EXPLORING THE IMPACT OF PUBLIC SECTOR ENTITY RESOURCES ON PUBLIC-PRIVATE PARTNERSHIP PROJECT PERFORMANCE IN GHANA: THE INFLUENCE OF COMPETITION AND TRANSPARENCY IN THE TENDERING PROCESS

by

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DECLARATION

I, Moses Dick Kwasi KUSEDZI, student number, ########, do hereby submit the thesis entitled “Exploring the impact of public sector entity resources on Public-Private Partnership project performance in Ghana: the influence of competition and transparency in the process,” submitted to the Central University of Technology, Free State, for the Degree Doctor of Philosophy (PhD) in Management Sciences (Project Management), and declare that it is my own original work, and complies with the Code of Academic Integrity of the Central University of Technology, Free State, as well as other relevant policies, procedures, rules, and regulations; and has not been submitted to any institution by myself or any other person in fulfilment (or partial fulfilment) of the requirements for the attainment of any qualification.

18/04/2022

SIGNATURE OF STUDENT DATE

DEDICATION

This thesis is dedicated to Mrs. Rosemary Kusedzi (Wife), Makafui, Queenstar and Zenith Kusedzi, my lovely children.

ABSTRACT

An innovative approach is needed to achieve value for money in public infrastructure provision in Ghana. Private-Public Partnership (PPP) is now used in Ghana to meet general infrastructural needs despite its limitations. The efforts to create value in public projects require effective and efficient utilisation of public entity resources through an effective tender process. This approach is intended to improve performance. In Ghana, quality, time and cost are used to measure project performance. The lack of knowledge, experience, and skills in PPP-related issues in public construction, and public-sector agencies lack of ability to procure public infrastructural projects due to inability to successfully apply project management approaches or processes to create value and meet the country infrastructural need has been a challenge for both previous and successive governments. This study investigated the impact of public sector entity project organisational resources on PPP performance in Ghana. The influence of competition and transparency in the tendering process.

The study is underpinned by the Resource-Based View, the Resource Dependency Theory, the Stewardship Theory of Corporate Governance, and the principles of public procurement. Deductive reasoning was used where hypotheses developed from the conceptual model which were tested. Random sampling was used to select respondents. A self-administered questionnaire was used to collect data from project participants between July-December, 2021 in the Volta Region of Ghana. A total of 500 questionnaires were sent out, and 453 of them were retrieved representing a 92% response rate. The data was analysed using the Partial Least-Square Structural Equation Modelling.

The findings indicate that public entity internal factors (hereafter called resources) such as project value (PV), quality project brief (QPB), public sector capacity (PSQ), quality governance structure (QGS), and risk sharing model (RSM) directly or indirectly affect successful PPP performance. Except for quality of governance, other public entity resources significantly impact PPP performance (on cost and within time). It was established that the PPP project performance criterion is met

when the public entity factors and tendering process are effective, efficient, and complied with in PPPs. It was further found that organisational resources have significantly positive direct and indirect effects on performance.

The study contributes to PPP and project management theory, policy, and practice in several ways, at least in the Ghanaian context. Firstly, the study has empirically confirmed specific public entity resources as organizational assets necessary to improve PPP project performance. Practice-wise, the study has revealed that effective quality governance structures (formal and informal) are prerequisites for project performance. Likewise, the study indicates that accurate risk-sharing models, public sector capacities, and resilient business cases attract private investments. Also, the study highlights accurate project value determination and competitive and transparent tendering systems as innovative practices in public project management.

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LIST OF ABBREVIATIONS

AVE:	Average Variance Extracted
BOT:	Build Own Transfer
BTO:	Build Transfer Operate
BOOT:	Build Own Operate Transfer
CA:	Cronbach's alpha
CB:	Covariance Based
CR:	Composite Reliability
CFA:	Confirmatory Factory Analysis
CT:	Competitive Tendering
CIOB:	Chartered Institute of Buildings
CSFs	Critical Success Factors
COVID-19	Coronavirus Disease-2019
DV:	Discriminant validity
GSC:	Ghana Statistical Council
HTMT:	Heterotrait-Menotrait ration
MoFEP:	Ministry of Finance and Economic Planning
MAM:	Measurement Assessment Model
OR-3P's:	Organisational Resources, Public -Private Partnerships
PMBOK Guide:	Project Management Book of Knowledge (Guide)
PSC:	Public Sector Capacity
PV:	Project Value
PPI:	Public Private Initiatives
PFI:	Private Finance Initiatives
PMI:	Project Management Institute
PLS:	Partial Least Square
PSL-SEM:	Partial Least Square-Structural Equation Modelling
PRINCE 2:	Project in control Environment
QGS:	Quality Governance Structure
QPB:	Quality Project Brief
RBV:	Resource-Based View
RET:	Relational Exchange Theory

RSM:	Risk Sharing Model
SPPPP:	Successful Public-Private Partnerships Performance
SET:	Social Exchange Theory
SEM:	Structural Equation Modelling
SD:	Standard Deviation
TT:	Transparent Tendering
UNECE:	United Nations Economic Commission for Europe
VRCC	Volta Regional Coordinating Council
WBS:	Work breakdown structure

DEFINITION OF KEY TERMS

TERM	DEFINITION
Project	Project is a temporary endeavour undertaken to create a unique project, service, or result (PMI, 2015).
	The study defined project as a temporary endeavour undertaken to create unique outcomes (public facilities) which are completed on schedule (time), within specified budget (cost), meet stakeholders' expectations and create value (quality).
Project life cycle	Project life cycle is defined as a series of phases that a project goes through from its initiation to closure of the project (Larson & Gray, 2018)
Project management	Project management is defined as application of knowledge, skills, tools, and techniques to project activities to meet the project requirements (PMI, 2015; Mulcahy, 2013)
Project Management Process Group	Project Management Process Group is defined as a logical grouping of project management processes to achieve specific project objectives. Process Groups are independent of project phases grouped into five (initiation; planning; execution; monitoring and control; and closing (Mulcahy, 2013; PMI, 2015; Larson & Gray, 2018; Russell et al., 2018).
Project management framework	Project management framework is a basic structure of understanding project management (PMI, 2015; Mulcahy, 2013)
	Construction management refers to the clients, organizations, and persons working together to fulfil the changing requirements of our global society to create, conserve, and improve the built environment (CIOB, 2014)

Agile management	Agile management refers to the effort of encouraging flexibility in project management processes and practices without compromising quality, scope, cost and schedule in the management of the project (PMI, 2015; Sumanta, 2016).
Public-Private Partnership	Public-Private Partnership involves private partners and public organisations teaming up their resources to undertake a specific project assignment with the purpose of sharing risk and benefit thereof (World Bank, 2016; Public Private Infrastructure Advisory Facility, 2016).
Resilient business case	Resilient business case refers to robustness of the needs justify to be supplied by public procuring agencies in attracting private fundings or investments.

CHAPTER 1

INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

The development outlook of a nation often depends on the efficient infrastructural provision. Infrastructural services serve as a remedy to many issues, including low economic growth, unemployment and improvement of industrial policy and national project competitiveness, as well as value for money (Sahoo and Dash, 2012; Palei, 2015; Holmgren and Merkel, 2017; Ahmadabadi and Heravi, 2019). Indeed, all governments are mandated by their constitution to provide public infrastructure precisely because crucial infrastructure like roads, power, rail, water and sanitation, schools, correctional facilities and hospitals are prerequisites for economic growth (Wang, Lim, Zhang, Zhao and Lee, 2020).

However, the provision of these infrastructural facilities is capital-intensive. It requires systems, structures, and project organisational resources from both public and private sector resources to meet project outcomes and objectives. The relationship between economic growth and infrastructure outcomes demands that effectiveness in project resource utilisation cannot be overemphasised (Sahoo and Dash, 2012; Palei, 2015; Holmgren and Merkel, 2017; Wang et al., 2020).

The continuous fiscal constraints currently facing global economies resulted in the need for innovative approaches to providing and financing infrastructure and services. Therefore, policy frameworks are required to address deficit public infrastructural needs (Lui, Yan and Suzanne, 2016; Ministry of Finance and Economic Planning, 2014). This realisation has led to the view that achieving project resources effectiveness is better done and value created through Public-Private Partnerships arrangements. Despite its challenges, public-private partnerships (PPPs) have appeared to be the innovative approach in implementing successful infrastructural projects delivery at national, regional, district and municipal levels (MoFEP, 2014). The credence of PPP lies in its ability to create value for money, ensure effective project resource utilisation, risk allocation

strategy, and improve competitiveness and transparency among project participants that the state cannot provide (Osei-Kyei and Chan, 2016; Kwofie, Afram and Botwchway, 2016). Therefore, the adoption of a PPP framework reflects the public agencies' desire to improve the quality, cost-effectiveness, and timely performance of public projects.

PPP is generally organised through three major stages: development, realisation and operation (Zhang, Ding, Gao and Hu, 2015). The development stage starts with the project initiation and ends with the financial closure or signing of the concession contract. The realisation stage comprises design development, construction, and commissioning (Zhang et al., 2015; Ahmadabadi and Heravi, 2019). The PPP operation stage involves a concessionary period, usually fifteen to thirty years (Public Private Infrastructure Advisory Facility, 2016; Jomo, Chowdhury, Sharma and Platz, 2016).

Although PPP is now adopted in public infrastructure provisioning in Ghana, it is still at a relatively early stage (KPMG, 2010; Osei-Kyei and Chan, 2016; Kwofie et al., 2016; Ameyaw and Chan, 2016; MoFEP, 2014; Owusu-Manu, 2018). Ghana first developed a PPP guideline in 2004, came up with the policy framework in 2011 and developed the PPP Bill in 2013 (MoFEP, 2014). Since then, projects, including the Eastern Railway Lines Project, Takoradi Port Multi-Purpose Project, Accra Plains Irrigation Project, and Tema Motorway expansion project, have been ongoing (Ministry of Finance and Economic Planning, 2014).

This study investigated the impact of public sector entity resources through tendering on successful PPP performance in Ghana. While it is evident that the investigation is multi-disciplinary because it deals with various management disciplines, such as public administration and business management, it is being carried out mainly from a project management perspective.

A practical significance of this study is its relevance to some of Ghana's sustainable development goals (SDGs) and infrastructural needs. The study resonates with the infrastructure provision objective of the national planning and development agenda

postulated in the 1992 Constitution of Ghana (National Development Commission of Ghana, 2017; Republic of Ghana, 2019). The study also resounds with SDGs 9, 11 and 17 that deal with industry, innovation and infrastructure; sustainable cities and communities; and a network of partnerships.

1.2 PROBLEM BACKGROUND

PPP involves private partners and public organisations teaming up resources to undertake a specific project (World Bank, 2016; Public Private Infrastructure Advisory Facility, 2016). PPP project success is primarily determined by the participating parties' appreciation of sharing of project resources to complete the project successfully (Osei-Kyei and Chan, 2016; Carbonara, Pellengrino and Costantino, 2019). From this perspective, it becomes evident that project management principles and practices are crucial to PPP project performance. Meanwhile, it is observable in Ghana that PPP projects have not performed according to expectations (Ministry of Finance and Economic Planning, 2018; Peprah, Amponsah and Oduro, 2019).

Meanwhile, regardless of context, numerous factors have been identified as possible causes of PPP non-performance (Carbonara et al., 2019; Osei-Kyei and Chan, 2016). Several sources have suggested that long durations, the high cost of transactions, issues of fairness and transparency, and or lack of competitiveness in the process could impede PPP project performance (Oppong-Peprah, Amponsah and Oduro 2019; Liu, Wang, Wilkinson, 2016; Ameyaw and Chan, 2016). Also, the inability to accurately pre-determine the cost or value of the project and the lack of technical expertise affect PPP project performance (Yan et al., 2019; Arthur, Agyemang and Nikoi, 2020).

Previous studies on PPP have identified risk-sharing, competitiveness, and transparency difficulties as significant impediments to successful PPP implementation (Lui et al., 2016; World Bank, 2014; Public Private Infrastructure Advisory Facility, 2016). Osei-Kyei and Chan (2016), postulated that PPP

implementation challenges in Ghana could be traced to problems such as the lack of managerial expertise and skills and the governance structures.

In Ghana, limited research exists on entity project organisational (resources) which are critical for PPP project success (Kwofie, Afram, and Botchway, 2016; Damoah et al., 2020; Owusu-Manu et al., 2021). PPP-related research in Ghana has focused on determining how PPP projects are chosen and implemented (Oppong-Peprah et al., 2016; Osei-Kyei and Chan, 2016; Ameyaw and Chan, 2016). Other researchers have looked for ways of developing an effective tendering process in PPP implementation (Kwofie et al., 2016), critical success factors and policy for public construction and mass housing projects (Kwofie et al., 2016; Osei-Kyei and Chan, 2017; Adinyira, Ahadzie and Kwofie, 2013).

1.3 PROBLEM STATEMENT

The lack of capabilities of public-sector entities to procure public infrastructural projects due to inability to successfully use project management approaches or methodologies notwithstanding, lack of knowledge, experiences and skills in PPP-related matters in public construction pose threats to project investment (Ahenkan, 2019; Zacharias et al., 2019; Owusu-Manu et al., 2019; Kuka et al.,2022). The quest for meeting Ghana's infrastructural needs via PPP appears non-negotiable, nonetheless there are apparent difficulties in its successful implementation (MoFEP, 2015; Osei-Kyei and Chan, 2015). Osei-Kyei and Chan's (2016) normative claims on critical success factors affecting PPP implementation in Ghana require validation through empirical assessment. Otherwise, they remain speculative (KPMG, 2010; Liu et al., 2016; Carbonara, Pellengrino and Costantino, 2020), rendering their usefulness in improving PPP performance doubtful. Leaning on the Resource-Based View (RBV) and Stewardship Theory of Corporate Governance (STCG), this study seeks to empirically unravel the PPP performance problem in Ghana by investigating the impact of public sector entity resources through tendering on successful PPP performance in Ghana.

1.4 GAPS IN KNOWLEDGE

Developed and developing nations have widely accepted PPP as an innovative model to support public infrastructural delivery in recent years, and several pieces of research have been conducted on critical factors affecting PPP projects have been acknowledged in the literature (Osei-Kyei et al., 2016; Du et al., 2018; Muhammad and Johar, 2019). Besides the interest in adopting PPPs as an alternative route in delivering public infrastructures, there is less research on public entity resources as *critical organisational assets* for effective PPPs. This study, therefore, seeks to augment and generate further interest in effective and efficient public entity resources as crucial determinants of delivering successful PPP projects. This thesis partially fills this gap by investigating the impact of public sector entity resources through tendering on successful PPP performance in Ghana.

1.5 MOTIVATION FOR THIS STUDY

Project management principles and practices have been confirmed in the research literature as the best alternative in ensuring public project implementation success to create value and meet project requirements on cost and within schedule (Larson and Gary, 2018; Mulcahy, 2013; PMI, 2015). In addition, Liu et al. (2016) argued that there is a strong link between project management principles and PPP in delivering public facilities. However, according to Osei-Kyei et al. (2016) and earlier suggested by Gatti (2022), private capital and management can help alleviate fiscal limitations while increasing efficiency in providing higher-quality public services.

Some studies have been devoted to critical success factors for successful PPPs and delivering public infrastructure. However, the knowledge gap identified the opportunity for project management research to contribute to public infrastructure debates and mitigate current deficits, especially in developing economies, through tendering and PPP as procurement strategy thereby improve project performance on cost, quality and within time (schedule) has motivated the study. The motive is

to ensure public project entities create value in the management of private-public sector institutional collaborations through a comprehensive organization resource utilization in procuring public infrastructural services, whilst positioning Ghana as PPP investment destination within the Sub-Sahara Africa.

1.6 RESEARCH QUESTIONS, OBJECTIVES, AND AIM

This section provides a summary of the research questions, objectives and aim that guided the study.

1.6.1 The primary and subsidiary research questions

In this sub-section, the main and subsidiary research questions are listed. The circumstances leading to these questions have been discused in the introductory, problem background and problem statement sections above.

1.6.1.1 Main research question

The main research question for this study is: ***What is the influence of public sector entity resources, and competition and transparency in the tendering process on the performance of public-private partnership projects in Ghana?*** In addition, ***how do public sector entity organisational resources and competition and transparency in the tendering process influence PPP performance in Ghana?***

1.6.1.1 Subsidiary research questions:

1. How does a resilient business case impact PPP projects' cost and time performance in Ghana?

2. How do quality project briefs impact PPP projects' cost and time performance in Ghana?
3. How does project value impact PPP projects' cost and time performance in Ghana?
4. How does public sector capacity impact PPP projects' cost and time performance in Ghana?
5. How does quality governance structure impact the cost and time performance of PPP projects in Ghana?
6. How does the risk-sharing model impact the cost and time performance of PPP projects in Ghana?
7. What is the moderating effect of the competitive tendering process on the impact of organisational resources on PPP time and cost performance in Ghana?
8. What is the mediating effect of the competitive tendering process on the impact of organisational resources on PPP time and cost performance in Ghana?
9. Based on the answers to the above questions, what can be done to optimise the cost and time performance of PPP projects in Ghana?

1.6.2 The main and subsidiary objectives:

Based on the above problem statement and research questions, the following research objectives were set to guide the study.

1.6.2.1 Main research objective

Main Objective: To investigate how selected public entity organisational resources influence PPP performance in Ghana through the tendering process.

1.6.2.2 Subsidiary research objectives are to:

1. Examine the impacts of resilient business case on cost and time performance of PPP projects in Ghana

2. Examine the impact of quality project brief on cost and time performance of PPP projects in Ghana
3. Examine the impact of project value on the cost and time performance of PPP projects in Ghana
4. Examine the impact of public sector capacity on the cost and time performance of PPP projects in Ghana
5. Examine quality governance structure on cost and time performance of PPP projects in Ghana
6. Examine the impact of risk sharing model on the cost and time performance of PPP projects in Ghana
7. To investigate the moderating effect of competitive and transparent tendering on the relationship between organisational resources and PPP time and cost performance.
8. To investigate the mediating effect of competitive and transparent tendering on the relationship between organisational resources and PPP time and cost performance.
9. To make recommendations for optimising the cost and time performance of PPP projects in Ghana.

1.6.3 Aim of the study

Drawing on the resource-based view, the resource complementarity, and the stewardship theories this study investigated how the selected public entity resources identified for this study interact with integrity (competition and transparency) in the tendering process to affect PPP project performance in Ghana. The aim is to contribute towards successful infrastructure provision through PPP project management.

1.7 SUMMARY OF RESEARCH METHODOLOGY

Following constitute a summary of the research methodology followed in the study.

1.7.1 Research philosophy

Determining a philosophical stance by choosing a research paradigm clarifies the starting point of investigating a phenomenon. The research philosophy determines how research should be done and how results should be interpreted (Bryman and Bell, 2011:24; Hurlimann, 2019; Haydam and Steenkamp, 2020).

There are two main research paradigms from which one can select: Interpretivism and Positivism (Cooper and Schindler, 2014). Interpretivists believe social phenomena are unique as they are created by individuals in specific contexts, making them too complex to formulate general rules and apply scientific principles to resolve (Mack, 2010; Ragab and Arisha, 2018). Interpretivists understand the social phenomenon from within their context and consider that there is an interactive relationship between the researcher and the research subjects (Ragab and Arisha, 2018). Therefore, according to Interpretivists, knowledge is constructed through beliefs, learning and experiences. Interpretivists believe in and emphasise the ability of individuals to create meaning (Singh and Singh, 2015; Creswell, 2014; Guba and Lincoln, 2011). On the other hand, Positivism adopts a scientific stance to research and aims to make generalised findings (Ragab and Arisha, 2018). In social science, the positivist paradigm assumes the researcher objectively obtains data while remaining external to the research process and independent of the subject of research (Ragab and Arisha, 2018). This study adopts the positivist philosophy. The purpose is to address the fact and gain actual knowledge on project organisational resources by measuring data and objectively interpreting the result.

1.7.2 Research approach

According to Saunders et al. (2015), there are two approaches common in research: deductive and inductive reasoning. The deductive approach follows a highly structured methodology and investigates causal relationships between variables to test phenomena by formulating hypotheses. On the other hand, in the

inductive approach, the researcher observes patterns and relationships to form a theory about a phenomenon using qualitative methodology. In this study, the deductive approach was followed in explaining the variables identified quantitatively to test an existing theory.

