EIO)	46
Table 4.8.	Extent of Institutional Pressure	47
Table 4.9.	Extent of Operational Performance	49
Table 4.10.	Extent of Financial Performance	50
Table 4.11.	Extent of Sustainability Performance	51
Table 4.12.	EFA on Supply Chain Innovation	52
Table 4.13.	EFA for Supply Chain Integration	53
Table 4.14.	EFA for Institutional Pressure	54
Table 4.15.	EFA for Supply Chain Performance	54
Table 4.16.	Descriptive Statistics and Correlation Results	56
Table 4.17.	Regression Analysis (Hayes Process)	58
Table 4.18.	Hypotheses Table	60

LIST OF FIGURES

Figure No.	Title	Page
Fig.2.1.	Supply Chain Innovativeness – Integration – Performance Framework	18
OF ABBREVIATIONS		
AIRA	All-India Rubber Association database	
AVE	Average Variance Extracted	
CARISCA	Centre for Applied Research in Supply Chain in Africa	
CBMWU	Construction and Building Materials Workers' Union	
CEC	Circular Economy Capability	
CEO(s)	Chief Executive Officer(s)	
CFI	Comparative Fit Index	
CMB	Common Method Bias	
CP	Coercive Pressure	
CR	Composite Reliability	
CSCM	Construction Supply Chain Management	
EFA	Exploratory Factor Analysis	
EIO	External Integration Orientation	
EPA	Environmental Protection Agency	
EU	Environmental Uncertainty	
FP	Financial Performance	
GCB	Ghana Commercial Bank Ltd	
GDP	Gross Domestic Product	
HND	Higher National Diploma	
IP	Institutional Pressure	
ITA	International Trade Administration	
JIT	Just-In-Time	
MP	Mimetic Pressure	
MRH	Ministry of Roads and Highways	
MSWR	Ministry of Sanitation and Water Resources	
MWH	Ministry of Works and Housing	
NGO(s)	Non-Governmental Organization(s)	
NP	Normative Pressure	
OIPT	Organizational Information Processing Theory	
OM	Operations Management	

OP	Operational Performance
RMSEA	Root Mean Square Error of Approximation
SC	Supply Chain
SC(s)	Supply Chain(s)
SCFs	Supply Chain Functions
SCI	Supply Chain Integration
SCM	Supply Chain Management
SCP	Supply Chain Performance
SCPI	Supply Chain Performance Index
SEM	Structural Equation Modeling
SME(s)	Manufacturing Small and Medium-Sized Enterprise(s)
SP	Sustainability Performance
SRM	Supplier Relationship Management
SRMR	Standardized Root Mean Square Residual
TLI	Tucker-Lewis's index
TQM	Total Quality Management



CHAPTER ONE

INTRODUCTION

1.1 Background of the study

In the realm of the construction industry, a sector marked by its competitiveness, complexity, and the demand for high-quality projects delivered swiftly and cost-effectively, the call for innovative and efficient management of construction supply chains is strikingly evident (Papadopoulos et al., 2016). Papadopoulos et al. (2016) assert that Construction Supply Chain Management (CSCM) holds great promise in integrating the various disciplines within the chain, encompassing internal and external suppliers, designers, vendors, contractors, subcontractors, and clients.

Innovativeness, as distinct from mere innovation capability, signifies the capacity for innovative actions (Wang & Ahmed, 2004; Zaheer & Bell, 2005 as cited in Das & Joshi, 2012). This organizational capability is integral, contributing to firm performance, resulting in profitable outcomes and elevated business performance (Akgün et al., 2007 as cited in Das & Joshi, 2012). Although the link between innovation capability and performance is well-established in service and manufacturing sectors, its role in construction firms requires further exploration.

Process innovation involves purposeful, novel organizational endeavors to alter production and service processes (Barney, 1991 as cited in Das & Joshi, 2012), encompassing developments in processes, systems, and reengineering activities (Khazanchi et al., 2006 as cited in Das & Joshi, 2012). Such innovations entail the integration of new elements into organizational operations (Damanpour, 1996 as cited in Das & Joshi, 2012, Asamoah et al., 2016; Asamoah et al., 2019), transforming a firm's value and uniqueness in the face of competitors (Roberts & Amit, 2003 as cited in Das & Joshi, 2012). Process innovations are challenging to replicate and slow to diffuse, as they necessitate substantial organizational change and shifts in management philosophy (Hayes, 2006 as cited in Das & Joshi, 2012), resulting in competitive advantage.

In the context of supply chains, firms recognize that supply chain innovation plays a pivotal role in strategic success and long-term survival (Seo et al., 2014). Innovation enhances knowledge dissemination, internal operations integration, and collaboration with supply chain partners (Seo et al., 2014 as cited in Kalyar et al., 2019). This encompasses knowledge, information, technology, and collaborative operations management (Hyland et al., 2003; Asamoah et al., 2019). Innovativeness facilitates process enhancements, enabling integrated information technology systems and more cohesive supply chains (Kim and Chai, 2017; Neutzling et al., 2018).

Strategic collaboration spurs innovation and vice versa, fostering integration across supply chain levels (Flynn et al., 2009; Neutzling et al., 2018). This dynamic encourages firms to optimize their internal processes, product development, inventory management, and manufacturing practices (Li et al., 2018; Maestrini et al., 2017). Correspondingly, firms innovate to manage cross-firm processes, decision-making collaboration, and partnerships (Kalyar et al., 2019).

The significance of supply chain integration (SCI) in transforming supply chain management into a competitive advantage is evident (Ataseven and Nair, 2017; Lu et al., 2017). SCI empowers businesses to adeptly tackle strategic, operational, and technological challenges (Liu et al., 2010, 2013). Integrating with suppliers enables efficient material flow and reduces production complexities (Gimenez et al., 2012; Migdadi et al., 2018). Internal integration enhances firm and supply chain performance (Alfalla-Luque et al., 2015; Bozarth et al., 2008; Chin et al., 2014). Customer integration ensures satisfaction and agility (Loon et al., 2017; Zhao et al., 2007).

Innovativeness influences integration, performance, and relationships within supply chains (Skippari et al., 2017), highlighting its role in SCM revitalization (Ojha et al., 2016; Panayides and Lun, 2009). Nonetheless, a comprehensive analysis of the antecedents of SCI, including its potential mediation through SC innovation, remains absent in the construction sector of emerging markets.

In the past decade, institutional theory has gained prominence in operations management and supply chain management (OM/SCM) (Kauppi, 2013). Firms' strategic actions are influenced by external forces, reflecting both profit motives and social legitimacy (Scott, 2008; Suchman, 1995). Coercive, mimetic, and normative mechanisms drive institutional isomorphism (DiMaggio and Powell, 1983), impacting eco-design, green purchasing, and innovation (Dubey et al., 2014).

In conclusion, the construction industry's pursuit of innovation-driven supply chain management for enhanced performance is a compelling challenge. The intricate interplay between Innovation, SCI, Institutional Influences and Supply Chain Performance remains a critical domain for investigation.

1.2 Problem Statement

The dynamic growth of the construction industry in recent times has not been paralleled by commensurate academic research progress. The construction sector's extensive interconnections with various segments of the economy underscore its ability to generate substantial multiplier effects, thereby enhancing welfare through elevated employment and income levels (ITA, 2022). Kalyar et al. (2019) delved into the nexus between environmental uncertainty (EU), supply chain integration (SCI), and supply chain performance (SCP) in the context of manufacturing small and medium-sized businesses (SMEs), providing a foundation for our exploration from an institutional theory perspective.

In this context, we assert that the influence of institutional pressures moderates the link between SC integration and performance. Our research seeks to investigate the potential role of innovation in shaping SC integration and enhancing supply chain performance within construction firms. Consequently, we propose that the extent of institutional pressure (IP) (Dubey et al., 2014) exerts a pivotal influence on the dynamic between SC integration and performance.

Despite the construction sector's noteworthy contribution to the Ghanaian economy elevating from 3.1% in 2020 to 5.7% in 2021 with a nominal GDP of GHS29.3 billion it remains relatively unexplored in terms of innovation research and theory development (GCB, 2022). Our study narrows its focus to innovation within the domain of construction processes, situated within the broader context of the supply chain.

Our research is fortified by existing literature advocating the moderating role of institutional pressure (Dubey et al., 2014; Kennedy and Fiss, 2009; Rogers et al., 2006). These pressures, encompassing coercive, mimetic, and normative influences, serve as drivers for SC integration adoption, which in turn augments supply chain performance. In light of the construction industry's intricacies and competitiveness, an in-depth examination of innovation and efficient construction supply chain management emerges as a vital research avenue. This approach stands to illuminate valuable insights for industry practitioners and lay the groundwork for future explorations.

1.3 Objective of the Study

This study, conducted in the context of the Ghanaian construction industry, aims to investigate the potential role of innovation in determining SC integration and improving the SC performance of construction firms. The study further proposes that the level of IP (Dubey et al., 2014) influences the relationship between SC integration and performance.

This research sought to address the following specific objectives:

- i. To examine the relationship between SC Innovativeness and SC performance of construction firms in Ghana
- ii. To examine the mediating role of SC integration on the relationship between SC innovativeness and SC performance among construction firms in Ghana.
- iii. To assess the moderating role of Institutional Pressures on the relationship between SC Integration and SC performance of construction firms in Ghana

1.4 Research Questions

- i. What is the relationship between SC Innovativeness and SC performance of construction firms in Ghana?
- ii. What is the mediating role of SC integration on the relationship between SC innovativeness and SC performance among construction firms in Ghana?
- iii. What is the moderating role of Institutional Pressures on the relationship between SC Integration and SC performance of construction firms in Ghana?

1.5 Significance of the Study

Ghana grapples with a substantial deficit in crucial sectors like power generation, maritime and rail transport, residential housing, and social infrastructure (GCB, 2022), resulting in an escalating demand for construction and infrastructure development to address housing shortages, enhance freight transport routes, and establish efficient export corridors (ITA, 2022). The construction domain in Ghana substantially contributes to infrastructure, housing, and building projects, boasting a roster of local and international entities (around 2,500) and a noteworthy labor force (ITA, 2022), providing employment to approximately 420,000 individuals.

The recent expansion of Ghana's construction industry, fueled by investments in infrastructure projects like roads, bridges, and airports (ITA, 2022), aligns with the government's initiatives promoting affordable housing, spurring residential construction endeavors. The sector, however, confronts challenges such as a scarcity of skilled labor, insufficient access to financing, and a lack of standardized practices. Despite these hurdles, Ghana's construction

industry is anticipated to flourish as the nation commits to fortifying its infrastructure and housing domain.

Within this trajectory, supply chain management emerges as a pivotal driver of sectoral advancement. This renders it essential for academic researchers to investigate and recommend improvements for the development of these critical components. This study strives to address specific gaps in existing literature. Firstly, it extends Kalyar et al.'s (2019) work by encompassing External Integration Orientation (EIO) in the scope of SCI, filling a previous dimension oversight. Additionally, the study adopts a sustainability perspective, as advocated by Katiyar et al. (2018), to measure SC performance. Lastly, it heeds the call for context-aware research in supply chain management (SCM), examining contextual factors that influence SC practices and outcomes.

Employing institutional theory (DiMaggio and Powell, 1983; Dubey et al., 2014) and Stakeholder Theory (Katiyar et al., 2018; Mitchell et al., 1997; Sarkis et al., 2009), this study investigates specific integration types pursued by firms to enhance SC performance (efficiency, effectiveness, and sustainability) under substantial institutional pressures (IP). Thus, it proposes the Supply Chain Innovativeness – Integration – Efficiency framework, spotlighting the contingent role of IP in emerging markets. The study not only broadens the conceptualization of IP beyond regulatory and market pressures but also delves into its social and economic implications.

This research will illuminate the imperative for innovative and effective SC management strategies to achieve superior performance, offering invaluable insights to construction industry practitioners and management in emerging markets like Ghana. Furthermore, by acknowledging SC integration's contingent nature, this study empowers managers with theories and evidence to comprehend IP's anticipated influence on SC performance outcomes. The incorporation of sustainability metrics and the exploration of innovation's impact on SC integration further elevate the scholarly discourse on SC performance.

1.6 Brief Methodology

This study adopted a purely quantitative and explanatory research approach, focusing on the construction sector within Ghana. The research scope encompassed both local and international medium to large firms operating within this sector. The target population for this research comprised various key roles within construction firms, specifically Project Directors/Managers, Procurement Directors / Managers / Coordinators / Supervisors, Warehouse Directors/ Managers/ Coordinators/ Supervisors, and Logistics Directors / Managers / Coordinators / Supervisors, collectively referred to as "actors."

To achieve the research objectives, primary data was collected through the distribution of questionnaires. The research employed a purposive sampling technique, selecting a total of 400 respondents from 100 Ghanaian construction firms. Within each firm, four individuals were chosen to participate, representing the aforementioned roles (i.e., Project Directors / Managers, Procurement Directors / Managers / Coordinators / Supervisors, Warehouse Directors / Managers / Coordinators / Supervisors, and Logistics Directors / Managers / Coordinators / Supervisors).

The study's focus on establishing relationships involved the utilization of descriptive and inferential statistical analyses. In the analytical phase, Statistical Product and Service Solutions

(IBM SPSS version 25) was employed as the software tool to examine and interpret the collected data.

1.7 Scope of the Study

The study focuses on medium to large local and international construction firms in Ghana. All investigations/ assessments were limited to respondents drawn from these institutions, and thus all evaluations on issues were made from the standpoint of these actors in the industry's supply chain.

1.8 Limitations of the Study

As with any research endeavor, this study is accompanied by several limitations that warrant careful consideration when interpreting the findings. Firstly, the sample size employed in this study is relatively modest, and the data collection process relied on a purposive sampling technique. Secondly, the assessment of integration perceptions pertains specifically to the focal firms, neglecting the perspective of their partners, namely suppliers and customers. This absence of partner viewpoints constitutes a noteworthy gap in the data. Thirdly, it's essential to acknowledge that this study's context is limited to the construction industry within Ghana. Consequently, the generalizability of the outcomes to diverse regions or industries may be subject to constraints. Lastly, it's important to recognize that the research design followed a static cross-sectional approach, thus, restricting the potential for in-depth temporal insights or causal relationships.

1.9 Organisation of the Study

The research study is structured into five distinct sections. The inaugural chapter serves as an introduction, providing an overview of the study's key components. This encompasses delving into the research's foundational background, articulating the problem statement that motivates the study, outlining the research's objectives and pertinent questions, elucidating the study's significance, providing a concise encapsulation of the research methodology, delineating the study's scope, and culminating in a transparent exposition of its limitations.

The subsequent chapter, Chapter Two, embarks on an extensive exploration of the literature landscape. This journey involves an in-depth examination of topics such as Supply Chain (SC) innovation, SC Integration (SCI), SC performance, and the influence of institutional pressure. This chapter substantiates its claims and assertions by citing scholarly articles, thereby underpinning its content with rigorous analysis and aligning with relevant theories. Furthermore, within this chapter, the terminologies utilized throughout the study are operationally defined to establish conceptual clarity.

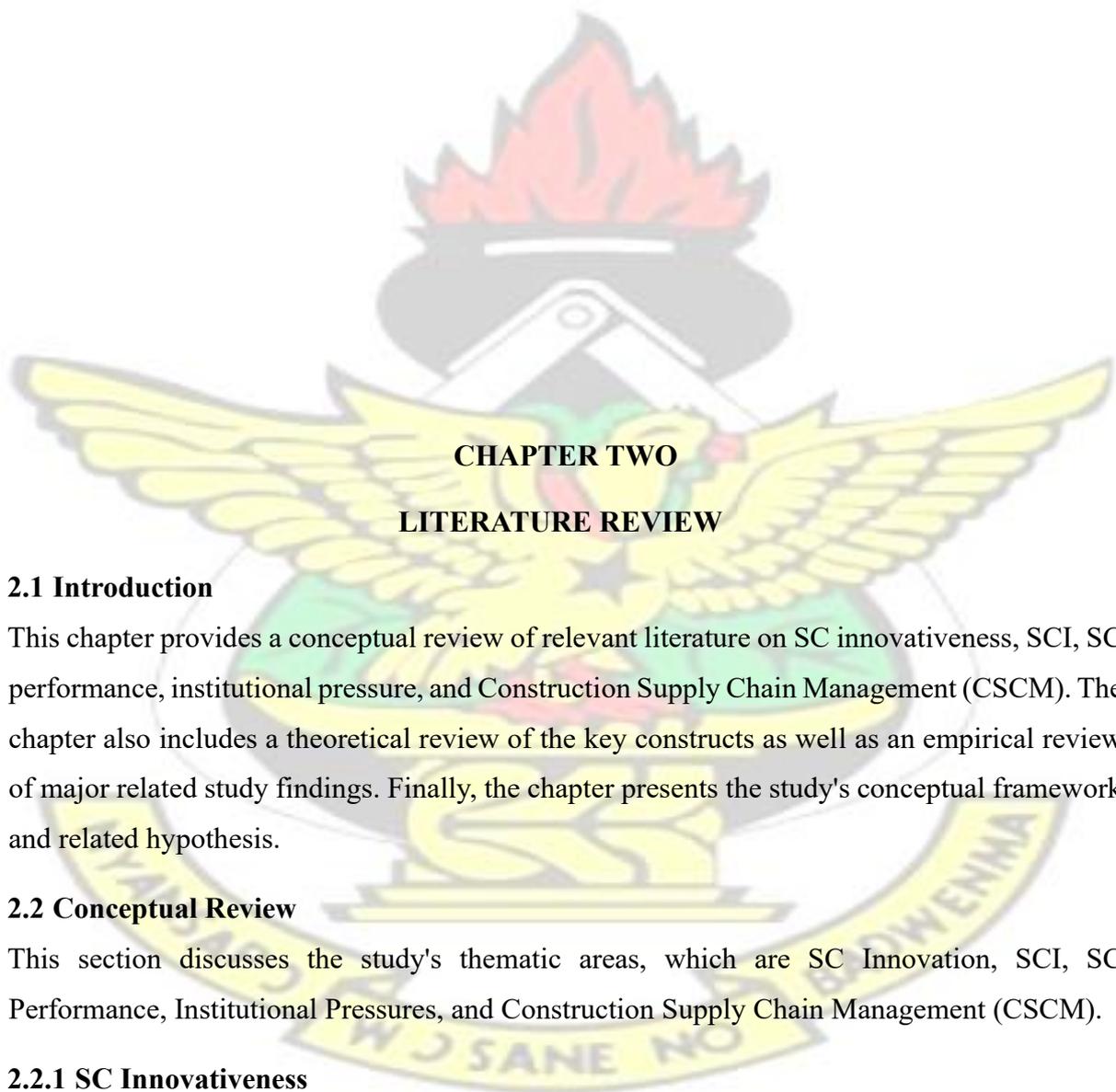
Chapter Three is dedicated to explicating the chosen methodology employed in the study. It rigorously outlines the rationale behind the selection of the sample size from the broader population and elucidates the rationale for opting for a specific sampling technique. Additionally, the chapter sheds light on the research instruments utilized and the methods employed to collect the essential data that underpins the study's analyses.

Transitioning to Chapter Four, the focus shifts towards the presentation and meticulous analysis of the empirical research findings. These findings are scrutinized through a quantitative lens,

ensuring a systematic approach to data quantification where necessary, thereby enhancing the depth and clarity of the insights drawn.

The concluding segment of the study, Chapter Five, encompasses a comprehensive synthesis of the amassed insights. This chapter not only encapsulates the research findings but also embarks on a discourse surrounding their implications, unraveling the practical significance of the study's outcomes. Ultimately, it culminates by providing prudent recommendations that are judiciously derived from the amalgamation of research results and theoretical underpinnings.

KNUST



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides a conceptual review of relevant literature on SC innovativeness, SCI, SC performance, institutional pressure, and Construction Supply Chain Management (CSCM). The chapter also includes a theoretical review of the key constructs as well as an empirical review of major related study findings. Finally, the chapter presents the study's conceptual framework and related hypothesis.

2.2 Conceptual Review

This section discusses the study's thematic areas, which are SC Innovation, SCI, SC Performance, Institutional Pressures, and Construction Supply Chain Management (CSCM).

2.2.1 SC Innovativeness

In recent scholarly investigations (Ojha et al., 2016; Panayides and Lun, 2009; Soosay et al., 2008), the concept of "supply chain innovativeness" has emerged as a pivotal catalyst for the rejuvenation of supply chain management (SCM), underscoring its indispensable role in

bolstering supply chain integration and performance. The contemporary business landscape demands that supply chains engage in perpetual innovation to maintain their market stance and navigate uncertainties adeptly. Consequently, organizations are directing their attention towards strategies geared at cultivating supply chain innovativeness (Mandal & Rao Korasiga, 2015).

Supply chain innovativeness draws substantially from Rogers' (1995) seminal definition of innovation, characterizing it as an idea, practice, or object that is perceived as novel by an individual or any adopting entity. This dynamic concept equips enterprises with the tools necessary to meet the exigencies of swiftly evolving markets (Li et al., 2018). Notably, while innovation accentuates the conception of novel ideas, its significance within the supply chain realm is contingent upon its ability to yield value for customers.

Contemporary research also underscores that the prowess to innovate compels organizations to forge strategic alliances with supply chain partners (Craighead et al., 2009; Kim and Chai, 2017; Seo et al., 2014), thereby unveiling a discernible link between innovativeness and integration. In essence, Lin (2008) characterizes supply chain innovativeness as an ensemble of tools poised to enhance organizational processes, aimed at facilitating seamless integration with suppliers, manufacturers, distributors, and customers.

The gamut of advantages associated with supply chain innovativeness is extensive, encompassing facets such as cost and lead-time reduction, formulation of innovative operational strategies, and the cultivation of flexibility (Stundza, 2009 as cited in Mandal, 2015).

In the context of the construction industry, supply chain innovativeness yields noteworthy benefits, including heightened efficiency, cost mitigation, and enhanced quality. Below are select exemplars illustrating how construction firms can inject innovation into their supply chains:

1. Harnessing Technology for Procurement Enhancement:

By embracing online platforms and digital tools, construction enterprises can automate and digitize procurement procedures, streamlining material acquisition processes.

2. Cultivating Supplier Relationships:

Cultivating robust bonds with suppliers empowers construction firms to negotiate favorable pricing terms and ensure a consistent flow of materials.

3. Adopting Just-in-Time (JIT) Delivery:

Implementation of JIT delivery mechanisms enables construction companies to curtail inventory expenses and mitigate the risk of material wastage or damage.

4. Exploring Alternative Materials:

The exploration of novel and alternative materials enables construction entities to curtail costs while bolstering sustainable practices.

5. Collaborative Endeavors:

Engaging in collaborative ventures with fellow construction firms or industry associates facilitates resource and expertise sharing, engendering efficient and effective supply chain management.

In conclusion, the concept of supply chain innovativeness stands as a pivotal facet in contemporary business paradigms, driving enhanced integration, operational excellence, and competitive resilience.

2.2.2 SC Integration (SCI)

Supply chain integration (SCI) signifies the extent of strategic collaboration between a company and its supply chain (SC) partners, encompassing the collective management of inter and intra-firm processes (Flynn et al., 2009). This collaborative endeavor aims to ensure the seamless and efficient flow of information, materials, products, and services, ultimately delivering optimal customer value with minimized costs and swift turnaround times (Frohlich and Westbrook, 2001; Migdadi et al., 2018).

When organizations achieve internal and external integration, operating as a cohesive entity, the potential for enhanced performance across their supply chains becomes palpable (Kannan and Handfield, 1998). This suggests that a heightened degree of integration correlates with heightened performance (Ataseven and Nair, 2017). Conversely, insufficient SC integration can culminate in elevated inventory expenditures, procurement delays, compromised product quality, as well as inaccuracies in product and demand prognostications, all of which imperil both the firm and its SC partners, thereby eroding customer experiences (Seo et al., 2014).

Within the realm of SC integration, both internal and external facets encompass multifaceted dimensions. In this study, the focus will be directed towards four pivotal dimensions of SCI, which are: internal integration, supplier integration, customer integration (Kalyar, et al., 2019; Flynn et al., 2009; Seo et al., 2014; Wong et al., 2011), and external integration orientation (EIO) (Kalyar, et al., 2019; Alfalla-Luque et al., 2015).

Internal Integration: Refers to the extent to which an organization can align its operational practices, protocols, and behaviors into collaborative, synchronized, and manageable procedures to meet customer demands (Chen and Paulraj, 2004; Kahn and Mentzer, 1996).

Supplier Integration: Captures the extent of collaborative alignment between a company and its suppliers, structuring inter-organizational strategies, practices, and processes as unified, synchronized endeavors (Chen and Paulraj, 2004; Stank et al., 2001).

Customer Integration: Gauges the level of collaboration between a company and its customers, molding inter-organizational strategies, practices, and processes into harmonized, synchronized activities (Flynn et al., 2009; Stank et al., 2001).

External Integration Orientation (EIO): Represents the extent to which firms view a collaborative stance with pivotal suppliers and customers as an integral aspect of their business strategy, as opposed to maintaining adversarial relationships (Alfalla-Luque et al., 2015).

The domain of construction also stands to benefit from supply chain integration, with several avenues available to bolster integration:

1. **Collaboration:** Close collaboration with suppliers and stakeholders enables construction firms to enhance coordination and streamline material and information flows.
2. **Information Sharing:** Utilizing digital tools and systems for real-time data sharing empowers construction entities to facilitate better decision-making and prompt problem resolution.
3. **Standardization:** The standardization of processes and systems across the supply chain minimizes complexity while optimizing efficiency.
4. **Lean Principles:** Applying lean principles, such as just-in-time (JIT) delivery and continuous improvement, empowers construction firms to curtail waste and enhance efficiency throughout the supply chain.
5. **Outsourcing:** Strategic outsourcing of specific activities to specialized providers allows construction firms to concentrate on core competencies.

In summation, the concept of supply chain integration emerges as a pivotal driver of collaborative efficacy, performance enhancement, and seamless customer experiences, with tangible applications resonating across various industries, including construction.

2.2.3 SC Performance

In the pursuit of aligning supply chain (SC) objectives with discernible performance benchmarks, the intricate nature of modern supply chains renders the process of indicator selection a formidable task (Panayides and Lun, 2009; Seo et al., 2014). Nevertheless, the literature encompasses a spectrum of definitions and constructs aimed at conceptualizing and evaluating SC performance. These performance gauges are typically classified into strategic, financial, operational, and tactical categories (Kalyar, et al., 2019; Asamoah et al., 2021). Responding to the stance of Tsanos et al. (2014), Kalyar et al. (2019) introduce two novel SC performance metrics: efficiency and effectiveness. These metrics are positioned to encapsulate the operational facets of SC performance, offering a more comprehensive perspective compared to the exclusive reliance on financial, tactical, or flexibility considerations (Tsanos et al., 2014). The dual dimensions of SC efficiency and effectiveness aptly represent the internal and external outcomes arising from SC operations (Kalyar, et al., 2019).

However, building upon and heeding the appeal put forth by Katiyar et al. (2018), the present research diverges by infusing sustainability considerations into the evaluation of a company's SC performance. In contemporary business landscapes, sustainable practices have transcended mere competitive differentiators, morphing into prerequisites for sustained longevity. Intriguingly, the examination of sustainability within the scope of supply chain performance remains a nascent endeavor, with scant scholarly exploration. Globalization's ripple effects have endowed supply chain distribution networks with heightened complexity, inevitably amplifying carbon emissions across the SC spectrum (Geng et al., 2017). The growing cognizance of the ecological ramifications instigated by manufacturing procedures, product transit, and sourcing practices has exerted mounting pressure not solely upon manufacturers, but also onto the array of supply chain partners operating both upstream and downstream (Geng et al., 2017). Concurrently, a confluence of internal policies and external regulations has compelled organizations to accord paramount importance to sustainability initiatives spanning economic, environmental, and social dimensions (Walker and Jones, 2012 as cited in Katiyar et al., 2018).

2.2.4 Institutional Pressure (IP)

The contours of an organizational institutional environment stretch beyond molding an entity's foundational tenets; they extend to enforcing external regulations, norms, and values that a firm must adhere to (Oliver, 1991; Suchman, 1995 as cited in Zeng et al., 2017). Within this context, the term "institutional pressure (IP)" encapsulates the sway exerted by the institutional

environment—comprising societal norms, regulations, and cultural underpinnings—on the configuration, structure, or conduct of an organization. This influence may or may not be rationalized, acceptable, or supportable (Qian and Burritt, 2008 as cited in Zeng et al., 2017).

Categorically, IP manifests in three distinct forms, contingent upon an institution's regulatory framework, rules, and cultural perceptions: coercive pressure (CP), normative pressure (NP), and mimetic pressure (MP). Rooted in institutional theory, this framework underscores that organizations encounter duress stemming from both technical and institutional dimensions (Greening and Gray, 1994 as cited in Zeng et al., 2017).

The crucible of external forces, spurred by stakeholders such as buyers, government agencies, and regulatory standards, engenders coercive pressure—a compulsion for compliance driven by variegated societal expectations (DiMaggio and Powell, 1983 as cited in Dubey et al., 2014). In parallel, the realm of normative pressure materializes through professional codes that oblige practitioners to hew to stringent directives (Dubey et al., 2014). The third facet, mimetic pressure, surfaces as organizations mirror the actions of their peers (Dubey et al., 2014).

This exploration contends that institutional pressures, ranging from national laws and governmental policies to professional codes and guidelines from non-governmental organizations (NGOs) stipulating benchmarks for corporate environmental stewardship and social accountability, wield influence over firms' supply chain integration (SCI) and supply chain performance (SC Performance).

2.2.5 Construction Supply Chain Management (CSCM)

Through intricate interconnections with various sectors of the economy, the construction industry is renowned for its ability to catalyze multiplier effects, thereby enhancing welfare through heightened employment and income levels (ITA, 2022). The construction process, characterized by multifaceted interfaces among stakeholders, often grapples with challenges arising from a lack of coordination among these participants. Addressing and mitigating this fragmentation, Supply Chain Management (SCM) offers a range of principles. As posited by Papadopoulos et al. (2016), Construction Supply Chain Management (CSCM) emerges as a potent paradigm to foster integration across the gamut of disciplines within the chain—including internal and external suppliers, designers, vendors, contractors, subcontractors, and both internal and external clients.

While SCM has been extensively explored and refined within manufacturing and service sectors, its application to the construction domain reveals that issues pervade construction

supply chains in a pervasive and persistent manner. A scrutiny of these challenges underscores their predominant emergence at the interfaces among diverse disciplines and functions, a facet amplified by the intricate nature of the construction landscape (Papadopoulos et al., 2016).

The distinctiveness of construction management, marked by sporadic flows and non-repetitive projects, contributes to its unique characteristics. Papadopoulos et al. (2016) delineate five pivotal disparities between manufacturing and construction supply chains: firstly, construction products are often tailored to individual clients; secondly, the nature of the product varies contingent upon the project; thirdly, project specifics dictate the location, equipment, and production methods; fourthly, construction personnel rotation is rapid within and across projects; and finally, not all components and materials can be stored on-site.

The construction supply chain's complex structure, involving a web of supplier-client relationships integral to project completion, accentuates the challenges faced. Scholarly insights by various authors (Vrijhoef & Koskela, 1999; Vrijhoef, 1998; Hong-Minh et al., 2000; Akintoye et al., 2000; O'Brien, 1999; Ofori, 2000; Vrijhoef et al., 2001) converge on the assertion that the interfaces connecting distinct parties within the chain introduce a gamut of issues that reverberate across the construction supply chain.

Despite the divergence between construction and manufacturing processes, SCM's applicability and efficacy extend to the construction realm (O'Brien, 1999 as cited in Papadopoulos et al., 2016). Integrated endeavors are pivotal in ameliorating performance, not solely in delivering superior projects to clients within or ahead of stipulated timelines, but also in minimizing waste and catalyzing cost reduction throughout the supply chain.

In light of these nuances, the objective of this study takes shape as an endeavor to propose a set of assertions aimed at augmenting construction supply chain management, including avenues such as Supply Chain Innovativeness (SCI) and bolstering Supply Chain Integration (SCI) among the constellation of supply chain actors.

2.3 Theoretical Review

This section reviews key theories used by previous researchers to explain the study's key constructs (i.e., stakeholder theory and institutional theory).

2.3.1 Stakeholder Theory

Katihar et al. (2018) embarked on their study drawing from stakeholder theory (Mitchell et al., 1997; Sarkis et al., 2009), which provides a foundation for organizations to transcend the mere

pursuit of shareholder return. Stakeholders encompass any group or entity that impacts or is impacted by the presence of an organization. This inclusive array comprises shareholders, employees, lenders, customers, government bodies, society, non-governmental organizations (NGOs), the media, the community, and the environment.

Every organizational operation is enmeshed within a business environment that 13rganizatio both the natural and societal realms. Addressing external stakeholders' concerns, as asserted by Silvestre (2015), becomes pivotal in averting substantial supply chain risks that could jeopardize an organization's sustenance. In response to these concerns, supply chains must mold their functions to accommodate stakeholders' requisites. This alignment ultimately catalyzes enhanced sustainability performance, cascading into improved supply chain performance (SCP).

Katiyar et al. (2018) unearthed that when supply chain functions (SCFs) harmonize with the needs of all stakeholders, they directly enhance supply chain operational performance and concurrently, through enhanced sustainability performance, exert an indirect positive influence.

2.3.2 Institutional Theory

Dubey et al. (2014) extended Wong et al.'s (2012) research on the moderating influence of environmental management and green operations on manufacturing firm performance, employing the lens of institutional theory (DiMaggio and Powell, 1983; Clemens and Douglas, 2006; Yu et al., 2006; Zhu and Sarkis, 2007; Sarkis et al., 2011). This perspective facilitated insights into institutional pressures and their interplay with environmental practice implementation. Their study contends that institutional pressures act as moderators, influencing the impact of supplier relationship management (SRM) and total quality management (TQM) on environmental performance.

Zeng et al. (2017) harnessed institutional theory, as articulated by Dubey et al. (2014) and Li (2014), to explore firms' circular economy capability (CEC) within the context of a sustainable supply chain. The outcomes underscored the significant positive influence of institutional pressure on supplier relationship management and long-term supply chain design. Furthermore, it highlighted the role of sustainable supply chain management practices in nurturing companies' circular economy capability. However, coercive, normative, and mimetic pressures showcased varying degrees of negative moderating effects.

Institutional theory, according to Scott (2008), posits that external forces prompt firms to adopt akin strategic actions. Firms, in line with this theory, are not solely driven by profit motives;

they recognize the significance of attaining social legitimacy (Suchman, 1995). This theory encapsulates two dimensions: economic and social (Ketokivi and Schroeder, 2004), and crystallizes into three pressures: coercive, normative, and mimetic (DiMaggio and Powell, 1983).

2.3.3 Theoretical Review Conclusion

Employing Institutional Theory (Dubey et al., 2014; Zeng et al., 2017; DiMaggio & Powell, 1983) and Stakeholder Theory (Katiyar et al., 2018; Mitchell et al., 1997; Sarkis et al., 2009), this study endeavors to explore specific integration strategies pursued by firms to enhance supply chain performance (efficiency, effectiveness, and sustainability) under the aegis of high institutional pressure (IP). Consequently, the present study extends on the “Supply Chain Innovativeness-Integration-Efficiency” framework developed by Kalyar, et. Al. (2019), spotlighting the contextual role of IP (Dubey et al., 2015) in burgeoning market construction, and delivering noteworthy empirical revelations. Furthermore, extending beyond Dubey et al.’s (2015) delineation of IP confined to regulatory and market pressures, this research probes deeper into the social and economic dimensions of IP for a more comprehensive inquiry.

Aligning with Katiyar et al. (2018), this research resonates with the assertion that “To meet the increasing concerns of external environment, a supply chain needs to design and configure its functions to make it compliant with the requirements of its stakeholders.”

2.4 Empirical Review

In the realm of supply chain management, previous studies have illuminated critical facets of innovation, sustainability, leadership, and institutional pressures, each contributing to our understanding of supply chain dynamics and performance.

Kalyar et al. (2019) conducted an extensive examination of innovation's impact on supply chain integration (SCI) and performance within South Asian manufacturing SMEs. Their study emphasized the pivotal role of external uncertainty (EU) in shaping the interplay between SCI and performance outcomes. Importantly, they introduced external integration orientation (EIO) as a vital dimension of SCI, addressing prior contradictions in the literature. Recognizing the dearth of research on innovation within the broader context of supply chain performance, this study explored the direct and mediated effects of supply chain innovativeness on performance, particularly in emerging markets. Contextual factors, as noted by previous scholars, emerged as crucial, with environmental uncertainty and organizational information processing theory providing valuable insights. The study's findings highlighted the positive influence of

innovativeness on SCI dimensions and the moderating effect of EU on the SCI-performance relationship. This research underscores the strategic value of pursuing both innovativeness and SCI for enhanced supply chain performance, particularly in dynamic environments.

Dubey et al. (2014) delved into the intricate dynamics of supplier relationship management (SRM), total quality management (TQM), leadership, and institutional pressures in the context of environmental performance. Acknowledging a research gap in the literature, they sought to bridge it by focusing on leadership and operational practices within green supply chain management. Drawing inspiration from a business excellence model, they highlighted the moderating role of institutional pressures, particularly in green manufacturing practices within the rubber industry. This study made three pivotal contributions: examining the impact of institutional pressures on environmentally conscious practices, proposing a green supply chain model for the rubber industry, and expanding research on environmentally friendly practices within manufacturing. They conducted their research within the largely unexplored rubber industry, a significant emitter of carbon emissions. Their findings demonstrated that integrating SRM and TQM under the influence of leadership and institutional pressures could drive environmental performance. These insights bolstered institutional theory and provided practical pathways to eco-conscious business practices.

Katiyar et al. (2018) delved into the impact of sustainability on supply chain performance (SCP) within Indian automobile companies. They recognized the omission of sustainability in previous SCP research and identified a research gap in understanding SCP drivers within the automobile industry. This study aimed to enrich the literature by establishing the connection between sustainability and supply chain functions (SCFs), proposing a foundational SCFsbased framework to assess their impact on sustainability performance. It also introduced the supply chain performance index (SCPI) to rank the significance of these drivers in SCP. Additionally, the study explored the mediating role of sustainability performance in the relationship between SCFs and supply chain operational performance. Through a robust data collection process from Indian automobile firms and advanced analytical techniques, they revealed that sustainability performance acts as a mediating force, influencing the interplay between SCFs and SCP. These findings align with stakeholder theory, emphasizing the need for organizations to consider more than just shareholder returns.

In summary, these empirical studies have significantly contributed to our understanding of supply chain dynamics, innovation, sustainability, leadership, and institutional pressures. They have enriched the literature by addressing research gaps and providing practical insights into

supply chain management in various contexts. This research sets the stage for further exploration of these critical dimensions within supply chain performance. Primarily, the present study seeks to extend the foundation laid by Kalyar et al. (2019), who adroitly incorporated External Integration Orientation (EIO) alongside the established dimensions of supply chain integration, namely internal integration, supplier integration, and customer integration. As elucidated by Kalyar et al. (2019), this augmentation was propelled by the recognition that EIO had hitherto been an overlooked facet in the realm of conceptualizing supply chain integration. Furthermore, while scholars like Kalyar et al. (2019) previously omitted sustainability from the metric tapestry of supply chain performance, this study responds to the clarion call articulated by Katiyar et al. (2018). The current research resolutely situates sustainability within the paradigm of supply chain performance evaluation, propelled by the contemporary business reality where sustainable practices are no longer just a competitive differentiator but an essential element for long-term survival. The dearth of inquiries delving into the union of sustainability and supply chain performance adds poignancy to this investigation.

Contextual elements have emerged as pivotal factors in supply chain management (SCM), as underscored by Kalyar et al. (2019), Gimenez et al. (2012), Lu et al. (2018), Tarafdar and Qrunfleh (2017), and Tarifa-Fernandez and De Burgos. The nuanced interplay of contextual factors has been found to either amplify or hinder the effects of diverse actions, strategies, and practices across supply chains. Recognizing the intrinsic value of contextual comprehension, this study builds upon Kalyar et al.'s (2019) revelations on the impact of environmental uncertainty (EU) on SC integration-performance. Expanding this scope, the study posits that institutional pressures (IP), as expounded by Dubey et al. (2014), can act as moderating forces, enhancing the impact of SC integration-performance interplay. Anchoring itself within the realms of institutional theory (DiMaggio and Powell, 1983; Dubey et al., 2014; Clemens and Douglas, 2006; Yu et al., 2006; Zhu and Sarkis, 2007; Sarkis et al., 2011) and Stakeholder Theory (Katiyar et al., 2018; Mitchell et al., 1997 & Sarkis et al., 2009), this study embarks on an expedition to discern the specific strands of integration that corporations seek in their quest to bolster SC performance embracing efficiency, effectiveness, and sustainability under the omnipresent influence of IP.

Manifesting as the crowning achievement of this endeavor, the study forges the innovative “Supply Chain Innovativeness-Integration-Efficiency” framework, which amplifies the narrative of IP’s contingent role within the burgeoning landscape of emerging market

construction. The empirical terrain yields consequential revelations, further solidifying the study’s significance. Moreover, augmenting the discourse ignited by Dubey et al. (2015), this study’s ambition unfurls in the exploration of IP’s broader societal and economic dimensions, culminating in a thoroughgoing exploration that transcends prior frontiers.



2.5 Conceptual Framework and Hypotheses Development

Within this section, the bedrock of the study’s conceptual framework is unveiled, where the intricate relationships intertwine to form a coherent tapestry. This exposition delves deep into explicating the connections, while also laying bare the hypotheses that guide the investigation.

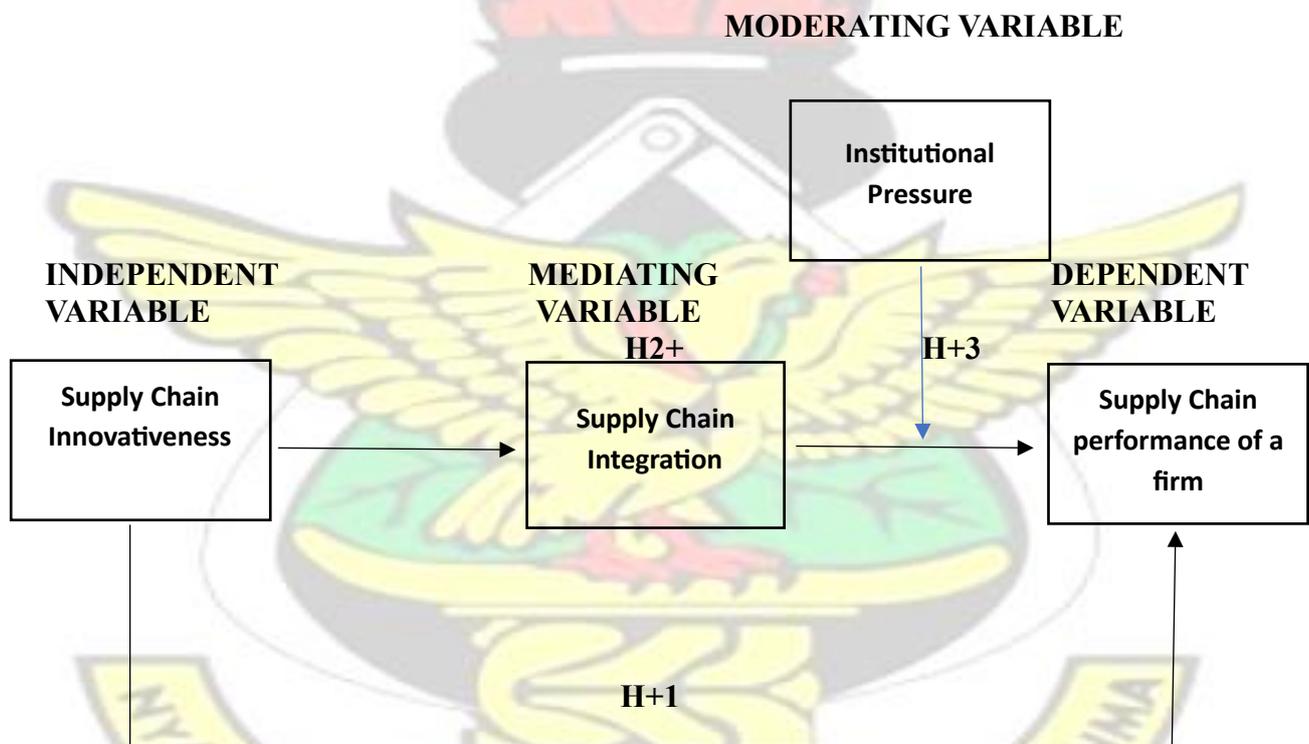


Figure 2.1 Supply Chain Innovativeness – integration – performance framework

Source: Author’s own construct adopted from Kalyar et al., (2019).

2.5.1 SC Innovativeness and SC performance of a firm

Within the dynamic landscape of supply chain management, the entwined relationship between SC innovativeness and performance emerges as a pivotal determinant of sustained competitive advantage. As businesses grapple with the relentless tide of uncertainty, the imperative to innovate remains paramount to not only safeguard their market standing but also to proactively

navigate the challenging currents of the industry (Mandal & Rao Korasiga, 2015). In this regard, a strategic emphasis on cultivating supply chain innovation strategies comes to the fore, a testament to the transformative potential of innovation within the SC domain (Mandal & Rao Korasiga, 2015).

Central to the vitality of innovation lies its intrinsic contribution to performance optimization, a notion predicated on the principles of experimentation and the continual embrace of novel methodologies (Panayides and Lun, 2009). Distinctly diverging from reliance on established practices, innovativeness fuels the propensity to explore uncharted territories, catalyzing the emergence of new operational paradigms (Panayides and Lun, 2009). A salient facet of supply chain innovation, spanning the realms of reduced costs, expedited lead times, novel operational strategies, and heightened flexibility, augments the performance landscape (Stundza, 2009, as cited in Mandal, 2015). Moreover, the arsenal of supply chain innovation fortifies enterprises against potential performance threats, curbing their immediate ramifications and fostering a resilient framework against future disruptions (Kalyar et al., 2019). Drawing from this discourse, the hypothesis crystallizes:

H1: SC Innovativeness is positively associated with SC performance of construction firms in Ghana.

2.5.2 SC integration and its Relationships

Within the intricate domain of supply chain management (SCM), the relationships among supply chain (SC) innovation, integration, and performance form a multifaceted nexus of paramount importance. Scholars have keenly identified SC innovation as a pivotal driver that empowers firms to introduce novel processes, thereby enhancing their ability to implement integrated information technology systems in collaboration with SC partners (Mandal, 2015; Kim and Chai, 2017). This collaboration seeks to foster integrated SCs while concurrently reinforcing a firm's market standing through the introduction and propagation of innovative products and services (Mandal, 2015; Kim and Chai, 2017).

Intriguingly, the adoption of innovation emerges as a versatile tool that equips firms to effectively navigate the dynamic currents of internal and external environmental shifts (Kalyar et al., 2019). This dual role of innovation intersects with the realms of strategic collaboration and integration, wherein innovation fosters collaboration, and in turn, collaboration fuels innovation across diverse echelons of the SC (Flynn et al., 2009; Neutzling et al., 2018; Seo et al., 2014). Elevated levels of firm innovativeness notably augment the likelihood of attaining

robust internal, supplier, and customer integration, along with a pronounced emphasis on the strategic orientation of external integration (EIO) (Kalyar et al., 2019). This comprehensive integration landscape underscores the pivotal role of innovativeness in nurturing integration across the holistic SC spectrum (Kalyar, M.N. et al., 2019).

Concurrently, the compelling interplay between SC integration and a firm's performance has been meticulously examined by academics, underscoring its transformative potential in shaping a firm's supply chain management (Beheshti et al., 2014; Ataseven and Nair, 2017; Kalyar et al., 2019; Lu et al., 2017). The triad of internal integration, supplier integration, and customer integration stands as a significant driver with a discernible impact on a company's financial performance (Ataseven and Nair, 2017). Evidently, companies that wholeheartedly embrace total supply chain integration consistently outperform their competitors in terms of financial metrics (Beheshti et al., 2014). It is noteworthy that a firm's operational performance thrives when it seamlessly integrates across internal and external dimensions, functioning as a cohesive entity (Kannan and Handfield, 1998; Asamoah et al., 2021). This integration-centric approach manifests in superior performance outcomes, accentuating the intrinsic relationship between integration and performance (Ataseven and Nair, 2017).