1.7.3 Research design

Several design types include experimental, comparative, case study, cross-sectional, longitudinal, and survey (Johnson, 2021; Rodriguez, 2021). According to Creswell (2014), in a cross-sectional survey research design, data is gathered from a large sample within a specific period to assess their opinions on a phenomenon being investigated. This research seeks to gather participants' views on PPP implementation in Ghana. A cross-section explanatory, correlational survey design was adopted to examine data for a generalisable understanding (Saunders et al., 2015) of the PPP implementation in public infrastructure project management.

1.8 NOVELTY OF THE STUDY

This study tests a novel framework that incorporates public entity organisational resources, tendering process, and project performance for successful PPP project management in the Ghanaian context. The study is unique because it broadly assesses the public entity project organisational resources and tests the applicability of the Resource-Based View (RBV) and Stewardship Theory of Corporate Governance (STCG) together in Ghana. The study is novel as it will lead to developing new strategies and guidelines in utilising project organisational resources for PPP project success. The study further helps in new policy design and direction for successful PPPs within the Ghanaian context.

1.9 CONTRIBUTION OF THE STUDY

This research could offer significant contributions to theory, policy, and practice in a variety of ways with the following being some possibilities.

Theoretically contributions – Generally, the study expands on existing theories regarding PPP, especially within the context of a developing country like Ghana through conceptual understanding, model development and comparison across contexts. These contributions are explicated as follows.

- ***Enhanced conceptual understanding***: The research provides a better understanding of the relationship between public sector resources, competition, transparency, and performance in public-private partnership (PPP) projects. It provides empirical evidence that researchers could use in challenging or confirming existing theories on how public sector resources impact PPP performance, contributing to ongoing academic discourse. It also provides new insights into the complex dynamics of competition and transparency in the tendering process.
- ***Model Development***: The research helps in developing a model that explains the dynamics and outcomes of PPP projects. The results of this research could be used by academics to validate or challenge existing theories about the role of resources, competition, and transparency in project performance.
- ***Comparison across contexts***: Given that the study focuses on Ghana, it contributes to theories about how context-specific factors (e.g., political, economic, cultural, institutional) shape the functioning and outcomes of PPP projects.

Policy Contributions – The result of the study also contributes to enhanced policy making in the following specific ways.

- ***Policy guidelines***: The results of the study could be used to inform the design of new policies aimed at improving the efficiency and effectiveness of PPP projects in Ghana with possible application in other nations across the world. Such policies could be shaped around optimal use of public

sector resources, the level of competition required in the tendering process, and the degree of transparency. To this end, the results of the study have been used to provide recommendations for increasing competition and transparency in the tendering process, which could benefit not only Ghana but also other countries with similar challenges. The results also provide insights into the optimal allocation and management of public sector resources in PPP projects, which could be useful in the formulation of better resource management policies.

- ***Risk Assessment***: The findings could guide policy-makers in assessing and managing risks associated with PPP projects, particularly those related to resource allocation, tendering process, and project performance.
- ***Regulatory framework***: The research could highlight gaps or challenges in the existing regulatory framework governing PPP projects, thus informing necessary reforms.

Practical contributions - The study is useful in identify practical strategies for improving the performance of PPP projects, which could be directly implemented by policymakers and practitioners in Ghana and other similar contexts with the following being some of the specifics.

- ***Capacity Building***: The findings could be used to develop training programs for public and private sector stakeholders involved in PPP projects. The training could focus on resource management, competitive tendering procedures, and transparency mechanisms.
- ***Operational efficiency***: The research could offer practical insights for enhancing the operational efficiency of PPP projects. This could include strategies for resource optimisation, competitive bidding, and transparent operations.
- ***Stakeholder engagement***: The study could help improve stakeholder engagement practices because it has highlighted the role and importance of transparency in building trust among stakeholders.

These contributions could be highly valuable, given the growing interest and investment in PPPs worldwide and the ongoing efforts to improve their

performance and outcomes. Overall, this research provides a more nuanced understanding of how public sector resources, competition, and transparency affect PPP project performance in Ghana. This enhanced understanding could contribute to more successful implementation of such projects, potentially leading to enhanced infrastructure development and better public services in the country.

This study is also valuable because it addressed at least two sustainable development goals (SDGs) (SDGs 8 and 9) for Ghana (United Nations Development Programme, 2021). Firstly, the study outcome addressed SDG 8: Promote sustained, inclusive, sustainable economic growth, full and productive employment, and decent work. This goal links with the national development agenda of promoting development-oriented PPP policies to support productive economies, create innovation in public supplies, and encourage the formalisation and growth of local contractors through access to financial services and technology for public projects. SDG 9 is to build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation. The purpose is to develop quality, reliable, sustainable, and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being. This research creates knowledge that enhances the capabilities in infrastructure space and project management using the PPP framework as an alternative route to increase public-private partnerships and for economic growth for Ghana (Ghana National Development Planning Commission, 2013). Finally, this study adds to existing theoretical project management knowledge by unravelling the complex relationships between public entity project organisational resources and tendering process for successful PPP project management.

1.10 SUMMARY OF THE THESIS CONTENT

The study is made up of seven chapters. Chapter one introduces the study background, problem statement, aim or the purpose and objectives of the study, research hypotheses, and summary of the philosophical stance of the research and research processes. The chapter ends with the novelty of the study.

Chapter two reviewed the literature of the study. The chapter comprises research pertinent to project management, the conceptualisation of PPP, a historical review of PPP, PPP experience in Ghana: challenges and benefits, the impact of organisational resources, and tendering process on PPP performance, among others.

Chapter three focused on the context of the study. The chapter looked at PPP as practised in the Ghanaian context. The chapter includes the following sub-themes: background of PPPs in Ghana; PPP at the national and local level; ongoing and completed PPP projects in Ghana; common challenges of PPP in Ghana; and the PPP experience at the district level in Ghana, among others.

Chapter four was mainly on the theoretical foundation, conceptual framework hypothesis of the study. It explains the theories adopted and how they apply within the Ghanaian context. The Resource-Based View (RBV) and Stewardship Theory of Corporate Governance (STCG) form the main theories, hypothesising PPP performance in this study. The conceptual framework defines the relevant variables for the research and maps how the variables relate to each other.

Chapter five comprised the research design and methodology used. The chapter included the philosophy and paradigm adopted, the study approach, the study's population and sample size, and the data analysis format for which PLS-SEM was used. The chapter ended with the ethical considerations of the study.

Chapter six covered the statistical analysis, results and discussion. Descriptive statistics, Statistics data normality, measurement (i.e., reliability and validity tests), and structural models (hypothesis testing), among others, were done in this chapter. The chapter ends with the importance-performance map analysis.

Finally, chapter seven concluded the study and recommendations. The chapter highlights the contributions made in this study, the implications for policy decisions, management practice and further research. The chapter revisits the aim and

objectives. A modified organisational factor influencing PPP performance, supported by the hypotheses tested and the results. The chapter ends with the study's limitations.

1.11 CHAPTER SUMMARY

This chapter has introduced the study by stating the background, problem statement, aim or the purpose and objectives of the study, research hypotheses, and summary of the philosophical stance of the research and research processes. The chapter includes the study's gap, the motivation of ensuring resources and tendering process effectiveness on PPPs performance in Ghana via public-private partnerships in meeting deficit public infrastructure, and project management practices. Four main sustainable development goals (SDGs) addressed in this chapter (SDGs 8, 9, 11 and 17) in delivering public infrastructural supplies for Ghana have been mentioned. The next chapter reviews the literature relating to project management.

CHAPTER 2

PROJECT MANAGEMENT OF PPP INFRASTRUCTURE PROVISION

2.1 INTRODUCTION

The global infrastructure market is growing and generally is characterised by rapid change. As a result, many organisations and countries are redefining themselves, embracing project-based business activities instead of traditional operations for public project management. This new paradigm has affected how public infrastructural projects are managed and conducted to create value. For example, the conventional public construction project management strategy where state agencies provide public infrastructure now welcomes private participation through PPP.

This chapter reviews the following project management issues related to the study. Firstly, projects and project management are conceptualised. Secondly, the project management knowledge areas defined by the Project Management Institute (PMI) are discussed. After that, the project management process groups (as defined by the PMI), also called the project life cycle, are examined. It is considered necessary not to discuss these two under separate sections because they consist of the same topics.

According to PMI (2015), projects generally consist of five process groups, namely initiating, planning, executing, monitoring, controlling, and closing, while a project management life cycle consists of five distinct phases initiation, planning, execution, monitoring, and closure. The category that is missing from the life cycle framework is controlling. However, the controlling aspects are embedded in the monitoring category when viewed from the lifecycle perspective. It would therefore be repetitive to discuss the lifecycle and process groups separately. The discussion here is entitled "*project management process groups*" for convenience. Next, the differences between public and private sector project management methods are discussed. After that, public sector infrastructural project management drivers and the determinants of project management performance

are discussed. The chapter ends with the reasons for adopting PPP in the context of providing public infrastructural projects.

2.2 PROJECTS AND PROJECT MANAGEMENT

The discussion here focuses on the conceptualisation of projects and project management in the context of public infrastructure project management. The intention is to lay a generic project management foundation for understanding the context within which public infrastructure projects are carried out.

2.2.1 Conceptualising a project

In this section, project is conceptualised to lay the foundation for understanding project management and for that matter, PPP project management. This exercise involves defining a project, discussing the uniqueness of projects, identifying project characteristics, outiling the various types of project resources, discussing what constitutes project success and project governance and transparency.

2.2.1.1 Defining a project

Projects are defined differently by different professional bodies and institutions. For example, projects are described by British Standard 6079 (2000) as a unique set of coordinated actions with specified starting and stopping points conducted by an individual or organisation to fulfil specific performance targets within the established schedule, cost, and performance limits. Also, according to Project Management Association (2004), projects are one-of-a-kind, short-term endeavours with a specific goal in mind. According to the Project Management Association of Japan (2005), a project is a value-creation activity based on a defined purpose within a set or agreed-upon schedule and under certain constraints such as resources and external constraints. According to PRINCE 2 (2009), a project is a management environment meant to deliver one or more business products in compliance with a defined business case. The most current

definition is the one offered by the Project Management Institute (PMI) (2015), the leading professional membership association for project managers (Tokar, 2018), which describes a project as a temporary endeavour undertaken to create a product, service, or result. This study, however, defines a project as a short-term endeavour with a distinct outcome (public facilities) which are completed on schedule (time), within a specified budget (cost), meets stakeholders' expectations and creates value (quality). Following this definition, the product in this study is any product from a public infrastructure project. Thus, the project could be hospitals, schools, and correctional facilities (prisons), among others, are the project's product.

2.2.1.2 Uniqueness of projects

All the definitions above have common themes throughout. They include uniqueness, temporary, and focus. Regarding time, location, and the team performing the job, product, service, or project, it may be a project that has not been done before (unsolicited project proposal). The project should, however, be something that has not been done before by someone, someplace. As a result, projects are said to contain some aspect of originality. It is temporal: the project may have a beginning and an end. Thus, it could be done by a temporary organisation to carry out the task based on given resources and budget. The team may move on once the project is completed. The financial resources accessible to the project may also be limited and transient. Thus, after completion, the funding ceases.

Furthermore, from the definitions, a project is a new unique or an improvement or correction to an existing item. It can also be a mixture of one or more publicly available items, services, or outcomes to be provided (PMI, 2015; Mulcahy, 2013). For instance, it offers multi-purpose sporting facilities that serve both the public university and the community where the university is situated. In addition, the outcome of a project depends on effective and efficient resource utilisation to accomplish the project outcome of cost and quality and meets scope specification requirements. Any unique product, result, or capability to execute a service that

must be developed and to complete a process, phase, or project can be considered an outcome. This may be referred to as a deliverable. The deliverable may be tangible or intangible depending upon the organisation's strategic objective of the organisation and products or services offered (PMI, 2015; Mulcahy, 2013). A public sector project deliverable for a university could be a library block with computers and air conditioners installed. Some project deliverables may have repetitive aspects. Yet, each project will remain unique with critical features regarding location, design, environment, situation and people involved (PMI, 2015; Mulcahy, 2013).

2.2.1.3 Project characteristics

The characteristics of a project are evident in project documents, whether for commercial or non-commercial purposes. The features must be defined, including emergency, uncertainty, social construction, or general purpose. The definition will involve people and organisations in identifying the need to be provided. The uniqueness of the project needs must attract financial obligations from private and public sector bodies to invest their resources. Elements such as the temporary nature of the project, mission focus, and the benefits and or the change impacts of the project on the people, and the organisation’s future, further highlight better need assessment of the project before construction. Integrating the requirements of identified stakeholder groups ensures the project is accepted (GroBer, Riediger and Jurien, 2022; PMI, 2015; Mulcahy, 2013; Harvey, 2010).

The features or characteristics defined in the project help design project delivery methods or contract types for each project which helps with quality assurance (Lee, Mistur and Ashuri, 2022). According to GroBer, et al. (2022), explicit project characteristics formalise relations between documents to be provided and ensure consistency. This consistency improves completeness and facilitates review activities that must be done to the general contract document. Documented project characteristics that define project scope and specifications requirements are resilient enough to attract private investments (Cuttaree and Mandri-Perrott, 2011). Contractors contribute to the project through the bidding process. And the

requirements provided in the bidding contract must meet standards to eliminate risk and improve project performance (GroBer et al., 2022).

2.2.1.4 Project resources

A project may entail a single person or a group of individuals collaborating to complete a project or phase. Similarly, a project can be started by a single organisational unit, numerous organisational units, or multiple organisations pooling resources (PMI, 2015; Mulcahy, 2013). Resources must correspond to the project demands. This demand may require a shift in organisational thinking for strategic direction to reap the benefit and minimise project costs. From a business perspective, a project requires effective and efficient resource usage. Thus, public infrastructure projects require effective and efficient resource usage to achieve a specific objective or maximise returns for shareholders or larger stakeholder groups.

In the public lens, projects involve solving social needs by providing public facilities. The returns might not be a factor here since this is for social investment. Moreover, mitigating deficit infrastructural needs for citizens should be the priority. Yet still, the project returns might be a factor since the highly capital-intensive nature of these kinds of projects requires significant resources from the state. Hefetz et al. (2014) indicated public infrastructural projects are capital projects requiring considerable budget implications on national resources. If the country's fiscal spaces are not right, the project might not be completed on schedule, and the cost of operation might be high to the state than expected (Schuler, 2012; Hilmarsson, 2017). Thus, as a public agency, the organisation must prepare before the project begins. This approach ensures there is rethinking regarding successful project completion and project cost allocated or available. Effective and efficient organisational resource usage by ensuring partners engage the essential resources and information collaboratively shared for the completion of the project on cost and within the schedule is critical. Public procuring agencies, for instance, must focus on better project needs and prioritise risk assessment before contracting it. The project initiated must have the necessary resources to

undertake the project engagement to create value (Ding and Bodea, 2022; PMI, 2015; Mulcahy, 2013).

2.2.1.5 Project success

The above definitions also provide the elements that must be observed and assessed to enhance the context of the project. The project must be focused on delivering the organisation's core strategic objective or clear idea and the specific mission the project is set up to produce, thereby meeting the parties' (PPP partners) performance criteria. It, therefore, means that the project objective must be aligned with the overall strategic goal of the organisations involved in the PPP arrangement (PMI, 2015; Mulcahy, 2013).

In public agencies' case, meeting the national development agenda by providing citizens with quality public facilities (infrastructural projects) is the national mission. This must be done within the national budget account whiles citizens can afford the payment strategies defined through flexible payment terms designed in the contract. The possibility of leveraging the cost risk of the project and guaranteeing future funding approaches call for private partners to participate in the process. Whilst the prime objective is to share risk and create benefits. Nonetheless, profit maximisation is the core objective of the private partners in engaging in the contract. The state, however, gains by possessing the facilities provided by resolving its deficit challenge of infrastructural needs being mitigated.

Nonetheless, projects are initiated fundamentally based on meeting four main objectives. Specifically, to comply with regulatory, legal, or social obligations; to meet stakeholder needs; to adopt or adapt commercial or technical strategies; and to create, improve, or repair products, processes, or services (PMI, 2015; Mulcahy, 2013). Whatever the purpose for initiating the project, these factors influence an organisation to utilise its limited resources and the effort of the leaders to strategise and make the necessary change impact cost and schedule the project completion date.

Furthermore, project success elements should be linked to the organisation's strategic objectives to generate a business value argument and policy consistency, particularly for public sector initiatives. The view is to ensure policy coherence and consistency of the projects in line with national goals and national development planning policy. The issues in the public organisations' multiple goals create policy incoherent in national project development and management for success (Negoita, 2018).

The policy inconsistency regarding national infrastructural funding and support, mostly in developing economies, affects the delay and cost of national projects (Hefetz et al., 2014). This situation might be due to different political ideologies and regimes' divergent national agendas towards infrastructural provision. The various viewpoint affects national project delivery objectives, which tend to impact project development and performance (Hefetz et al., 2014). Thus, inconsistency affects project prioritisation and selection for most development projects (Hefetz et al., 2014; Pilkaite and Chmeilauskas, 2016; Maceta and Berssaneti, 2019).

Yet still, projects in the public sector have become integral upon which development partners continue to provide the needed assistance through bilateral and multilateral cooperation for additional funding and support for infrastructural provisions in developing economies (Yamin and Sim, 2016; World Bank, 2015). Therefore, continuous funding and support will call for success factors or criteria in monitoring, coordinating, design training and institutional environment that significantly relates to project success (Yamin and Sim, 2016; World Bank, 2015).

According to the Project Management Institute (2015), a project is successful when completed within scope, time, cost, quality, resource, and risk constraints. Atkinson (1999) looked at project success from the "iron triangle" of time, cost, and quality perspective. Shenhar (2001), cited by Yamin and Sim (2016), referred to project success on a measurement scale that must be met regarding project efficiency, customer impact, business and immediate success, and future planning. Thus, a project is successful when it is completed within the identified constraints (scope, schedule, cost, quality, risk and meeting stakeholders' expectations).

In the private sector, project success is measured based on profit maximisation for the shareholder's motive (Hefetz et al., 2014; Pilkaite and Chmeilauskas, 2016; Maceta and Berssaneti, 2019). However, success is pronounced differently in public sector projects (Maceta and Berssaneti, 2019). The criteria in the public sector focus on transparency, fairness, and openness.

2.2.1.6 Project governance and transparency

Ultimately, ensuring quality governance formally and informally, for instance, is to build trust in the public procurement system and process, thereby achieving the stated objectives or meeting the criteria in public project implementations (da Cruz et al., 2016; Maceta and Berssaneti, 2019).

Public project administration is under pressure from stakeholders worldwide, including citizens, who expect value in the value chain of public supplies (Elilis, Matin, Ramcharitar, 2019). Schedule slippage, cost overruns, and poor quality are typical in public project supplies (Elilis et al., 2019). Project stakeholders are encouraged to ensure high transparency and openness in the procurement process, creating value and meeting public project performance on cost and within time. This requires taking responsible and reasonable decisions or actions on public spending on the projects to create value (Hefetz et al., 2014; Pilkaite and Chmeilauskas, 2016; Maceta and Berssaneti, 2019).

The governance and transparency requirement aligns with the study definition of a project as a short-term endeavour to develop innovative public facilities that are finished on time and within budget and meet stakeholders' expectations to create value (PMI, 2015; Mulcahy, 2013). The temporary nature of a project is that the public budget is under constraints and competing with different project needs and objectives. The resources needed to provide the project facilities are limited in supply and call for maximum usage at the private and public contracting levels, especially in partnership engagements. Whilst project facilities must be completed on schedule and within cost to meet political campaign promises, citizens want value for money off their taxes for funded projects. The implication is that achieving

these competing needs calls for project management practices for using public entity project organisational resources among the project partners for successful Public-Private Partnerships performance for value.

Having discussed what a project is, the following section discusses what project management entails.

2.2.2 What is project management?

The question of what project management means requires one first to define it. The Project Management Institute (PMI) (2023), perhaps the most authoritative project management professional body, defines project management as “the use of specific knowledge, skills, tools and techniques to deliver something of value to people”. Similarly, the Association of Project Management (APM) (APM, 2019) defines it as “the application of processes, methods, skills, knowledge, and experience to achieve specific project objectives according to the project acceptance criteria within agreed parameters. Project management has final deliverables constrained to a finite timescale and budget”. These definitions suggest that project management can be defined as *the implementation of an integrated system consisting of several knowledge areas, tools, techniques, activities, and processes to achieve a specific objective within a specified time, cost and quality*. This definition leads to the need to examine its important components below.

Firstly, project management includes identifying requirements and stakeholders' many demands, concerns, and expectations as the project is planned and executed (PMI, 2015; Mulcahy, 2013). It is critical to balance competing project restrictions, including scope, quality, time, money, resources, and risk, to mention a few (Mulcahy, 2013). Moreover, the definition of project management above highlighted key variables (*knowledge, skills, tools, and techniques*) whose applications are relevant to managing a project (Mulcahy, 2013; PMI, 2015).