Conversely, a paucity of SC integration precipitates detrimental consequences, encompassing elevated inventory costs, procurement delays, compromised product quality, and skewed forecasts, collectively imperiling the firm and its SC partners while undermining customer experiences (Seo et al., 2014; Owoo and Lambon-Quayefio, 2020; Park, 1989; World Bank, 1984). Furthermore, Alfalla-Luque et al. (2015) highlight the affirmative correlation between a firm's external Integration orientation (EIO) and its overall performance. This underscores the transformative potential of cooperative strategic collaboration and the significance of SC integration and EIO as predictive factors for supply chain performance (Alfalla-Luque et al., 2015).

Significantly, the mediation role of SC integration surfaces as an essential determinant that shapes a firm's SC performance (Panayides and Lun, 2009). Anchored in innovation, SC integration unfolds as a conduit that optimizes SC cycle efficiency, flexibility, order fulfilment, and lead times (Panayides and Lun, 2009). This iterative process of integration and integration orientation finds expression in the amelioration of SC effectiveness, efficiency, and sustainability, collectively bolstering overall SC performance (Panayides and Lun, 2009).

In harmony with these dynamics, the hypothesis emerges that alongside its direct influence, innovativeness intricately enhances internal, supplier, customer integration, and EIO within SCs, thereby fostering the efficiency, effectiveness, and sustainability performance of the supply chain domain. As a result, the following hypotheses are proposed:

H2: SC integration mediates and has a positive relationship with both SC innovativeness and SC performance among construction firms in Ghana.

2.5.3 Moderating role of Institutional Pressures (IP)

The intricate tapestry of organizational dynamics is interwoven with the moderating influence of Institutional Pressures (IP), an omnipresent force shaping the contours of organizational behavior (Oliver, 1991; Suchman, 1995). The paradigm of institutional theory casts an illuminating light on this intricate interplay, unearthing the intricate tango between organizations and their contextual environs (Berger and Luckmann, 1966; Meyer and Rowan, 1977; Zucker, 1977). Within this framework, the mosaic of organizational conduct is cast under the spell of external rules, norms, and values—a powerful force steering organizations on their trajectory (Oliver, 1991; Suchman, 1995).

Framed within this lens, organizational integration metamorphoses into a canvas where the brushstrokes of institutional environment leave an indelible mark. The genesis of integrative inclinations, be it with suppliers, customers, or internal strata, often arises from the crucible of external and internal pressures (Zeng et al., 2017). An orchestra of coercive pressures emanating from the competitive milieu, government mandates, and vested interests orchestrate a symphony that nudges firms towards embracing integrative practices. In a harmonious echo, mimetic pressures wield their influence, prompting firms to emulate the strides of their counterparts, mirroring their successful supply chain integration (SCI) ventures.

The tableau finds further depth within the bounds of stakeholder theory, an orchestrator of organizational endeavors that transcend the realms of shareholder returns (Katiyar et al., 2018; Mitchell et al., 1997; Sarkis et al., 2009). A holistic assembly of shareholders, employees, customers, society, and the wider ecosystem forms the consortium of stakeholders that shape and are shaped by the organization's existence (Silvestre, 2015). Acknowledging the resonant reverberations of these stakeholders, a compelling narrative emerges—one that underscores the urgency of aligning organizational mechanisms to appease the varied constituents. An organization's survival and prosperity hinge upon the harmonization of functions with

stakeholder needs, paving the path to sustainability performance, and subsequently, performance augmentation (Silvestre, 2015).

In corroboration of these premises, this study embarks on an exploration that peers into the crucible where Supply Chain Integration (SCI) strategies gestate under the watchful eyes of external pressures and stakeholder dynamics. Within this realm, Institutional Pressures (IP) emerge as the sentinel that mediates the interplay of SC integration, External Integration Orientation (EIO), and performance dimensions. It is thus posited that the moderating hand of IP tempers the relationship between SC integration and the triad of operational, financial, and sustainability performance, resonating in the Ghanaian construction landscape.

Hypothesis: Institutional Pressures (IP) wield their moderating influence over the nexus of SC Integration and the multifaceted realm of performance within Ghanaian construction firms.

As a result, the following hypotheses are proposed:

H3: Institutional Pressures (IP) moderates the relationship between SC Integration and SC performance within Ghanaian construction firms.



CHAPTER THREE

APPROACH AND METHODOLOGY

3.1 Introduction

This chapter describes the approach, techniques and methods that were used to select respondents and how the data was analyzed. It specifically describes the Research design and approach, data and sources, target population, sample size determination and sampling procedures/techniques. In addition, it includes the data collection instrument, pre-testing of instrument, ethical issues, data processing and analysis.

3.2 Research Design

A paramount subject that holds centrality within scientific research, social science, and a multitude of other disciplines is the concept of research design. Essentially, a research design functions as a meticulously crafted blueprint, charting the trajectory from the inception of research purposes and questions to the eventual outcomes. It stands as a comprehensive and strategic planning process, facilitating the accumulation and analysis of data to enhance comprehension of a specific subject matter (Abutabenjeh & Jaradat, 2018). As expounded by Babbie (2004), a research design embodies a series of deliberate decisions encompassing the subject of study, the demographic under scrutiny, the research methodologies employed, and the overarching objectives.

The quintessential essence of research design, as described by O'Sullivan et al. (2007), comprises the orchestration of determinations pertaining to the timing and frequency of data collection, the specific data to be acquired from the targeted participants, the methodologies of data acquisition, and the strategies to be implemented for data analysis. This sentiment is echoed by Creswell (2008), who encapsulates research design as a compendium of strategies and protocols spanning the spectrum from broad foundational assumptions to the minutiae of data collection and analysis methodologies.

The realm of research design, as delineated by Babbie (2004), unfurls a rich tapestry of diverse choices available to social researchers. Each design is a deliberate curation of choices, encapsulating the who or what to be studied, the when, the how, and, fundamentally, the why.

Variants such as case studies, surveys, experiments, ethnography, grounded theory, and archival research emerge as notable manifestations. In the pursuit of probing the postulated interrelations between variables, the instrument of choice was a survey questionnaire. As Zikmund et al. (2010) elucidate, a survey is a research technique that oscillates between interviews with a selected sample or the observation and delineation of respondent behavior.

This study adheres to a cross-sectional design, capturing data at a singular point in time. The survey questionnaire encompasses constructs such as innovativeness, supply chain integration, supply chain performance, and institution pressures (IP).

In consonance with the research purpose, research can be categorized into exploratory, descriptive, and explanatory types, as posited by Saunders et al. (2007). The exploratory type serves as a beacon for deciphering the landscape of “what is happening,” imbued with the capacity to unveil novel insights, raise pertinent questions, and cast phenomena in novel illuminations. Descriptive studies, on the other hand, cater to diverse research objectives, encompassing the depiction of phenomena or attributes pertaining to a target populace, as well as the unearthing of associations amidst various variables (Cooper and Schindler, 2014). Explanatory research endeavors encompass studies that establish causal relationships between variables (Zikmund et al., 2010).

Within the context of this study, aiming to discern causal relationships among variables, an explanatory research design is deemed the most fitting. The explanatory approach emerges as a compelling methodological choice within survey research, endeavoring to establish valuable models for the establishment of causal connections between independent and dependent variables. This design, as aptly expounded by Abutabenjeh & Jaradat (2018), not only serves the purpose of description but, more notably, the purpose of explanation, unraveling shifts in the valuations of dependent variables.

3.3 Research Approach

Creswell’s (2008) has meticulously categorized research approaches into three distinct paradigms: quantitative, qualitative, and mixed methods. In essence, qualitative research navigates the intricate landscape of business objectives through methodologies that empower researchers to unveil intricate narratives of market phenomena, without being tethered to numerical metrics (Zikmund et al., 2010). On the opposite end of the spectrum lies quantitative research, which is hinged upon empirical evaluations that delve into research objectives via numerical measurement and analytical techniques.

For the present study, poised to delve into predictive causal relationships among variables, a deliberate selection has been made to adopt a purely quantitative and explanatory research approach. This approach, meticulously aligned with the investigative purpose, seeks to unravel the intricate threads of cause and effect embedded within the variables under scrutiny. By adopting a predominantly quantitative lens, this study strives to unravel the empirical associations, employing numerical analysis as a beacon to illuminate the interconnections among the research constituents.

3.4 Population of the Study

As underscored by Abutabenjeh and Jaradat (2018), the term “population” encapsulates the group that forms the bedrock from which the researcher seeks to glean insights and draw informed conclusions. This all-encompassing concept denotes the entirety of observations constituting the fertile ground from which a representative sample is meticulously cultivated (Singh, 2006). Cooper and Schindler (2014) augment this understanding, characterizing the research population as the esteemed “target population,” encompassing a rich tapestry of individuals, occurrences, or records that house the invaluable information requisite to address the study's overarching objectives.

Steering our gaze toward the research's contextual realm, it spans the intricate terrain of medium to large enterprises operating within Ghana's construction sector, spanning both local and international spheres. To provide a more concrete depiction, the entities comprising this research's purview include D1/K1, D2/K2, A1B1, A1B1S1, and A2B2. This compilation of registered construction firms has been meticulously collated through the examination of the roster of contractors in commendable standing, thoughtfully published on the digital domains of Ghana's esteemed Ministries of Roads and Highways (MRH), Sanitation and Water Resources (MSWR), Works and Housing (MWH), and the reputable Chamber of Construction Industry Ghana (GhCCI). The rationale behind the selection of the construction industry as the research's focal point emanates from its substantial and well-documented multiplier effects, extending intricate tendrils of influence through both backward and forward linkages with other sectors of the economy. Such interconnectedness begets heightened welfare, typified by amplified levels of employment and income—a premise robustly substantiated by the International Trade Administration (ITA, 2022).

3.5 Sampling and Sampling Techniques

Sampling entails the artful extraction of a subset of individuals from a broader population, enabling the estimation of overarching population characteristics. This judicious practice offers

a dual boon of expediting data collection while simultaneously curtailing costs, as aptly articulated by Singh and Masuku (2014), along with insights from Kish (1965) and Robert (2004). With each observation meticulously appraising specific attributes of discernible entities demarcated as distinct individuals, sampling finds its manifold applications across diverse domains, including business, medicine, and agriculture, as expounded by Singh and Masuku (2014).

The realm of sampling techniques embodies the methodologies employed to cherry-pick individuals from whom data shall be diligently garnered (Kish, 1965; Gupta and Kapoor, 1970). The calculus for estimating sample size and power analysis predominantly hinges on the research's foundational design and its cardinal metrics.

Within the rich tapestry of sampling techniques, a bifurcation emerges: probability sampling and non-probability sampling. Probability sampling encompasses methodologies such as simple random sampling, systematic sampling, stratified sampling, and clustered sampling. In stark contrast, non-probability sampling encompasses techniques like convenience sampling, quota sampling, judgment (or purposive) sampling, and snowball sampling.

Within the confines of this study, the purposive sampling technique has been adroitly wielded. Renowned as judgment sampling, this non-probability approach entails the deliberate selection of an informant based on specific attributes they bring to the table (Tongco, 2007). Tongco (2007) expounds that this technique's potency shines brightest when delving into a distinct cultural domain and engaging knowledgeable experts within it. Here, the researcher forges a clear path by identifying the requisites of knowledge, subsequently embarking on a quest to pinpoint individuals capable and willing to offer insights derived from their expertise or experience—insights mirrored in the perspectives of Bernard (2002) and Lewis & Sheppard (2006). Notwithstanding its inherent bias, the technique's resilience endures, weathering comparison against its probabilistic counterparts. The crux lies in the astute selection of purposive samples, a hallmark that hinges upon the informant's dependability and proficiency, a sentiment echoed by Tongco (2007).

Drawing from a judicious amalgamation of considerations, encompassing temporal and financial facets, and underpinned by a quest for representativeness and adequacy, this study ultimately resolved to target a quota of 400 respondents emanating from 100 Ghanaian construction firms. This stratagem entails the precise targeting of four respondents from each firm individuals occupying roles such as Project Directors / Managers, Procurement Directors

/ Managers / Coordinators / Supervisors, Warehouse Directors / Managers / Coordinators / Supervisors, and Logistics Directors / Managers / Coordinators / Supervisors.

3.6 Data Collection Method

As previously delineated, this study adhere to a decidedly quantitative research design approach. The comprehensive data collection endeavors encompassed both primary and secondary sources.

Primary data sources embody the wellspring of information gleaned from direct observations or active engagement with the subject matter, in contrast to secondary data sources that convey such insights indirectly (Schuurman, 2018). Among the array of techniques available for primary data collection are observation, document review, structured interviews, and questionnaires/surveys. To anchor the primary data collection for this study, questionnaires were chosen, given their aptitude for yielding data of commendable quality, remarkable response rates (Williams, 2003), and a shroud of anonymity that fosters a more candid and forthright exchange, a factor underscored by Marshall (2005).

In harmonious counterpoint, the exploration of secondary data sources was a pivotal facet aimed at setting the contextual stage for the study and establishing the landscape of prior inquiries within the field. Cooper and Schindler (2003) shed light on the nature of secondary data, classifying it as data procured for objectives beyond the realms of a specific research project. This research ventured into a tapestry of literature originating from published books, reports, conference proceedings, and peer-reviewed journals.

Design of the Instrument

At the crux of this study's data collection methodology lies the meticulous design of the instrument, a mechanism meticulously calibrated to explore the hypothesized linkages among the variables in question. This intricate interplay is embodied by various scales, each poised to glean subjective insights across a spectrum. The Likert scale, adorning the continuum from one to seven, metamorphoses respondents' agreement or disagreement with each statement. These numerical translations span from "strongly disagree" (1) to "strongly agree" (7), with intermediate gradations delineating nuances of opinion.

The questionnaire deftly navigates 'through a constellation of topics, unraveling the tapestry of respondent firms. An exhaustive list of attributes, including firm name, size, ownership, age, contractor classification, ongoing project count, annual procurement outlays, as well as informant job position and nationality, are meticulously probed.

With innovation forming a crucial axis, a ten-item scale adapted from Panayides & Lun (2009) and Mandal (2015) was deployed. The evaluation of supply chain integration considered facets such as internal integration, supplier integration, customer integration, and environmental interface optimization (EIO). These dimensions find their roots in works by Seo et al. (2014), Stank et al. (2001), Narasimhan & Kim (2002), Flynn et al. (2010), Wong et al. (2010), Wong et al. (2011), and Kalyar et al. (2019). Supply chain performance, operating at the confluence of operational, financial, and sustainability realms, draws inspiration from diverse scholars like Dubey et al. (2014), Rahmani et al. (2018), Katiyar et al. (2018), and Geyi et al. (2020). Institutional pressures (IP) unfurls through a fifteen-item scale, meticulously tailored from Zeng et al. (2017), Dai et al. (2021), Carter & Jennings (2002), and Emmelhainz & Adams (2002).

For a more comprehensive portrayal, the table below delineates the constructs within the study, encompassing sub-constructs, the tally of items per construct, and the scholarly origins from whence these items have been culled. **Table 3.1 Measurement Constructs**

CONSTRUCT	SUB-CONSTRUCT	NO. OF ITEMS	SOURCE
Supply Chain Innovativeness	NONE	10	Panayides & Lun, (2009) and Mandal, (2015)
Supply Chain Integration	Internal Integration	5	Seo et al. (2014); Stank et al., (2001); Narasimhan & Kim (2002); Flynn et al. (2010) and Wong et al. (2011)
	Supplier Integration	5	Seo et al. (2014); Narasimhan & Kim (2002); Flynn et al. 2010; and Wong et al. 2011)
	Customer Integration	5	Seo et al. (2014); Narasimhan & Kim (2002); Flynn et al. (2010) & Wong et al. (2011)
	External Integration Orientation (EIO)	3	Kalyar, et al. (2019) and AlfallaLuque et al. (2015)
Institutional Pressures	NONE	15	Zeng et al. (2017) ; Dai et al. (2021) ; Carter & Jennings (2002) and Emmelhainz & Adams (1999)
Supply Chain Performance	Operational Performance	6	Dubey., et al (2014); Asamoah et al., (2021)
	Financial Performance	4	Rahmani et al. (2018)

	Sustainability Performance	6	Katiyar et al. (2018); Dubey., et al (2014) and Geyi et al. (2020)
--	----------------------------	---	--

The questionnaires were distributed to 400 respondents representing a cohort of 100 construction firms strewn across the length and breadth of Ghana. At the heart of this study's analytical framework lies the firm level, thus beckoning forth the engagement of key individuals. Project Managers/ Directors, Procurement Coordinators/ Managers/ Directors, Warehouse Coordinators/ Managers/ Directors, and Logistics Coordinators/ Managers/ Directors emerged as the prime candidates, duly approached and entrusted with the task of diligently completing the questionnaires.

3.7 Validity and Reliability

In the realm of research endeavor, a fundamental imperative is to meticulously scrutinize the validity and reliability of the instruments employed for data collection an ethos underscored by Heale & Twycross (2015).

Validity

The crux of validity hinges upon the precision with which a concept finds its embodiment within the contours of a quantitative study (Heale & Twycross, 2015). Within this intricate landscape, three distinct archetypes emerge. Foremost is content validity, a sentinel that scrutinizes whether the instrument's compass effectively spans the entirety of content or constructs requisite for comprehending the variable's essence. Construct validity steps onto the stage, gauging the fidelity with which a research tool encapsulates the very construct it is intended to unravel. Lastly, criterion validity orchestrates an examination of the interrelationships between the research instrument under scrutiny and other instruments wielding the power to gauge the same variables.

To ensure the veracity of the research instrument, its genesis was rooted in a diligent literature review, a measure designed to imbue it with validity. A pilot testing phase for the questionnaires was embarked upon, a strategic exercise aimed at gauging their potential effectiveness. Further bolstering this initiative, fieldworkers received comprehensive training, arming them with the skills to adroitly administer the questionnaires. The crucible of construct validity was duly subjected to scrutiny via the tandem application of exploratory factor analysis (EFA). EFA embarked upon an odyssey to discern the extent of convergence among items within each construct.

Reliability

The bedrock of reliability rests in the consistency and precision demonstrated by an instrument, echoing harmoniously across a multitude of scenarios (Heale & Twycross, 2015). Within this realm, a trinity of attributes unfolds. Stability charts a course, scrutinizing the consistency of outcomes as the instrument weathers the tides of repeated testing. Equivalence follows suit, extending its compass to gauge the uniformity of responses across a multitude of users or alternate forms of the instrument. Homogeneity (internal consistency), the final dimension, probes the resonance among all the items within a scale, scrutinizing their shared capability to measure a singular construct.

The crucible of internal consistency (homogeneity) became the lodestar in gauging instrument reliability, a domain to be measured via diverse yardsticks such as item-to-total correlation, split-half reliability, Kuder-Richardson coefficient, or Cronbach's Alpha (α). To test the research instrument's reliability, the most prevalent measure of internal consistency—Cronbach's Alpha (α)—stood at the forefront. This holistic approach propelled the assessment of item internal consistency. A threshold reliability score of 0.7 or beyond stands as the benchmark of acceptability, echoing Shuttleworth's (2015) guiding assertion.

3.8 Data Analysis

Data analysis unfolds as an iterative voyage, a process wherein numbers are deftly manipulated and imbued with interpretative significance, all in pursuit of unearthing insights, addressing research queries, validating hypotheses, or unearthing meanings emergent from the data's inductive tapestry (Mertens et al., 2017). In the milieu of a quantitative research endeavor like the present one, numerical data stand at the forefront, beckoning a meticulous analysis to propel the journey toward conclusions.

Two principal quantitative data analysis methodologies command the stage: descriptive statistics and inferential statistics. Initiating this narrative is the realm of descriptive statistics, aptly labeled as descriptive analysis. It serves as the bedrock for researchers, facilitating the encapsulation of data's essence and unveiling latent patterns. Among its eminent denizens, the likes of mean, median, mode, percentage, frequency, and range bear testament to its prowess. Venturing forth, inferential statistics, hailing as inferential analysis, unveil a realm of complexity. This domain unearths relationships interwoven among multiple variables, facilitating the art of generalization and prediction. In this symphony of exploration, illustrious

techniques like correlation, regression, and analysis of variance seamlessly synchronize (Gebreamlak et al., 2019).

Within this study's realm, the dual mantles of descriptive and inferential statistics were adroitly donned to fathom the troves of amassed data. Descriptive statistics, serving as the herald, unveiled the unique characteristics embellishing the data. Simultaneously, the mantel of inferential statistics enfolded correlation and regression techniques to unfurl the banners of mediation effects, illuminating the dynamics that both describe and prognosticate the intricate relationships tethering the diverse constructs. The collection of data underwent the meticulous phases of editing, coding, and analysis, all orchestrated within the sanctum of IBM SPSS Statistics 25, serving as the adept maestro for this analytical symphony.

3.9 Ethical Issues

Embedded within every research endeavor resides a tapestry of ethical considerations. A rich spectrum of ethical nuances has been meticulously woven into the fabric of this study, encompassing elements such as informed consent, confidentiality, and empathetic neutrality. Safeguarding the cloak of respondent anonymity stands as a paramount directive, and to this end, stringent measures were implemented. The researcher orchestrated a careful orchestration, ensuring respondents abstained from inscribing their names or contact details on the instruments.

In tandem with this ethical overture, the principles of voluntarism and non-coercion unfurl their wings. Participation in the research study bore the distinctive mantle of voluntariness, bereft of any veiled coercion. To further embellish this ethical saga, the solemn act of seeking consent was enshrined. The ascent of each company's management and employees was diligently secured before embarking on the journey, ensuring a harmonious union between the research process and the volition of the participants. A letter of introduction emanating from the venerable KNUST School of Business accompanied each fieldworker, an emblem of authenticity, fostering respondent confidence and nurturing a gateway into hallowed precincts, including restricted organizations.

3.10 Unit of Analysis

At the core of this study's investigative purview lies the realm of individual firms. The decision to center the research within the precincts of the construction industry emerges from the profound ripple effects it generates, resonating across diverse sectors of the economy. This

phenomenon engenders an augmented state of welfare, manifesting as heightened employment and income levels, a truth substantiated by the (ITA, 2022).

Papadopoulos et al. (2016) cast light upon the tantalizing prospects encapsulated within Construction Supply Chain Management (CSCM), a beacon heralding the potential for seamless integration across the diverse dimensions of the chain, spanning internal and external suppliers, designers, vendors, contractors, subcontractors, and the esteemed echelons of internal and external clients.

Ghanaian contractors, an integral player within this theater, are stratified into eight expansive categories, a division rooted in the nature of their undertaken tasks. Classifications traverse an array of designations from A to S, each delineating distinctive domains. The classification, an intricate weave of financial acumen, equipment ownership, and human resources, manifests through a numerical assignment ranging from 1 to 4 bestowing names such as D1 or A3. Contractors burgeoning within Financial Class 4 are endowed with the capacity to vie for projects valued at up to US\$ 75,000. Meanwhile, Class 3 contractors navigate within the ambit of contracts up to US\$ 200,000. Further still, the realm of Class 2 contractors extends to contracts amounting to US\$ 500,000, while the hallowed domain of Class 1 contractors remains unbounded, indicative of their well-appointed prowess in executing construction endeavors surpassing the threshold of US\$ 500,000. For those bearing the mantle of a D1/K1 license, the panorama expands—such entities stand equipped to vie for construction projects encompassing the entirety of Ghana's borders.

In the tapestry of this exploration, the epilogue of firm selection culminates in a quartet of respondents chosen from each construction entity engaged. It is within the contours of these respondent firms that this study's narrative finds its confines, weaving a tale that navigates the intricate threads of construction, integration, and management.

CHAPTER 4

DATA ANALYSIS, INTERPRETATION OF RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the analysis of the empirical data leveraged to test the study's hypotheses. Before presenting results on tested hypotheses, this section submits highlights on fundamental

insights on the data. Hence, the chapter is categorized into several sections notably: response analysis, demographics, reliability and validity checks, correlation, hypotheses testing and discussion of findings. Simply put, the chapter presents the findings of the study, together with a discussion of the results in consonance with existing literature and relevant studies.

4.2 Background Profile Information

This component of the study presents a highlight of the demographics of and their respective firms that participated in this cross-sectional survey. Also, the section response analysis which gives a snapshot of the nature and quantum of data solicited for the study. Non-response bias analysis is equally captured in the section of the study.

4.2.1 Response Analysis

The data collection exercise for this study commenced with the administration of 450 questionnaires to 450 informants to construction firms in Ghana. With the unit of analysis being firm level, each informant responded to questionnaires on behalf of their respective firms. After three weeks of field exercise, field officers succeeded in retrieving 400 completed questionnaires. To enhance data quality, questionnaires were subjected to acute scrutiny in checks for missing values, incomplete questionnaires etc. Following the recommendation of prior studies, questionnaires that failed to answer at least 95% of questions on substantial items or constructs were deleted/dropped. After the said checks, 28 questionnaires were dropped owing to missing values, too many outliers (normalization concerns). Hence, this study's effective response rate was 82.7%.

4.2.2 Non-Response Bias

Since one source of data, particularly data emanating from cross-sectional survey is likely to be confounded by biases from respondents, it is prudent to invalidate the presence of nonresponse bias in this study. Several procedures were followed to ensure non-response bias was absent in this dataset. Firstly, to rule out the possibly of non-response bias, the researcher did a rigorous assessment of the features of the effective sample of the study compared to the population. Evidence as presented in table 4.1 display that, there is no statistical difference pertaining substantial features of the sample and population of the study. Statistically, the researcher following the recommendation of Amstrong and Overton (1977), compared early respondents (responses that were retrieved in the first two weeks of the field exercise) and late respondents (responses in the last one week of the field exercise). Using the independent sample t-test precisely Levene's test for equality of variance, it was found that, there were no statistical differences between key variables of interest for both early and late respondents.

Drawing inferences from table 4.1, the independent sample t-test results indicate no statistical evidence of any significant difference on internal integration (t-value= -.129; p-value=.898); supplier integration (t-value= -.431.; p-value= .666); customer integration (t-value= -.131; pvalue=.896); external integration orientation (t-value= .016; p-value=.987); operational performance (t-value= .193; p-value=.847); financial performance (t-value= -.151; pvalue=.880); sustainable performance (t-value= .124; p-value=.902); firm age (t-value= .319; p-value=.750); firm size (t-value= -.636; p-value=.525) and projects executed (t-value= .339; p-value=.734). Based on the evidence portrayed in table 4.1, it is crystal clear the results from the independent sample t-test does not show any evidence of statistical difference between key constructs and characteristics for any early and late respondents.

Table 4.1: Non-Response Bias Analysis

Variable	Response Time	N	Mean	SD	T-value	P-value
Internal Integration	Early (2 weeks)	220	5.6027	1.00492	-.129	.898
	Late (1 Week)	152	5.6158	.89990		
Supplier Integration	Early (2 weeks)	220	5.0791	.99226	-.431	.666
	Late (1 Week)	152	5.1224	.88850		
Customer Integration	Early (2 weeks)	220	4.8700	1.04999	-.131	.896
	Late (1Week)	152	4.8842	.98828		
External Integration Orientation	Early (2 weeks)	220	5.4470	1.07776	.016	.987
	Late (1 Week)	152	5.4452	.99220		
Operational Performance	Early (2 weeks)	220	5.4902	.99697	.193	.847
	Late (1 Week)	152	5.4704	.92966		
Financial Performance	Early (2 weeks)	220	4.8852	1.02350	-.151	.880
	Late (1 Week)	152	4.9013	.98883		
Sustainability Performance	Early (2 weeks)	220	5.3970	1.19984	.124	.902
	Late (1 Week)	152	5.3816	1.15209		
Firm Age	Early (2 weeks)	220	17.02	10.819	.319	.750
	Late (1 Week)	152	16.66	10.415		
Firm Size	Early (2 weeks)	220	4.13	1.105	-.636	.525
	Late (1 Week)	152	4.20	1.032		
Number of Projects Executed	Early (2 weeks)	220	19.74	26.979	.339	.734
	Late (1Week)	152	18.78	26.438		

Source: Field Survey, 2023.

4.2.3 Demographic Characteristics

This component of the chapter shares insights on the demographic information of informants who responded on behalf of their firms together with characteristics of firms that participated

in the survey. Pertinent among such demographics include gender, age, education level, designation and experience of informants. Pertaining to firm characteristics, key features captured include; nature of ownership, firm age, firm size, projects executed, firm annual procurement spend and number of ongoing projects, firm type, ownership and legal form, firm class of contractor etc. Table 4.2 displays such demographic information of informants and surveyed firms.

Table 4.2 Demographic Information

Variables	Frequency	%	
Gender of respondents	Male	272	73.12
	Female	100	26.88
	Total	372	100
Education level of respondents	Diploma/HND/Related	50	13.44
	1 st Degree	150	40.32
	2 nd Degree or more	172	46.24
	Total	372	100
Position of Respondents	Procurement manager	141	37.90
	Supply chain manager	44	11.83
	Logistics manager	107	28.80
	Production manager	28	7.65
	Project manager	46	12.40
	Other (Finance)	6	1.60
	Total	372	100
Experience of Respondents	Less than 1yr	7	1.9
	1-5yrs	83	22.3
	6-10yrs	146	39.2
	10+yrs	136	36.6
	Total	372	100
Nationality of Respondents	Ghanaian	249	66.9
	Expatriate	123	33.10
	Total	372	100
Demographics of Firms			
Annual Procurement Spent	600,000 – 1,000,000	113	30.4
	1,000,000 +	259	69.6
	Total	372	100
Class of Contractor	D1/K1 OR A1B1	342	91.9
	A1B1S1	18	4.8
	D2/K2 OR A2B2	12	3.2
	Total	372	100.0
Ownership Type	Solely Ghanaian	232	62.4
	Foreign Owned	108	29.0
	Joint Venture	32	8.6

	Total	372	100.0
Legal Form	Limited Liability	292	78.5
	External Company	80	21.5
	Total	372	100.0
Firm Size	100 – 199	46	12.4
	200 – 299	51	13.7
	300 – 399	72	19.4
	400 +	203	54.6
	Total	372	100.0

Table 4.2 Continued

Variable	Range	Mean	Std. Dev.
Projects Executed	1– 117	19.350	26.728
Ongoing Projects	0 – 15	3.220	2.250
Firm age	3 – 68	16.88	10.643

Source: Field Survey, 2023.

Table 4.2 above captures highlights of the demographics of informants and firms that participated in the survey. Drawing inferences from the above table, it is evident that, regarding gender of informants, males were predominant with over 73%. Also, a little below 23% of total number of respondents were females. Considering the industry in construction industry, the said gender distribution is a true reflection of the gender of informants as most top managers within the construction industry are males.

Furthermore, the researcher solicited data on the level of education of informants. This was to help assess whether the informants understood and had enough knowledge pertaining to the variables of interest in this study. Inferring from the results in table 4.2, it is evident that 50 informants representing 13.44% of total number of informants had HND/Diploma as their highest academic qualification. Results further showcase that a whopping 150 respondents representing 40.32% of total number of participants in the survey has first degree as their highest level of educational qualification. Finally, data demonstrate that 172 respondents had at least a master's degree. Considering that over 86% of informants had a minimum of bachelor's degree qualification, it can be presumed that, informants understood that required of them in the survey, hence heightening the quality of the dataset.

Pertaining to the designation of informants, analysed results suggest that almost all informants were experts within the study's predefined respondents. For instance, results indicate that 141 respondents were procurement experts within their respective organizations. More specifically, procurement experts occupied roles such as procurement managers, director of procurement, strategic global sourcing director, sourcing coordinator among others. Also, 44 respondents

representing 11.83% of total respondents were supply chain experts with specific roles such as supply chain directors, supply chain managers, head of global supply chain etc.

Logistics experts made up 28.80% of total number of respondents. These experts occupied specific logistics roles such as warehouse managers, transport managers, director of logistics, logistics coordinators etc. Forty-six respondents representing 12.40% of total respondents were experts in project management. Specific roles handled by informants in this area of specialty include but are not limited to project managers, project coordinators, directors of projects etc. Production/Operations experts made up 7.65% of the total number of respondents for the survey. Finally, finance experts contributed only 1.60% of the total number of respondents for this survey. Drawing inferences from the designation of informants, it is evident that data was solicited from informants with the requisite knowledge and expertise in their various areas of specialties. As such, the quality concerns of the study's dataset are not a problem as respondents were the right persons within their firms to respond to the survey.

Also, to further check the level of knowledge and expertise of respondents for the study, informants were required to indicate the number of years they have been serving in their specific roles. Evidence as portrayed in table 4.2 suggests that, over 75% of informants have been serving in their respective roles for at least 6 years. This revelation suggests that informants for this survey had the requisite expertise and knowledge pertaining to the areas of specialties, thus making them the ideal candidates for this survey as far as data quality is concerned.

As captured in table 4.2, key characteristics of the participating firms were equally captured. Per results presented, it is revealed that all the organizations used in the study are privately owned. This result is a clear depiction of the construction space in Ghana as the construction industry in Ghana is mainly characterised by privately owned organisations. The fact that all the organizations are privately owned suggests that they operate in a competitive market environment where the primary goal is to maximize profits. Additionally, the lack of state-run enterprises suggests that the government may have a limited role in regulating or influencing the operations of these organizations, which can have both positive and negative implications depending on the context.

Table 4.2 provides a detailed distribution of the operational years of organizations used in the study, allowing researchers to examine the distribution of companies across different years of operation. Inferring from results on the said characteristic, it is revealed that, on average, a

construction firm within the Ghanaian space has been operation for 17 years (mean=16.88; Std=10.643). Specifically, it is revealed that; the most common operational years are 11 (8.3%), 13 (8.1%), and 17 (8.1%), followed by 8 (7.5%) and 5 (5.9%). The least common operational years are 3 (2.2%), 6 (6.2%), 14 (1.3%), 16 (1.3%), 20 (1.1%), 26 (1.1%), 30 (1.1%), 40 (1.1%), 59 (1.1%), and 68 (1.1%). The dataset provides insights on the distribution of the operational years of the organizations. This information is useful in identifying the age and experience of the organizations in the industry. Organizations that have been operational for longer periods may have more experience and expertise than those that are newer. However, this may not always be the case, as the quality of the organization's management and the effectiveness of its operations also play a critical role in its success. The information in the table can also be used to assess the stability and reliability of the organizations, as those that have been operational for longer periods may be perceived as more stable and reliable.

Regarding ownership structure of participated firms, it is evident that the majority of the companies (62.4%) are solely Ghanaian-owned, while 29.0% are foreign-owned and 8.6% are joint ventures. This information is useful for understanding the business landscape in Ghana and how ownership structures may affect different aspects of the companies, such as their performance or growth potential.

The ownership structure of an organization can has several impacts, including its access to resources, technology, and markets. For example, foreign-owned companies may bring in foreign expertise and capital, which can enhance the organization's competitiveness and growth prospects. On the other hand, solely Ghanaian-owned organizations may face more challenges accessing capital and resources but may be better integrated into local markets and communities. Joint ventures involve collaboration between Ghanaian and foreign partners, which can bring in both local and foreign expertise and resources. This can create opportunities for knowledge sharing and technology transfer, leading to mutual benefits for both partners. From a policy perspective, understanding the ownership structure of businesses can help policymakers design policies that better support the growth and development of different types of organizations. For example, policies that support access to finance may be particularly important for Ghanaian-owned businesses, while policies that support technology transfer and innovation may be more important for foreign-owned businesses.

Furthermore, a breakdown of the legal form of the construction organizations was presented in the study, allowing researchers to examine the distribution of companies across different legal structures. It can be seen that the majority of the companies (78.5%) are limited liability companies, while the remaining 21.5% are external companies. This information is useful for

understanding the legal and regulatory environment in Ghana and how it impacts the formation and operation of different types of companies. Limited liability legal form means that the owners or shareholders of the organization have limited liability for any debts or legal issues faced by the organization. This means that the personal assets of the shareholders are protected from creditors and legal claims, and they are only liable for the amount of money they invested in the organization. External companies, on the other hand, are organizations that are incorporated outside Ghana but are authorized to do business in the country. These companies are required to register with the Registrar-General's Department and comply with Ghana's laws and regulations. The legal form of an organization can have implications for the organization's operations, tax liabilities, and legal responsibilities. Limited liability legal forms can provide a level of protection to shareholders, while external companies may have different tax obligations and regulatory requirements.

Also, the table provides information on the class of contractor of construction organizations used in the study. This classification is specific to Ghana's Ministry of Roads and Highways, Ministry of Sanitation and Water Resources, and Ministry of Works and Housing. The data shows that there are three classes of contractors: D1/K1 or A1B1, A1B1S1, and D2/K2 or A2B2. Most of the construction firms fall under the category of D1/K1 or A1B1, accounting for 91.9%. This indicates that many contractors are involved in the construction of projects that require them to possess this class of contracting qualification and can execute large-scale infrastructure projects. The second most frequent class of contractor is A1B1S1, with a valid percentage of 4.8%. This class of contractor is less commonly involved in construction projects compared to the previous category. Finally, the D2/K2 or A2B2 class of contractor has a valid percentage of 3.2%. This indicates that this class of contractor is the least frequently involved in the construction projects and can execute smaller-scale projects. Overall, this table suggests that many contractors involved in construction projects possess the D1/K1 or A1B1 qualification. This can be used to compare the performance of different categories of contractors in terms of project delivery and quality.

Based on the size of firms, it is evident that; 54.6% of construction companies surveyed have 400 or more employees, while 19.4%, 13.7%, and 12.4% of the companies have 300-399, 200-299, and 100-199 employees, respectively. The number of employees data provides some insights into the contribution of the construction industry to the Ghanaian economy in terms of employment. The fact that the majority of the companies surveyed (54.6%) have over 400 employees suggests that the construction industry is a significant employer in Ghana. This indicates that the industry has the potential to contribute significantly to the country's economic

growth and development. Furthermore, the number of employees data also suggests the potential impact of the construction industry on other sectors of the economy. For instance, the industry's demand for construction materials, such as cement, steel, and other building materials, has the potential to stimulate growth in the manufacturing sector. In addition, the construction industry's need for various services, such as transportation, catering, energy, and banking, creates employment opportunities in these sectors as well. Overall, the number of employees data indicates that the construction industry plays a crucial role in the Ghanaian economy and has the potential to contribute significantly to its growth and development. The study also solicited figures on the number of projects executed by firms that participated in the survey. The data suggest that on average each participated firm had executed 19 projects (mean=19.350; Std = 26.728) and has at least two projects currently ongoing (mean = 3.220; Std = 2.250). Specifically, the most common number of executed projects was 10, followed by 5, and then 1. The data suggests that the construction industry in Ghana is dominated by many small and medium-sized projects, with only a small proportion of contractors having executed many projects. The data can be used to assess the level of competition within the industry and the potential for growth and expansion of companies with a limited track record. Additionally, it could be used to identify potential areas for improvement in the procurement process to ensure that contractors have equal access to a diverse range of projects.

Finally, data on "Annual Procurement Spend" was equally solicited to help grasp the extent to which participated firms commit financially to their projects. Results as again captured in table 4.2 suggest that the majority of the companies (69.6%) spent over 1,000,000 Ghanaian cedis annually on procurement, while 30.4% spent between 600,000 and 1,000,000 cedis annually. This data suggests that the organizations surveyed have significant procurement budgets, and that procurement is an important aspect of their operations. It also suggests that there may be significant opportunities for businesses that supply goods or services to these organizations, particularly those that are able to offer competitive pricing and high-quality products or services. This information is useful for policymakers and businesses to better understand the procurement practices and needs of contractors in Ghana and to make more informed decisions about investment and resource allocation. It also provides insights into the broader economic trends and conditions in the country. Additionally, the above data provides useful insights for policymakers and analysts who are interested in understanding procurement trends in the Ghanaian economy.

4.3 Descriptive Statistics

This component of the study presents a summary of the extent to which each of the key constructs of interests in the study are manifested within surveyed firms. Pertinent among these constructs are supply chain innovativeness, supply chain integration, institutional pressures and supply chain performance.

4.3.1 Extent of Supply Chain Innovativeness

Premised on prior literature, the study conceptualizes supply chain innovation as a unidimensional construct. Based on prior studies, ten items were adapted to measure the said construct. The scale for the said items was anchored on seven-point Likert scale from 1-7, where 1 – strongly disagree, 2 – disagree, 3 – somehow disagree, 4 – neutral, 5 – somehow agree, 6 – agree and 7 – strongly agree. Table 4.3 presents a snapshot of the descriptive statistics on the extent of supply chain innovativeness in participating firms.

Table 4.3 Supply Chain Innovativeness

Measurement/Statement	N	Range	Mean	Std.	Skewness	Kurtosis
INN1: Our supply chain has formal new product and service development process.	372	1-7	5.51	1.164	-1.137	3.220
INN2: Our supply chain monitors and documents new product and service ideas.	372	1-7	5.45	1.322	-1.312	2.750
INN3: Our supply chain focuses on process and technological innovation.	372	1-7	5.40	1.410	-1.060	1.651
INN4: Our organisation frequently try out new ideas in the procurement and supply chain context	372	1-7	5.34	1.329	-.784	.859
INN5: Our organisation seek out new ways to do things in our procurement and supply chain	372	1-7	5.34	1.394	-.861	.916
INN6: Our organisation have increasingly introduced new processes in the procurement and supply chain in the last 5 years	372	1-7	5.63	1.279	-.859	.307
INN7: Our organisation often introduces new ways of servicing the supply chain.	372	1-7	5.09	1.318	-.531	.043
INN8: Our organisation is creative in the methods of operation in the supply chain.	372	1-7	5.00	1.238	-.491	-.018
INN9: Sustainable procurement is considered as part of my organization's long-term performance strategy.	372	1-7	5.25	1.403	-.910	.696
INN10: Our organisation incorporates local content as part of our supply chain	372	1-7	5.96	1.223	-1.090	.926
Scale Mean			5.40			

Source: Field Survey, 2023.

The above table presents descriptive statistics for supply chain innovation-based views from 372 informants. As already discussed, ten items measured supply chain innovation. The mean score for the construct is 5.40, which indicates that, on average, the respondents perceive their companies to be relatively innovative in their supply chain practices. The standard deviation values range from 1.164 to 1.410, suggesting that there is some variability in the respondents' perceptions across the individual items.

Considering the individual items, INN1, INN2, and INN3 have the highest mean scores (i.e., 5.51, 5.45 and 5.40 respectively), indicating that respondents believe that their organization has a formal new product and service development process, monitors and documents new product and service ideas, and focuses on process and technological innovation. INN7 and INN8 have the lowest mean scores (i.e., 5.09 and 5.00 respectively), indicating that respondents are less likely to agree that their organization often introduces new ways of servicing the supply chain and is creative in the methods of operation in the supply chain. INN6 and INN10 have the highest maximum scores (i.e., 5.63 and 5.96 respectively), most respondents agree that their organization has increasingly introduced new processes in the procurement and supply chain in the last 5 years and incorporates local content as part of their supply chain. Overall, the data suggests that respondents perceive their companies to be innovative in their supply chain practices, particularly in terms of formal processes, monitoring and documenting new ideas, and focusing on process and technological innovation. However, there is room for improvement in introducing new ways of servicing the supply chain and being creative in the methods of operation in the supply chain.

4.3.2 Extent of Supply Chain Integration

Defined as the degree to which internal and external supply chain players work together to create synergy aimed at delivery the right product to the right place, at the right time, at the right price and condition, supply chain integration was conceptualized as a multidimensional construct encapsulating internal integration, customer integration, supplier integration and external integration orientation.

4.3.2.1 Extent of Internal Integration

Internal integration as a sub-construct of supply chain innovation was measured using five items adapted from literature. Again, the said construct was anchored on a seven-point likert scale from 1-7, where 1 – strongly disagree, 2 – disagree, 3 – somehow disagree, 4 – neutral, 5 – somehow agree, 6 – agree and 7 – strongly agree. Table 4.4 captures a summary of the perception of informants on the extent to which their firms have internal synergy.

Table 4.4: Extent of Internal Integration

<i>Statement</i>	<i>N</i>	<i>Range</i>	<i>Mean</i>	<i>Std.</i>	<i>Skewness</i>	<i>Kurtosis</i>
II1: Our Organisation’s internal supply chain activities are closely coordinated.	372	1-7	5.68	1.100	-.459	.681
II2: Our Organisation effectively shares operational information between departments.	372	1-7	5.66	1.332	-1.209	1.807
II3: Our Organisation has invested in technology designed to facilitate crossorganizational data exchange.	372	1-7	5.34	1.391	-.530	-.550
II4: Within our organisation, we emphasize information flows amongst engineering, purchasing, inventory management, and production departments	372	1-7	5.75	1.142	-.776	.852
II5: Our Organisation has a high level of responsiveness within the firm to meet other department’s needs.	372	1-7	5.61	1.145	-1.256	3.604
Scale Mean			5.61			

Source: Field Survey, 2023.

Table 4.14 shows the descriptive statistics for Internal Integration, which is a sub-construct of SCI measuring how well an organization’s internal supply chain activities are coordinated and how effectively operational information is shared between departments. The sub-construct consists of five measures (II1 to II5), and each measure was rated on a scale ranging from 1 to 7, with higher scores indicating higher levels of internal integration.

The mean score for the Internal Integration sub-construct is 5.61, which suggests that, on average, the surveyed organizations have a relatively high level of internal integration. Among the individual items, II4 (“Within our organization, we emphasize information flows amongst engineering, purchasing, inventory management, and production departments”) had the highest mean score (5.75), indicating that the organizations surveyed place particular emphasis on coordinating activities and sharing information among these key departments. Meanwhile, II3 (“Our Organisation has invested in technology designed to facilitate cross-organizational data exchange”) had the lowest mean score (5.34), suggesting that while many organizations have invested in technology to support internal integration, there is still room for improvement in this area. The standard deviations for each measure are relatively small, suggesting that the responses are clustered around the mean and that there is relatively little variability in the ratings. Overall, these statistics indicate that internal integration is a relatively strong aspect of the supply chain practices in these organizations.

4.3.2.2 Extent of Supplier Integration

Premised on prior literature, supplier integration was measured leveraging five items. Using a seven-point likert scale of 1-7, respondents were asked to indicate the extent to which agree or disagree with each of the five items measuring supplier integration. Table 4.5 captures a summary of responses from informants on all items capturing supplier integration.

Table 4.5: Extent of Supplier Integration

<i>Statement</i>	<i>N</i>	<i>Range</i>	<i>Mean</i>	<i>Std.</i>	<i>Skewness</i>	<i>Kurtosis</i>
SI1 Our Organisation’s supply chain activities are well integrated with suppliers’ logistics activities.	372	1-7	5.39	1.187	-.875	2.374
SI2 Our Organisation share information with our major suppliers through information technologies	372	1-7	5.27	1.101	-1.059	4.335
SI3 Our Organisation have a high degree of strategic partnership with suppliers	372	1-7	5.45	1.316	-.776	1.137
SI4 Our organisation actively pursues business relationships and programs targeted at maximizing supplier involvement.	372	1-7	4.69	1.282	-.603	.375
SI5 Our organisation visits supplier sites and helps them to improve their environmental performance.	372	1-7	4.67	1.466	-.584	-.048
Scale Mean			5.09			

Source: Field Survey, 2023.

Table 4.15 provides descriptive statistics for the Supplier Integration sub construct of SCI, which measures the degree of integration between an organization’s supply chain activities and those of its suppliers. The sub construct is composed of five items.

The mean score for the construct is 5.09, indicating that on average, the organizations in the sample have a moderate level of supplier integration. Among the five items, “Our Organisation has a high degree of strategic partnership with suppliers” has the highest mean score of 5.45, while “Our Organization visits supplier sites and helps them to improve their environmental performance” has the lowest mean score of 4.67. The standard deviations for the items range from 1.101 to 1.466, indicating that there is some variability in the responses for each item. Overall, the descriptive statistics suggest that while the organizations in the sample have some degree of supplier integration in areas such as having a relatively high degree of strategic partnership with suppliers and sharing information with them through information technologies, there is room for improvement in areas such as pursuing business relationships and programs to maximize supplier involvement and visiting supplier sites to improve their environmental performance.

4.3.2.3 Extent of Customer Integration

Drawing inferences from prior studies, customer integration was operationalized using five items. To solicit views of informants on the extent to which their respective construction firms integrate with customers, a seven-point likert scale was used. As such, informants were tasked to indicate the extent of their firm on each item ranging from 1-7, where 1 – strongly disagree, 2 – disagree, 3 – somehow disagree, 4 – neutral, 5 – somehow agree, 6 – agree and 7 – strongly

agree. Table 4.6 presents a summary of results on the extent to which respondents perceive their firms Integrate with their respective customers/clients.

Table 4.6: Extent of Customer Integration

<i>Statement</i>	N	Min	Mean	Std.	Skewness	Kurtosis
CI1 Our Organisation has a high level of information sharing with customers about market information	372	1-7	4.77	1.053	-.445	.025
CI2 Our Organisation shares information to major customers through information technologies	372	1-7	5.20	1.325	-.461	.344
CI3 Our Organisation has a high degree of joint planning and forecasting with major customers to anticipate demand visibility	372	1-7	4.84	1.335	-.436	-.227
CI4 Our customers are involved in our product development processes	372	1-7	4.87	1.418	-.649	.141
CI5 Our Organisation actively communicate with end customers about our sustainability values	372	1-7	4.70	1.395	-.977	1.093
Scale Mean			4.88			

Source: Field Survey, 2023.