The value of an integrated project management system cannot be overstated. The learned information, skills, tools, and methodologies are all applicable in helping organisations meet their project requirements or objectives within cost and on schedule (Mulcahy, 2013; PMI, 2015). Also, the appropriate integration of project management techniques, knowledge and skills through the required project management processes can help to effectively and efficiently apply resources to create value in PPP projects (Mulcahy, 2013; PMI, 2015).

The project management techniques, knowledge and skills help to balance project constraints such as scope, quality, schedule, costs, resources, risk, and customer satisfaction. At the same time, they help offset the impact of project constraints (as the increased scope can directly increase cost or schedule) (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). Further, when appropriately integrated, the project management techniques, knowledge and skills help respond to risk and uncertainties in real-time, meet business objectives and stakeholder expectations and raise chances of success. They also improve the use of organisational resources; manage change more effectively; identify, recover, and or terminate failing projects.

Project management is most effective and efficient when project resources are judiciously utilised to respond appropriately to the influence of a changing project environment. Therefore, the judicious utilisation of PPP resources is a precondition for the project baseline objectives to be achieved on cost and within schedule (time) (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018).

2.3 TWO PROJECT MANAGEMENT FRAMEWORKS

As stated in Section 2.1, two important project management frameworks considered pertinent to the current study are the project management knowledge areas and the project management process groups. They are crucial to this study because knowledge areas specify the cognitive abilities PPP project managers must possess. At the same time, the process groups or life cycles define the processes that the PPP must undergo. It is again argued that the differentiation in

nomenclature or terminology is only cosmetic as the issues considered under project management process groups are identical to those covered under the project life cycle terminology.

While discussing project management frameworks, it is vital to bring up the issue of *project management methodologies*. It is crucial to bring this matter up early because those new to project management terminology could easily confuse methodologies and frameworks and use them interchangeably. Yet, they are distinct terminologies (Kissflow.com, 2023). As elaborated in subsequent sections, the term *project management framework* provides a flexible overall structure and direction to a project (Kissflow.com, 2023). In other words, a project framework guides projects to their goal while being flexible enough to adapt to evolving conditions. On the contrary, project management methodologies are detailed, rigid and prescriptive (Kissflow.com, 2023). Examples of project management methodologies are PRINCE2, Agile, Kanban, Waterfall, Scrum and many more.

Considering the nature of this study, no more attention will be paid to project management methodology as it is not so relevant to the current research. Instead, the review will primarily focus on project management frameworks.

2.3.1 Project management knowledge areas

To date, the Project Management Institute (2023) has identified ten project management knowledge domains. It includes scope management, time management, cost management, risk management, human resource management, procurement management, communication management, stakeholder management, quality management and integration management, and agile management are some of the knowledge areas covered (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013; Harvey, 2010).

2.3.1.1 Integration management

Admittedly, project integration management is challenging to comprehend. However, it is safe to view integration management as establishing a project charter, developing a project management strategy, directing and managing project activity, managing project knowledge, monitoring and controlling project work, executing integrated change control, and closing the project (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013; Harvey, 2010). All processes in all knowledge area domains are integrated into alignment (scope, schedule, cost, quality, resource, communication, risk, procurement, and stakeholder management). Project management does not happen in a vacuum but results from teamwork and harmony achieved through integration (Larson & Gray, 2018; PMI, 2015; Mulcahy, 2013; Harvey, 2010). Therefore, project integration management can be seen as the knowledge area that helps project teams work together more seamlessly by combining other knowledge areas and various processes, systems, and methodologies to work synergistically. This knowledge area will be vital in managing PPP projects for at least two reasons. Firstly, because PPP involves at least two stakeholder groups (public and private sector) in the project team, interests are bound to differ, with each group working under its expectations and sometimes methodologies. Moreover, managing PPP projects could be complex because they are usually large. In such situations, project integration management becomes critical to a PPP project's success.

2.3.1.2 Scope management

The practices required to ensure that the project includes all of the necessary work and only the work needed to execute the project successfully are known as project scope management (Larson & Gray, 2018; PMI, 2015; Mulcahy, 2013). For Monnapa (2023), "project scope management defines and outlines all work included within a project, such as objectives, tasks, outputs, and deadlines". This definition is concise and easy to comprehend. Based on these definitions, the primary goal of project scope management is regulating what is and is not included in the project.

Specifically, the main scope management activities include collecting requirements, defining the scope, constructing a work breakdown structure (WBS), and validating the scope. Collecting requirements is developing and recording stakeholder expectations to meet project objectives (Larson and Gray, 2018; Mulcahy, 2013). Defining scope is writing a detailed description of the project's goals and objectives (Larson and Gray, 2018; Mulcahy, 2013). WBS involves breaking down project deliverables and work into smaller, more manageable parts. Validating the scope of work means formalising project deliverables (Larson and Gray, 2018; Mulcahy, 2013).

The take-home from the above discussion is that scope management guides how a PPP project manager must manage and control the project's scope so that project scope creep does not occur. Secondly, appropriate scope management is necessary for PPP projects because public money is at stake, and accountability will be paramount. Moreover, Ghana is known as a heavily indebted country. It is only reasonable that proper scope management pervades PPP project management in Ghana. With a clear scope, PPP project managers in Ghana can ensure that scope creep with its attendant cost escalation will be avoided.

2.3.1.3 Time management

Project time management refers to the procedures that must be followed to ensure the project is completed on time (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013). Time is one of the most expensive resources in project management that cannot be compromised. Yet a significant challenge of project management is effective and efficient time management. The problem is that a delay in timing translates into cost and further expenditure that might be beyond project team members' control (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013). Scheduling, schedule monitoring, and controlling are vital components of this knowledge area (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013). A significant incentive for public sector participation in PPP is that private sector participation in PPP enhances time-saving and time certainty (Rao and Safdar, 2019). A usual cliché in business is time is money. This axiom takes us to project cost

management since money and costs are literally synonyms – meaning project costs are time-dependent.

2.3.1.4 Project cost management

A cost is a resource sacrificed to attain a specific goal or something given up in exchange for it (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013; Harvey, 2010). Larson and Gray (2018) indicate that project cost management encompasses the procedures necessary to complete the project within the approved budget.

The first deliverable in the cost management process is the Cost Management Plan, which is a document that contains policies, procedures, and frameworks for how project costs will be managed and controlled (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013; Harvey, 2010). PPP cost management must be planned. Developing rules, procedures, and documentation for project cost planning, management, spending, and control constitute cost management planning and are essential for effective and efficient PPP project management (Larson & Gray, 2018; PMI, 2015; Mulcahy, 2013). It includes accurately estimating the financial resources required to complete the PPP project scope (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013). It also involves appropriate PPP budgeting (combining the projected costs of specific activities, task packages, or resources to create an authorised cost baseline) (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013). Finally, PPP project costs must be controlled by monitoring the project's progress to update the budget and manage changes to the cost baseline (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013). Like time management, a significant incentive for public sector participation in PPP is that private sector participation in PPP enhances and ensures cost savings, thereby guaranteeing value for money.

2.3.1.5 Human resource management

Project human resource management includes the procedures for organising, managing, leading, and motivating the project team (Larson and Gray, 2018;

Mulcahy, 2013). It also involves identifying and specifying project roles and duties and the project's required skills and reporting format (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013). These generic project management roles are also applicable in managing PPP projects. For example, the PPP project manager must effectively organise, manage, lead, and motivate the team comprising people assigned tasks and responsibilities to complete the project.

Active involvement and participation by team members in the planning process strengthen team members' commitment to the project (Larson and Gray, 2018). For PPP projects, it makes more sense for all stakeholders with different and divergent objectives to be involved in planning to have their buy-in and commitment.

Making the best use of a project's resources can save money and time. The team competencies will have to be developed to enhance project team performance. Also, tracking team members' performance and providing honest and real-time feedback is critical for project success. (Larson and Gray, 2018; Mulcahy, 2013). For these reasons, PPP infrastructure project managers must consider the human resource function as a critical competency to execute.

2.3.1.6 Project quality management

Quality management is one of the most critical facets of any project, including the construction project's success (Mane and Patil, 2015). More so because “in construction, project quality is a project feature that meets the expectations of critical project stakeholders….” (Rajaratnam, Jayawickrama, and Perera, 2021:4). Similarly, PPP projects must have an effective quality management system at the construction sites with clear policies and procedures required for continual process improvement throughout the project phases (Mane and Patil, 2015). Moreover, for example, performing quality assurance is auditing quality requirements and quality control measurement results to ensure that approved quality standards and operational definitions are followed). Another critical project quality management procedure is identifying quality requirements or standards for the project and

product and documenting how the project will demonstrate compliance (PMI, 2015; Mulcahy, 2013; Harvey, 2010). For example, quality assurance auditing and quality control measures are imperative to ensure approved quality standards (PMI, 2015; Mulcahy, 2013). It stands to reason that quality management is crucial to PPP infrastructure project success. Unfortunately, according to Osei-Bonsu, Kissi, and Agyekum (2016), the construction industry performs poorly in quality compared to other industries in Ghana.

As Rajaratnam et al. (2021:4) allude to, a key reason for poor PPP project quality is the loosely structured relationships among project participants. In other words, close relationships among participants can promote project quality assurance. In this respect, Larson and Gray (2018) and Mulcahy (2013) aver that effective quality management systems at project construction sites always consist of well-established quality management policies and procedures for continual process improvement throughout the project phases (Larson and Gray, 2018; Mulcahy, 2013). The extent to which relationships among project participants are close or not in Ghana's PPP projects is unknown, as the literature search did not reveal any evidence.

2.3.1.7 Risk management

Risk is uncertainties that can positively or negatively impact accomplishing project goals (PMI, 2015; Mulcahy, 2013). This definition indicates that the event has a chance of occurring between 0-100% of the time. There is no danger if there is a 0% chance of something happening, and if an occurrence has a 100 per cent likelihood of occurring, it is a certainty that it will impact the project objectives (PMI, 2015; Zavadskas et al., 2014; Mulcahy, 2013). Risks come with negative consequences, called threats, and these increase the cost of a project, including PPP projects and impact overall project objectives (Zavadskas et al., 2014; Mulcahy, 2013). Likewise, risks with positive consequences, called opportunities or positives, could be enhanced or shared for the benefit of the project partners (PMI, 2015; Jayasudha and Vidivelli, 2016). PPP obviously intends to share risk among public sector entities and private partners. Example of risk that can affect

PPP projects includes demand risk, environmental risk, organisational factor-specific risk, regulatory risk, flood risk, currency exchange risk, technology risk, credit risk, political risk, and many more (Jayasudha and Vidivelli, 2016; Forteza et al., 2022).

Project risk management aims to reduce or minimise risk severity (PMI, 2015; Jayasudha and Vidivelli, 2016). Effective project risk management strategies minimise project risks to the minimum level that benefits the parties (PMI, 2015; Mulcahy, 2013; Jayasudha & Vidivelli, 2016). Effective risk management includes planning, identification, analysis, monitoring, and control (PMI, 2015; Jayasudha and Vidivelli, 2016). On the other hand, efficient project risk management entails proactiveness to minimise the project's hazards (PMI, 2015; Jayasudha & Vidivelli, 2016). The project team must therefore be proactive rather than reactive in managing project risk (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018; Russell et al., 2018). In PPP project management, proactivity is likely a problem, given the different stakeholders and their views on risk in general.

2.3.1.8 Communication management

The procedures that must be followed to ensure that project information is generated, gathered, distributed, saved, retrieved, and disposed of promptly and appropriately are referred to as project communications management (PMI, 2017; Mulcahy, 2013; Larson & Gray, 2018). Project managers spend roughly most of their time (90%) communicating (PMI, 2017; Mulcahy, 2013). This situation means that managers of PPP project communication might even be more considering Most of the projects might even spend more time given the more significant number of stakeholders in PPP projects (Zavadskas et al., 2014; Mulcahy, 2013).

Communication PPP project activities have many dimensions, including internal project team members and external stakeholder groups such as the public entity and the private partner. Good communication management builds a link between the various stakeholders participating in a project and facilitates the integration of

diverse viewpoints and interests typical in PPP project execution (Larson and Gray, 2018; Zavadskas et al., 2014; Mulcahy, 2013).

2.3.1.9 Stakeholder management

Stakeholders have a lot of power and influence over a project. Project stakeholder management aims to identify all persons or organizations impacted by a project, understand stakeholder expectations, and engage stakeholders effectively (Eskerod & Jepsen, 2016). Stakeholder management is critical because projects affect different stakeholders differently (Aladpoosh, Shaharoun and Saman, 2012). Various stakeholders may have competing project requirements, interests and power that influence the project's outcome (Tsetse et al., 2021; Larson and Gray, 2018). For example, PPP project deliverables could be rejected if they don't meet public entity needs (Tsetse et al., 2021; Larson and Gray, 2018; Eskerod and Jepsen, 2016; PMI, 2015; Mulcahy, 2013; Aladpoosh et al., 2012). On the other hand, a PPP project would gain buy-in with stakeholders' involvement (Sumanta, 2016; PMI, 2015; Mulcahy, 2013; Harvey, 2010). As stated earlier, communication and collaboration in multiple project environments like PPPs with project stakeholders are essential to meet their needs and expectations, resolve issues, and encourage participation in project decisions and activities (Larson and Gray, 2018; PMI, 2015; Mulcahy, 2013). Also, controlling stakeholder engagement, monitoring stakeholder interactions and changing stakeholder engagement plans and strategies are relevant to PPP projects (Larson and Gray, 2018; Sumanta, 2016; PMI, 2015; Mulcahy, 2013; Harvey, 2010).

2.3.1.10 Procurement management

Purchasing goods, works, and services from a third party is known as procurement (Mwikali and Kavale, 2012). Other terms used in this process include purchasing and outsourcing (Mulcahy, 2013; PMI, 2015; Russell et al., 2018). Subcontractors may be hired by the project organization to oversee a portion of the contract (Mulcahy, 2013; PMI, 2015; Russell et al., 2018). Contracts between a buyer and a seller are sometimes used in procurement. A contract is a legally enforceable

agreement that requires the seller to deliver the specified products, services, or outcomes in exchange for the buyer's monetary or other valuable consideration. The agreement might be simple or complex, depending on the complexity of the deliverables and work necessary (Larson and Gray, 2018; Zavadskas et al., 2014; Mulcahy, 2013).

A typical project procurement process will include plan procurements which involve documenting project procurement/purchasing decisions, defining the methodology, and locating potential vendors (Larson and Gray, 2018; Zavadskas et al., 2014; Mulcahy, 2013). Conduct procurement is the procedure for obtaining answers from sellers, selecting a seller, and awarding a contract (Larson & Gray, 2018; Zavadskas et al., 2014; de Araujuo et al., 2017; Mulcahy, 2013). The process of administering procurement entails managing procurement relationships, evaluating contract performance, and making the necessary changes and corrections to the contract (Larson and Gray, 2018; de Araujuo et al., 2017; Mulcahy, 2013). The term "close procurements" refers to completing the procurement for each project (Larson and Gray, 2018; Zavadskas et al., 2014; de Araujuo et al., 2017; Mulcahy, 2013). This process has profound implications for PPP infrastructure project management because each party (the public entity and the private partner) could spend considerable time settling the legalities and responsibilities between them.

2.3.2 The process group (lifecycle) perspective

Besides the abovementioned knowledge, a sequence of project management procedures must be followed for effective project management (PMI, 2015). A project management process is a logical group of project management procedures collaborating to achieve project objectives (Mulcahy, 2013; PMI, 2015). The five project management process groups are initiation, planning, execution, monitoring and control, and closure (Mulcahy, 2013; PMI, 2015).

2.3.2.1 The initiation process (phase)

The initiation phase of a project or a new phase of an existing project begins with the initiation procedure (PMI, 2015; Mulcahy, 2013). Project authorisation is obtained at this phase to apply project resources after a project manager is appointed. High-level information is obtained to secure key stakeholders' inputs into the proposed projects. Project manager selection; determining organisational culture and existing systems; Identifying process, procedure, and historical information about the project; dividing projects into phases or smaller projects; understanding project business cases and benefits management plans are some project activities under the project initiation process (Mulcahy, 2013). Other tasks include determining initial needs, assumptions of high-level risks and constraints, finding existing agreements; determining project and product feasibility within limits; and evaluating project and product feasibility, among others. Further, initiating the process group involves establishing quantifiable goals and success criteria, identifying high-stakeholder groups likely to impact the project objectives and assessing their expectations, interest, influence, and impact on the project. Finally, the stage also involves seeking modifications or changes, creating a log of assumptions, and creating a list of stakeholders (PMI, 2015; Mulcahy, 2013).

2.3.2.2 The planning process (phase)

The planning process groups are made up of procedures that define the project's scope, refine the objectives, and detail the steps required to meet the project's objectives (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). These are the procedures expected in PPP public infrastructure project management. In planning, the PPP public infrastructure project team must keep to the timetable and execute the project on time. The development approach for the project, its life cycle, and how the team will plan for each expertise area are all decided here (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). The plan process group determines what to buy and prepares procurement documents by defining and prioritizing needs, developing a project scope statement, and deciding what to buy (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). The plan process group also

determines and plans for the project team that will be required. It is also responsible for creating the Work Breakdown Structure (WBS) and Work Breakdown Structure dictionary; an activity list; and a network diagram buy (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). Other activities under planning process groups that PPP public infrastructure project managers must deal with include estimating resource requirements, activity durations and costs; determining critical paths; and developing schedules and budgets (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). After the project budget has been set, the PPP public infrastructure project management team must determine quality standards, processes, and metrics, including all roles and responsibilities, all under the planning process group (Mulcahy, 2013; PMI, 2015; Russell et al., 2018).

The planning process group form a significant component towards effective and efficient project management. Hence, critical attention and proper documentation of activities must be done and followed suit. The project team will have to identify potential risks likely to impact the project objectives and document them. The team must also prepare communication plans to be communicated to the various stakeholders involved in the project (Mulcahy, 2013; PMI, 2015; Russell et al., 2018). Furthermore, under the planning process group, the PPP public infrastructure project team must return to previous iterations to double-check the plans (Zavadskas et al., 2014; Mulcahy, 2013). The project teams will then finish the procurement strategy and paperwork, build realistic and sufficient project management plans and baselines as part of the planning process and obtain formal approval from the stakeholders. The planning process group is the lengthiest procedure to be followed by the PPP public infrastructure project management team, and it must be done well if the correct results are obtained for the project (PMI, 2015; Mulcahy, 2013).

2.3.2.3 The executing process (phase)

The procedures needed to fulfil the activities outlined in the project management plan to meet the project's goals is the execution process group (Mulcahy, 2013). During execution, the PPP public infrastructure project management team must

work per the project management plan. Some broad critical tasks include creating deliverables, requesting and implementing changes where needed and continuously carrying out quality assurance activities (Zavadskas et al., 2014; Mulcahy, 2013). More specifically, other activities include the project manager obtaining final team and physical resources; managing people; evaluating team and individual performances, providing training; arranging team building events; giving recognition and awards; and using an issue log to handle disputes (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018).

Conflicts within the PPP public infrastructure project management team are expected to be resolved amicably at this stage because execution process groups facilitate conflict resolutions; realise resources as work is completed on schedule (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). The process also includes the project team sending and receiving project information and soliciting feedback as part of executing project plans and reporting on project performances (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). It is also expected that other project activities, including facilitating stakeholder engagements and managing expectations; holding meetings to update stakeholders on the project; evaluating sellers, negotiating with sellers; as well as using and sharing project knowledge are done here (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). Finally, executing contingency plans; and updating the project management plan and project document as the final steps for the executing process group (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018).

2.3.2.4 The monitoring and controlling process (phase)

Public infrastructure projects need to be monitored and controlled. This activity is undertaken by the monitoring and controlling process group. Broadly, monitoring and controlling the project, assessing performance against a performance measurement baseline, measuring performance against other metrics in project management, and analysing and evaluating data and performance are all project tasks that fall under the monitoring and control process group (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). Specifically, tracking, reviewing, and regulating the

project's progress and performance and identifying and implementing any necessary plan adjustments are all examples of specific activities under the monitoring and control procedures (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). These activities aid in assessing influencing variables that lead to changes in the project plan; seeking modifications; performing integrated change control; for the project (Zavadskas et al., 2014; Mulcahy, 2013). The monitoring and controlling activities ensure the work complies with the requirements (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). Due to frequent complaints about the quality of infrastructure projects, it is only prudent that public infrastructure projects executed through PPP must be carefully monitored and controlled.