Table 4.6 shows descriptive statistics for the Customer Integration dimension of SCI, which assesses the extent to which an organization collaborates with its customers to improve supply chain performance. The sub construct is composed of five items.

Looking at the statistics, we can see that the mean score for this dimension is 4.88, indicating a moderate level of customer integration overall. Among the individual items, the highest mean score (5.20) is for CI2 (“Our Organization shares information to major customers through information technologies”), indicating that the organization is relatively effective at sharing information with its customers through digital means. The lowest mean score (4.70) is for CI5 (“Our Organization actively communicates with end customers about our sustainability values”), suggesting that the organization could do more to communicate its sustainability values to its customers. The standard deviations for the individual statements range from 1.053 to 1.418, indicating that there is some variation in responses among the sample population.

Overall, the descriptive statistics suggest that while the organization has some level of customer integration, there is room for improvement in some areas.

4.3.2.4 Extent of External Integration Orientation (EIO)

Based on extant literature, this dimension of supply chain integration was measured using three items adapted from literature. To measure external integration orientation – a key dimension of supply chain integration, respondents were asked to indicate the extent to which their respective

firms perform on all three items tapping into the said construct. Again, a seven-point likert scale of 1-7 was used to measure the extent to which external integration orientation in the supply chain of construction companies is observed among surveyed firms.

Table 4.7: Extent of External Integration Orientation (EIO)

<i>Statement</i>	<i>N</i>	<i>Range</i>	<i>Mean</i>	<i>Std.</i>	<i>Skewness</i>	<i>Kurtosis</i>
EIO1 Our organisation works as a partner with suppliers, rather than having an adversarial relationship	372	1-7	5.21	1.152	-.550	.995
EIO2 Our organisation believes that cooperative relationships will lead to better performance than adversarial relationships	372	1-7	5.46	1.289	-.806	1.763
EIO3 Our organisation believes that a firm should work as a partner with its surrounding community	372	1-7	5.67	1.191	-1.400	3.462
Scale Mean			5.45			

Source: Field Survey, 2023.

Table 4.7 shows the descriptive statistics for three items (EIO1, EIO2, EIO3) related to the “external integration orientation” sub construct of SCI, which measures the extent to which an organization views its relationships with suppliers and the community as cooperative partnerships rather than adversarial. Overall, the mean score for the EIO sub construct is 5.45, which indicates a relatively high level of external integration orientation. EIO1 has the lowest mean score of the three measures, with a mean of 5.21. EIO2 has a slightly higher mean score of 5.46, and EIO3 has the highest mean score of 5.67. The standard deviations for all three measures are relatively similar, ranging from 1.152 to 1.289, indicating that there is some variability in respondents’ scores, but the scores are generally clustered around the mean. Overall, the scores for the EIO scale suggest that respondents generally agree that their organization values partnerships and cooperative relationships, both with suppliers and the community.

4.3.3 Extent Institutional Pressure

To institutional pressure, the draws on existing literature. Hence, institutional pressure was measured using fifteen items. Again, the measure items were anchored on a seven-point likert scale.

Table 4.8 Extent of Institutional Pressure

<i>Statement</i>	<i>N</i>	<i>Min</i>	<i>Mean</i>	<i>Std.</i>	<i>Skewness</i>	<i>Kurtosis</i>
IP1 Our clients are more sensitive towards sustainable practices	372	1-7	5.28	1.226	-.402	.052

IP2 The funding agencies requirements and regulations provide clear guidelines concerning sustainability issues.	372	1-7	5.51	1.411	-.690	-.022
IP3 Government regulations provide clear guidelines concerning sustainability issues.	372	1-7	5.23	1.639	-.747	-.132
IP4 Environmental Protection Agency (EPA) strictly monitors the pollution level of our organisation on a periodic basis.	372	1-7	5.49	1.636	-1.074	.595
IP5 Sustainable practices decrease incidence of penalty fee charged by the Environmental Protection Agency (EPA).	372	1-7	5.93	1.132	-.878	.948
IP6 Maximum purchases of the organisation are local market oriented.	372	1-7	4.59	1.716	-.495	-.446
IP7 Our organisation pays “living wages” greater than the country’s or region’s minimum wage and provide supplementary non-financial benefits.	372	1-7	4.85	1.596	-.475	-.049
IP8 Our organisation strictly complies with labor laws and the Construction and Building Materials Workers’ Union (CBMWU) guidelines	372	1-7	5.31	1.435	-.835	.681
IP9 Our organisation provides opportunities for employee growth and self-development.	372	1-7	4.68	1.576	-.854	.315
IP10 Our organisation has Social Welfares initiatives such as donating to related causes and funding research into sustainability.	372	1-7	4.68	1.691	-.678	-.112
IP11 Our organisation provides employees with safety and occupational health working conditions	372	1-7	5.76	1.186	-1.429	3.743
IP12 Our organisation contributes to reducing carbon footprints by transporting in bulk	372	1-7	5.09	1.413	-.884	1.033
IP13 Our processes ensure local companies who have the capacity to execute contracts are not rejected exclusively based on the principle of the lowest evaluated bid	372	1-7	5.19	1.285	-.573	.334
IP14 Our organisation ensures it does not procure goods and services resulting from slavery or child labor	372	1-7	5.77	1.582	-1.158	.641
IP15 There are periodic reviews on environmental performance and social performance of suppliers.	372	1-7	4.79	1.542	-.746	.252
Scale Mean			5.21			

Source: Field Survey, 2023.

As shown in table 4.8, it evident that, surveyed firm scores quite good pertaining to the extent to which pressure from institutions influences a number of their decision. On individual items basis, informants revealed that; their firms desist from sourcing from suppliers with child labour or slavery tack record (mean=5.77; Std=1.582; Skwn=-1.158; Kt=.641); their firms encourage local firms to bid in their procurement processes (mean=5.19; Std=1.285; Skwn=.573; Kt=.334); their firms source from supplier that heed to sustainability practices

(mean=5.28; Std=1.226; Skwn=-.402; Kt=.052); their firms' source of funding demands strict adherence to sustainability concerns and practices (mean=5.51; Std=1.411; Skwn=-.690; Kt=.022); government regulations demands adherence to sustainability practices (mean=5.23; Std=1.639; Skwn=-.747; Kt=-.132); environmental protection agency strictly monitors their activities (mean=5.49; Std=1.636; Skwn=-1.074; Kt=.595); since their firms heed to sustainable practices, penalty fee charged by environmental protection agency for violating environmental laws has seen a drastic reduction (mean=5.59; Std=1.132; Skwn=-.878; Kt=.948); their firms comply with labour laws and construction and building material guidelines (mean=5.31; Std=1.435; Skwn=-.835; Kt=.681); their firms provide employees with safety and occupational health working conditions (mean=5.76; Std=1.186; Skwn=-1.429; Kt=3.743); their firms contribute to reduction in carbon footprint (mean=5.09; Std=1.413; Skwn=-.884; Kt=1.033).

Furthermore, results from views of informants quite unsure on whether their firms; purchase a chunk of their raw materials from local firm (mean=4.59; Std=1.716; Skwn=-.495; Kt=-446); pays salaries above the minimum wage in the country (mean=4.85; Std=1.596; Skwn=-.475; Kt=-.049); provide opportunities for employee growth and self-development (mean=4.69; Std=1.576; Skwn=-.854; Kt=315); have social welfare initiatives such as donating to related causes and funding research on sustainability (mean=4.68; Std=1.691; Skwn=-.678; Kt=-.112).

4.3.4 Extent of Supply Chain Performance

Drawing inferences from prior studies, supply chain performance was operationalized as a multi-dimensional construct. The dimensions for said construct in this study encapsulates operational performance, financial performance and sustainability performance. The below table submits summaries oof the views of informants on the extent to which each of these dimensions are manifested within surveyed firms.

4.3.4.1 Extent of Operational Performance

Based on evidence from existing literature, operational performance was measured using six items. Again, a seven-point likert scale was leveraged to measure the extent to which each of these items are observed within surveyed firms. Table 4.9 presents a summary of the descriptive statistics on the said sub-construct. **Table 4.9 Extent of Operational Performance**

<i>Statement</i>	<i>N</i>	<i>Min</i>	<i>Mean</i>	<i>Std.</i>	<i>Skewness</i>	<i>Kurtosis</i>
OP1 Projects are delivered to our clients fully completed with the right specifications	372	1-7	5.91	1.266	-1.349	2.685
OP2 Our organisation always meets deadlines as promised to supply chain partners.	372	1-7	5.08	1.460	-.857	.284

OP3 Our projects accord with customer requirements in terms of quality.	372	1-7	5.87	1.155	-.758	.573
OP4 Our organisation has increased operational flexibility through collaboration with suppliers.	372	1-7	5.35	1.000	-.491	1.204
OP5 Our organisation's inventory controls, and management has improved over the past year.	372	1-7	5.38	1.330	-.733	.391
OP6 Our organisation has improved productivity and made good use of resources.	372	1-7	5.31	1.266	-.696	.637
Scale Mean			5.48			

Source: Field Survey, 2023.

Table 4.9 shows the descriptive statistics for the sub construct operational performance – which is a measure of how well the companies are performing in terms of meeting customer requirements, delivering projects on time, and improving productivity. The table shows that, on average, the respondents rated their organization's operational performance as relatively high. The mean scores range from 5.08 to 5.91, with a scale mean of 5.48. OP1 received the highest mean score of 5.91, indicating that respondents feel that their organizations are delivering projects to clients with the right specifications. OP3 also received a relatively high mean score of 5.87, indicating that respondents feel that their organization's projects accord with customer requirements in terms of quality.

OP2 received the lowest mean score of 5.08, indicating that respondents feel that their organization does not always meet deadlines as promised to supply chain partners. OP5 and OP6 received mean scores of 5.38 and 5.31, respectively, indicating that respondents feel that their organization has improved its inventory controls and management and productivity in the past year. The standard deviations for the items range from 1.000 to 1.460, indicating some variation in the responses. Overall, the table suggests that the respondents perceive their organization's operational performance positively, with room for improvement in meeting deadlines as promised to supply chain partners.

4.3.4.2 Extent of Financial Performance

Inferring from the manner at which financial performance has been measured in literature, this study measured financial performance using four items adapted from literature. Using a sevenpoint likert scale, informants were required to indicate the extent to which their respective firms score on financial performance. This sub-construct measures the financial performance of supply chains of construction companies surveyed.

Table 4.10 Extent of Financial Performance

<i>Statement</i>	<i>N</i>	<i>Min</i>	<i>Mean</i>	<i>Std.</i>	<i>Skewness</i>	<i>Kurtosis</i>
FP1 Our organisation's operations costs (i.e., overall cost) has reduced over the past year.	372	1	4.38	1.504	-.487	.039
FP2 Our organisation's rate of return is appropriate.	372	2	5.06	1.208	-.947	1.214
FP3 Our organisation's market share and competitiveness has risen at a reasonable rate over the past year.	372	2	5.12	1.259	-.528	.414
FP4 Our organisation's profitability has increased over the past year	372	2	5.01	1.377	-.523	-.035
Scale Mean			4.89			

Source: Field Survey, 2023.

Table 4.10 shows the results of a survey conducted to assess the financial performance of construction companies based on four factors: operations cost reduction, rate of return, market share and competitiveness, and profitability. The mean score for Financial Performance is 4.89, which is slightly below the midpoint of the scale, indicating that there is room for improvement in this area. The scores for FP1 indicate that the organization has not been very successful in reducing its overall costs over the past year. The mean score for this item is 4.38, which is below the midpoint of the scale, suggesting that the organization may need to explore ways to cut costs in order to improve its financial performance. The scores for FP2 and FP3 suggest that the organization's rate of return and market share/competitiveness have improved at a reasonable rate over the past year. However, the mean scores for these items (5.06 and 5.12, respectively) are only slightly above the midpoint of the scale, indicating that there may still be room for further improvement. The scores for FP4 indicate that the organization's profitability has increased over the past year. The mean score for this item is 5.01, which is slightly above the midpoint of the scale. Overall, the financial performance dimension appears to be relatively strong, with most items having mean scores above the midpoint of the scale.

4.3.4.3 Extent Sustainability Performance

To measure sustainability performance, the study draws insights from existing literature. As such, six items adapted from literature were used to measure this construct. The measurement scale for the items were anchored on a seven-point likert scale.

Table 4.11 Extent of Sustainability Performance

<i>Statement</i>	<i>N</i>	<i>Min</i>	<i>Mean</i>	<i>Std.</i>	<i>Skewness</i>	<i>Kurtosis</i>
SP1 Our organisation's performance in waste and carbon footprints (CO2 emissions) reduction has improved	372	1	4.99	1.767	-.617	-.466

SP2 Our organisation has reduced Hazardous materials consumption on its projects	372	1	5.13	1.596	-1.041	.808
SP3 Our organisation has reduced employee and environmental accidents and health hazards	372	2	5.90	1.194	-.847	.419
SP4 Our organisation's performance in efficient use of energy has been appropriate.	372	1	5.17	1.649	-.948	.402
SP5 Our employment practices and work environment have created the types of benefits that create social value.	372	2	5.45	1.147	-.710	.802
SP6 Our organisation has Improved community involvement and development	372	2	5.70	1.259	-.671	-.001
Scale Mean			5.39			

Source: Field Survey, 2023.

Table 4.11 shows the descriptive statistics for the sustainability performance of the construction companies surveyed. The mean score for the Sustainability Performance sub construct is 5.39, indicating that respondents generally rated their organization's sustainability performance positively. The standard deviations for the items range from 1.147 to 1.767, indicating a moderate degree of variability in the ratings. Notably, respondents rated their organization's performance in reducing employee and environmental accidents and health hazards the highest (mean = 5.90), while their performance in reducing hazardous materials consumption received the lowest mean score (mean = 5.13).

4.4 Model Testing and Hypotheses Evaluation

This facet of chapter four presents results on the hypothesized relationships theorized in the study. Specifically, section presents results on; 1) the relationship between supply chain innovation and supply chain performance; 2) the association between supply chain innovation and supply chain integration; 3) the relationship between supply chain integration and supply chain performance; 4) the mediating role of supply chain integration in the relationship between supply chain innovation and supply chain performance; 5) the mediating moderated role of supply chain integration and institutional pressures in the relationship between supply chain innovation and supply chain performance.

This section of the chapter equally presents on correlation results aimed as showcasing the extent to which each of the key variables of interest inter-correlate. Prior to testing the study's hypotheses, reliability and validity assessment of items and constructs were conducted to ascertain the degree of internal consistency of set of items that tap into supply chain innovation, supply chain integration, supply chain performance and institutional pressure.

4.4.1 Reliability and Validity

Before testing the study’s hypothesized paths, it was prudent to assess the reliability and validity of constructs and items tapping into each construct. As such, both reliability and validity tests were conducted to ensure validity and reliability concerns does not affect the findings of the study. To assess reliability, Cronbach Alpha was used. This help assessed the internal consistency of items tapping into supply chain innovation, supply chain integration, institutional pressure, and supply chain performance. From table 4.11 – 4.14, it is evident that all items tapping into their respective latent variables demonstrated high level of internal consistency as all constructs had Alpha values above .70 (Hair et al. 2014).

Furthermore, the validity of construct was assessed using exploratory factor analysis. First of all, exploratory factor analysis was conducted to identity the extent to which items for each construct converge on their latent variable. Results as captured in the respective table showcases that, all items demonstrated high factor loadings of .50 (Hair et al. 2014), showcasing some level of convergent validity and discriminant validity.

The recomputed Cronbach’s Alpha is above .70, (Hair et al., 2014). These test results depict that, not only is unidimensionality attained, but also scale reliability as well as convergent and discriminant validity. From Table 4.12 to 4.15 display exploratory factor analysis and Cronbach’s Alpha.

Table 4.12: EFA on Supply Chain Innovation

Item Code	Exploratory Factor Analysis		Reliability Analysis			
	Components and loadings	Evs	%V	C/ α	CC	C/ α if deleted
Supply chain innovation (INN)						
INN1	.693	5.577	55.77	.910	.610	.905
INN2	.768				.693	.900
INN3	.772				.705	.899
INN4	.740				.665	.901
INN5	.849				.801	.893
INN6	.854				.807	.893
INN7	.733				.660	.902
INN8	.684				.613	.904
INN9	.610				.532	.910
INN10	.733				.661	.902

Note: Evs = Eigenvalues; %V = Percentage of variance explained; C/ α = Cronbach’s Alpha;

CC = Items total correlations; α if deleted = Cronbach's Alpha value if item deleted **Source:** Field Survey, 2023.

Table 4.13: EFA for Supply Chain Integration

Exploratory Factor Analysis					Reliability Analysis					
Components and loadings					Evs	%V	C/ α	Item Code	CC	C/ α if deleted
Internal Integration (II)										
II1	.297	.413	.383	.524	1.108	6.158	.843		.623	.819
II2	.198	.023	.157	.756				.562	.837	
II3	-.050	.389	.075	.791				.691	.801	
II4	.377	.048	.218	.721				.663	.808	
II5	.421	.429	.066	.604				.734	.790	
Supplier Integration (SI)										
SI1	.522	.203	.440	.388	8.582	47.676	.799		.599	.756
SI2	.834	.075	.022	.278				.595	.759	
SI3	.782	.412	.147	.186				.753	.702	
SI4	.635	.118	.360	.233				.554	.769	
SI5	.802	.050	.306	.113				.447	.811	
Customer Integration (CI)										
CI1	.320	.248	.690	.121	1.316	7.312	.840		.550	.832
CI2	.643	.132	.531	.047				.587	.823	
CI3	.078	.201	.795	.295				.699	.791	
CI4	.040	.308	.813	.024				.633	.811	
CI5	.250	.586	.598	.011				.763	.772	
External Integration Orientation (EIO)										
EIO1	.518	.526	.246	.180	1.686	9.369	.824		.687	.751
EIO2	.347	.693	.239	.181				.733	.702	
EIO3	.300	.654	.091	.323				.625	.809	

Note: Evs = Eigenvalues; %V = Percentage of variance explained; C/ α = Cronbach's Alpha; CC = Items total correlations; α if deleted = Cronbach's Alpha value if item deleted **Source:** Field Survey, 2023.

Table 4.14: EFA for Institutional Pressure

Exploratory Factor Analysis				Reliability Analysis				
Components and loadings				Evs	%V	C/ α	CC	C/ α if deleted
Item Code								
Institutional Pressure (IP)								
IP1	.638			6.183	41.218	.883	.573	.875
IP2	.771						.688	.870
IP3	.585						.525	.877
IP4	.692						.595	.874
IP5	.676						.590	.875
IP6	.646						.523	.892
IP7	.559						.552	.880
IP8	.813						.735	.868
IP9	.623						.511	.882
IP10	.685						.523	.882
IP11	.703						.626	.874
IP12	.744						.673	.871
IP13	.727						.678	.871
IP14	.690						.560	.875
IP15	.635						.598	.874

Note: Evs = Eigenvalues; %V = Percentage of variance explained; C/ α = Cronbach's Alpha; CC = Items total correlations; α if deleted = Cronbach's Alpha value if item deleted; **Source:** Field Survey, 2023.

Table 4.15: EFA for Supply Chain Performance

Exploratory Factor Analysis				Reliability Analysis				
Components and loadings				Evs	%V	C/ α	CC	C/ α if deleted
Item Code								
Operational Performance (OP)								
OP1	.232	.795	.314	1.635	10.221	.865	.817	.813
OP2	.067	.718	.354				.646	.847
OP3	.128	.881	.179				.682	.839
OP4	.241	.739	-.070				.492	.868
OP5	.489	.626	.282				.677	.839
OP6	.263	.667	.418				.664	.841

Financial Performance (FP)								
FP1	.646	-.048	.223	8.465	52.908	.743	.587	.833
FP2	.792	.284	.273				.780	.554
FP3	.548	.417	.429				.608	.645
FP4	.856	.210	-.088				.553	.673
Sustainability Performance (SP)								
SP1	.371	.134	.734	1.107	6.922	.840	.750	.875
SP2	.261	.280	.815				.775	.868
SP3	.306	.214	.748				.689	.883
SP4	.484	.259	.638				.773	.868
SP5	.311	.520	.614				.753	.876
SP6	.305	.405	.582				.639	.888

Note: Evs = Eigenvalues; %V = Percentage of variance explained; C/ α = Cronbach's Alpha; CC = Items total correlations; α if deleted = Cronbach's Alpha value if item deleted **Source: Field Survey, 2023.**

4.4.2 Common Method Bias (CMB) Analysis

Since single respondents is a prime source of common method bias particularly when same informant responds to items on all variables for a given study and not actual data (Podsakoff et al., 2003), investigating common method bias was deemed salient for this quantitative study. The study leveraged varied procedures to ensure common method bias concerns are ruled out in this study. As such, both procedural and statistical remedies were leveraged to ensure that common method bias was minimal if not non-existent.

Procedurally, a cover letter that explained the relevance of the study to industry practitioners precisely regarding managerial decision making and policy making served as the front page for the distributed questionnaires. Contained in the cover letter was a clear-cut message that guaranteed informants of anonymity and offered clear instructions or guide. Furthermore, the survey questionnaire distanced the study's variables of interest – predictor, moderators, controls and outcome by incorporating four other variables which were not of interest to the current survey. This helped reduce the tendency of informants being able to figure out the testable hypotheses of the study. Pertaining statistical remedies, Harman's single- factor test with an exploratory analysis using principal component extraction method with varimax rotation was leveraged using SPSS version 23. With all variables of interest captured, the EFA generated five components or factors, with first factor accounting for 41.298% of the variance. Since no

single variable or factor accounted for majority of variance (over 50%) in the model, common method bias is not a problem in this study. This clearly communicates that, there is no common method bias issues as far as this study's data is concerned.

4.4.3 Inter-Construct Correlation and Descriptive Analysis

To ascertain the extent to which key constructs of the study in supply chain innovation, supply chain integration (internal integration, supplier integration, customer integration and external integration orientation), institutional pressure and supply chain performance (operational, financial and sustainability performance) inter-correlate, correlation analysis was conducted. As captured in table 4.12, it is evident that a chunk of the construct correlate with each other.

Table 4.16: Descriptive Statistics and Correlation Results

Variable	1	2	3	4	5	6	Mean	SD
1.Firm age	1						1.1528	.25704
2. Firm Size	.130*	1					.6006	.13608
3. INN	.050	-.041	1				5.3965	.97401
4. SCI	.024	-.018	.812**	1			5.2567	.86371
5. IP	.077	-.033	.792**	.731**	1		5.2088	.91366
6. SCP	.059	-.047	.796**	.735**	.855**	1	5.2549	.95988

Note: Sd = standard deviations, INN = supply chain innovation; SCI = supply chain integration; IP = institutional pressure; SCP = supply chain performance.

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

* Correlation is significant at 0.05 level (2-tailed). **Source: Field Survey, 2023.**

Drawing inferences from table 4.12, it crystal clear that, firm age (Coefficient = .130; pvalue<.05) correlates with firm size; supply chain innovation correlates significantly and positively supply chain integration (Coefficient = .812; p-value<.05), institutional pressure (Coefficient = .792; p-value<.05) and supply chain performance (Coefficient = .796; pvalue<.05). Also, supply chain innovation was found to have a positive and significant correlation with institutional pressure (Coefficient = .731; p-value<.05) and supply chain performance (Coefficient = .735; p-value<.05). Finally, institutional pressure was found to have a positive and significant correlation on supply chain performance (Coefficient = .855; pvalue<.05).

4.4.4 Model Assessment Results

To test the study's hypothesized model or relationships, Hayes Process Macro version 4.2 imbedded in SPSS version 25 was leveraged. This was to enhance that; the study's set of hypotheses were examined using consistent estimates. As such, this analytical tool helped estimate; 1) the direct relationship between supply chain innovativeness and supply chain performance; 2) the association between supply chain innovativeness and supply chain integration; 3) the relationship between supply chain integration and supply chain performance; 4) the indirect effect of supply chain innovation on supply chain performance through supply chain integration; and 5) the indirect effect of supply chain innovation on supply chain performance through supply chain integration under the boundary condition of institutional pressure (mediated moderated relationship).