2.3.2.5 The project closing process (phase)

The closing process group is the final phase of the project management process group. This stage consists of several important activities. The closure process group includes activities performed to formally complete or close a project (Mulcahy, 2013; PMI, 2015; Larson and Gray, 2018). It consists of the following actions. Validating that work has been completed according to specified requirements; completing final procurement closure; gaining final acceptance of the project (product); completing financial closure; soliciting customer feedback on the project; completing final performance reporting; indexing and archiving records; and gathering final lessons learned and updating knowledge bases to be used for the upcoming project (Mulcahy, 2013; PMI, 2015).

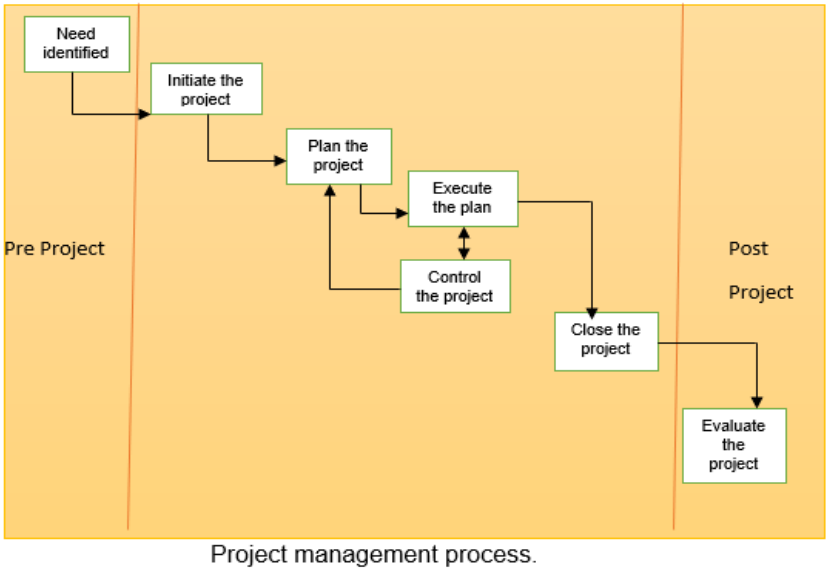

Figure 2.1: Project management process group

2.3.3 Summative assessment of project management frameworks

The above sections have discussed two common frameworks in project management: project management knowledge areas and project management process groups or lifecycles. Section 2.2.1 has highlighted the generic content knowledge required of project managers in charge of PPP projects. Similarly, Section 2.3.2 has highlighted the processes and stages or lifecycle project managers and their team members must go through to deliver PPP infrastructure that meets expectations. In other words, it is expected that judicious application of the pieces of knowledge throughout the project management processes and stages or lifecycle must lead to acceptable project performance. The question arises, how do we measure project performance to say that it is successful? The following section interrogates this issue.

2.4 PROJECT PERFORMANCE MEASUREMENT

Performance areas are a collection of measurements that focus on project aspects and audit such areas to satisfy project stated objectives based on the project's current and future status (Parmenter and Gerber, 2015).

A broad classification of anticipated outcomes in project contracts agreements can be referred to as project success criteria (Garvin et al., 2011). Garvin et al. (2011) allude to the following project success criteria relevant to PPP performance measurement. Firstly, performance measures must reflect financial and societal goals and be documented in the contract agreement. Secondly, performance measures must derive from realistic service levels the agency seeks and impose contractually. Third, the performance criteria must be reflected in the design, construction, operation, and maintenance of the facilities provided. Lastly, the performance measures must demonstrate how management integrates safety and environmental impact on project objectives apart from meeting the essential performance criteria (cost, schedule, and quality) set up in the contract.

Neely et al. (2000), quoted by Ingle and Mahesh (2020), employed the performance prism model, which included measuring stakeholder demands, developing process and capability plans, and so on (Quality Scotland, 2008). Furthermore, Kapan and Norton (1992), cited by Ingle and Mahesh (2020), suggested a balanced scorecard focusing on many aspects of the project, such as financial, customer, internal business process, and learning and growth. Nine performance model criteria are the focus of the European Foundation for Quality Management (EFQM). Leadership, people, strategy and policy, partnership and processes, and results as people, customers, and society results are the five enablers (Ingle & Mahesh, 2020). Leadership, strategic planning, customer, market focus, measurement analysis, knowledge management, and business results are all part of the Malcolm Baldrige National Quality Award (MBNQA) (Ingle & Mahesh, 2020). The PMI (2015) has indicated that the project cost, schedule, and quality, including other constraints such as effective risk management, stakeholder engagement, and customer satisfaction, are key performance measures to be considered in providing sustainable PPPs. These views (Ingle and Mahesh, 2020; Garvin et al., 2011; Quality Scotland, 2008; Neely et al., 2000) mean that infrastructure project performance measure is multi-faceted.

Every nation has its national development planning goals related to infrastructure provision. The increasing population of countries, including Ghana, means competing demands, including policy coherence and infrastructure needs. Therefore, in setting up project performance criteria, it is only reasonable that goals and performance criteria must align, including when providing public project infrastructure. In addition, performance measures must align with overall agency goals to create value for it (Liu et al., 2015; Garvin et al., 2014). PPP project committees should ensure project performance (success) criteria are based on policy coherence and national infrastructural agenda.

Public sector entities and partners in PPP projects need performance criteria. Garvin et al. (2014) recognised that key performance indicators are necessary for ensuring contract compliance. Today's importance of satisfying customer needs points to quality as a performance criterion. However, no customer, especially a public sector entity participating in PPP infrastructure projects, has bottomless pockets to the extent of not worrying about the cost. Similarly, it will be unreasonable to suggest that time is not essential. Nevertheless, PPPs are not a delivery method linked to performance management systems (Garvin et al., 2014).

The complexity of the construction project environment entails that different stakeholders have their measuring criteria to judge the success of the construction project. Ingle and Mahesh (2020) illustrated this complexity by revealing as many as ten areas to measure construction project performance: schedule, cost, customer relation, quality productivity, finance, environment, communication, finance, and stakeholder satisfaction. However, according to PMI (2015) and Sardar et al. (2021), this number can be whittled down to only three for construction projects, namely within time, on cost, and meets scope specification requirements. Despite the multiplicity of performance measures, the most successful standards for measuring constructional project performance are the combination of the financial and non-financial performance criteria (Ingle and Mahesh, 2020; Tripathi and Jha, 2018).

Public sector projects in Ghana are characterised by several challenges that tend to affect the overall performance. Most of the obstacles affecting project performance are financial. For instance, constraints of delayed payment to contractors may be attributed to inadequate cash flow, lack of government creditworthiness, and insufficient collateral security from contractors (Ofori et al., 2017). Moreover, the financial constraints lead to delayed completion dates and project cost overrun (Ahadzie et al., 2014; Danso and Ofori-Kuragu, 2014; Gyaase and Takyi, 2014; Osei-Kyei and Chan, 2017). This situation shows the intricate relationship between cost and time in managing public infrastructure projects. For this reason and due to scope limitations imposed by PhD research, *within cost* (financial) and *on time* (non-financial) are used to measure the performance of PPP infrastructure projects in this study.

2.5 CHAPTER SUMMARY

This chapter has provided significant insight into project management from a public sector perspective, especially regarding PPP infrastructure project management. First, the literature has revealed that creating value in public infrastructure requires due diligence in the PPP implementation process. For example, PPP tendering can only be improved and create value when organisational resources are effectively and efficiently utilized for effective PPPs. The literature review has also revealed that private and public partners in PPP projects gain value and effective resource usage when tendering processes are done competitively and transparently. In other words, if not compromised, the tendering process of submitting bids for evaluation and subsequent award of PPP contracts creates efficiency in using the organisational resources provided (Casady et al., 2019). Thus, whichever method is applied, the public sector organisation in a PPP program must ensure effective resource harnessing to achieve project objectives. It, therefore, means that procedures regarding formal and informal governance structures, capacities of the tendering entities, and risk-sharing strategies, among others, will have to be assessed and evaluated competitively. The next chapter

focuses on public-private partnerships and infrastructural development in the Ghanaian context.

CHAPTER 3

PUBLIC-PRIVATE-PARTNERSHIP IN GHANA

3.1 INTRODUCTION

The previous chapter provided an in-depth perspective on project management with a specific emphasis on project management in the public sector. The discussion led to the realisation that for government to deliver on its infrastructure provision promise, an innovative approach that includes the private sector is required. One of these innovations used in developed countries (such as the UK, China, Canada, Australia, Spain, Portugal, the USA etc.) is the public-private partnership (PPP) concept, where a public sector entity collaborates with at least one private sector partner to carry out government projects.

This chapter discusses PPP development and experience as an alternative approach to solving infrastructural needs for the country. It also provides an in-depth discussion of factors affecting the performance of PPP in the Ghanaian context. The chapter further discusses the background of PPP in Ghana; PPP development in developed and developing economies; selected completed and ongoing PPP projects in Ghana; and PPP development at the local levels.

3.2 THE HISTORICAL PERSPECTIVE OF PPP

In this section, the historical development of PPP is traced and discussed. The discussion starts with a global perspective. This consists of its developmental trajectory in the developed and developing country and the continental African contexts are presented and discussed. The discussion is finally narrowed to the Ghanaian context.

3.2.1 PPP in the developed countries

Historically, PPPs or Private Finance Initiatives (PFI) originated in the United Kingdom (UK) during the late 1980s and early 1990s (Sharer, 2022; Offer, 2022; Quiggin, 2022). Since its introduction, PPP has become preferred UK government initiatives in solving its public infrastructural challenges (Agarchand and Laishram, 2017). The global communities have also been responsive to the initiative as a critical policy to respond to public infrastructural challenges. Both developed, and developing economies have adopted initiatives to reduce pressures on the national budget and or for national treasury management to support public supply decisions and national development (Khalifa et al., 2015).

In Canada, for instance, PPP projects worth over Canadian $130 billion have been undertaken (Palcic et al., 2019; Casady et al., 2019). There were close to 100 PPPs for highways in the USA (Mochon et al., 2022) as part of PPP initiatives to respond to public infrastructural challenges. Also, China is not left out as PPP activity is vigorously pursued across Asia and the Pacific oceans to solve infrastructural needs for the people (Palcic et al., 2019). China, for example, had over 10,000 PPP projects as of September 2016 worth about 12.5 trillion Yuan (Whang et al., 2018). The number of PPP projects in the UK, Australia, Spain, Portugal and the other developed worlds have increased astronomically over the years since its introduction in the United Kingdom (UK) in the late 1980s and early 1990s (Sharer, 2022; Offer, 2022; Quiggin, 2022; Whang et al., 2018). Compare to Sub-Sahara African countries, spending less than $600 million annually on public infrastructure services (2020; Tan and Zhao, 2019; Owusu-Manu et al., 2019).

3.2.2 PPP in Africa and other developing countries

Developing economies are not left out in the adoption of PPPs. The PPP policy adoption for infrastructure provision is seen as *life support* and has long been seen as a way to manage infrastructural challenges in Africa. In Africa, PPP has been

used to reduce national budget burdens (Mwakapala and Sun, 2018; Sevi-Olajide et al., 2021).

The challenges and the benefits of adopting PPP as a procurement module are common across Africa. PPP developments in Africa and other developing countries aim to solve macroeconomic challenges, meet public infrastructure demands, and create value for money for its citizens (Babatunde et al., 2015). In Africa, PPP projects, including telecommunications, water, energy, and transportation sectors, account for the majority of the investment in the continent (Owusu-Manu et al., 2020; Chileshe et al., 2020; Osei-Kyei and Chan, 2016).

In Nigeria, for instance, PPP has been widely seen as the solution to infrastructure deficits but without a challenge at the early adoption stages (Babatunde et al., 2015). For example, in November 2012, the concession for the 105-kilometre Lagos-Ibadan Expressway, valued at US$597 million and issued in 2009 under a BOT model, was withdrawn. The US$250 million Murtala Mohammed Airport Terminal 2 (MMA 2) concession, completed in April 2007, has been mired in dispute between the Nigerian federal government and the concessionaire over the concession period (Babatunde et al., 2015). The concessionaire found it challenging to meet its financial obligations and expected revenue (Chileshe et al., 2020; Babatunde et al., 2015).

In Kenya, the population has expanded to 9.7 million since 2016, with a Gross Domestic Product (GDP) of 5.8% and an inflation rate of 6.3%, resulting in a labour force of only 18.66 million (Wetangula and Mazurewicz, 2017). Furthermore, Kenya's population is expected to grow to 59 million by 2030 and 75 million by 2050, with the infrastructure development sector at the forefront of the Vision 2030 projection board (Chileshe et al., 2020). The phenomenon cut across the sub-Saharan African countries needing urgent infrastructure for which PPP seem to be the only hope for direction.

In addition, the Kenyan government, for instance, is increasingly interested in PPPs (public-private partnerships) to boost the infrastructure and housing sectors. Between 2012 and 2020, total infrastructure investment needs were USD 62,176

million, with the government of Kenya (GOK) promising USD 25,000 million, leaving a USD 37,000 million financial deficit (World Bank 2016; World Bank PPI Database 2018). The GOK is increasingly interested in PPPs as its citizens' demand for quality and affordability grows. The funding deficit for infrastructure is expected to be reduced by USD 40 billion over the next eight years. Kenya also ranks first in PPP investment (over $8.5 billion) compared to neighbouring countries such as Uganda and Tanzania (World Bank, 2016; Chileshe et al., 2020).

3.2.3 Historical perspective on PPP in Ghana

Ghana has developed notable policies in governing infrastructural supplies. To regulate and increase the use of PPP for vital infrastructure construction, the Ministry of Private Sector Participation was established (Osei-Kyei and Chan, 2017; Kwofie et al., 2016). Ghana developed a PPP guideline in 2004 and a policy framework in 2011 (MoFEP, 2015). On 3rd June 2011, the government adopted the Policy as a framework for implementing PPP contracts. The PPP Bill followed the 2011 policy framework in 2013 to cash in on the benefits of the model (MoFEP, 2015). PPPs are, therefore, currently governed by the Policy, sector-specific laws and laws of general application in line with the Public Procurement Authority (MoFEP, 2015). Government efforts to manage PPPs development have led to the passing of the Public Private Partnerships Act, 2020, Act 1039. Though the country has been noted as one of the Sub-Saharan countries adopting PPPs, according to Kwofie et al. (2019), it is yet to reach its maturity stage of PPP practices.

3.3 REFLECTING ON PPPS IN GHANA

Given the economic and social benefits of PPP projects, the country continues to view PPP models as optimal for delivering infrastructure. It has set aside various projects for PPP delivery and contractual arrangements (Kwofie et al., 2016). For example, statutory entities like the Ghana Highway Authority can enter into PPP arrangements. To this end, there has been a purposeful effort through policy to

promote the local private sector's participation in PPP in Ghana (Osei-Kyei and Chan, 2017; Bruchez, 2014; Tserng et al., 2012).

The government of Ghana uses PPPs to manage complex operations in pubic investments by adopting legal frameworks and other institutional processes (MoFEP, 2015; Osei-Kyei and Chan, 2017; Owusu-Manu et al., 2022). However, Ghana's PPP implementation experience has been met with mixed reactions.

Several financial reports, including annual budget statements, noted macroeconomic challenges that affect the fiscal budget for effective PPP project delivery (Bawumia, 2014; World Bank, 2016; MoF, 2017; Budget Statement of Ghana, 2019). In addition, an inadequate legal framework is noted as one of the significant constraints for effective PPPs in Ghana (Oppong-Peprah et al., 2016; Osei-Kyei and Chan, 2015). Land acquisition issues where chiefs and families hold land in trust also impede the process (Oppong-Peprah et al., 2016; Osei-Kyei and Chan, 2015). Further, the lack of transparency and accountability in the process due to corruption, cronyism and nepotism within the procurement process affects PPPs (Oppong-Peprah et al., 2016; Agyenim-Boateng et al., 2017). These challenges affect effective project delivery within schedule and on the cost performance baseline of effective PPPs (Liu et al., 2016). Nevertheless, the country has reaped enormous benefits from PPPs. The country's current infrastructural deficits are huge (MoFEP, 2018). Ghana faces financial challenges as its annual financial budget is consistently unbalanced (Government of Ghana, 2019). Investment in critical assets (capital projects) such as roads, hospitals, schools and correctional facilities benefit from PPP modules (Agyenim-Boateng et al., 2017; Ameyaw and Chan, 2015).

While there is an effort to reduce cost, the national treasury or budget through private sector investment, additional funding from the private sector through the PPPs mechanism is welcome (World Bank, 2016; Agarchand and Laishram, 2017). A leveraged public asset for funds frequently supplements Ghana's infrastructural deficit challenges. Value for money is further established as the private sector provides quality and innovations (KPMG, 2010; Liu et al., 2016;

Osei-Kyei and Chan, 2016; Owusu-Manu et al., 2020). Technologies and innovations are provided in project implementations (Mulcahy, 2013; McDermot et al., 2020; Rose et al., 2016). Skills and knowledge are shared to benefit local subcontractors (McDermot et al., 2020; Agyenim-Boateng et al., 2017). Ghana generally gained access to improved but high-quality facilities, while the private sector benefited from the guaranteed revenue streams and profits (KPMG, 2010; World Bank, 2015; MoFEP, 2018).

Under the PPP, the Ministry of Finance (MoF), through its Public Investment Division (PID), is still responsible for developing the legal, institutional and regulatory framework for the PPP programme in Ghana. PID serves as the secretariat of all PPP-related activities, whilst the inter-ministerial approval authority and the PPP approval committee have been established to approve the implementation of PPPs. This committee is often chaired by the Minister of Finance, who may issue guidelines for effectively managing PPP projects according to the context. The Public Investment Division (PID) serves as an advisory unit. It provides technical expertise to support the relevant ministries, departments and agencies in developing and managing prospective transactions (MoFEP, 2015). Other additional responsibilities of this division may include project financial analysis and serve as a gatekeeper on all PPP transactions in Ghana (MoFEP, 2015).

In Ghana, PPP may be undertaken nationally through the relevant ministries and departments. Much is unknown about the capacities of the local authorises embarking on PPP policies and implementations as the concept is immature. Several reasons are assigned, primarily due to the lack of technical capabilities and financial resources to engage in the process meaningfully. More so, in Ghana, the authorities at the national level do not mandate any particular district and municipal assemblies to enter into PPP arrangements on the government's behalf or serve as guarantors. The notion is that agreement entered into will have to be borne by the state and on the national budget, which is currently facing constraints (MoFEP, 2015; World Bank, 2016).

The increasing need for infrastructure at the districts and municipal assemblies level required policy shifts and structural reforms. Budget and government subventions are not enough to mobilise funds for needed facilities. Therefore, the need to seek private funding to support meeting infrastructural provisions becomes an alternative. Key objectives of the policy that governs both national and local levels include the following.

- Encourage and facilitate investment by the private sector by creating an enabling environment for PPPs where value for money for the government can be demonstrated.
- Increase availability of public infrastructure and service and improve service quality and efficiency of projects.
- To accelerate needed infrastructure and service investments, combine public assets and funds with private sector resources from local and international markets.
- Ensure attainment of required and acceptable local and international social and environmental standards.
- Protect the interests of all stakeholders, including the end user, affected people, government and the private sector.
- Set up efficient and transparent institutional arrangements for the identification, structuring and competitive tendering of PPP projects.
- Provide a framework for developing efficient risk-sharing mechanisms.
- Encourage and promote indigenous Ghanaian private sector participation in delivering public infrastructure and services.

(MoFEP, 2015)

The above policy objectives provide the springboard for the participation of the private sector bodies to identify opportunities in leveraging resources at the local level of PPPs in Ghana.

3.4 MANAGING INFRASTRUCTURE PROJECTS IN GHANA VIA PPP

The preoccupation of this section is to explore the infrastructure provision environment in Ghana and to articulate why the PPP approach should be followed.

3.4.1 The public infrastructure provision environment in Ghana

A nation's economic success is undoubtedly attributable to adequate public infrastructure well maintained for posterity. It is equally valid that an excellent infrastructural system in place not only boosts confidence in the national economy and the governance system but also guarantees investor confidence for future investments. Thus, the ability to grow and become a more viable and competitive nation in the world markets depends on excellent infrastructural services. Among others, these services include good roads, schools, hospitals, airports, bridges, railways, airports, ports, and correctional facilities, which are essential for the quality of life for citizens.