Using model 14 as recommended by Dr. Hayes, the estimate was made earlier and very comprehensible. As captured in table 4.16, it is evident that, the model fit indices demonstrated goodness of models as all models had p-values of less than .05. Furthermore, the model fit indices results showcased that, the predictor (s) explain between 65%-78% of variance in the outcome variable. According to Dr. Hayes, a relationship is deemed significant when zero does not fall between the lower limit confidence interval and the upper limit confidence interval.

Firstly, to test the study's first hypothesis, the Process software did help regress supply chain performance on supply chain innovation. The findings as portrayed in table 4.16 indicate that; supply chain innovativeness (Coeff=.2541; t-value=5.2478; p-value=.0000; LLCI= .1589; ULCI=.3493) has a positive and significant effect on supply chain performance. This said revelation is in consonance with the first hypothesis of the study. Furthermore, the results reveal that, institutional pressure (Coeff=.4322; t-value=4.7878; p-value=.0000; LLCI= .2547; ULCI=.6097) significantly predicts supply chain performance; supply chain integration (Coeff=-.0226; t-value=-.2691; p-value=.7880; LLCI=-.1874; ULCI=.1422) does not have a significant predictive power on supply chain performance.

To address the study's second hypothesis and research objective, the mediating role of supply chain integration on the association between supply chain innovativeness and supply chain performance. Drawing inferences from the process results, it was found that, supply chain integration (Coeff=-.2095; p-value=.000; LLCI= .1340; ULCI=.2842) partially mediates the association between supply chain innovativeness and supply chain performance.

Pertaining the indirect effect of supply chain innovativeness on supply chain performance through supply chain integration under the boundary conditions of institutional pressures – the stud's third hypothesis, the Process estimates did indicate that, at low, mean and high values of

the moderators, supply chain integration mediates the association between supply chain innovativeness and supply chain performance (Index of moderated mediation: Index = .0250; BootSE = .0079; BootLLCI = .0099; BootULCI = .0410). This revelation aligns with the study's final hypothesis as the link between supply chain innovativeness and supply chain performance was mediated and moderated by supply chain integration and institutional pressure respectively. These results are captured in table 4.17.

Table 4.17: Regression Analysis (Hayes Process)

Run MATRIX procedure:						
***** PROCESS Procedure for SPSS Version 4.2 beta *****						
Written by Andrew F. Hayes, Ph.D. www.afhayes.com						
Documentation available in Hayes (2022). www.guilford.com/p/hayes3						

*						
Model : 7						
Y : SCP						
X : INNO						
M : SCI						
W : IP						
Sample						
Size: 372						
OUTCOME VARIABLE:						
SCI						
Model Summary						
R	R-sq	MSE	F	df1	df2	p
.8123	.6598	.2545	717.4456	1.0000	370.0000	.0000
Model						
	coeff	se	t	p	LLCI	ULCI
constant	1.3698	.1475	9.2895	.0000	1.0798	1.6597
INNO	.7203	.0269	26.7852	.0000	.6674	.7731

OUTCOME VARIABLE:						
SCP						
Model Summary						
R	R-sq	MSE	F	df1	df2	p
.8806	.7755	.2091	316.9305	4.0000	367.0000	.0000

Model						
	coeff	se	t	p	LLCI	ULCI
constant	.7813	.3375	2.3150	.0212	.1176	1.4450
INNO	.2541	.0484	5.2478	.0000	.1589	.3493
SCI	-.0226	.0838	-.2691	.7880	-.1874	.1422
IP	.4322	.0903	4.7878	.0000	.2547	.6097
Int_1	.0347	.0159	2.1836	.0296	.0034	.0659
Product terms key:						

Int_1	:	SCI	x	IP
-------	---	-----	---	----

Test(s) of highest order unconditional interaction(s):					
	R2-chng	F	df1	df2	p
M*W	.0029	4.7680	1.0000	367.0000	.0296

Focal predict:	SCI (M)
Mod var:	IP (W)

Conditional effects of the focal predictor at values of the moderator(s):

IP	Effect	se	t	p	LLCI	ULCI
4.3813	.1294	.0486	2.6618	.0081	.0338	.2251
5.4667	.1671	.0520	3.2107	.0014	.0648	.2694
5.9333	.1833	.0551	3.3248	.0010	.0749	.2917

***** DIRECT AND INDIRECT EFFECTS OF X ON Y *****

Direct effect of X on Y						
	Effect	se	t	p	LLCI	ULCI
	.2541	.0484	5.2478	.0000	.1589	.3493

Conditional indirect effects of X on Y:

INDIRECT EFFECT:						
INNO	->	SCI	->	SCP		

IP	Effect	BootSE	BootLLCI	BootULCI
4.3813	.0932	.0336	.0268	.1592
5.4667	.1204	.0326	.0557	.1835
5.9333	.1320	.0329	.0672	.1946

Index of moderated mediation:

	Index	BootSE	BootLLCI	BootULCI
IP	.0250	.0079	.0099	.0410

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:

5000
W values in conditional tables are the 16 th , 50 th , and 84 th percentiles.
OUTCOME VARIABLE:
SCI
Model Summary
R R-sq MSE F df1 df2 p
.8123 .6598 .2545 717.4456 1.0000 370.0000 .0000
Model
coeff se t p LLCI ULCI
constant 1.3698 .1475 9.2895 .0000 1.0798 1.6597
INNO .7203 .0269 26.7852 .0000 .6674 .7731
OUTCOME VARIABLE:
SCP
Model Summary
R R-sq MSE F df1 df2 p
.8806 .7755 .2091 316.9305 4.0000 367.0000 .0000
Model
coeff se t p LLCI ULCI
constant .7813 .3375 2.3150 .0212 .1176 1.4450
INNO .2541 .0484 5.2478 .0000 .1589 .3493
SCI -.0226 .0838 -.2691 .7880 -.1874 .1422
IP .4322 .0903 4.7878 .0000 .2547 .6097
Int_1 .0347 .0159 2.1836 .0296 .0034 .0659
Product terms key:
Int_1 : SCI x IP
Test(s) of highest order unconditional interaction(s):
R2-chng F df1 df2 p
M*W .0029 4.7680 1.0000 367.0000 .0296

Focal predict: SCI (M)
Mod var: IP (W)
Conditional effects of the focal predictor at values of the moderator(s):
IP Effect se t p LLCI ULCI
4.3813 .1294 .0486 2.6618 .0081 .0338 .2251
5.4667 .1671 .0520 3.2107 .0014 .0648 .2694
5.9333 .1833 .0551 3.3248 .0010 .0749 .2917

Source: Field Survey, 2023.

Table 4.18: Hypotheses Table

Hypothesis	Paths	Path (B)	T-stats	P-V	Conclusion
H1	INNO -----⑦>> >>>>>SCP	.2541 5.2478			Fully Supported
H2	INNO -⑦>> SCI --⑦>>SCP	.2095	-	.000	Fully supported
H3	INNO -⑦>> SCI --⑦>>SCP moderated by IP	.0250	-	.000	Fully Supported

Note: INNO =Supply chain innovativeness; SCI=supply chain integration; SP=supply chain performance.

Source: Field Survey, 2023.

This study assessed the mediated moderated effect of supply chain integration and institutional pressure in the relationship between supply chain innovativeness and supply chain performance.

To address the study’s research question of whether supply chain integration mediates the link between supply chain innovativeness and supply chain performance under the boundary condition of institutional pressure, three key hypotheses were theorized, with each addressing each research objective. Consistent with prior studies, cross-sectional survey was leveraged to solicit data from construction firms in Ghana to test the said hypotheses. Solicited data was subjected to varied quantitative analytical tools so as to craft meaning out of the data. Leveraging SPSS and Mplus, results from, Hayes Process are displayed in table 4.17. Results did reject the null hypothesis for all three hypotheses as series of analytical model results reveal that: 1) supply chain innovativeness predicts supply chain performance among construction firms in Ghana; 2) supply chain integration has a positive relationship and mediates the relationship between supply chain innovativeness and supply chain performance among construction firms in Ghana; 3) Institutional pressures moderates the relationship between SC integration and SC performance among construction firms in Ghana.

4.5 Discussion of Results

This component of the study discusses pertinent findings consistent with the research questions and objectives. Supply chain management is an important aspect of the construction sector’s development and growth as such this study offers immense contribution to the supply chain literature, industry practitioners and policy makers by investigating the potential role of innovativeness in determining SC integration and improving the SC performance of construction firms emphasizing the contingent role of IP in emerging markets. To address the said research questions, three pertinent hypotheses consistent with the study’s objectives,

notably; 1) H1 – SC Innovativeness is positively associated with SC performance of construction firms; 2) H2 – SC integration has a positive relationship and mediates the relationship between supply chain innovativeness and supply chain performance among construction firms in Ghana and 3) H3 – Institutional Pressures (IP) moderates the relationship between SC Integration and SC performance of construction firms were tested using cross-sectional survey data from top managers in 100 construction firms. Drawing insights from the findings, results are discussed together with the theoretical contribution as well as practical and policy implications.

4.5.1 SC Innovativeness and SCP

The results from the analysis indicate a significant positive path ($B = 0.2541$, $t\text{-stats} = 5.2478$, $p < 0.001$) between Supply Chain (SC) Innovativeness and Supply Chain Performance (SCP), providing strong support for Hypothesis 1.

Supply chain innovativeness offers a multitude of advantages such as cost reduction, lead-time reduction, and the generation of new operational strategies (Stundza, 2009, as cited in Mandal, 2015). This underscores the need for innovative and effective management approaches to coordinate supply chains in order to achieve superior performance. Particularly in emerging markets like Ghana, construction firms and practitioners benefit from highly optimized integrations with supply chain partners.

The integration of innovativeness within the supply chain can bring about significant benefits to construction firms, including increased operational efficiency, cost reduction, and improved product quality. However, supply chain performance is a complex concept, encompassing strategic, financial, operational, and tactical dimensions (Kalyar et al., 2019). Setting and measuring supply chain goals amid this complexity is challenging (Panayides and Lun, 2009; Seo et al., 2014). To address this, Kalyar et al. (2019) proposed a novel supply chain performance metrics focused on efficiency and effectiveness at the supply chain level. Additionally, sustainability emerges as an integral aspect of measuring supply chain performance, given its influence on long-term competitiveness and survival. Incorporating sustainability metrics recognizes the environmental impact of manufacturing, transportation, and sourcing, particularly in a globalized context (Geng et al., 2017).

The organizations' sustainability role within the supply chain has been driven by both internal policies and external regulations, prompting organizations to prioritize economic, environmental, and social initiatives (Walker and Jones, 2012, as cited in Katiyar et al.,

2018). This shift adds a new dimension to academic research on supply chain performance. With the increased complexity of supply chain distribution networks, there is a heightened need to address sustainability concerns throughout the entire supply chain. This aligns with the growing awareness of environmental impacts and the various pressures placed on manufacturers and their supply chain partners (Geng et al., 2017).

The present study contributes by establishing a significant positive relationship between SC Innovativeness and SC Performance, illustrating that innovative approaches can lead to enhanced supply chain performance in the construction industry. The consideration of sustainability as a performance metric adds depth to supply chain research, encompassing economic, environmental, and social dimensions.

In conclusion, the study's findings provide substantial evidence for the role of innovation in shaping supply chain performance within the context of construction firms in Ghana. The implications of these findings extend beyond efficiency gains, touching upon sustainability and the multifaceted nature of supply chain performance measurement.

4.5.2 SC Integration and its Relationships

Hypothesis 2 is fully supported by the analysis, with a significant positive path ($B = 0.2095$, $t_{stats} = -, p < 0.001$) between Supply Chain (SC) Innovativeness (INNO), Supply Chain Integration (SCI), and Supply Chain Performance (SCP).

The findings underscore the crucial role of SC integration in construction firms in Ghana. SC integration is demonstrated to possess a positive association with both SC innovativeness and SC performance, thereby validating Hypothesis 2. This aligns with the research of numerous academics who have highlighted the significance of SC integration in driving long-term competitive advantages (M. Beheshti, H. et al., 2014; Ataseven and Nair, 2017; Kalyar et al., 2019; Lu et al., 2017).

The impact of internal Integration, supplier Integration, and customer Integration on financial performance is notable (Ataseven and Nair, 2017). Total SC integration leads to superior financial performance, positioning companies ahead of their competitors (M. Beheshti, H. et al., 2014). Firms that successfully operate as a unified entity, integrating both internally and externally, experience enhanced SC performance (Kannan and Handfield, 1998; Ataseven and Nair, 2017).

Conversely, inadequate SC integration leads to detrimental outcomes, including elevated inventory costs, procurement delays, subpar product quality, and disrupted demand forecasts (Seo et al., 2014; Owoo and Lambon-Quayefio, 2020; Park, 1989; World Bank, 1984). The significance of integration is highlighted by Alfalla-Luque et al. (2015) who emphasize that enhanced integration orientation positively correlates with a firm's performance. Strategic collaboration rather than adversarial relationships bolster operational performance, reinforcing the positive influence of SC integration and Effective Integration'Orientation (EIO) on SCP.

Panayides and Lun (2009) emphasize that innovativeness drives interactions with suppliers and customers and motivates investments in novel systems and processes. This perspective suggests that innovation fosters strategic partnerships, ultimately enhancing firms' capabilities and performance. The interplay between innovativeness and SC integration is reinforced by the proposition that innovation directly and indirectly boosts SC performance through the mediating mechanisms of internal, supplier, customer integration, and EIO. In essence, innovation not only directly enhances SC performance but also facilitates greater integration and improved sustainability, effectiveness, and efficiency of SCs.

To conclude, the findings of this analysis illuminate the intricate dynamics between SC Innovativeness, SC Integration, and SC Performance in the context of construction firms in Ghana. The empirical validation of Hypothesis 2 underscores the significance of fostering integration and innovation as interdependent drivers of enhanced supply chain performance.

4.5.3 Institutional Pressures and Moderation

The findings of this study provide substantial evidence supporting Hypothesis 3, which suggests that Institutional Pressures (IP) moderate the relationship between Supply Chain Integration (SCI) and Supply Chain Performance (SCP) in construction firms in Ghana. The significant moderated path ($B = 0.0250$, $t\text{-stats} = -$, $p < 0.000$) indicates that institutional pressures play a crucial role in shaping the influence of SC integration on SC performance.

Institutional theory offers a lens through which to understand how organizational behavior is influenced by external and internal pressures (Oliver, 1991; Suchman, 1995). These pressures, stemming from the organizational environment, shape the principles and norms that organizations follow. The study highlights that organizations are subject to a range of institutional pressures, originating from both external circumstances and internal organizational dynamics. These pressures compel firms to embrace integration with suppliers, customers, and internally, often to ensure survival in competitive markets.

The study incorporates Insights from scholars like Zeng, H. et al. (2017), who assert the positive impact of institutional pressures on supply chain relationship management and longterm supply chain design. This substantiates the notion that institutional pressures catalyze integrative behaviors within the supply chain domain.

Furthermore, the institutional environment significantly influences individual organizations' integration processes. External coercive pressures, arising from competitors, trading partners, customers, and governmental entities, drive firms to adopt integrative practices. Mimetic pressures come into play as firms emulate successful supply chain integration practices demonstrated by their peers. Normative pressures further shape behavior, as organizations conform to normalized best practices amid rapidly changing environments.

Stakeholder theory (Katiyar et al., 2018; Mitchell et al., 1997; Sarkis et al., 2009) provides additional insights into organizations' motivations beyond shareholder returns. This theory encompasses a spectrum of entities affected by or affecting an organization, including shareholders, employees, customers, and society at large. Silvestre's work (2015) underscores the critical nature of addressing external stakeholders' concerns to avoid risks to the supply chain and the organization's very existence. In this context, supply chains must align their functions with stakeholder needs to achieve enhanced sustainability performance, resulting in improved SCP.

The study posits that effective implementation of SC integration strategies hinges on navigating a complex interplay of external environmental factors, stakeholders, and diverse pressures. The moderating influence of Institutional Pressures (IP) in the relationship between SC integration and External Integration Orientation (EIO) on SC efficiency, effectiveness, and sustainability performance highlights the intricate dynamics at play. This study deepens our understanding of the nuanced mechanisms through which institutional factors shape SC integration practices, ultimately impacting performance outcomes.

In conclusion, the study accentuates the critical role of Institutional Pressures in shaping the relationship between SC Integration and SC Performance. This contribution broadens our understanding of the interplay between organizational pressures, integration practices, and the broader context within which construction firms in Ghana operate.

KNUST

CHAPTER 5

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section summarizes the study's findings, the author's concluding remarks, and recommendations for firms, industries, policy makers, and the research world.

5.2 Summary of findings

This segment encapsulates the outcomes of the study, derived from the analyses performed.

5.2.1 SC Innovativeness and SCP

In examining the first hypothesis and 1st objective, the utilization of Process software was found to contribute to the enhancement of supply chain performance through supply chain innovation. The results demonstrate that supply chain innovativeness (Coefficient = 0.2541; t-value = 5.2478; p-value = 0.0000; LLCI = 0.1589; ULCI = 0.3493) exerts a positive and significant impact on supply chain performance, aligning with the initial hypothesis. Additionally, the study uncovers that institutional pressure (Coefficient = 0.4322; t-value = 4.7878; p-value = 0.0000; LLCI = 0.2547; ULCI = 0.6097) significantly predicts supply chain performance, while supply chain integration (Coefficient = -0.0226; t-value = -0.2691; p-value = 0.7880; LLCI = -0.1874; ULCI = 0.1422) does not exhibit significant predictive power over supply chain performance. Therefore, in alignment with objective 1, this investigation confirms that supply chain innovativeness serves as a predictor of supply chain performance within the construction sector of Ghana.

These findings underscore the importance of innovative and effective management strategies for orchestrating supply chains to achieve superior performance. In the context of emerging

markets like Ghana, construction firms and industry practitioners stand to benefit from optimized integration with supply chain partners. The incorporation of innovation into the supply chain framework can yield substantial advantages, including heightened operational efficiency, cost reduction, and improved product quality.

In addition to Kalyar et al.'s (2019) proposal of novel supply chain performance metrics emphasizing efficiency and effectiveness at the supply chain level, this study emphasizes the integral role of sustainability in gauging supply chain performance due to its influence on longterm competitiveness and survival. Incorporating sustainability metrics acknowledges the environmental impact of manufacturing, transportation, and sourcing, particularly within a globalized context (Geng et al., 2017). This study contributes by establishing a significant positive correlation between supply chain innovativeness and supply chain performance, highlighting the potential for innovative approaches to enhance supply chain performance in the construction industry. The consideration of sustainability as a performance metric enriches supply chain research by encompassing economic, environmental, and social dimensions.

These findings offer valuable insights to both the supply chain literature and industry practitioners, informing the adoption of innovative practices for improved supply chain performance. Policymakers can also benefit by crafting strategies that encourage sustainable and innovative supply chain management, particularly in the context of emerging economies like Ghana.

5.2.2 SC Integration and its Relationships

To investigate the study's second hypothesis and research objective 2, we examined the mediating effect of supply chain integration on the link between supply chain innovativeness and supply chain performance. Our analysis reveals that supply chain integration (Coefficient = -0.2095; p-value = 0.000; LLCI = 0.1340; ULCI = 0.2842) partially mediates the connection between supply chain innovativeness and supply chain performance. Consequently, supply chain integration establishes a positive relationship and acts as a mediator between supply chain innovativeness and supply chain performance within the construction sector of Ghana.

These findings accentuate the pivotal role of supply chain integration in Ghanaian construction firms. Our results showcase a positive correlation between supply chain integration, supply chain innovativeness, and supply chain performance, thereby confirming the validity of Hypothesis 2. These results align with the research of esteemed scholars who have underscored

the significance of supply chain integration in fostering enduring competitive advantages (M. Beheshti, H. et al., 2014; Ataseven and Nair, 2017; Kalyar et al., 2019; Lu et al., 2017).

The intricate interplay between innovativeness and supply chain integration gains further credence from the proposition that innovation wields a direct and indirect influence on supply chain performance via mediating mechanisms encompassing internal, supplier, and customer integration, along with environmental impact optimization. In essence, innovation not only directly enhances supply chain performance but also nurtures heightened integration, fostering improved sustainability, effectiveness, and efficiency within supply chains. In conclusion, our analysis illuminates the nuanced dynamics among supply chain innovativeness, supply chain integration, and supply chain performance within the realm of Ghanaian construction firms.

The empirical validation of Hypothesis 2 underscores the importance of cultivating Integration and innovation as mutually reinforcing catalysts for elevating supply chain performance.

These insights offer valuable contributions to supply chain literature, equipping industry practitioners with actionable knowledge to enhance their supply chain management practices. Policymakers can also benefit from these findings by formulating strategies that promote both integration and innovation, fostering a more robust and competitive construction sector in Ghana.

5.2.3 Institutional Pressures and Moderation

Regarding the indirect impact of supply chain innovativeness on supply chain performance through the lens of supply chain integration under the contextual influence of institutional pressures – corresponding to the study’s third hypothesis and fifth objective – the Process estimates signify that, across low, mean, and high levels of the moderators, supply chain integration mediates the connection between supply chain innovativeness and supply chain performance (Index of moderated mediation: Index = 0.0250; BootSE = 0.0079; BootLLCI = 0.0099; BootULCI = 0.0410). This discovery aligns seamlessly with the ultimate hypothesis, where the correlation between supply chain innovativeness and supply chain performance was both mediated and moderated by supply chain integration and institutional pressure, respectively. Consequently, institutional pressures wield a moderating influence over the association between supply chain integration and supply chain performance within Ghana’s construction sector. This underscores the pivotal role of institutional pressures in shaping the interrelation between supply chain integration and supply chain performance.

The study underscores that organizations confront diverse Institutional pressures emanating from both external environmental factors and internal organizational dynamics. These pressures impel firms to embrace integration across suppliers, customers, and internal functions, often as a means of ensuring competitiveness and survival. This underscores the notion that institutional pressures serve as catalysts propelling integrative behaviors within the domain of supply chain. Coercive external pressures arising from competitors, trading partners, customers, and governmental bodies compel firms to adopt integrative approaches. Mimetic pressures also exert their influence as firms emulate successful supply chain integration practices demonstrated by their peers. Normative pressures further shape behavior, as organizations conform to established best practices amidst rapidly evolving landscapes. The study suggests that the successful implementation of supply chain integration strategies hinges on adeptly navigating the intricate interplay of external environmental forces, stakeholder dynamics, and multifaceted pressures.

The outcomes augment the tenets of Institutional Theory and Stakeholder Theory. In summation, the study highlights the pivotal role of Institutional Pressures in shaping the interrelationship between Supply Chain Integration and Supply Chain Performance. This contribution enriches our comprehension of the intricate interplay between organizational pressures, integration practices, and the overarching context in which Ghanaian construction firms operate.

These findings offer substantial contributions to the discourse in supply chain literature, providing industry practitioners with valuable insights for effective decision-making. Policy makers, too, can benefit by crafting strategies that acknowledge the mediating role of institutional pressures in fostering successful supply chain integration practices and enhancing overall supply chain performance in the construction sector of Ghana.

5.3 Conclusion

In culmination, the study employed Hayes Process Macro version 4.2 integrated within SPSS version 25, ensuring consistent and robust estimation of the hypothesized relationships. This analytical tool facilitated the comprehensive assessment of the study's hypotheses, encompassing various dimensions of supply chain innovativeness, integration, and performance. The utilization of this methodology enhanced the accuracy and reliability of our findings, paving the way for meaningful insights.

Firstly, our analysis affirmed that supply chain innovativeness significantly enhances supply chain performance, validating our initial hypothesis. Moreover, institutional pressure emerged as a robust predictor of supply chain performance, while supply chain integration showed limited predictive influence. This underscores the pivotal role of innovation and institutional pressure in shaping supply chain effectiveness within Ghana's construction sector.

Furthermore, our exploration of the mediating role of supply chain integration revealed its positive impact on the relationship between supply chain innovativeness and supply chain performance. This not only corroborates the significance of integration in elevating performance but also underscores its intermediary role in enhancing the link between innovativeness and performance. This insight holds vital implications for optimizing supply chain strategies among construction firms in Ghana.

Lastly, within the contextual realm of institutional pressures, we found that these pressures moderate the association between supply chain integration and supply chain performance. The intricate interplay of external and internal pressures shapes integration practices, reaffirming the nuanced dynamics between organizational behavior and external influences.

This research enriches supply chain literature by contributing empirical evidence to the interplay of innovation, integration, and institutional pressures in the construction industry. For industry practitioners, these findings offer actionable insights into enhancing supply chain performance through innovation and integration strategies. Policymakers can leverage these insights to formulate strategies that promote adaptive integration practices and foster innovation within Ghana's construction sector.