Ghana, in recent times, has shown considerable interest and taste for public infrastructure due to the increasing population growth (MoFEP, 2015; GSC, 2021). However, the infrastructure provision environment in Ghana is faced with various constraints. For instance, the country is experiencing a deficit balance of payment and non-creditworthiness as credit agencies are unwilling to trust more investment funding support (World Bank, 2021). This situation indicates that Ghana's fiscal space cannot guarantee additional loans necessary for capital project investments, a critical component for initiating capital infrastructural projects and investments. No wonder the World Bank (2021) and MoFEP (2022) agree that the infrastructure project environment in the country faces poor economic indicators as Ghana's fiscal space currently is extremely difficult to support infrastructural investment funding.

The most recent announcement by credit rating agencies like Moody's and Fitch rated Ghana as B- (World Bank, 2021; MoFEP, 2022). This outlook does not show positive signs for project investment and opportunities (World Bank, 2021; MoFEP,

2022). With the increasing population needing infrastructural service, creating an investment through public-private partnerships engagement for Ghana is noteworthy to investigate.

Nonetheless, the challenge is not only peculiar to the Ghanaian economy. Most developing countries face deficit financing as national budgets and foreign reserves are depleted, creating a cash-crash frenzy that does not support capital project investments (World Bank, 2021). Yet the projects are capital projects requiring substantial financial outlay for which proper quantitative risk assessments from both parties are to be done to guarantee investment.

A good foundation for public project investments is always based on transparency, fairness and openness in the transactional process. However, as Zhang et al. (2014), Kwofie et al. (2016), and Liu et al. (2016) observed the uncompetitive nature of the tendering processes at times does not encourage private investment. The lack of integrity in public projects is a worry. Since corrupt practices are found within public project environments in Ghana, effective monitoring and adherence to the regulatory requirements for compliance are essential.

Another challenge is the change from a short contract duration (2-5 years) to a long-term contract period of PPP projects, mostly ranging from (20-30 years). The challenges are high transactional negotiations and early PPP contract termination on ex-ante risk management to ex-post risk management are common features characterising public infrastructure projects environment and management (Xiong et al., 2017).

Despite the challenges, Xiong et al. (2017) believe Ghana's peaceful judiciary system is conducive to contracting and PPP development. While this assessment is debatable, the argument is that PPP contracting thrives well when friendly and laid-down procedures for public infrastructure exist. In addition, the availability of local building materials and human labour creates a competitive advantage for investing in infrastructural projects in Ghana (Xiong et al., 2017).

3.4.2 Making a case for PPP in infrastructure provision in Ghana

As stated, Ghana is experiencing a deficit in infrastructural needs amid increasing population growth (Gatti, 2022; Damoah et al., 2020; Owusu-Manu et al., 2021). The country, therefore, needs partnership arrangements and, for that matter, private sector resources in terms of financing and technical know-how in PPPs to provide public facilities. Adopting PPP will assist Ghana in creating value in public project supplies and mitigate the public infrastructure deficit.

Ghana stands to benefit from the universal motives of PPPs, which include: reducing the public sector cost of administration, sharing risk with private partners, raising enough for the provision of public facilities, minimising pressure on the public sector budget, and ultimately creating value for money in public project supplies and these cannot be overemphasized (Zhang et al., 2018; Wang et al., 2018; World Bank, 2015; Public Private Infrastructure Advisory Facility, 2016; Chan et al., 2011).

Adopting PPP entails considering several critical factors. From policy development to project organisational contracting levels, organisational resources must effectively be utilized to benefit both contractual parties (public and private). Nevertheless, the complexities involved in the PPP arrangement require state agencies and private organisations in Ghana to make maximum use of organisational resources for successful PPPs.

PPP may be used to provide government infrastructure. PPP is credited for increased efficiency in public project delivery, budgetary difficulties, belief in greater efficiencies and optimizing the commercial value of the public infrastructure (Osei-Kyei & Chan, 2017). The general environment for the management of public infrastructure projects through PPP has already been created in Ghana (Danso & Ofori-Kuragu, 2014; Gyaase and Takyi, 2014; Osei-Kyei and Chan, 2017).

Similarly, the *government-alone* approach to infrastructure provision is associated with high capital costs, high sunk costs and economies of scale, requiring an

alternative funding approach if the provision of public infrastructure for the citizens is to be sustained (Osei-Kyei and Chan, 2017). The long-term implications of not having sustainable infrastructure provision systems like PPP are that citizens do not enjoy quality projects from their taxes. The resources committed to infrastructural projects may be wasted (Liu et al., 2016; Kim, 2016; Casady et al., 2019).

3.5 CHALLENGES TO PPP IMPLEMENTATION IN GHANA

PPP generally involves design, construction, financing, operation and maintenance (Simon et al., 2020; Damoah et al., 2020; Owusu-Manu et al., 2021). Such complexity creates many problems for developing economies like Ghana, whose resources, expertise and investments may be inadequate to support successful PPP deliverables (Simon et al., 2020). The Ghanaian experience in providing social infrastructure, as in hospitals and schools, compared to economic infrastructure (roads, rail or airport) is always different, requiring different methodologies (Owusu-Manu et al., 2021; Kuka et al., 2022).

Gao (2018) has indicated that choosing the right partner for PPP is a firm foundation for collaboration. Anago (2022), further opined that adopting choices influences public-private partnerships outcome. It allows the private sector to take financial risks without the government's help determining their contractual and commitment trust levels to achieve acceptable results (Damoah et al., 2020; Kuka et al., 2022; Anago, 2022). Unfortunately, choosing the right PPP collaborator is difficult in Ghana for several reasons. For example, cronyism is typical in creating values, yet it is a constraint to overcome in delivering effective PPPs development in Ghana (Carbonara et al., 2013; Teo et al., 2017; Liu et al., 2016). Another challenge is the high risk of losing a bid in Ghana (Agyenim-Boateng et al., 2017). The likely effect is that a private party with the capacity to develop the project might not bid (De Schepper et al., 2015a; Simon et al., 2020), leaving mediocre parties to win the bid.

Ghana's macroeconomic figures are not investment-friendly enough as there is deficit financing coupled with the balance of payment issues (Gevorkyan and Kvangraven, 2016; NDPC, 2017; Alagidede et al., 2018). Such a situation cannot support external guarantees for critical infrastructural project investments (Awuku et al., 2022; Ampratwum and Osie-Kysie, 2022).

A summary of project success and failure across some selected countries, including Ghana, has identified project-related factors and financial issues affecting smooth PPP project implementation. According to Frimpong et al. (2003), cited by Khlaifat et al. (2017), inflation, price escalation of construction materials and procurement process challenges, project meeting technical performances, financial difficulties, poor contractor management, and delay in payment are common in Ghana.

Ghana is beset with developmental challenges. Mega-projects have flooded the country, especially since the discovery of oil in 2009. However, some organizations working on these projects have a poor understanding of project management, while others are well-organized (Damoah et al., 2020; Owusu-Manu et al., 2021; Kuka et al., 2022). The competence of individuals working on such initiatives is critical since they might significantly impact the project's and the business entity's performance. The interest in PM competence is based on the notion that competent project managers and project team members would perform successfully, resulting in successful projects and organizations' success (Ofori, 2014).

Low project management competence has been cited as an issue in Ghana (Ofori, 2014). It may be attributed to inadequate training and development for project managers and their team members. How projects are managed depends upon the skills and knowledge acquired by the project team and the structures in place to shape project management directions and the methodologies utilized. In Ghana, public project outcomes have been considered poor (Ofori, 2014; Owusu-Manu et al., 2021; Kuka et al., 2022). Ghanaian managers have different levels of project integration, human resource, communication, quality, risk, and scope management

skills, but their project management skills are lacking. Ahadzie et al. (2009), on the competencies project managers, require for housing construction in Ghana, indicated that they should focus on their professional growth to develop their talents and skills.

Aboagye et al. (2022) further have established that project managers in Ghana must strengthen and increase their capability in terms of skills, personal traits, and knowledge to achieve project management best practices for Ghanaian road development projects. A proper blend of these attributes would be a must-have for project managers. Project managers and project-based road infrastructure organizations, for instance, will be able to gain the trust of their stakeholders and achieve cost-effectiveness, quality, and time management improvements as a result.

According to Addo-Duah, Westcott, Mason, Booth and Mahamadu (2014), procurement in Ghana's public sector is shifting from a clerical activity to a more strategic function. However, Addo-Duah et al. (2014) and Attakora-Amaniampong (2016) have observed a shortage of skilled workers to perform the function.

3.6 CHAPTER SUMMARY

This chapter has provided an insight into Public-Private-Partnership in Ghana. This task was done by discussing PPP development and experience as an alternative approach to solving infrastructural needs for the country. The chapter also provided an in-depth discussion of factors affecting the performance of PPP in the Ghanaian context. The chapter further discussed the background of PPP in Ghana; PPP development in developed and developing economies; selected completed and ongoing PPP projects in Ghana; and PPP development at the local levels.

Through the discussion, it became clear that to enhance success in providing infrastructure in Ghana, PPP is required. However, it also became clear that in utilising PPP for infrastructure project delivery, several challenges need to be appreciated and overcome. For example, it became clear that cronyism is typical

in Ghana. Moreover, the high risk of losing a bid in Ghana due to lack of transparency and cronyism often leads to a situation where a competent private company with capacity to develop the project might not bid (De Schepper et al., 2015a; Simon et al., 2020), leaving mediocre parties to win the bid. From this perspective, integrity in the bidding process becomes the only way to ensure that private participants bring value to the PPP project to ensure success. The next chapter considers the theories which underpin the study.

CHAPTER 4

THEORETICAL AND CONCEPTUAL FRAMEWORK AND HYPOTHESES

4.1 INTRODUCTION

The previous chapter continued the literature review by providing an insight into PPP globally and in Ghana. Together, the introductory chapter (Chapter 1) and the literature review chapters (Chapter 2 and Chapter 3) have made it possible for this chapter (Chapter 4) to identify appropriate theories, develop a conceptual framework and hypotheses to guide the study.

4.2 THE THEORETICAL FRAMEWORK

This study is founded on three primary theories namely, the Resource-Based View (RBV), the Resource Dependency Theory (RDT) and the Stewardship Theory of Corporate Governance (STCG). Further more, two principles concerning probity of corporate governance namely, transparency and competitive are also applied.

4.2.1 The resource-based view (RBV)

The RBV of the firm has its roots in the work of Edith Penrose, who argued in her book "The Theory of the Growth of the Firm" (Penrose, 1959) that a firm's success is largely determined by its internal resources, capabilities, and knowledge. However, it was not until the 1980s and 1990s that the RBV of the firm became a more widely recognized and influential theory in management.

One of the pioneers of the RBV of the firm was Barney (1991), whose seminal article "Firm Resources and Sustained Competitive Advantage" laid out the key assumptions and ideas of the RBV. According to Barney, a firm's resources must meet four criteria to be considered a source of sustainable competitive advantage:

they must be valuable, rare, inimitable, and non-substitutable (known as the VRIN criteria).

Since then, many scholars have built upon the RBV of the firm theory, exploring topics such as the role of dynamic capabilities, the sources of resource heterogeneity, and the importance of firm-specific knowledge. The RBV of the firm has also been combined with other theories, such as transaction cost economics and institutional theory, to provide a more comprehensive view of strategic management.

Overall, the RBV of the firm has had a significant impact on our understanding of the sources of firm performance, and it continues to be a valuable theoretical framework for studying strategic management.

Resource-Based View theory (RBV), examines performance differences of project companies based on their resources to be used in executing the project for an outcome (Peteraf and Barney, 2003) cited by Almarri and Gardiner (2014). The Resource-Based View theory (RBV), has become one of the most prominent and quoted theories in management history and is widely used in project management (Almarrri and Gardiner, 2014; Killen et al., 2012). It shows how the company's internal source uses its resources to remain competitive and create synergy for competitive advantage. This contribution is based on multiple related studies: core competencies (Hamel and Prahalad, 1994), dynamic capabilities (Helfat and Peteraf, 2003), and strategic capabilities (Hamel and Prahalad, 1994; Theriou et al., 2009; Madhani, 2010; Taher, 2012), and the knowledge-based view (Grant, 1996b).

The dominant idea in the (RBV) theory which is applicable to this study is that countries and or project companies may contest or compete against each other based on their resources, abilities, and experiences when tendering for PPP projects (Madhani et al., 2009). The theory makes two main assumptions: (1) an industry's resources may differ, and (2) these resources may not be entirely transferable among firms. Therefore, resource discrepancies between organizations can remain long (Barney, 1991).

Barney (1991), and several scholars, including Conner (1991) and Peteraf (1993), have investigated the relationship between the resource-based paradigms for firm strategic planning and management. Empirical research has assessed the relative impact of industry and firm qualities on a firm performance, Hansen and Wernerfelt (1989), Rumelt (1991), McGahan and Porter (1997). Those who explored the resource-based view's position in the context of neoclassical microeconomics focused their efforts on describing and evaluating the characteristics of resources and capabilities of a firm. Peteraf (1993), Dierickx, and Cool (1989), and Barney (1986b) are three important theoretical developments in this field.

Numerous empirical studies have attempted to quantify these aspects of a firm's resources and capabilities, and subsequently correlate these metrics with a firm's performance. For example, Robins and Wiserma (1995), Henderson and Cockburn (1994), Makadok (1999), and (Barney & Arikan, 2001) demonstrated that firms base their strategies on path-dependent, causally ambiguous, socially complex, and intangible assets outperform firms that base their strategies solely on tangible assets. Makadok (2001), refers to resource-based theories as "resource picking" theories because they focus on how businesses use their valuable, uncommon, and costly to imitate resources and capabilities to produce economic competitive benefit.

Evolutionary versions of resource-based logic have been developed by scholars interested in firm capabilities in responding to change overtime and the competitive implications of those changes in atypical project settings. This evolutionary viewpoint is backed by an empirical study by Barnett, Greve and Park (1994), Levinthal and Myatt (1994), and Karim and Mitchell (2000). One of the evolutionary versions is the resource complementarity theory (RCT).

4.2.2 The resource complementarity theory (RCT)

The study uses resource complementarity thoery (Harrison et al., 1991), a logic which explains the importance of sourcing from alliance among project partners as

an opportunity to capitalise on the strengths of a project entity's resources. There are complementry effects as each partner has distinctive symmeterical core resources to contribute dissimilar resource to the benefit of the project thereby create synergies. The interorganisational resource complementarity capabilities in the form of (skills, knowledge, technologies, governance structures) for instance differ across. Support strategic partenership and offer synergistic benefits from reoucrce combinations.

There are studies that support the idea that inter-organisational interactions create competitive advantage, and that inter-firm resource linkages are source of idosyncrasy across organisations for shared benefits (Barry et al. 2019; Palafox-Alcantar et al., 2020). According to Conner (1991), Dierickx and Cool (1989a), Lippman and Rumelt (2003), Mahoney and Pandian (1992), Peteraf (1993), Teece (1987), and Thomke and Kuemmerle (2002), firms are characterised by heterogeneous resource endowments. Different bundles of resources vary in their degree of "complementarity," "specificity," "synergy," "specialization," or "relatedness". Through, interorgnisational governance structures and partnerhsip, organisational complementarity resources are shared collaboratively thereby supplementing the effort, to manage the project uncertaintities and equally shared the benefits common within project settings.

Further, according to Murray, Kotabe, and Zhou (2005), the resource complementarity create alliances which are anticipated to produce more value than "go-it-alone" strategies, particularly when the partners' capabilities are combined in a way that strengthens the competitive advantage for one or more partners. Unlike acquisitions, alliaince through partnerships alliance allow access to complementary assets without needing a financial outlay or commitment over the long term (Ireland and Hitt, 1999). The resource complementarity theory capitalized on opportunities and reducing threats and how resource deploments could impact on organisation outcomes. Resource complementarity promotes mutual dependence, facilitates formation, development and collaborative effectiveness for strategic alliance in project resource uasge (Parkhe, 1991; Murray et al., 2005; Palafox-Alcantar et al., 2020). Additionally, it is not always possible to

get complementary resources through market procedures (Chung et al., 2000). However, resource complementarity thoery aimed to attract the needed resources investment, and promote flexibility for long-term collaborative engagement among the project partners to maiximize project resources, create value, and mititgate project cost-risk on schedule.

4.2.3 The stewardship theory

The stewardship theory (ST) was introduced by Donaldson and Davis (1989). The ST takes a normative view of agents who act on behalf of an organisation's owners or shareholders. According to Davis and Donaldson (1991), a good board of directors (BOD) (stewards) appointed by the owners of the organisation would work for the organisation's best interests. In other words, BOGs are expected to work in the organisation's best interest. In pursuing the organisation's best interest, Davis, Schoorman and Donaldson (1997) identify that BOGs must display integrity and independence. This view resonates with the principles of procurement.

4.2.4 Transparency and competition principles of PPP governance in Ghana

Ghana's national policy on PPP which was promulgated in 2011 is anchored on 12 guiding principles. The 12 principles include the following: Value for money; Risk allocation; Ability to pay; Local content and Technology transfer; Safeguarding public interest and consumer rights; Environmental, climate and social safeguards; Environmental, climate and social safeguard; Clear objectives and output requirement; Accountability; Transparency; Competition; Contracting authority, ownership and commitment; and Stakeholder consultation process (Republic of Ghana, 2011). While all the 12 principles are important to running successful PPP's, competition and transparency appear most relevant to the tendering process.

The below transparency principles statement is a vindication that the transparency principle of PPP governance in Ghana is focused more on the procurement

including tendering process. According to Republic of Ghana (2011:5), the "principles of transparency shall guide all PPP projects". In the exact words of Republic of Ghana (2011:5),

> *"There must be a well-defined procurement process for the PPP. Instructions to bidders must be clear and unambiguous to prevent manipulation or abuse of the process. The bid conditions and evaluation criteria must lead to the attainment of …. economy and efficiency and must be made available to all Interested private sector parties. Where a decision is taken to consider an unsolicited bid, there must be dear and objective reasons supporting the decision which shall be in conformity with this policy. The process shall be accessible to the public……. Equal opportunity and access to information must be given to all interested bidders".*

Republic of Ghana (2011:5).

Similarly, regarding competition, Republic of Ghana (2011:5) states "as much as feasible all PPP projects should be subjected to a competitive process….". It is common causes that competition is a key tenet of procurement. Hence it is reasonable that competitive tendering too should be a relevant theoretical perspective for PPP. The foundation of stewardship theory is a set of behavioural presumptions for project procurement managers and tendering officials to demonstrate elements of probity and integrity in their project procurement decisions. It is predicated on the idea that agent interests are consistent with owner goals (Davis et al., 1997). Thus; Tendering officials' trustworthiness; open competitive process; fairness, consistency and transparency of process; identification and resolution of conflict of interest; accountability in relation to project decision making and monitoring and evaluating performance are protected. This ultimately create value for money and potentially mitigate the project tendering transactional cost, eliminate corrupt tendencies common in public contract and thereby complete project on schedule.

The broad objective of probity and integrity process as in stewardship function is designed to achieve value for money; provide accountability as in project

governance (Decarolis et al., 2020; World Bank, 2020; Berrone et al., 2019). Probity and integrity process ensures all bids will be assessed against the same criteria; preserve public and bidder confidence in project governance processes and improve defensibility of decisions to potential legal challenge or other external scrutiny (OECD, 2009; Rizzo, 2013; Ghossein et al., 2018). The open competitive processes guaranteed fairness, consistency and transparency of the process. The probity provides scrutiny of the tendering process, to ensure prescribed processes have been adhered to; monitored and evaluated for an improved project performance. It also presupposes that managers will use resources most efficiently to improve firm performance and value because they have the best access to information and knowledge (Donaldson and Davis, 1994). And that these information resources are equally available, and accessible openly and fairly to all parties concerned within the helm of transparency and competitively.

4.3 THE CONCEPTUAL FRAMEWORK AND ITS JUSTIFICATION

This section describes the conceptual framework and provides theoretical justification for it.

4.3.1 The conceptual framework

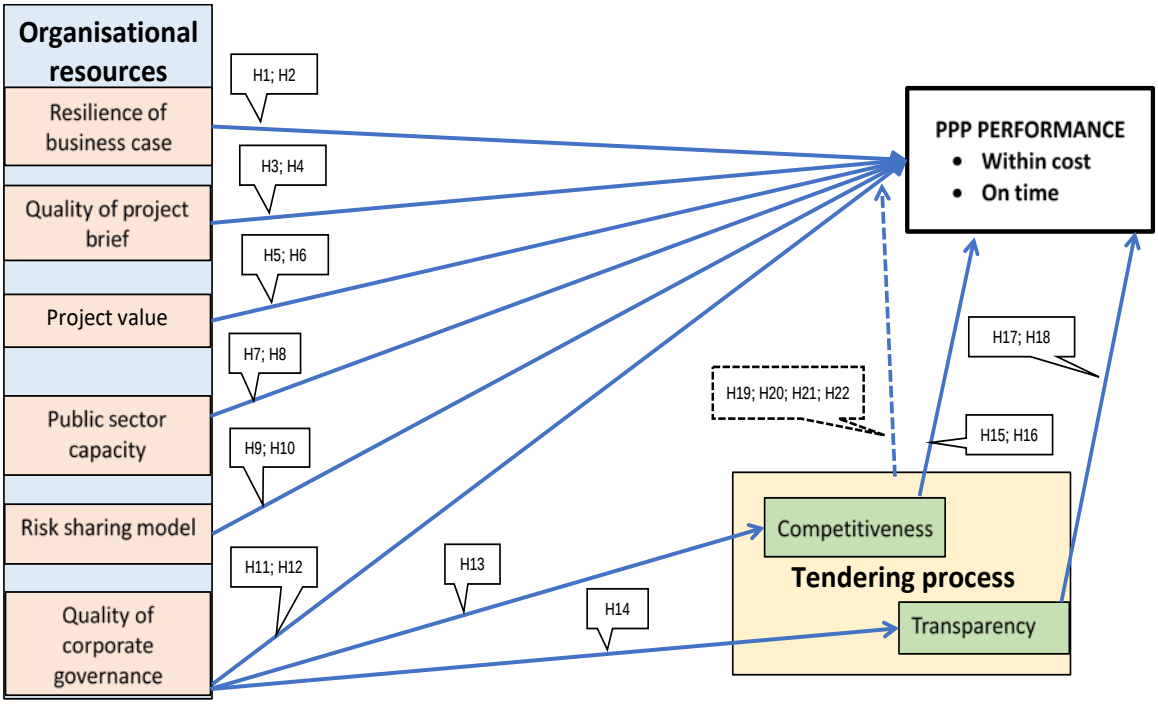

Figure 4.1 Conceptual framework

Figure 4.1 describes the study's conceptual framework indicating the path to PPP performance in Ghana. It illustrates the relationship among the variables. The outcome (dependent) variable is the PPP performance which is measured along two dimensions, namely, cost and time. The predictor or independent variables consists of six organisational resources. Competitive tendering (CT) and transparent tendering (TT) which are two dimensions of the variable tendering process integrity (TPI) play both mediation and moderation roles. Firstly, TPI (CT and TT) mediates the relationship between quality of corporate governance dimension of organisational resources and project performance. Finally, TPI (CT and TT) again moderates the relationship between organisational resources and project performance. The organisational resources consist of project value (PV), quality project brief (QPB), public sector capacity (PSQ), Quality of corporate governance (QGS), and risk sharing model (RSM).

4.3.2 Application of the theories to the conceptual framework

Whilst the Private sector exchange resources in the form of financing, and technical expertise in the PPP's arrangement, the public agencies (government) resource enabling project environment, clearly defined roles and structures, and guaranteed natural resources with an increasing population along with, to create cost-benefit for successful PPPs. Such development underpinned social exchange notion of developing a relationship between two parties for shared cost-benefit. The end users and project gain substantial benefits from the resource complementarity due to the exchange of resources across board. Whereas the private entities use their technical expertise and financial resource in the infrastructural facilities provision through PPP engagement. The structural corporate governance process for instance, provided by public entity guaranteed success in the tendering process for fairness project transparency and competitiveness. The interaction between two parties in the social exchange theory create cost-benefit analysis and determine mitigate project cost-risks benefits in PPP contracts (Casady et al., 2019; Cropanzano et al., 2017).

Also, though a legal relationship has been developed which must be protected. Interpersonal project level relationship supports sociological and psychological tenets relevant for trust building and resources levelling between partners for collaborative engagements (Cropanzano et al., 2017). The resource complementarity and stewardship functions guaranteed resilient partnership drives and long-term relationships strength for successful PPP practices. This, invariably affects PPP performance as individual party resource strengths complement the weakness of other parties in relational contract (Schiele et al., 2012; Cropanzano et al., 2017). Relational contracting is heavily reliant on the behaviour of the parties and the willingness to create alliance for shared benefits (Zhu and Cheung, 2022).

In addition, partnerships between project parties for long-term employed fundamental economic principles of resource complementarity to create synergies (Cummins, et al., 2022; Dadush, 2022; Almarri and Gardiner, 2014). Client-driven agendas are informed through relational contracting, and aim at increasing

performance in terms of the cost, resources and technology pooled together and or shared to create value or competitive advantage (Zhu and Cheung, 2022; Zheng et al., 2018). Project partnership which is relational contracting concept is viewed as client and supplier relationship and currently practice in construction project management (Ameway et al., 2015; Zheng et al., 2018). The resource complementarity theory is the alternative to the transaction approaches with the object of reducing cost and meeting client's expectations through relational exchange of resources (Rosen et al., 2014; Cummins et al., 2022). This phenomenon is a value creation strategy and synergy creation effort to proactively ensure close collaboration, and replenishment, enhance competitiveness among the PPP tendering parties. This assist in mitigating project cost-risk and allow early project completion on schedule.

Partnering requires exchange and exchanges in the form of organisational resources support parties' weakness and strengthen competing stand for long-term benefits and values. Whilst the stewardship theory (ST) introduced by Donaldson and Davis (1989) focuses on a normative view of agents who act on behalf of an organisation's owners or shareholders in the management of organisation resources for value. Probity and integrity of individuals in-charge of the tendering processes, systems, and structures integrity guaranteed for transparent and competitive for faire drives within the PPP tendering. This ultimately, enhances project performance and resource capabilities for future project investments. The capabilities of PPP teams or parties to accurately perform it stewardship's roles or functions on behalf of the public and or larger stakeholders' group, guaranteed tendering process transparency and fairness. When capacities and structures are available for instance, each of the parties, whether public or private capabilities, competencies, and or integrity pertaining to the organizational resources usage and how to determine accurate "project value (PV); provide quality of project brief (QPB); have competent but experience public sector capacity (PSC); practice quality corporate governance (QGS); develop resilient business case (RBC); determine risk sharing model (RSM) for successful PPP performance (SPPP) become non-negotiable.

The study therefore proffers that effective integration of the resources identified is a skill, expertise and or experience critical resource complementarity for PPP parties in their contractual arrangement and or practice. Thus, the concept of relational resource complementarity can be developed and perceived stewardship protected in PPP practice to create value for money, competitive advantage and synergies in this social exchange theory (SET). The future benefits are enormous as value for money is gained in supplies (Ameyaw et al., 2015), Clients are satisfied with the facility provided, and individual tenderers are assured and guaranteed for long-term PPP engagements due to probity and accountability in the process (World Bank, 2020; Ghossein et al., 2018; Osie-Kyei et al., 2016). Party's loyalty is sustained and bonds developed, profitability and risks are shared among the parties due an improve resource complementarity and stewardship roles adequately advanced (Schoorman and Donaldson,1997; Birasnay et al., 2019; Sukoco et al., 2018). The short to medium term are that project transactional costs are minimized, project completed on schedule creating further competitive advantage for efficient and effective project organisation resource usage.

Whilst Ghana is being touted as a climax of hospitality, and having robust contractual legal system as elements critical for successful PPPs. The ability to provide efficient project environment and processes or procedures by Ghana, and for that matter at the district municipal and metropolitan levels of PPP contracting is critical resource complementarity and necessary for successful PPPs. This further consolidates long-term collaboration effort and play a critical stewardship functional role to manage the continent resources for value through PPP contractual engagement. where tangible and intangible resources capabilities are shared for the benefit of the parties.

Ghana benefits from this theoretical foundations in solving its infrastructural needs. Whereas the private sector provides economic resources in terms of technical and financial, the country provides social amenities, the public sector agencies provide enabling project environment with clarity project governance structures for instance, and available resources guaranteed to sustain theoretical foundation of this study. Each party whether public or private, capabilities and competencies

relied on how the organizational resources are utilized across the strategic and operational level of PPP contracts. The effectiveness of the resource usage provides strengths and covers the weakness of other hence the Resource Complementarity. Also, to be successful required a robust public sector capacity (PSC); alone with quality governance structure (QGS); and resilient business case (RBC). The Stewardship principles will therefore have to be applied to ensure probity and integrity within project procurement functions for successful PPP performance (SPPP).

4.4 RELATING VARIABLES INCLUDING HYPOTHESES DEVELOPMENT

This section is devoted to the hypothesis development or linking the variables in the conceptual framework.

4.4.1 Resilience of business case and PPP performance

A resilient business case is a justification for the project prepared in advance by public agencies to attract investments (PMI, 2015; Khallaf et al., 2018). A resilient business case is defined in this study as a robustness of investment portfolio at the district and or municipal contracting levels capable of attracting private sector funding or investments (Khalifa et al., 2015). A typical project organisation has a project sponsor, preferably (the government) who is accountable for creating and maintaining a successful project business case. The document explains the justifications, feasibility, and return on investment in pursuing the PPP project goals (PMI, 2015). The business case must be resilient enough to attract private investments. A need assessment must precede the robust business case preparation within the cost and schedule baseline to be provided. A resilient business case must demonstrate economic feasibility and be viable to invest in (Liu et al. (2016). It must list the objectives and reasons for and validate the benefits the project seeks to deliver as part of a coal project investment (PMI, 2015; Mulcahy, 2013; Rose et al., 2014).

The ability to justify the project to the local authorities to create revenue streams and add value is a resource for successful PPPs. Most public sector organisations do not have a functioning business desk for drafting PPP contracts (World Bank, 2016). A resilient business case provided by skilful personnel is well documented (Ghazali et al., 2018). The base is to authorise the PPP project for which work will be done on budget and within schedule. The cost-risk to the project increases if a resilient business case is not provided (PMI, 2015; Mulcahy, 2013). The private sector service providers might have the ability to justify the project according to public sector guidelines (Panda, 2016). However, the government may be lacking a robust business case. Hence, it is essential that private sector participation meet the requirements (Spoann et al., 2019; Hueskes et al., 2017; Soliño and Gago de Santos, 2016).

Based on the discussion of the literature, the study proposed the following hypotheses:

H_1: *Resilient business case has a significant positive impact on PPP cost performance.*

H_2: *Resilient business case has significant positive impact on PPP time performance.*

4.4.2 Quality of project brief and PPP performance

The literature shows that one of the critical indicators for a successful PPP is using standardised input-output-outcome specifications for project definition (Simon et al., 2020; Cui et al., 2019; KPMG, 2010). A well-defined project states the needed requirements to be provided. And it is based on quality project brief provided by both partners. The quality project brief serves as a guideline that increases correct understanding of what needs to be provided. It supports the project governance process for high-level stakeholder engagement (Velotti et al., 2012). A poorly defined project brief creates difficulties in mutual understanding and cost estimation for project partners. It affects partners' ability to determine resources

usage and schedule management, thereby affecting the overall PPP performance (Velotti et al., 2012). This increases the overall cost of the project to the partners. The financial implications may go beyond stakeholders' control and management as other viable investment options may be deferred. The consequential effects of poor quality project brief, leads to redesigning efforts that might increase cost operations affecting investments (Liu et al., 2016). A quality project brief refers to the existence of a clearly defined procurement project brief based on agreed project objectives, scope, significant deliverables, milestone, schedule, activities, process, including resources required to deliver the expected outcome (Ren et al., 2019; Liu et al., 2016).

According to Yuan et al. (2012), there are key performance indicators, the physical characteristics of the project, financial and marketing, innovation and learning, stakeholders, and process; these are to be specified clearly in the project. This will outline the scope of the project in meeting client criteria objectives. A clearly defined PPP project brief describes the quality, and in line with project performance objectives, the timeline of completion of the project, target audience to be served, and scope of the project (Xiong et al., 2015; Osei – Kyei and Chan, 2016). The ability of public parties to provide short but summary documents in real-time to high-level stakeholders or investors can ensure direct response (Velotti et al., 2012). The private sector project team can check back on it frequently while providing an onward response for financial inclusion and acceptance (Velotti et al., 2012). The project brief demonstrates a document indicating how the project's specification requirements will be met on schedule (PMI, 2015). It therefore, requires identifying quality requirements to meet specifications or standards for the projects.

However, the challenge is the readiness of public sector bodies, especially in developing markets in charge of drafting PPP contracts (Khalifa et al., 2015). The ability to provide quality standard project brief attracts private investments and necessitates the use of organisational resources (Schunemannn et al., 2014). Having a reliable but skilful and trained PPP project team can provide a quality brief. This will further meet PPPs project's financial closure. Adherence to the time

and cost of the project, is a critical dimension for meeting the financial closure of the project. Quality standard project brief further consolidates partnership understanding of the need to channel resources between the parties as resources within the enterprise environment (Schunemannn et al., 2014).

This study therefore tests the following hypotheses:

H_3: *Quality of project brief has significant positive impact on PPP cost performance.*

H_4: *Quality of project brief has significant positive impact on PPP time performance.*

4.4.3 Project value (cost) and PPP performance

According to Dennehy et al. (2017), the project's economic and financial viability is an asset. Procurement options are relevant when the project subcommittee is able to determine the project value through proper but effective estimations (Dennehy et al., 2017).The project's value or cost is defined as the project's overall economic and financial value at the lowest cost on the public purse capable of creating value for money in supplies (Cui et al., 2019). Low cost of the PPP project ensures affordability (Siemiatycki and Farooqi, 2012). An increasing cost of PPP projects has the likelihood of transferring the cost to the public who might not be in the position to pay. This directly affects the project's bankability, affecting the overall PPP project objective as an alternate procurement route (Hueskes et al., 2017). It, therefore, means that ensuring cost-effectiveness and operating within the cost limit will create value and improve successful PPP performance.

Moreover, ensuring cost-effectiveness provides the basis for financial performance sustainability for PPP projects (Cui et al., 2019). The relationships between the project and economic indicators' cost will invariably determine whether citizens can afford PPP undertakings (Cui et al., 2019). Among value for money drivers, knowing the project's cost is essential for ensuring how risks are shared, and whether the project can be afforded by the users (Dewulf and Garvin, 2020). The better the project participants, primarily the public entities capable of determining

the project's cost, the more influential the cooperation arrangement between the public and private sector organisations in ensuring successful PPPs (Cui et al., 2019). For instance, the tendering phase of PPP projects can be complex, and long in duration (Ren et al., 2019; Liu et al., 2016; Cabrera et a., 2015). These make PPPs expensive, and negatively impact on value creation (Simon et al., 2020). It therefore calls for competition in the process and fairness as well as openness for transparency in achieving the partnership deals or purposes. Such a phase might require a high level of activities that should be done well on schedule to allow cost-effectiveness to prevent it from impacting the project's overall performance.

Thus, if the cost of the project and the processes involved are determined, they will further eliminate cost-risk to the PPP frameworks, thereby creating value (Cui et al., 2019). This ultimately affects the financial performance of both parties (Cui et al., 2019). When the sector institutions reasonably estimate the cost of the projects, it increases the overall success criteria, thereby impacting the financial and social performance of the PPP project (Simon et al., 2020). The partnership engagement meets the project objectives performance criterion. While an accurate cost projects estimation from the PPP arrangement will ensure sustainable revenue streams and profit for private parties, citizens are assured of public facilities that they can use.

There will be less pressure on the national budget to provide the facilities if the accurate cost of the project is determined (Dewulf and Garvin, 2020). The fear of loss of revenue to the private parties due to poor costs of project estimation is invariably mitigated through government guarantees (Dewulf and Garvin, 2020). The implications are that the opportunity of meeting citizens' demand for better facilities are guaranteed through an accurate project cost determination. This also ensures that social contract agreements between citizens and the government are met in constant need for value creation in public contract management and administration.

Based on the discussion from the literature, the study therefore proposes the following hypotheses to be tested:

H_5: The lower the value of the project, the better the PPP cost performance.

H_6: The lower the value of the project, the better the PPP time performance.

4.4.4 Public sector capacity and PPP performance

The public sector capacity depends on the experience and knowledge of its staff or employees in the PPPs implementation process. The level of knowledge, skills and experience of the public sector project team promotes competitiveness and transparency in the PPP process and enhances value (Spoann et al., 2019). PPPs' success will depend upon the capacities of the resources of the public sector bodies capable of ensuring effective partnership from the long-term engagement practice (Liu et al., 2016). While good governance structure and public sector capacities cannot do without each other (Martins et al., 2011), having strong public sector capacities can provide legislative instruments and roles for stakeholders (Osei – Kyei and Chan, 2017). Previous researchers have advocated that both (governance structure and public sector capacities) play integral part in successful PPPs (Cristofoli et al., 2021; Verhoest et al., 2016; Hueskes et al., 2017).

In this study, public sector capacity is defined as the general project teams' ability to carry out successful PPP procedures and policies while following centralised guidelines and regulatory frameworks provided (Khalifa et al., 2015). Critical barriers such as political constraints, corrupt practices, lack of skills in negotiating the successful contract, and undefined project scope, restrain private sector investor participation in PPP (Ojelabi et al., 2020). In emerging markets like Ghana, where public sector incapacity is common (Liu et al., 2016)**,** this can affect PPP performance. It is therefore fair to insinuate that, competent public sector project teams in a PPP project capable of understanding the process and uncertainties governing the process creates value. Moreover, a committed public sector entity with relevant capacities develops and retains value creation in the PPPs.

The project committee can ensure compliance within the PPP processes whilst adhering to the guidelines provided (Belachew and Shyamasundar, 2013). Knowledge, skills and technical expertise are shared among the parties for

effective contract management and administration for the parties (Liu et al., 2016). These steps reduce possible financial pressure on the public purse due to enhanced public sector capacities (Spoann et al., 2019). Also, the overall PPP performance is improved collaboratively through effective tendering in PPP projects as skills and knowledge are shared. While public sector personnel capacities are improved, private partners benefit from the capabilities mainly through the effective process and guidelines that are provided for fairness and transparency in the PPP tendering process. Operational transactions are thus improved considerably, creating value (Damjanovic et al., 2017). The partners' capabilities are vital during the PPPs phases (Akbari Ahmadabadi and Heravi, 2019). Invariably, value will be added if the capacities and capabilities of both partners are considered and developed for adequate public project supplies (Khalifa et al., 2015). This probity helps ensures that overall, PPPs projects are successfully executed.

Having technical know-how also helps in implementing successful PPPs (Damjanovic et al., 2017). Therefore, technical know-how should be reflected in the government procuring teams. The government's commitment depends on the public sector capacities and willingness to provide resources in this direction (Perryer and Jordan, 2005). This should be demonstrated in the commitment by the political authorities to ensure value in the transactional process that accommodates fairness, transparency and openness that allow competition in the process of tendering, for instance. A committed public procuring agency that ensures PPP transactions are fair, transparent and adequately structured creates an advantage (Li et al., 2016). However, the lack of a good project team's skills and expertise diminishes effective negotiation for PPPs transaction and further risk the nation's effort for value (Ojelabi et al., 2020). There is possible dispute leading to monumental judgement debt from the partnership deals thereby pushing further pressure on the national fiscal stabilization effort.

There are existing research that offers great insights into structuring and implementing successful PPP projects to achieve better value for money (Liu et al., 2016; Kukah et la., 2022; Zhao et al., 2022). However, studies of this kind are

at a high level, lacking specific guidance on improving the effectiveness and efficiency of developing local capacities (Liu et al., 2016). For instance, ensuring a transparent and competitive tendering process, designing of contract types, management and determination of actual revenue streams, and risk-sharing allocation mechanisms between the parties require skills and innovative expertise from both partners (Ameyaw and Chan, 2016).

Public-private partnership (PPP) is a desirable way for financing, construction, operation and maintenance (Damjanovic et al., 2017). However, it requires public sector capacities, which is significant in designing rules, procedures and policies for successful PPPs. How to achieve these requires thorough procedural, organisational arrangements and management interventions from public sector authorities. This, therefore, demands critical leadership from both parties (Damjanovic et al., 2017). Leadership in terms of resource commitment and support is non-negotiable for effective PPPs. The public sector will play a leading role in this direction. However, their resource capacities and capabilities will be vital as these must be leveraged for effective PPP performance (Liu et al., 2016). The rules and procedures for PPP engagement must be clearly defined by the team and implemented on schedule (Ojelabi et al., 2020).

Developing capability measures of public sector organisations, involves five principal components (Ojelabi et al., 2020; Puntillo et al., 2022). The conventional practices of training and development, organisational practices, enhancement of personnel through government-aided intervention are necessary (Puntillo et al., 2022; Azamela et al., 2022; Ojelabi et al., 2020). The principal components ensure the success in organisation. These have the likelihood of impacting the organization when adopted in improving public sector capacities. This assists PPP project teams in meeting project performance to provide cost effective and work within schedule (Mulcahy, 2013; Rose et al., 2014; Yuan et al., 2012).