To conclude, this study advances our understanding of the multifaceted interactions within supply chain dynamics, highlighting the pivotal roles played by innovation, integration, and institutional pressures. The implications span academia, industry, and policy circles, collectively contributing to the optimization of supply chain management practices in the construction domain of Ghana.

5.4 Recommendations

Based on the comprehensive findings, several meaningful recommendations can be made to guide various stakeholders in the construction industry, academia, and policymaking. These recommendations are grounded in the insights gained from the research study.

5.4.1 Enhancing Supply Chain Innovativeness

Construction firms in Ghana should prioritize fostering a culture of innovation within their supply chain operations. This can involve investing in research and development efforts to identify novel ways to improve processes, products, and services. Encouraging crossfunctional collaboration and knowledge-sharing can stimulate innovative ideas that contribute to supply chain performance.

5.4.2 Prioritizing Sustainable Practices and Long-Term Perspective:

Given the positive relationship between supply chain innovativeness and supply chain performance, construction firms should explore sustainable practices that enhance both environmental and economic aspects of their operations. Integrating sustainability metrics into performance evaluations can provide a more holistic view of the impact of supply chain activities on long-term competitiveness. The research also demonstrates the significance of considering long-term competitiveness and survival through sustainability metrics.

Construction firms should adopt a holistic perspective that balances short-term gains with longterm environmental and economic impacts.

5.4.3 Strategic Supply Chain Integration:

The study underscores the importance of supply chain integration in driving supply chain performance. Construction firms should develop strategies to optimize integration with suppliers, customers, and internal functions. Embracing technology and digital tools can facilitate smoother information flow and collaboration, leading to improved operational efficiency and responsiveness.

5.4.4 Navigating Institutional Pressures:

Construction firms should acknowledge and navigate the various institutional pressures that shape their operational decisions. External coercive, mimetic, and normative pressures can influence the adoption of supply chain integration practices. To successfully respond to these pressures, firms should adopt adaptive strategies that align with industry best practices while considering their specific organizational context.

5.4.5 Policy Implications:

Policymakers in Ghana should consider the mediating role of institutional pressures and the moderating influence they exert on supply chain integration. Crafting policies that encourage collaboration and innovation within the construction sector can enhance its competitiveness. Initiatives aimed at fostering sustainable practices, such as green construction standards and

incentives for adopting innovative technologies, can contribute to the industry's overall growth and development.

5.5 Recommendations for Future Studies

While this study contributes significant insights to the field of supply chain management (SCM) and offers valuable implications for practitioners, it is essential to acknowledge its limitations. Notably, the study's sample size is limited, employing purposive sampling for data collection from focal firms. Additionally, the study's assessment of integration perceptions relies solely on focal firms, omitting partner perspectives (suppliers and customers). To address these limitations, future researchers are encouraged to employ longitudinal research designs and involve SC partner firms to form dyads or triads, thus providing a more comprehensive and realistic view of SC integration dynamics.

Furthermore, the study's contingent factor solely examines institutional pressure's impact on the SC integration-performance relationship. Future studies should consider incorporating additional moderating variables such as relationship quality (Chang et al., 2016), competitive strategy (Huo et al., 2014), and information system capability (Tarafdar and Qrunfleh, 2017) to deepen our understanding of these intricate dynamics.

Continuous collaboration among academics, researchers, and industry practitioners is paramount for advancing the body of supply chain knowledge. Facilitating the exchange of best practices, case studies, and research findings can expedite the adoption of effective strategies. Building upon the study's contributions to the supply chain literature, future research endeavors can further explore uncharted dimensions of this complex interplay. This collaborative effort will not only enhance the practical relevance of SCM but also pave the way for informed decision-making in the realm of supply chain management.

KNUST

REFERENCES

- Abutabenjeh, S. and Jaradat, R. (2018) “Clarification of research design, Research Methods, and research methodology,” *Teaching Public Administration*, 36(3), pp. 237–258. Available at: <https://doi.org/10.1177/0144739418775787>.
- Akgün, A.E. et al. (2007) “Emotional and learning capability and their impact on product innovativeness and firm performance,” *Technovation*, 27(9), pp. 501–513. Available at: <https://doi.org/10.1016/j.technovation.2007.03.001>.
- Alfalla-Luque, R., Marin-Garcia, J.A. and Medina-Lopez, C. (2015) “An analysis of the direct and mediated effects of employee commitment and supply chain integration on 73rganizational performance,” *International Journal of Production Economics*, 162, pp. 242–257. Available at: <https://doi.org/10.1016/j.ijpe.2014.07.004>.
- Ambrosini, V. and Bowman, C. (2009) “What are dynamic capabilities and are they a useful construct in strategic management?,” *International Journal of Management Reviews*, 11(1), pp. 29–49. Available at: <https://doi.org/10.1111/j.1468-2370.2008.00251.x>.
- Armstrong, J.S. and Overton, T.S. (1977) ‘Estimating nonresponse bias in Mail Surveys’, *Journal of Marketing Research*, 14(3), p. 396. [Doi:10.2307/3150783](https://doi.org/10.2307/3150783).
- Asamoah, D. et al. (2019) ‘Effect of inter-organizational systems use on supply chain capabilities and performance’, *IFIP Advances in Information and Communication Technology*, pp. 293–308. doi:10.1007/978-3-030-20671-0_20.
- Asamoah, D., Andoh-Baidoo, F., and Agyei-Owusu, B. (2016) “Examining the Relationships between Supply Chain Integration, Information Sharing, and Supply Chain Performance: A Replication Study,” In *Proceedings of the 22nd Americas Conference on Information Systems*, San Diego, California, (4), pp. 2749 – 2758
- Asamoah, D., Boso, N. and Anin, E.K. (2021) ‘Moderating effect of supply chain complexity in governance mechanisms and operational performance relationship: Evidence from a sub-Saharan African market’, *Africa Journal of Management*, 7(3), pp. 400–422. [Doi:10.1080/23322373.2021.1927448](https://doi.org/10.1080/23322373.2021.1927448).
- Abutabenjeh, S. and Jaradat, R. (2018) “Clarification of research design, Research Methods, and research methodology,” *Teaching Public Administration*, 36(3), pp. 237–258. Available at: <https://doi.org/10.1177/0144739418775787>.

- Ataseven, C. and Nair, A. (2017) “Assessment of Supply Chain Integration and performance relationships: A meta-analytic investigation of the literature,” *International Journal of Production Economics*, 185, pp. 252–265. Available at: <https://doi.org/10.1016/j.ijpe.2017.01.007>.
- Babbie E (2004) *The Practice of Social Research*. Belmont, CA: Thomson/Wadsworth
- Bai, C. and Sarkis, J. (2010) “Green Supplier Development: Analytical Evaluation using rough set theory,” *Journal of Cleaner Production*, 18(12), pp. 1200–1210. Available at: <https://doi.org/10.1016/j.jclepro.2010.01.016>.
- Barney, J. (1991) “Firm Resources and sustained competitive advantage,” *Journal of Management*, 17(1), pp. 99–120. Available at: <https://doi.org/10.1177/014920639101700108>.
- Berger, P. L., Luckmann, T., 1966. *The Social Construction of Reality*. Doubleday, New York.
- Bernard, H.R. 2002. *Research Methods in Anthropology: Qualitative and quantitative methods*. 3rd edition. AltaMira Press, Walnut Creek, California.
- Bierma, T.J. and Waterstraat, F.L. (1999) “Cleaner production from chemical suppliers: Understanding Shared Savings Contracts,” *Journal of Cleaner Production*, 7(2), pp. 145–158. Available at: [https://doi.org/10.1016/s0959-6526\(98\)00073-0](https://doi.org/10.1016/s0959-6526(98)00073-0).
- Bozarth, C.C. et al. (2008) “The impact of supply chain complexity on manufacturing plant performance,” *Journal of Operations Management*, 27(1), pp. 78–93. Available at: <https://doi.org/10.1016/j.jom.2008.07.003>.
- Chen, I.J. and Paulraj, A. (2004) “Towards a theory of supply chain management: The constructs and measurements,” *Journal of Operations Management*, 22(2), pp. 119–150. Available at: <https://doi.org/10.1016/j.jom.2003.12.007>.
- Chen, Q., Özkan-Seely, G.F. and Roth, A.V. (2017) “The role of direct outsourcing in New Product Manufacturing Strategy,” *Journal of Enterprise Transformation*, 7(3-4), pp. 168–187. Available at: <https://doi.org/10.1080/19488289.2017.1409299>.
- Chin, T.A. et al. (2014) “The impact of supply chain integration on operational capability in Malaysian manufacturers,” *Procedia – Social and Behavioral Sciences*, 130, pp. 257–265. Available at: <https://doi.org/10.1016/j.sbspro.2014.04.030>.
- Clemens, B. and Douglas, T.J. (2006) “Does coercion drive firms to adopt ‘voluntary’ green initiatives? Relationships among coercion, superior firm resources, and Voluntary Green Initiatives,” *Journal of Business Research*, 59(4), pp. 483–491. Available at: <https://doi.org/10.1016/j.jbusres.2005.09.016>.
- Craighead, C.W., Hult, G.T. and Ketchen, D.J. (2009) “The effects of innovation-cost strategy, knowledge, and action in the supply chain on firm performance,” *Journal of Operations Management*, 27(5), pp. 405–421. Available at: <https://doi.org/10.1016/j.jom.2009.01.002>.
- Creswell JW (2008) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks, CA: SAGE Publications.
- Dai, J., Xie, L. and Chu, Z. (2021) “Developing Sustainable Supply Chain Management: The interplay of institutional pressures and sustainability capabilities,” *Sustainable*

- Production and Consumption, 28, pp. 254–268. Available at: <https://doi.org/10.1016/j.spc.2021.04.017>.
- Damanpour, F. (1996) “Organizational Complexity and Innovation: Developing and testing multiple contingency models,” *Management Science*, 42(5), pp. 693–716. Available at: <https://doi.org/10.1287/mnsc.42.5.693>.
- Das, S.R. and Joshi, M.P. (2012) “Process innovativeness and firm performance in technology service firms: The effect of external and internal contingencies,” *IEEE Transactions on Engineering Management*, 59(3), pp. 401–414. Available at: <https://doi.org/10.1109/tem.2011.2157163>.
- DiMaggio, P.J. and Powell, W.W. (1983) “The Iron Cage Revisited: Institutional isomorphism and collective rationality in organizational fields,” *American Sociological Review*, 48(2), p. 147. Available at: <https://doi.org/10.2307/2095101>.
- Dubey, R., Gunasekaran, A. and Samar Ali, S. (2014) “Exploring the relationship between leadership, operational practices, institutional pressures and environmental performance: A framework for green supply chain,” *International Journal of Production Economics*, 160, pp. 120–132. Available at: <https://doi.org/10.1016/j.ijpe.2014.10.001>.
- Eisenhardt, K.M. and Martin, J.A. (2000) “Dynamic capabilities: What are they?,” *Strategic Management Journal*, 21(10-11), pp. 1105–1121. Available at: [https://doi.org/10.1002/1097-0266\(200010/11\)21:10/11<1105::aidsmj133>3.0.co;2-e](https://doi.org/10.1002/1097-0266(200010/11)21:10/11<1105::aidsmj133>3.0.co;2-e).
- Fine, C.H. (1998), *Clockspeed: Winning Industry Control in the Age of Temporary Advantage*, Perseus Books Reading, New York, NY.
- Flynn, B.B., Huo, B. and Zhao, X. (2009) “The impact of Supply Chain Integration on performance: A contingency and configuration approach,” *Journal of Operations Management*, 28(1), pp. 58–71. Available at: <https://doi.org/10.1016/j.jom.2009.06.001>.
- Frohlich, M.T. and Westbrook, R. (2001) “Arcs of integration: An International Study of Supply Chain Strategies,” *Journal of Operations Management*, 19(2), pp. 185–200. Available at: [https://doi.org/10.1016/s0272-6963\(00\)00055-3](https://doi.org/10.1016/s0272-6963(00)00055-3).
- Galbraith, J. (1973), *Designing Complex Firms*, Addison-Wesley, New York, NY.
- Ganga, G.M. and Carpinetti, L.C. (2011) “A fuzzy logic approach to supply chain performance management,” *International Journal of Production Economics*, 134(1), pp. 177–187. Available at: <https://doi.org/10.1016/j.ijpe.2011.06.011>.
- Gebremlak et al. (2019) *Your guide to qualitative and quantitative data analysis methods – atlan: Humans of data*, Atlan. Available at: [https://humansofdata.atlan.com/2018/09/qualitative-quantitative-data-analysismethods/#:~:text=The%20two%20most%20commonly%20used,descriptive%20statistics%20and%20inferential%20statistics.\(Accessed:January6,2023\)](https://humansofdata.atlan.com/2018/09/qualitative-quantitative-data-analysismethods/#:~:text=The%20two%20most%20commonly%20used,descriptive%20statistics%20and%20inferential%20statistics.(Accessed:January6,2023)).
- Geng, R., Mansouri, S.A. and Aktas, E. (2017) “The relationship between Green Supply Chain Management and performance: A meta-analysis of empirical evidences in Asian

- emerging economies,” *International Journal of Production Economics*, 183, pp. 245–258. Available at: <https://doi.org/10.1016/j.ijpe.2016.10.008>.
- Geyi, D.A.G. et al. (2020) “Agile capabilities as necessary conditions for 75rganizati sustainable supply chain performance: An empirical investigation,” *International Journal of Production Economics*, 222, p. 107501. Available at: <https://doi.org/10.1016/j.ijpe.2019.09.022>.
- Gimenez, C., van der Vaart, T. and Pieter van Donk, D. (2012) “Supply Chain Integration and performance: The moderating effect of Supply Complexity,” *International Journal of Operations & Production Management*, 32(5), pp. 583–610. Available at: <https://doi.org/10.1108/01443571211226506>.
- Greening, D.W. and Gray, B. (1994) “Testing a model of organizational response to social and political issues,” *Academy of Management Journal*, 37(3), pp. 467–498. Available at: <https://doi.org/10.5465/256697>.
- Gunasekaran, A., Patel, C. and McGaughey, R.E. (2004) “A framework for Supply Chain Performance Measurement,” *International Journal of Production Economics*, 87(3), pp. 333–347. Available at: <https://doi.org/10.1016/j.ijpe.2003.08.003>.
- Gupta SC and VK Kapoor (1970): *Fundamental of mathematical statistics*, SC Publication, New Delhi, India.
- Hassini, E., Surti, C. and Searcy, C. (2012) “A literature review and a case study of sustainable supply chains with a focus on metrics,” *International Journal of Production Economics*, 140(1), pp. 69–82. Available at: <https://doi.org/10.1016/j.ijpe.2012.01.042>.
- Hayes, A.F. and Rockwood, N.J. (2019) ‘Conditional process analysis: Concepts, computation, and advances in the 76rganizat of the contingencies of Mechanisms’, *American Behavioral Scientist*, 64(1), pp. 19–54. [Doi:10.1177/0002764219859633](https://doi.org/10.1177/0002764219859633).
- Hayes, R. (2006) “Operations, strategy, and technology: Pursuing the Competitive Edge,” *Strategic Direction*, 22(9). Available at: <https://doi.org/10.1108/sd.2006.05622iae.001>.
- Heale, R. and Twycross, A. (2015) “Validity and reliability in quantitative studies,” *Evidence Based Nursing*, 18(3), pp. 66–67. Available at: <https://doi.org/10.1136/eb-2015102129>.
- Helfat, C. E.; Finkelstein, S.; Mitchell, W.; Peteraf, M. A.; Singh, H.; Teece, D. J.; Winter, S. G. 2007. *Dynamic capabilities: understanding strategic change in organizations*. London: Blackwell.
- Hong-Minh, S.M., Disney, S.M. and Naim, M.M. (2000) “The Dynamics of Emergency Transshipment Supply Chains,” *International Journal of Physical Distribution & Logistics Management*, 30(9), pp. 788–816. Available at: <https://doi.org/10.1108/09600030010351471>.
- Hsu, C.-W. and Hu, A.H. (2009) “Applying hazardous substance management to supplier selection using analytic network process,” *Journal of Cleaner Production*, 17(2), pp. 255–264. Available at: <https://doi.org/10.1016/j.jclepro.2008.05.004>.
- Huang, M.-C., Yen, G.-F. and Liu, T.-C. (2014) “Reexamining Supply Chain Integration and the supplier’s performance relationships under uncertainty,” *Supply Chain*

- Management: An International Journal, 19(1), pp. 64–78. Available at: <https://doi.org/10.1108/scm-04-2013-0114>.
- Hyland, P.W., Soosay, C. and Sloan, T.R. (2003) “Continuous improvement and learning in the supply chain,” *International Journal of Physical Distribution & Logistics Management*, 33(4), pp. 316–335. Available at: <https://doi.org/10.1108/09600030310478793>.
- ITA (2022) Ghana – construction and Infrastructure, International Trade Administration | Trade.gov. Available at: <https://www.trade.gov/country-commercial-guides/ghanaconstruction-and-infrastructure> (Accessed: December 3, 2022).
- Kahn, K.B. and Mentzer, J.T. (1996) “Logistics and interdepartmental integration,” *International Journal of Physical Distribution & Logistics Management*, 26(8), pp. 6–14. Available at: <https://doi.org/10.1108/09600039610182753>.
- Kalyar, M.N., Shafique, I. and Ahmad, B. (2019) “Effect of innovativeness on Supply Chain Integration and performance,” *International Journal of Emerging Markets*, 15(2), pp. 362–386. Available at: <https://doi.org/10.1108/ijoem-09-2018-0486>.
- Kanji, G.K. and Wong, A. (1999) “Business excellence model for supply chain management,” *Total Quality Management*, 10(8), pp. 1147–1168. Available at: <https://doi.org/10.1080/0954412997127>.
- Kannan, V.R. and Handfield, R.B. (1998), “Supply chain management: supplier performance and firm performance”, *International Journal of Purchasing and Materials Management*, Vol. 34 No. 3, pp. 2-9.
- Katiyar, R. et al. (2018) “Impact of sustainability and manufacturing practices on supply chain performance: Findings from an emerging economy,” *International Journal of Production Economics*, 197, pp. 303–316. Available at: <https://doi.org/10.1016/j.ijpe.2017.12.007>.
- Kauppi, K. (2013) “Extending the use of institutional theory in operations and Supply Chain Management Research,” *International Journal of Operations & Production Management*, 33(10), pp. 1318–1345. Available at: <https://doi.org/10.1108/ijopm-102011-0364>.
- Kennedy, M.T. and Fiss, P.C. (2009) “Institutionalization, framing, and diffusion: The logic of TQM adoption and implementation decisions among U.S. hospitals,” *Academy of Management Journal*, 52(5), pp. 897–918. Available at: <https://doi.org/10.5465/amj.2009.44633062>.
- Kenyon, G.N., Meixell, M.J. and Westfall, P.H. (2016) “Production Outsourcing and Operational Performance: An empirical study using secondary data,” *International Journal of Production Economics*, 171, pp. 336–349. Available at: <https://doi.org/10.1016/j.ijpe.2015.09.017>.
- Ketokivi, M.A. and Schroeder, R.G. (2004) “Strategic, structural contingency and institutional explanations in the adoption of innovative manufacturing practices,” *Journal of Operations Management*, 22(1), pp. 63–89. Available at: <https://doi.org/10.1016/j.jom.2003.12.002>.

- Khazanchi, S., Lewis, M.W. and Boyer, K.K. (2006) “Innovation-supportive culture: The impact of organizational values on Process Innovation,” *Journal of Operations Management*, 25(4), pp. 871–884. Available at: <https://doi.org/10.1016/j.jom.2006.08.003>.
- Kim, M. and Chai, S. (2017) “The impact of supplier innovativeness, information sharing and strategic sourcing on improving supply chain agility: Global Supply Chain Perspective,” *International Journal of Production Economics*, 187, pp. 42–52. Available at: <https://doi.org/10.1016/j.ijpe.2017.02.007>.
- Kish, Leslie (1965): *Survey Sampling*. New York: John Wiley and Sons, Inc. p. 78-94
- Kraljic, P., 1983. Purchasing must become supply management. *Harv. Bus. Rev.* 61 (5), 109–117.
- Ku, C.-Y., Chang, C.-T. and Ho, H.-P. (2009) “Global Supplier selection using fuzzy analytic hierarchy process and fuzzy goal programming,” *Quality & Quantity*, 44(4), pp. 623–640. Available at: <https://doi.org/10.1007/s11135-009-9223-1>.
- Lewis, J.L. & S.R.J. Sheppard. 2006. Culture and communication: can landscape visualization improve forest management consultation with indigenous communities? *Landscape and Urban Planning* 77:291–313.
- Li, S., Zhao, X. and Huo, B. (2018) “Supply Chain Coordination and innovativeness: A social contagion and learning perspective,” *International Journal of Production Economics*, 205, pp. 47–61. Available at: <https://doi.org/10.1016/j.ijpe.2018.07.033>.
- Li, Y. et al. (2014) “Governance of sustainable supply chains in the Fast Fashion Industry,” *European Management Journal*, 32(5), pp. 823–836. Available at: <https://doi.org/10.1016/j.emj.2014.03.001>.
- Liang et al. (2007) “Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of Top Management,” *MIS Quarterly*, 31(1), p. 59. Available at: <https://doi.org/10.2307/25148781>.
- Lii, P. and Kuo, F.-I. (2016) “Innovation-oriented supply chain integration for combined competitiveness and firm performance,” *International Journal of Production Economics*, 174, pp. 142–155. Available at: <https://doi.org/10.1016/j.ijpe.2016.01.018>.
- Lin, C.H., Peng, C.H. and Kao, D.T. (2008) “The innovativeness effect of market orientation and learning orientation on business performance,” *International Journal of Manpower*, 29(8), pp. 752–772. Available at: <https://doi.org/10.1108/01437720810919332>.
- Liu, H. et al. (2009) “The role of institutional pressures and organizational culture in the firm’s intention to adopt internet-enabled Supply Chain Management Systems,” *Journal of Operations Management*, 28(5), pp. 372–384. Available at: <https://doi.org/10.1016/j.jom.2009.11.010>.
- Liu, H. et al. (2013) “Effects of supply chain integration and market orientation on firm performance,” *International Journal of Operations & Production Management*, 33(3), pp. 322–346. Available at: <https://doi.org/10.1108/01443571311300809>.
- Lo, C.K.Y., Yeung, A.C.L. and Cheng, T.C.E. (2012) “The impact of environmental management systems on financial performance in fashion and Textiles Industries,”

- International Journal of Production Economics, 135(2), pp. 561–567. Available at: <https://doi.org/10.1016/j.ijpe.2011.05.010>.
- Loon, L.K. et al. (2017) “The power of organizational innovativeness in Shaping Supply Chain Operational Performance,” *Advanced Science Letters*, 23(9), pp. 8579–8585. Available at: <https://doi.org/10.1166/asl.2017.9933>.
- Lu, D. et al. (2017) “From Supply Chain Integration to operational performance: The moderating effect of market uncertainty,” *Global Journal of Flexible Systems Management*, 19(S1), pp. 3–20. Available at: <https://doi.org/10.1007/s40171-0170161-9>.
- M. Beheshti, H. et al. (2014) “Supply Chain Integration and firm performance: An empirical study of Swedish manufacturing firms,” *Competitiveness Review*, 24(1), pp. 20–31. Available at: <https://doi.org/10.1108/cr-06-2013-0060>.
- Maestrini, V. et al. (2017) “Supply Chain Performance Measurement Systems: A systematic review and Research Agenda,” *International Journal of Production Economics*, 183, pp. 299–315. Available at: <https://doi.org/10.1016/j.ijpe.2016.11.005>.
- Mandal, S. (2015) “An integrated-empirical logistics perspective on supply chain innovation and firm performance,” *Verslas: teorija ir praktika*, 17(1), pp. 32–45. Available at: <https://doi.org/10.3846/btp.2016.541>.
- Marshall, G. (2005) “The purpose, design and administration of a questionnaire for Data Collection,” *Radiography*, 11(2), pp. 131–136. Available at: <https://doi.org/10.1016/j.radi.2004.09.002>.
- Mertens, W., Pugliese, A. and Recker, J. (2017) *Quantitative Data Analysis: A companion for accounting and information systems research*. Cham, Switzerland: Springer.
- Meyer, J.W. and Rowan, B. (1977) “Institutionalized organizations: Formal structure as myth and ceremony,” *American Journal of Sociology*, 83(2), pp. 340–363. Available at: <https://doi.org/10.1086/226550>.
- Migdadi, M.M. et al. (2018) “An empirical examination of collaborative knowledge management practices and 79rganizational performance: The mediating roles of supply chain integration and knowledge quality,” *International Journal of Business Excellence*, 14(2), p. 180. Available at: <https://doi.org/10.1504/ijbex.2018.089149>.
- Miller, D. (1992) “Environmental fit versus internal fit,” *Organization Science*, 3(2), pp. 159–178. Available at: <https://doi.org/10.1287/orsc.3.2.159>.
- Mitchell, R.K., Agle, B.R. and Wood, D.J. (1997) “Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts,” *Academy of Management Review*, 22(4), pp. 853–886. Available at: <https://doi.org/10.5465/amr.1997.9711022105>.
- MRH (2022) Ministry of Roads & Highways, Ministry of Roads Highways. Available at: <https://mrh.gov.gh/publications/contractor-classification/#contractors-in-goodstanding> (Accessed: January 4, 2023).
- MWH (2022) Classification of contractors – ministry of works and housing – mwh. Available at: <https://www.mwh.gov.gh/classification-of-contractors/> (Accessed: January 4, 2023).