Based on the literature review, the study therefore proposes the following hypotheses to be tested:

H_7: Public sector capacity has significant positive impact on PPP cost performance.

H_8: Public sector capacity has significant positive impact on PPP time performance.

4.4.5 Risk-sharing model and PPP performance

Risk is uncertainties that are likely to occur and may result in either a negative or positive outcome for the project (Mulcahy, 2013; PMI, 2015). The financial implications of risk uncertainties to the project include delay in project completion (PMI, 2015; Mulcahy, 2013; Rose et al., 2014). Poor risk sharing allocation can affect the overall financial and social performance of PPP funding. The private partners may likely be exposed to diverse portfolio investments and options to use their limited funds. Agreeing on the rightful formula for sharing PPP risks, guarantees private partner participation in the contract (Mulcahy, 2013; Ojha & Pandey, 2017). Risk-sharing model in this study is defined as the reasonable allocation of uncertainties likely to occur in PPPs contract which have the tendencies to ultimately impact positively or negatively on the financial and social performance of the project (Mulcahy, 2013; Rose et al., 2014). Risks are shared between the partners (Khallaf et al., 2018). Both public and private sector PPP stakeholders involved in the PPP will manage the uncertainties defined within the PPP contract agreement.

Further, terms and specifications on how risks are to be managed and shared must be specified in the PPP contract agreement (Mulcahy, 2013). The formula for risk-sharing prevents future conflicts common in PPPs. The parties' inability to determine and agree on these indicators in the contract agreement could impact the financial and social performance outlook of PPPs. The uncertainties could affect the cost and schedule effectiveness, as final project deliveries delay, creating additional risk (Mulcahy, 2013; Rose et al., 2014). Effective risk management strategies prevent conflicts that often deny the actual achievement of the PPP objectives (Akbari Ahmadabadi and Heravi, 2019). However, there is the need for the parties to guarantee each other to be transparent in the process,

in terms of information sharing for proper risk allocation and strategies among them (World Bank, 2016; Dewulf and Garvin, 2020).

Based on the above, the study therefore proposes the following hypotheses to be tested.

H_9: Risk sharing model has significant impact on PPP cost performance.

H_{10}: Risk sharing model has significant impact on PPP time performance.

4.4.6 Governance structure and PPP performance

According to Chan et al. (2010a), the progress of PPP is in line with the regulatory systems and procedures in place that help in managing successful PPP contract performance. Regulatory and policies originate from governance structures guide PPPs success. A good governance structure stimulates both transparent and competitive PPPs (Li et al., 2005; Cruz and Marques, 2011).

In this study, the governance structure is defined as a responsive system or outlines clearly provided to guide PPPs process and practice (Hueskes et al., 2017). The governance structure involves a responsible body that takes decisions, and provides leadership directions throughout the PPP implementation process. A transparent and responsive governance structure involves formal and informal mechanisms in ensuring procedures and rules are applied for successful PPPs (Hueskes et al., 2017). Unilaterally, this will prescribe detailed rules and procedures governing the process. However, this will regulate relationships, trust, loyalty and reciprocity among contracting parties for long term contractual relations and benefits (Martins et al., 2011; Cruz and Marques, 2011).

There are many different ways governance structure operates as in PPPs and how it impacts overall PPP project performance. The public entities can use formal and informal mechanisms as governance instruments to peruse the agenda (Liu et al., 2016). It, therefore, requires control mechanisms characterised by the executive command in regulating transactions among the parties, both private and public (government) (Cruz and Marques, 2011). As a formal instrument strategy, this

requires leadership that outlines clear roles and responsibilities for smooth implementation strategies to be on point.

According to Zheng et al. (2008), this involves contractual governance where formal governance instruments are deployed for effective PPPs. Formal contractual governance instruments may unilaterally prescribe detailed rules and procedures (Hueskes et al., 2017). A simple reference design or rigid tender specifications, and incentives to private consortiums in terms of risk transfer, functional output specifications, performance monitoring and performance-based rewards and sanctions (Shen et al., 2016; Hueskes et al., 2017). However, informal governance instruments include network governance instruments or relational governance (Hueskes et al., 2017). The use of both formal and informal structures affects the sustainable future of PPPs contractual engagement. For instance, PPP performance is influenced by aspects like mutual trust, cooperative decision-making, and process management (Verhoest et al., 2016; Hueskes et al., 2017). More so, informal governance instruments in PPP projects might encourage an interaction for mutual building and trust relationally. This is essential for an effective contract administration process for PPPs. Effective utilisation of both governance structures results in successful PPPs performance, thereby creating value addition to the process.

The governance structures are critical within the project life cycle, whether at the predictive, iterative and or incremental level of the project (Project Management Institute, 2015; PMBOK Guide, 2015). Each of the processes and the cycle will require the application of rules and procedures. For instance, successful PPPs contain several phases: need assessments and options approval; preparation and conception; tendering process and contract award; implementation & contract management; and contract termination (Ren et al., 2019; Liu et al., 2016; Cabrera et a., 2015). These phases will eventually require suite governance structures and how procedures and guidelines are agreed upon relationally in managing contracts for the parties (Verhoest et al., 2016; PMI, 2015).

In PPPs, the rules and procedures often limit opportunities (Dewulf and Garvin 2015). Flexibility and adaptability are required for uncommon traditional procurement solutions. Ghana adopts a centralised approach to PPP practice; rolling out at the lower level will consequently require flexibility and adaptability to ensure rules and procedures are sustainably adhered to, to influence the financial performance of PPPs and acceptance (Zonneveld et al., 2011; Dewulf and Garvin 2020).

Though delay in the process, insufficient diligence, informal control, among others, are to be expected, formal procedures cannot be compromised. Compromising could further implicate the PPP implementation process and affect project performance (Dewulf and Garvin, 2020). While public and private parties will regularly be engaged in short-to long-term business activities subject to the changing environment. Their responses in such engagement will require moderation and relational approaches to regulate effective PPP practice (Dewulf and Garvin, 2020). Project management agility and flexibility, and relational strategies must be aligned with emphasis on learning and adaptation to eliminate poor governance structures in the PPP project set-up (Dewulf and Garvin, 2020). The parties must be ready to understand each other and the rules and procedures for the contract. Therefore, it requires both formal and informal approaches while being flexible enough to implement effective PPPs.

Based on the discussion of literature, the study therefore proposes the following hypothesis to be tested.

H_{11}: *Quality of governance structure has significant impact on PPP cost performance.*

H_{12}: *Quality of governance structure has significant impact on PPP time performance.*

4.4.7 Tendering process probity and PPP performance

The PPPs tendering processes are concerned with selecting a competent entity, and or consortium with sound technical and financial solutions for a proposed

project (Liu et al., 2016). The objective is to improve the process while selecting the most competent supplier and or tenderer to implement the PPPs contract. An effective tendering process open to fair competition and transparency guarantee risk mitigation, project cost control, and the completion of the project on (Mulcahy, 2013; Rose et al., 2014). Researchers including Solino and Gago (2016) and Liu et al. (2017), have indicated that there is high cost in the preparation, bidding and awarding of PPP contracts especially at the tendering stages. According to Solino and Gago (2016), a developed model based on the transaction costs must cover the entire life cycle of the contract and the tendering process of the PPP contracts. They also indicated that cost borne during the tendering stages (ex-ante) and enforcement costs, renegotiation costs, and the cost arising from litigation (ex post) call for open procedures and accurate information sharing in the tendering process. Moreover, information sharing in the tendering process ensures confidence and competitiveness in the process (Liu et al., 2016; Guilen, 2022). Tenderers submit information describing their business qualifications and detailed technical and financial proposals, based on sets of pre-defined criteria to be evaluated by trained public institutions or officials (World Bank, 2016). According to Liu et al. (2016), whether through direct negotiation, competitive negotiation and competitive tendering, the processes must be fair, transparent and open to create value.

In addition, whichever tendering process is being adopted, the objective is to ensure fairness, openness for transparency (Casady et al., 2019). If competitiveness and transparency do exist, there is the likelihood of preventing social mistrust in the process. Should any party be aggrieved, it ultimately affects the overall PPP performance practices as the cost of a probable redress at the court of competent jurisdictions could affect the process and delay the completion date of the project. PPPs are often characterized by long duration of tendering periods. This often deter bidders for contracts and increase transaction costs (Palcic et al., 2019). Liu et al. (2016), also opined that tendering efficiency is improved among the parties when there is robust business case development, governance structures, effective communication system, high level of transparency, quality project brief, public sector capacities that provide accurate information for the process. There is need to balance between streamlining and

competition (Liu et al., 2016). Effective and efficient tendering process affect project transactional cost and relational contracting agreement of the PPPs (Liu et al., 2016). The three levels of tendering competitiveness, (direct negotiation, competitive negotiation and competitive tendering (Liu et al., 2016; Kim, 2016), may not create value when the process is not open and fair. Each of these levels influences transaction costs, procurement schedule, and accountability on PPP performance. Therefore, it is important that effectiveness and efficiency in the tendering processes are assured to prevent increase cost to the project due to possible delays.

A transparent tendering process will have to be open and fair to all parties, allowing procuring parties invited and interested to submit their tenders based on the requirements provided (Casady et al., 2019). Transparency is a complex phenomenon that requires "fairness or openness" in PPP tendering process efforts (Garvin, 2010; Li et al., 2016; Palcic et al., 2019). This approach supports the social capital cost concept, which ensures that public interest, transparency, and fair competition are adhered to which is critical for effective PPP performance practices (Reeves et al., 2017; Casady et al., 2019). This approach further supports the relational exchange theory adopted in this study. As entities relationally exchange resources for effective PPPs, it should be done within the premise of fair competition and transparency to invariably create value and improve PPPs' overall financial performance and on social contract.

Based on the discussion above, the study therefore proposes the following hypotheses to be tested.

H_{13}: *Quality of governance structure has significant indirect impact on PPP performance via competitiveness of PPP tendering process.*

H_{14}: *Quality of governance has significant impact on PPP performance via the transparency of PPP tendering process.*

H_{15}: *Competitiveness of tendering process has significant impact on PPP cost performance.*

H_{16}: *Competitiveness of tendering process has significant impact on PPP time performance.*

H_{17}: *Transparency of tendering process has significant impact on PPP cost performance.*

H_{18}: *Transparency of tendering process has significant impact on PPP time performance.*

H_{19}: *Competitiveness of tendering process has moderating effect on the impact of organisational resources on PPP cost performance.*

H_{20}: *Competitiveness of tendering process has mediating effect on the impact of organisational resources on PPP time performance.*

H_{21}: *Transparency of tendering process has moderating effect on the impact of organisational resources on PPP cost performance.*

H_{22}: *Transparency of tendering process has mediating effect on the impact of organisational resources on PPP time performance.*

Table 4.1: Summary of outcome variables

Variables	Indicators	Reference	Range of scale
Dependent Variables (Performance success criteria)			
Time Performance	Schedule effectiveness in PPPs Quality in respective of PPP projects Completion of the project on schedule	GroBer, Riediger & Jurien, (2022); PMI, (2015); Whang et al. (2017); Mulcahy (2013); Harvey, (2010); Larson & Gray (2018); Bely et al. (2022); Mulcahy, (2013); PMI, (2015)	5-point LS; 1= a very weak time performance, 5= a very strong time performance.
Cost performance	Cost benefit analysis of the project Cost effectiveness in PPPs Financial sustainability for the PPPs Ability of the users to pay for the PPP projects provided	Larson & Gray (2018); Mladenovic et al., (2013); Chan & Adabre (2019); Makgopa (2019); Srinivasan & Dhivya (2019); McErlane et al. (2016); Mulcahy, (2013); PMI, (2015)	5-point LS; 1= a very weak cost performance, 5= a very strong cost performance.

4.5 CHAPTER SUMMARY

This chapter has presented the underlying theories, the variables and the conceptual framework leading to the formulation of hypotheses for the study. The underlying theories discussed were the Resource-Based View (RBV), The Resource Complementarity Theory (RCT) and the Stewardship Theory of Corporate Governance (STCG). In addition, two fundamental principles concerning probity of corporate governance namely, transparency and competition in tendering (Palafox-Alcantar et al., 2020; Murray et al., 2005; Donaldson & Davis, 1989; Schoorman and Donaldson, 1997) were also applied. The argument is that PPP parties require effective but efficient organisational resources utilization that are complementarily shared to create mutual long-term project benefits. The next chapter focuses the research methodology undertaken for the study.

CHAPTER 5

RESEARCH METHODOLOGY

5.1 INTRODUCTION

The previous chapter focused on the conceptual framework of the study and reviewed the literature on the impact of the organisational factors, and tendering process for successful PPP performance on cost and within schedule (time). The review echoed the need for effective organisational resources and tendering process effectiveness in meeting PPP project objectives both financial and social performance perspectives. Chapter six comprised the research design and the methodology used described how the study was conducted. Research methodology refers to rigorous analysis of the method or technique applied in the stream of research, to ensure that the conclusions drawn are valid, reliable and credible. The chapter is made up of the philosophy and paradigm adopted;, the study approach, population and sample size of the study, format for data analysis for which PLS-SEM was used. The chapter ends with ethical consideration where the study acknowledged confidentiality, data anonymity, data preservation which are essential for the study.

5.2 RESEARCH PARADIGM/ PHILOSOPHICAL ASSUMPTIONS

In research, philosophical stance is significant and leads to investigation of a phenomenon based on a specific paradigm chosen. A research paradigm, is a cluster of beliefs that dictates to scientists in a particular discipline what should be examined, how research should be conducted, and how the results should be interpreted (Bryman and Bell, 2011:24). According to Blumberg, Cooper, and Schindler (2011:17), a research philosophy can be divided into two primary categories: positivism and pragmatism. and interpretivism. This study followed the positivists beliefs to investigate successful PPP (Public Private Partnership) performance. This positivist philosophy and other competing ones are discused in the following sections to place the research in context.

5.2.1 Positivism

A research philosophy derived from the scientific sciences, based on the idea that the social world exists externally, and can be objectively seen by an impartial researcher acting as an objective analyst (Mc Manus and Arisha, 2017). The positivist approach to research is scientific, with the goal of developing generalised findings from experiments and systematic observations of reality (Collins and Hussey, 2013; Creswell, 2013). It believes that reality is stable and can be observed and described from an objective viewpoint without interfering with the phenomena being studied (Creswell, 2013). When applied to social science, however, the positivist paradigm presumes that the researcher obtains data while remaining external to the study process and independent of the research subject. Neuman (2011:520), cited by Alias et al. (2018), further postulate that positivism is a research paradigm that combines a logical method with exact quantitative data measurement to allow the researcher to find and confirm causal laws that allow human behaviour predictions.

The positivist studies can be longitudinal or cross-sectional and deductive in design, and may use survey questionnaire to make generalizations from the sample population by simplifying human experience into numerical data that are well suited for statistical analysis. Positivism draws on single reality (ontological) and epistemological whilst viewing issues from two main perspectives and use quantitative data to analyse results. Positivism is concerned with uncovering truth and presenting it through empirical means (Hennig Van Rensburg and Smith, 2004) cited by (Mohamed and Arisha, 2017). This often involves manipulation of reality with variations in variables so as to identify regularities in (and to form) the social world. Predictions can be made on the basis of the previously observed and explained realities and their inter-relationships. The outcomes however of positivist research are replicable factual generalisations about social phenomena (Mc Manus and Arisha, 2017).

As stated earlier, positivism underpins this research hence objectivity is crucial in undertaking the research. Although interpretivism did not feature in the research, it is necessary to highlight its main tenets.

5.2.2 Interpretivism

Social sciences necessitate a distinct research philosophy, and as a result, the social world cannot be comprehended using natural science research methods (Mohamed and Arisha, 2017). The constructivist philosophy, which is a branch of interpretivism, rest on the philosophy that knowledge is constructed through beliefs, or learning that human experiences are intrinsically subjective and are shaped by the environment in which they live (Saunders et al., 2015; Brinkmann and Kvale, 2015). Natural phenomena, on the other hand, are unique because they are formed by individuals in specific situations, and are too complicated to be reduced to generalized laws and equations, according to interpretivists (Crotty, 1998; Mack, 2010; Mohamed and Arisha, 2017). Since, understanding of the social phenomenon under investigation is not the same as absolute truth, it cannot be applied to other conditions (Mohamed and Arisha, 2017).

Adopting a contrary stance to positivism, the phenomenological paradigm aims to study social phenomena from within their own context and considers that there is an interactive relationship between the researcher and research subjects (Mc Manus and Arisha, 2017). Interpretive research emphasizes the importance of humans as social actors, with a researcher gaining knowledge through entering the social worlds of research subjects to gain a subjective and empathic understanding of the phenomena being examined (Holden and Lynch, 2004). Interpretive research results provide an understanding of the social phenomenon under inquiry, not absolute truth, and hence cannot be applied to other situations (Mc Manus and Arisha, 2017). Interpretive paradigm is underpinned by observation and interpretation, thus to observe is to collect information about events, while to interpret is to make meaning of that information by drawing inferences or by judging the match between the information and some abstract pattern. Understand the world from subjective point of view and uses interview that relies on subjective

relationship between the researcher and subjects (Creswell, 2013). This means gathering information through inductive qualitative technique is considered in interpretivism.

Positivism has the advantage of being cost-effective in collecting huge amounts of data, having a clear theoretical emphasis for the research from the start, being easier to compare, and giving the researcher more control over the research process (Saunders et al., 2009; Brinkmann and Kvale, 2015). Positivism, on the other hand, is inflexible, and once data collecting begins, it is difficult to change direction. It is also inept at understanding social processes, and it frequently fails to find the meanings people attach to social phenomena (Mohamed and Arisha, 2017).

Interpretivism, on the other hand, makes it easier to comprehend how and why things happen, allows researchers to be aware of changes as they happen, excels at understanding social processes, and accommodates complexity and contextual elements. Data collecting for interpretivism can be time consuming; data processing can be difficult and complex; researchers must live with the uncertainty that no apparent patterns will emerge; non-researchers often regard interpretivism as less credible (Brinkmann and Kvale, 2015). Moreover, Crotty (1998), cited by Bashir et al. (2017), argued that ontology and epistemology are inextricably linked, making them impossible to disentangle from a conceptual standpoint when discussing research technique. To develop meaningful reality, they should be simultaneously studied together to construct meaningful information. Purists, on both sides between positivism and interpretivism phenomenology argue that a researcher must take a position on the bipolar debates on epistemology and ontology by adopting a single research philosophy (Mohamed and Arisha, 2017; Guba and Lincoln, 2011).

5.3 RESEARCH APPROACH

Research approach is a procedure signifying the detail steps to data collection, analysis and interpretation (Creswell, 2014). There are basically two approaches

namely deductive and inductive approaches and are based on the data being collected and analysed quantitatively or qualitatively respectively, even though a research approach may be a combination of both which is called abductive approach.

Whilst the inductive approach begins with observation to create theory or generates hypothesis, the deductive approach does the opposite and starts by testing hypotheses based on exixting theory and moves from general idea or theory to a particular situation in the real world. If the predictions are correct then the theory is supported, if not rejected or modified (Saunders et al., 2015). The deductive approach connotes positivist paradigm and denotes a quantitative research method in which the study hypothesis is either validated or disproved (Singh and Singh, 2015; Creswell, 2014; Guba and Lincoln, 2011).

This research takes the deductive approach. The deductive approach typically concentrates on measuring or counting and involves collecting and analysing numerical data and applying statistical tests. Quantitative research concentrates on measuring the scale, and the range of a phenomena (Guba and Lincoln, 2011; Creswell, 2014). This research seeks to gather participants' views on public-private partnerships for infrastructural development in Ghana to test hypothesis developed based on the construct after in-depth literature studies. The deductive process is associated with linking causes and effects (Creswell, 2014).

5.4 RESEARCH DESIGN

Research design is the blueprint for conducting a study with maximum control over factors that may interfere with the validity of findings. It is the overall plan for answering research questions or testing the research hypothesis. It provides a framework and the plan of a project. It explains the type of research (experimental, quasi-experimental, survey, correlational, review, and so on) (Johnson, 2021; Rodriguez, 202; Brinkmann and Kvale, 2015; Munoz-Garcia and Villena-Martinez, 2021). According to Creswell (2014), in a survey research design, data is gathered from a large sample size within a specific period to assess their opinions on a

phenomenon being investigated. This study adopted the cross-section, explanatory, correlational, survey design. The explanatory design explores causality and identify cause-and-effect relationships (correlation). The correlational element measures the relationships among the various valiables in the hypothesised conceptual framework.