- Neutzling, D.M. et al. (2018) “Linking sustainability-oriented innovation to supply chain relationship integration,” *Journal of Cleaner Production*, 172, pp. 3448–3458. Available at: <https://doi.org/10.1016/j.jclepro.2017.11.091>.
- O’Sullivan E, Rassel GR and Berner M (2007) *Research Methods for Public Administrators*. London: Routledge.
- Ofori, G. (2000) “Greening the Construction Supply Chain in Singapore,” *European Journal of Purchasing & Supply Management*, 6(3-4), pp. 195–206. Available at: [https://doi.org/10.1016/s0969-7012\(00\)00015-0](https://doi.org/10.1016/s0969-7012(00)00015-0).
- Ojha, D., Shockley, J. and Acharya, C. (2016) “Supply chain organizational infrastructure for promoting entrepreneurial emphasis and innovativeness: The role of trust and learning,” *International Journal of Production Economics*, 179, pp. 212–227. Available at: <https://doi.org/10.1016/j.ijpe.2016.06.011>.
- Oliver, C. (1991) “Strategic responses to Institutional Processes,” *Academy of Management Review*, 16(1), pp. 145–179. Available at: <https://doi.org/10.5465/amr.1991.4279002>.
- Owoo, N.S. and Lambon-Quayefio, M.P. (2020) “The construction sector in Ghana,” *Mining for Change*, pp. 119–138. Available at: <https://doi.org/10.1093/oso/9780198851172.003.0006>.
- Pallant, J. (2021) *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. London: Routledge.
- Panayides, P.M. and Venus Lun, Y.H. (2009) “The impact of trust on Innovativeness and supply chain performance,” *International Journal of Production Economics*, 122(1), pp. 35–46. Available at: <https://doi.org/10.1016/j.ijpe.2008.12.025>.
- Papadopoulos, A.G. et al. (2016) “Supply chain improvement in construction industry,” *Universal Journal of Management*, 4(10), pp. 528–534. Available at: <https://doi.org/10.13189/ujm.2016.041002>.
- Park, S.-H. (1989) “Linkages between industry and services and their implications for urban employment generation in developing countries,” *Journal of Development Economics*, 30(2), pp. 359–379. Available at: [https://doi.org/10.1016/0304-3878\(89\)90009-6](https://doi.org/10.1016/0304-3878(89)90009-6).
- Qian, W. and Burritt, R. (2008) “The development of Environmental Management Accounting: An institutional view,” *Environmental Management Accounting for Cleaner Production*, pp. 233–248. Available at: https://doi.org/10.1007/978-1-4020-8913-8_12.
- Rahmani, K., Emamisaleh, K. and Iranzadeh, S. (2018) “Sustainable Supply Chain Management Practices and sustainability performance in the Food Industry,” *The South East Asian Journal of Management*, 12(1). Available at: <https://doi.org/10.21002/seam.v12i1.8689>.
- Reefke, H. and Sundaram, D. (2017) “Key themes and research opportunities in sustainable supply chain management – identification and evaluation,” *Omega*, 66, pp. 195–211. Available at: <https://doi.org/10.1016/j.omega.2016.02.003>.
- Robert M. Groves (2004): *Survey Errors and Survey Costs*, ISBN 0-471-67851-1
- Roberts, P.W. and Amit, R. (2003) “The dynamics of innovative activity and competitive advantage: The case of 80organizati retail banking, 1981 to 1995,” *Organization Science*, 14(2), pp. 107–122. Available at: <https://doi.org/10.1287/orsc.14.2.107.14990>.

- Rogers, E.M. (1995) "Diffusion of innovations: Modifications of a model for Telecommunications," *Die Diffusion von Innovationen in der Telekommunikation*, pp. 25–38. Available at: https://doi.org/10.1007/978-3-642-79868-9_2.
- Rogers, K.W. et al. (2006) "A supplier development program: Rational process or institutional image construction?," *Journal of Operations Management*, 25(2), pp. 556–572. Available at: <https://doi.org/10.1016/j.jom.2006.05.009>.
- Sarkis, J., Gonzalez-Torre, P. and Adenso-Diaz, B. (2009) "Stakeholder pressure and the adoption of environmental practices: The mediating effect of training," *Journal of Operations Management*, 28(2), pp. 163–176. Available at: <https://doi.org/10.1016/j.jom.2009.10.001>.
- Sarkis, J., Zhu, Q., and Lai, K.-hung (2011) "An organizational theoretic review of Green Supply Chain Management Literature," *International Journal of Production Economics*, 130(1), pp. 1–15. Available at: <https://doi.org/10.1016/j.ijpe.2010.11.010>.
- Saunders, M., Levin, P., and Thornhill, A. (2007) *Research Methods for Business Students*, Fifth Edition, Prentice-Hall, London
- Schuurman, B. (2018) "Research on terrorism, 2007–2016: A review of data, methods, and authorship," *Terrorism and Political Violence*, 32(5), pp. 1011–1026. Available at: <https://doi.org/10.1080/09546553.2018.1439023>.
- Scott, W.R., 2008. *Institutions and Organizations: Ideas and Interests*, 3rd ed.. Sage Publications, Los Angeles, CA.
- Seo, Y.-J., Dinwoodie, J. and Kwak, D.-W. (2014) "The impact of innovativeness on Supply Chain Performance: Is Supply Chain Integration a missing link?," *Supply Chain Management: An International Journal*, 19(5/6), pp. 733–746. Available at: <https://doi.org/10.1108/scm-02-2014-0058>.
- Shuttleworth, M. (2015) Internal consistency reliability, Internal Consistency Reliability – Internal Compability Test. Available at: <https://explorable.com/internal-consistencyreliability> (Accessed: January 5, 2023).
- Silvestre, B.S. (2015) "Sustainable Supply Chain Management in emerging economies: Environmental turbulence, institutional voids and sustainability trajectories," *International Journal of Production Economics*, 167, pp. 156–169. Available at: <https://doi.org/10.1016/j.ijpe.2015.05.025>.
- Singh, A.S. and Masuku, M.B., 2014. Sampling techniques & determination of sample size in applied statistics research: An overview. *International Journal of economics, commerce and management*, 2(11), pp.1-22.
- Singh, K.Y (2006) *Fundamentals of Research Methodology*, New Age International, New Delhi. ISBN 978-81-224-2418-8
- Skippari, M., Laukkanen, M. and Salo, J. (2017) "Cognitive barriers to collaborative innovation generation in Supply Chain Relationships," *Industrial Marketing Management*, 62, pp. 108–117. Available at: <https://doi.org/10.1016/j.indmarman.2016.08.002>.

- Soosay, C.A., Hyland, P.W. and Ferrer, M. (2008) “Supply Chain Collaboration: Capabilities for Continuous Innovation,” *Supply Chain Management: An International Journal*, 13(2), pp. 160–169. Available at: <https://doi.org/10.1108/13598540810860994>.
- Soosay, C.A., Hyland, P.W. and Ferrer, M. (2008) “Supply Chain Collaboration: Capabilities for Continuous Innovation,” *Supply Chain Management: An International Journal*, 13(2), pp. 160–169. Available at: <https://doi.org/10.1108/13598540810860994>.
- SPSS: How to Analyse and Interpret LIKERT-SCALE Questionnaire Using SPSS (2021) YouTube. YouTube. Available at: <https://www.youtube.com/watch?v=k1jxs2xaUXI> (Accessed: February 26, 2023).
- Stank, T.P., Keller, S.B. and Daugherty, P.J. (2001) “Supply Chain collaboration and Logistical Service Performance,” *Journal of Business Logistics*, 22(1), pp. 29–48. Available at: <https://doi.org/10.1002/j.2158-1592.2001.tb00158.x>.
- Strategy & Research Dept., G.C.B. (2022) Construction Sector Focus on Real Estate Developments, Gcbbank.com.gh. Available at: <https://www.gcbbank.com.gh/researchreports/sector-industry-reports/122-construction-sector-focus-on-real-estatedevelopment-2022/file> (Accessed: December 27, 2022).
- Suchman, M.C. (1995) “Managing legitimacy: Strategic and institutional approaches,” *Academy of Management Review*, 20(3), pp. 571–610. Available at: <https://doi.org/10.5465/amr.1995.9508080331>.
- Tarafdar, M. and Qrunfleh, S. (2016) “Agile Supply Chain Strategy and supply chain performance: Complementary roles of Supply Chain Practices and information systems capability for Agility,” *International Journal of Production Research*, 55(4), pp. 925–938. Available at: <https://doi.org/10.1080/00207543.2016.1203079>.
- Tarifa-Fernandez, J. and De Burgos-Jiménez, J. (2017) “Supply Chain Integration and performance relationship: A moderating effects review,” *The International Journal of Logistics Management*, 28(4), pp. 1243–1271. Available at: <https://doi.org/10.1108/ijlm-02-2016-0043>.
- Teece, D.J. (2007) “Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance,” *Strategic Management Journal*, 28(13), pp. 1319–1350. Available at: <https://doi.org/10.1002/smj.640>.
- Teece, D.J., Pisano, G. and Shuen, A. (1997) “Dynamic capabilities and strategic management,” *Strategic Management Journal*, 18(7), pp. 509–533. Available at: [https://doi.org/10.1002/\(sici\)1097-0266\(199708\)18:7<509::aidsmj882>3.0.co;2-Z](https://doi.org/10.1002/(sici)1097-0266(199708)18:7<509::aidsmj882>3.0.co;2-Z).
- Testa, F. and Iraldo, F. (2010) “Shadows and lights of GSCM (Green Supply Chain Management): Determinants and effects of these practices based on a multi-national study,” *Journal of Cleaner Production*, 18(10-11), pp. 953–962. Available at: <https://doi.org/10.1016/j.jclepro.2010.03.005>.
- Tongco, M.D. (2007) “Purposive sampling as a tool for informant selection,” *Ethnobotany Research and Applications*, 5, p. 147. Available at: <https://doi.org/10.17348/era.5.0.147-158>.

- Tsanos, C.S., G. Zografos, K. and Harrison, A. (2014) “Developing a conceptual model for examining the supply chain relationships between behavioural antecedents of collaboration, integration and performance,” *The International Journal of Logistics Management*, 25(3), pp. 418–462. Available at: <https://doi.org/10.1108/ijlm-02-20120005>.
- Tushman, M. and Nadler, D. (1986) “Organizing for innovation,” *California Management Review*, 28(3), pp. 74–92. Available at: <https://doi.org/10.2307/41165203>.
- Vachon, S. and Klassen, R.D. (2006) “Green Project Partnership in the supply chain: The case of the package printing industry,” *Journal of Cleaner Production*, 14(6-7), pp. 661–671. Available at: <https://doi.org/10.1016/j.jclepro.2005.07.014>.
- van der Vaart, T. and van Donk, D.P. (2008) “A critical review of survey-based research in Supply Chain Integration,” *International Journal of Production Economics*, 111(1), pp. 42–55. Available at: <https://doi.org/10.1016/j.ijpe.2006.10.011>.
- van Hoof, B. and Lyon, T.P. (2013) “Cleaner production in small firms taking part in Mexico’s Sustainable Supplier program,” *Journal of Cleaner Production*, 41, pp. 270–282. Available at: <https://doi.org/10.1016/j.jclepro.2012.09.023>.
- Vanichchinchai, A. (2012) “The relationship between employee involvement, Partnership Management and supply performance,” *International Journal of Productivity and Performance Management*, 61(2), pp. 157–172. Available at: <https://doi.org/10.1108/17410401211194662>.
- Vickery, S.K. et al. (2003) “The effects of an Integrative Supply Chain Strategy on Customer Service and Financial Performance: An analysis of direct versus indirect relationships,” *Journal of Operations Management*, 21(5), pp. 523–539. Available at: <https://doi.org/10.1016/j.jom.2003.02.002>.
- Vrijhoef, R. (1998). Co-makership in construction: towards construction supply chain management, Graduate Thesis, Technical Research Centre of Finland, Espoo.
- Vrijhoef, R., Koskela, L. (1999). Roles of supply chain management in construction, 7th Conference of the International Group for Lean Construction, Berkeley, USA. Vrijhoef, R., Koskela, L., and Howell, G. (2001). “Understanding construction supply chains: an alternative interpretation.” *Proceedings 9th Annual Conference International Group for Lean Construction*, Singapore.
- Wang, C.L. and Ahmed, P.K. (2004) “The development and validation of the 83organizational innovativeness construct using confirmatory factor analysis,” *European Journal of Innovation Management*, 7(4), pp. 303–313. Available at: <https://doi.org/10.1108/14601060410565056>.
- Williams, A. (2003) “How to ... write and analyse a questionnaire,” *Journal of Orthodontics*, 30(3), pp. 245–252. Available at: <https://doi.org/10.1093/ortho/30.3.245>.
- Wong, C.W.Y. et al. (2012) “Green operations and the moderating role of environmental management capability of suppliers on manufacturing firm performance,” *International*

- Journal of Production Economics, 140(1), pp. 283–294. Available at: <https://doi.org/10.1016/j.ijpe.2011.08.031>.
- Wong, C.Y., Boon-itt, S. and Wong, C.W.Y. (2011) “The contingency effects of environmental uncertainty on the relationship between supply chain integration and operational performance,” *Journal of Operations Management*, 29(6), pp. 604–615. Available at: <https://doi.org/10.1016/j.jom.2011.01.003>.
- World Bank (1984). ‘The Construction Industry: Issues and Strategies in Developing Countries’. Washington, DC: World Bank
- Youn, S. et al. (2013) “Strategic Supply Chain Partnership, Environmental Supply Chain Management Practices, and performance outcomes: An empirical study of Korean firms,” *Journal of Cleaner Production*, 56, pp. 121–130. Available at: <https://doi.org/10.1016/j.jclepro.2011.09.026>.
- Yu, J., Welford, R. and Hills, P. (2006) “Industry responses to EU Weee and Rohs Directives: Perspectives from China,” *Corporate Social Responsibility and Environmental Management*, 13(5), pp. 286–299. Available at: <https://doi.org/10.1002/csr.131>.
- Zaheer, A. and Bell, G.G. (2005) “Benefiting from network position: Firm capabilities, structural holes, and performance,” *Strategic Management Journal*, 26(9), pp. 809–825. Available at: <https://doi.org/10.1002/smj.482>.
- Zelt, S., Schmiedel, T. and vom Brocke, J. (2018) “Understanding the nature of processes: An information-processing perspective,” *Business Process Management Journal*, 24(1), pp. 67–88. Available at: <https://doi.org/10.1108/bpmj-05-2016-0102>.
- Zeng, H. et al. (2017) “Institutional pressures, sustainable supply chain management, and Circular Economy Capability: Empirical evidence from Chinese eco-industrial park firms,” *Journal of Cleaner Production*, 155, pp. 54–65. Available at: <https://doi.org/10.1016/j.jclepro.2016.10.093>.
- Zhang, C. and Dhaliwal, J. (2009) “An investigation of resource-based and institutional theoretic factors in technology adoption for operations and Supply Chain Management,” *International Journal of Production Economics*, 120(1), pp. 252–269. Available at: <https://doi.org/10.1016/j.ijpe.2008.07.023>.
- Zhao, L. et al. (2013) “The impact of Supply Chain Risk on Supply Chain Integration and Company Performance: A global investigation,” *Supply Chain Management: An International Journal*, 18(2), pp. 115–131. Available at: <https://doi.org/10.1108/13598541311318773>.
- Zhao, X. et al. (2007) “The impact of power and relationship commitment on the integration between manufacturers and customers in a supply chain,” *Journal of Operations Management*, 26(3), pp. 368–388. Available at: <https://doi.org/10.1016/j.jom.2007.08.002>.
- Zhu, Q. and Sarkis, J. (2007) “The moderating effects of institutional pressures on emergent green supply chain practices and performance,” *International Journal of Production Research*, 45(18-19), pp. 4333–4355. Available at: <https://doi.org/10.1080/00207540701440345>.

Zikmund, W.G., Babin, B.J, Carr, J.C, and Griffin, M. (2010), Business Research Methods, 8th edition, South Western, Cengage learning, USA.

Zucker, L.G. (1977) “The role of institutionalization in cultural persistence,” American Sociological Review, 42(5), p. 726. Available at: <https://doi.org/10.2307/2094862>.

KNUST



KNUST

APPENDIX



	7-point Likert Scale						
INSTRUCTIONS: Indicate your opinion for the following statement by placing a checkmark () in the right column under the 7-point Likert Scale.							
	Strongly Disagree	Moderately Disagree	Disagree	Neither Agree nor Disagree	Agree	Moderately Agree	Strongly Agree
1. Our supply chain has formal new product and service development process.							
2. Our supply chain monitors and documents new product and service ideas.							

3. Our supply chain focuses on process and technological innovation.							
4. Our Organisation frequently try out new ideas in the procurement and supply chain context							
5. Our Organisation seek out new ways to do things in our procurement and supply chain							

SURVEY QUESTIONNAIRE

My name is Frank Oppong Adomako. I am an MSc. Procurement and Supply Chain Management Student of the Kwame Nkrumah University of Science and Technology School of Business, Department of Supply Chain & Information Systems. This survey instrument has been designed to enable me carry out a research on ***Innovativeness On Supply Chain Integration And Performance Of Construction Firms In Ghana Investigating The Moderating Role Of Institutional Pressures***. Any information provided will ***ONLY*** be used for general information, and it will be treated as ***HIGHLY CONFIDENTIAL***.

INSTRUCTIONS: Please kindly write in ink in the box which corresponds to the statement, which in your opinion is the most appropriate answer to the related question. For the following questions, kindly select by checking () all that apply.

Name of Company:.....	Title or Job Position in the Company:.....		
State run Enterprise: <input type="checkbox"/> Yes <input type="checkbox"/> No	Nationality: <input type="checkbox"/> Ghanaian <input type="checkbox"/> Expatriate	How long have you worked in this company?.....	
When was the company incorporated in Ghana?.....	Number of executed (Completed) projects? _____		
Ownership of company: <input checked="" type="checkbox"/> Solely Ghanaian Owned; <input type="checkbox"/> Foreign Owned; <input type="checkbox"/> Joint /entureship; <input type="checkbox"/> Other (specify).....			
Legal form of Entity <input type="checkbox"/> Sole Proprietorship; <input type="checkbox"/> Limited Liability; <input type="checkbox"/> Partnership; <input type="checkbox"/> External Company; <input type="checkbox"/> Other (specify).....			
Number of Employees [] <100; [] 100-199; [] 200-299; [] 300-399; [] 400+	Number of current (ongoing) projects? _____		
Please place a check in your company's class of contractor in the industry	<input checked="" type="checkbox"/> D1/K1; <input type="checkbox"/> D2/K2; <input type="checkbox"/> A1/B1; <input type="checkbox"/> A1/B1S1; <input type="checkbox"/> A2/B2; Other <input type="checkbox"/> (specify).....		
Please indicate the annual procurement spend of the Company in New Ghana Cedis	<input type="checkbox"/> <100,000; <input type="checkbox"/> 100,000-200,000; <input type="checkbox"/> 200,000-300,000; <input type="checkbox"/> 300,000-400,000; <input type="checkbox"/> 400,000-500,000; <input type="checkbox"/> 500,000-600,000; <input type="checkbox"/> 600,000-1,000,000; <input type="checkbox"/> >1,000,000		

6. Our Organisation have increasingly introduced new processes in the procurement and supply chain in the last 5 years							
7. Our Organisation often introduce new ways of servicing the supply chain.							
8. Our Organisation is creative in the methods of operation in the supply chain.							
9. Sustainable procurement is considered as part of my organization's long-term performance strategy.							
10. Our organisation incorporates local content as part of our supply chain							

11. Our Organisation's internal supply chain activities are closely coordinated.							
12. Our Organisation effectively shares operational information between departments.							
13. Our Organisation has invested in technology designed to facilitate cross-organizational data exchange.							
14. Within our organisation, we emphasize information flows amongst engineering, purchasing, inventory management, and production departments							
15. Our Organisation has a high level of responsiveness within our firm to meet other departments' needs.							
16. Our Organisation's supply chain activities are well integrated with suppliers' logistics activities.							
17. Our Organisation share information with our major suppliers through information technologies							
18. Our Organisation have a high degree of strategic partnership with suppliers							
19. Our organisation actively pursues business relationships and programs targeted at maximizing supplier involvement.							
20. Our organisation visits supplier sites and helps them to improve their environmental performance.							
21. Our Organisation has a high level of information sharing with customers about market information							
22. Our Organisation shares information to major customers through information technologies							
23. Our Organisation has a high degree of joint planning and forecasting with major customers to anticipate demand visibility							
24. Our customers are involved in our product development processes							
25. Our Organisation actively communicate with end customers about our sustainability values							
26. Our organisation works as a partner with suppliers, rather than having an adversarial relationship							
27. Our organisation believes that cooperative relationships will lead to better performance than adversarial relationships							
28. Our organisation believes that a firm should work as a partner with its surrounding community							

29. Our clients are more sensitive towards sustainable practices							
30. The funding agencies requirements and regulations provide clear guidelines concerning sustainability issues.							
31. Government regulations provide clear guidelines concerning sustainability issues.							
32. Environmental Protection Agency (EPA) strictly monitors the pollution level of our organisation on a periodic basis.							
33. Sustainable practices decrease incidence of penalty fee charged by the Environmental Protection Agency (EPA).							
34. Maximum purchases of the organisation are local market oriented.							
35. Our organisation pays “living wages” greater than the country’s or region’s minimum wage and provide supplementary non-financial benefits.							
36. Our organisation strictly complies with labor laws and the Construction and Building Materials Workers' Union (CBMWU) guidelines							
37. Our organisation provides opportunities for employee growth and self-development.							
38. Our organisation has Social Welfares initiatives such as donating to related causes and funding research into sustainability.							
39. Our organisation provides employees with safety and occupational health working conditions							
40. Our organisation contributes to reducing carbon footprints by transporting in bulk							
41. our processes ensure local companies who have the capacity to execute contracts are not rejected exclusively based on the principle of the lowest evaluated bid							
42. Our organisation ensures it does not procure goods and services resulting from slavery or child labor							
43. There are periodic reviews on environmental performance and social performance of suppliers.							
44. Projects are delivered to our clients fully completed with the right specifications							
45. Our organisation always meets deadlines as promised to supply chain partners.							
46. Our projects accord with customer requirements in terms of quality.							
47. Our organisation has increased operational flexibility through collaboration with suppliers.							
48. Our organisation’s inventory controls, and management has improved over the past year.							

49. Our organisation has improved productivity and made good use of resources.							
50. Our organisation's operations costs (i.e., overall cost) has reduced over the past year.							
51. Our organisation's rate of return is appropriate.							
52. Our organisation's market share and competitiveness has risen at a reasonable rate over the past year.							
53. Our organisation's profitability has increased over the past year							
54. Our organisation's performance in waste and carbon footprints (CO2 emissions) reduction has improved							
55. Our organisation has reduced Hazardous materials consumption on its projects							
56. Our organisation has reduced employee and environmental accidents and health hazards							
57. Our organisation's performance in efficient use of energy has been appropriate.							
58. Our employment practices and work environment have created the types of benefits that create social value.							
59. Our organisation has Improved community involvement and development							

Thank you. Your participation is greatly appreciated. If you are interested in a personalized copy of the analyzed results, please attach a business card or provide your contact information.