5.5 POPULATION AND SAMPLING

5.5.1 The population

Population is the number of people or items the researher use has considered for the study (Brinkmann and Kvale, 2015; Fowler, 2014; Denzin and Lincoln, 2013; Cooper and Schindler, 2011). The population for this study comprised all the project directors and participants that implement PPP in the Volta Region of Ghana, numbering five hundred and eighty-nine (589) (VRCC, 2020). The population was made up of Coordinating directors (CoDs):18, Environmental officers (EnOs): 254, Procurement officers (PcOs):77, Project Engineers (PrEs): 77, Budget Officers (BuOs):58, Planning officers (PlOs):23, Finance officers (FiOs):23, Internal Auditors (IAs):23, Presiding Members (PMs):18, and Private Project consultants for the districts (PPrCs):18 (VRCC, 2020). The population was obtained from districts and municipal assemblies including Adaklu, Afadjato-South, Agotime-Zoipe, Akatsi-North, Akatsi-South, Anlo, Central Tongu, Ho West, Ho Municipal, Keta Municipal, Ketu North Municipal, Ketu South Municipal, Kpando Municipal, Hohoe Municipal, North Dayi, North Tongu, South Dayi and South Tongu (VRCC, 2020).

5.5.2 Sampling and sampling frame

The fundamental purpose of sampling is to select a sample that represent the population in such a way as to produce statistics that can accurately estimate the true population parameters (Saunders et al., 2016). Sampling allows for representation to ease data collection. It also allows for consideration of different

categories of a group. Thus, saving of time, effort and resources (Saunders et al., 2016; Pradhan, 2013; Babbie and Mouton, 2007). The sample frame consists of a list of all the possible elements from which a sample is drawn. The sample frame identifies the population for statistical treatment. Because a researcher rarely has direct access to the entire population of interest in social science research, a researcher must rely upon a sampling frame to represent all the elements of the population of interest. Project participants drawn from the Volta Regional Coordinating Council (VRCC, 2020) formed the sample frame for this study. Thus, a total of the 18 administrative districts in the region made up of 589 people wereconnected with PPP projects. A sample frame is the list of the total population available from which the sample is selected for a study (Brinkmann and Kvale, 2015; Kumar,2014).

5.5.3 Sampling technique

Stratified random sampling strategy was chosen for this study. This is a probability sampling technique that ensures there is adequate representation of the key population or project participants in the study. It was used to break project participants into smaller subunits of interest to be investigated (termed a stratification variable). In this manner, there is an effort to make the sub-divisions more homogeneous or alike so that representatives in each of the sub-groups can randomly be selected to form part of the sample size (Saunders et al., 2016; Pradhan, 2013; Babbie and Mouton, 2007). The administrative districts in the Volta Region were divided into six strata, and respondents were selected from each stratum using simple random sampling technique (Babbie and Mouton, 2007). According to Saunders et al. (2016), the technique ensures a high representativeness of all the strata.

5.5.4 Sampling criteria

The sample criteria specify the specific features that elements in the population must possess in order to be included in the study (Cooper and Schindler, 2011; Ahadzie et al., 2014). According to Burns and Grove (2012), the criteria for

inclusion define the research population of interest. As a result, in order to achieve the study's goals and objectives, the PPPs project participants designate must have specific characteristics. The following four characteristics were then used as qualifying criteria for respondents in the study:

- Must be operating in the Volta Region of Ghana.
- Experience in engaging in PPP projects for the last ten years
- Having a good understanding of PPPs; with hands-on experience in tendering processes of PPP projects.
- The target respondents should include practitioners from public procuring authorities, PPP consultants or experts in the districts.

The sample size is a portion of the population from which data for a study is collected (Brinkmann and Kvale, 2015; Saunders et al., 2016; Canhoto et al., 2014). The sample size for PPPs project participants was calculated using Yamane's (1967) sample size determination formula, which was cited by Atiase et al. (2018):

$$S = \frac{N}{[1 + N\,(e^2)]}$$

Where: S = sample size, N= sample frame, e = marginal error (degree of confidence interval) = 0.05 (5%). The sample size was determined as follows:

Table 5.1: Sample size determination for quantitative study

Respondents per assemblies	Total Population	Proportional sample size allocation
Coordinating directors (CDs)	18	$\frac{18}{[1+18\,(0.05^2)]}$=17
Environmental Health officers (EHOs)	254	$\frac{254}{[1+254\,(0.05^2)]}$=155
Procurement officers (POs)	77	$\frac{77}{[1+77\,(0.05^2)]}$=65
Project Engineers	77	$\frac{77}{[1+77\,(0.05^2)]}$=65
Budget officers (BOs)	58	$\frac{58}{[1+58\,(0.05^2)]}$=51
Planning officers (POs)	23	$\frac{23}{[1+23\,(0.05^2)]}$=22

Finance officers (FOs)	23	$\frac{23}{[1+23\ (0.05^2)]}$=22
Internal Auditors (IAs)	23	$\frac{23}{[1+23\ (0.05^2)]}$=22
PPP consultants (P3Cs)	18	$\frac{18}{[1+18\ (0.05^2)]}$=17
Presiding Members (PMs)	18	$\frac{18}{[1+18\ (0.05^2)]}$=17
	589	453

The sample size for the data collection was calculated using the sample size determination formula (see Table 5.1) to obtain the sample size of four hundred and fifty-three (453). A proportionate stratification of the districts and municipal assemblies in Ghana's Volta Region was accomplished using stratified random sampling.

5.6 CONSTRUCT DEVELOPMENT FOR THE STUDY

This section of the thesis outlines and discusses the various steps followed in developing the concceptual framework guiding the research.

5.6.1 The proposed research model

The literature review for literature to for developing the conceptual framework has indicated that there is strong relationship between the variables project organisational resources and tendering process on PPP performance. The conceptual model of the study has six main independent variables which include project value (pv), quality of project brief (qpb), public sector capacity (psc), governance structure (gs), resilient business case (rbc), risk sharing model (rsm), which are moderated and meditated by tendering process. It is predictable that the independent variables and moderated variables would positively impact successful PPP performance on time and within cost. Table 5.2 provides summary of formulated hypotheses.

Table 5.2 Summary of formulated hypothesis

	List of Hypotheses	
1.	H_1:	Resilient business case has significant positive impact on PPP cost performance
2.	H_2:	Resilient business case has significant positive impact on PPP time performance
3.	H_3:	Quality of project brief has significant positive impact on PPP cost performance
4.	H_4:	Quality of project brief has significant positive impact on PPP time performance
5.	H_5:	The lower the value of the project the better the PPP cost performance
6.	H_6:	The lower the value of the project the better the PPP time performance
7.	H_7:	Public sector capacity has significant positive impact on PPP cost performance
8.	H_8:	Public sector capacity has significant positive impact on PPP time performance
9.	H_9:	Risk sharing model has significant impact on PPP cost performance
10.	H_{10}:	Risk sharing model has significant impact on PPP time performance
11.	H_{11}:	Quality of governance structure has significant impact on PPP cost performance
12.	H_{12}:	Quality of governance structure has significant impact on PPP time performance
13.	H_{13}:	Quality of governance structure has significant impact on competitiveness of PPP tendering process
14.	H_{14}:	Quality of governance has significant impact on the transparency of PPP tendering process
15.	H_{15}:	Competitiveness of tendering process has significant impact on PPP cost performance
16.	H_{16}:	Competitiveness of tendering process has significant impact on PPP time performance
17.	H_{17}:	Transparency of tendering process has significant impact on PPP cost performance
18.	H_{18}	Transparency of tendering process has significant impact on PPP time performance
19.	H_{19}	Competitiveness of tendering process has moderating effect on the impact of organisational resources on PPP cost performance
20.	H_{20}	Competitiveness of tendering process has mediating effect on the impact of organisational resources on PPP time performance
21.	H_{21}	Transparency of tendering process has moderating effect on the impact of organisational resources on PPP cost performance
22.	H_{22}	Transparency of tendering process has mediating effect on the impact of organisational resources on PPP time performance

5.6.2 Measurement criteria of the dependent variables

The dependent variable in the study is PPPs project performance. The sub-variables, with different measures (cost effectiveness in PPPs, schedule effectiveness in PPPs, financial sustainability, quality in respect of specifications) measuring financial performance of successful PPPs. Similarly, social performance was measured using sub-variables (social acceptance of the project, ability of the users to pay for the PPP projects provided, cost benefit analysis).

The study defined successful PPP performance as a transparent but competitive outcome of the process where a competent private consortium or a firm, having technical-know-how and financial solutions for an anticipated project to create value for stakeholders, and profitable for the private sector organisation and for future investments. {A successful PPP project performance was measured from both social and financial perspectives in this study. Whilst the social argument supports stakeholders' acceptance of the project and the ability of the end-users able to afford or pay for the facilities; the financial performance argued PPP project completed within time and on cost for the parties.} Please reconstruct those sentences. Empirically, successful PPP performance has been measured at the district level using a Likert scale of one to five. The variables were measured based on the scale designed "1 =Strongly Disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strongly Agree" (Joshi et al. 2015). One (1) means there is strongly disagreement with successful PPP performance in the district and five (5) means there is a very high level of successful PPP performance in the district.

5.6.3 Mediating and moderating variables

A PPP is essentially, a public procurement arrangement between the public sector organisation and the private sector (Marques, 2010). Tendering is part of the procurement process. As such PPP tendering must adhere to the tenets of procurement. Although a plethora of principles principle exist, none appear as importance as probity which means transparency and competitiveness in the tendering process. It is argued that a successful PPP project performance requires

competitive and transparent tendering process where public agencies provide enabling environment for bidders to compete favourably with the objective of being fair and transparent to all parties' concerned. This means seeking competition and openness that accommodate fairness for individual suppliers, contractors, consultants and or combination of both who are invited by the procuring public entity at the district tender committee level to compete without contravening the process. Moreover, there must be adherence to required regulations (PPA); required documents and information are provided by the client and on time; there is available post evaluation or auditing of the PPP process.

The variables were measured based on the scale designed "1 =Strongly Disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strongly Agree" (Joshi et al. 2015) to assess competitive tendering (CT) (Joshi et al. 2015). The Likert scale rating were by PPP experts in each study districts, where one (1) means there was no competitiveness and transparency (or sole sourcing through direct negotiation) whiles five (5) means there was a very highly competitive & transparent PPP tendering process (i.e., more than ten bidders) in the district PPP contracts or projects accordingly.

5.7 MEASURING THE INDEPENDENT VARIABLES

Having presented and discussed the dependent, mediating and moderating variables, this section provides an in-depth discussion on the independent or predictor variables used in the research.

5.7.1 Resilient business case

Resilience business case (rbc=H_1) has been defined as a robust investment portfolio valuable at the district and or municipal level. The robustness of the business case provided should be capable of attracting private sector fundings or investments. Business case prepared by the contractor or agencies in accordance with the public sector is a good start for effective PPPs. A good practice and

guidance issued by the authority attracting funding ensure there is a resilience business case provided. The Resilience business case must be flexible enough to include clear need assessment; economic viability determination by budget committee; sufficient consideration of procurement options to be used; available innovation desk case development at the district and municipal levels for contracting, among others.

A resilient business case demonstrates the economic viability to invest (Liu et al. (2016). A resilient business case provides strong case points, validating the benefits and values the project seeks to deliver (PMI, 2015; Mulcahy, 2013; Rose et al., 2014). This depends upon how the local economy is structured. A robust economy that is healthy attracts investment. Developing economies often suffer due to deficit balance of payment and external debts to manage (World Bank, 2016; Public Private Infrastructure Advisory Facility, 2016). A good external reserves and effective public financial management support resilient business portfolio investments for project partners (World Bank, 2016; Ghazali et al., 2018).

Infrastructure Australia (2008), indicated that resilient business case is based on the Project's economic and financial viability of the existing country which is critical to create value. Government' depends upon fiscal economic stability in creating a winning business case (Liu et al. (2016). A robust economy at the local level is a further point of investment opportunities for foreign or private investment (World Bank, 2015; Public Private Infrastructure Advisory Facility, 2016). whilst effective management of long-term contracts and commercial viability by the partners determine resilience or robustness to investment (Zhan, 2005; Mulcahy, 2013; Rose et al., 2014; Khalifa et al., 2015; Ghazali et al., 2018). The contention therefore is having a resilient business case prepared by the district level PPP authorities which could attract private fundings or investments. There is likelihood of improving future PPP project funding efforts and performance. When resilient business case is provided. The participants in this study were asked if the public sector developed a robust business case to attract PPP investments.

5.7.2 Quality project brief

The second predictor variable, quality project brief (qpb=H_2) referred to in this study as the existence of a clearly defined procurement project brief base on agreed project objectives, scope, major deliverables, milestone, schedule, activities, process including resources required to deliver the expected outcome. The quality project brief is the first step in identifying the client's needs for the creation of a built asset or the provision of services. It includes the statement of need and describes the possible requirements of the project to be provided. It is a key document upon which the design and costing are based. The literature shows that the key distinguishing features of a successful PPP tendering, are based on the standardized input-output-outcome specifications requirements gathering and design (Liu et al., 2016). The ability of the procuring agency to update guidelines is based on skills to assist in documentation thereby increase the quality of project brief to be provided (Yuan et al., 2011).

The experience and knowledge of the public sector further promotes competitiveness and transparency of the tendering process for quality PPPs. This is crucial but significant enough for effective PPP transactions in creating value for money (Dulaimi et al., 2010). A poorly defined project brief creates difficulties in meeting the project objectives agreed upon by theclients and the other project partners (Velotti et al., 2012; Liu et al., 2016). This could affect the overall cost and time of the PPP performance thus, increasing the end user fees. Key variables measured within the context of Project Value in this study include, there is clarity of project requirements to be provided in the contract; the goals or objectives of the project clearly stated; the process and procedures in achieving the project objectives are clearly defined and stated; there is reference to corporate experience and on similar past projects good or bad); the project outcomes meet client or user acceptance criteria of (quality, cost, scope, schedule).

5.7.3 Project value

The first predictor variable cost of project (pv=H_3) which is defined as the overall economic and financial value of the project at lowest cost on public purse that is capable of creating value for money in supplies. According to Zhan, (2005) project's economic and financial viability of Governments' is a capital asset and provide procurement options to be undertaken. The economic viability depends upon the fiscal structure and prudent macro-economic stability of the procuring country, and the ability of the national budget to withstand changes that may occur in atypical project environment (KPMG, 2010; World Bank, 2015; Public Private Infrastructure Advisory Facility, 2016). A well calculated project value (influence) will ultimately determine what project end users may pay in the form of tolls and or levy as proceeds from PPP contracts affecting project performance (Infrastructure Australia, 2008).

The project value represents the total of all items associated with the project which are supported by long-term funds by the project authorities. It denotes the project's bankability of government financial years. This has to be accurately estimated as poor estimation could lead to shortage of funds impacting on the cost-risk and sustainability of the PPPs performance. The tendencies of having bankable accurately estimated affect successful PPP''s for future funding efforts. This further determines project viability outcomes for an accepted choice or decisions to be made on PPPs as an alternate procurement route of supplies. Key variables measured within the context of Project Value in this study include, there is accurate cost estimating strategies; there is reasonable cost-risk allocation formular; there is overall economic value disclosure; there is overall social value disclosure; there is overall financial value disclosure clarity of revenue streams determination; tender valuation include value for money comparison; there is a detail appraisal audit system implemented in post project evaluation; there is sustainable funding opportunities or options for PPP contract. The PPP procurement experts were asked if the public sector creates efficient but lowest cost of project for the public.

5.7.4 Public sector capacity

Public sector capacity (psc=H_4) is defined in this study as the ability of the district or local level contracting agencies capability of managing and or implementing PPP procedures, policies and or phases to create value. The purpose of this predictor variable is to provide competent public sector having the technical skills, needed experiences and knowledge, as an organisational resource. More so, procurement teams capable of following due process is an asset and for that matter likely to mitigate risks that might occur in PPP contract engagements.
The PPP involves regulatory frameworks and contracting policies requiring continuous training for capacity development if agencies are to be relevant. Managing, the four PPP phases for instance requires competence right from the public sector perspectives and private settings. Thus,; resource applications in terms of capacities across diverse backgrounds create value and affect PPP performance.

Key variables measured within the context of Public sector capacity in this study include, there is sufficient public sector experience and knowledge; there is sufficient technical capacity in terms of skills in promoting PPP at the local level of contracting; there is capacity to manage risk at the local level; public sector project team can monitor performance at each level of PPPs; there is leadership involvement at each level of PPP contracting; public sector personnel can conduct in-depth market survey prior to PPP engagements; there is competency to structure, implement, and evaluate the project considering financial, legal technical aspect of PPPs; there is constant dialogue with key advisory on resource guarantee and risk-allocation strategies; there is support for continuous process improvement for further training, knowledge sharing, skill development in PPPs.

5.7.5 Risk sharing model

Risk sharing model (rsm=H_5) has been defined in this study as reasonable allocation of project risks (uncertainties) both positive and negative likely to occur in PPP contracting. Reasonably, project risks might occur due to fiscal challenges

of the local or centralised economy or uncertainties which may positively and negatively affect overall project performance. Negative risks identified are to be shared and mitigated whilst positive ones enhance and shared among PPP partners. Risks identified are to be shared among contracting parties to create value and confidence in the contract. Effective risk allocation strategies will ensure qualification and quantification of priority risks identified thereby allocating reasonable financial resource to mitigate them. Cost-risks to the projects are minimised which directly and indirectly affect service or project users. The ability to design a formula for sharing risk identified is critical determinate for effective PPPs (PMI, 2015; Mulcahy, 2013; Rose et al., 2014).

Also, Chou and Pramudawardhani (2015), indicated that risk sharing and or allocation is critical for sustainability of the project and the partnership. And efficient risk allocation reduces overall project cost and serves as incentive for future fundings for PPP partners (World Bank, 2016; Public Private Infrastructure Advisory Facility, 2016; Liu et al., 2016; Khallaf et al., 2018). An effective risk sharing mechanism promotes private sector participation to compete, and improves PPP tendering transparency which affects PPP performance objectives (World Bank, 2015; Public Private Infrastructure Advisory Facility, 2016; Liu et al., 2016).

Risk sharing model in this study includes, “there is sufficient public decision-making on risks identification, assessments, quantification and management; there is alternate guarantees available to mitigate PPP risks; there is sufficient project permit and approvals; force majeure determinations and quantification are done; uncertainties on fiscal consolidation and tax policy and for long-term contractual relations were considered in managing PPP risks identified.”

5.7.6 Quality governance structure

Quality Governance structure (qgs=H_6) is defined in this study as a responsive system or body that takes decision, provides leadership and directions during PPP procurement process. The study proffers that having responsive governance

structures with roles and responsibilities clearly define, serve as resources for contracting parties especially the public sector in attracting private resources or investments. Whilst a procuring entity with leadership promotes effective governance and administration of contract which it serve as critical resource for infrastructural investments.

According to Li et al. (2005), cited by Verhoest et al. (2013), governance structures are progressively in line with the regulatory systems to avert conflict in contract. Whilst Martins et al. (2012), indicated that a good governance structure stimulates both transparent and competitive procurement tendering which ultimately affecst project performance (Chan et al. (2010a), (Verhoest et al., 2013). More so, both parties' ability to provide quality governance will depend upon leadership in place that will ensure available skills, positive attitude, experience and commitment towards effective PPPs (Hueskes et al., 2017; Damjanovic et al., 2017). In the project management literature, project governance has been gaining much interest (Ahola et al., 2014) cited by Brunet (2018). A good governance is an important factor for PPP project success in terms of government developing sound economic policy and administrating projects (Zhang et al., 2015). International Journal of Project Management special issue on "Governance projects under complexity: theory and practice in project management", according to Pitsis et al. (2014), argued that project governance has the potential to become a conventional field of research and industrial practice. Brunet (2018), have admitted that project governance is difficult to conceptualize.

However, quality governance structured in this study include, prescribed rules and procedures; strong political support to the project; loyalty to the project objectives; clear dispute resolution processes or structures; institutional capacities at the lower level of project decisions; and clearly specification of roles and responsibilities of the parties; the ability of the public partners providing sound legal and fiscal environment. A quality governance structured provides the clear rules and regulations and or guidelines in for tendering which ultimately affect project performance in terms of cost and devoid of delay in project implementation efforts.

Table 5.3: Summary of variables and how they are measured

Variables	Indicators	Reference	Number of Items	Measured
Dependent Variables (PPP Performance success)				
Financial Performance	Cost effectiveness in PPPs Schedule effectiveness in PPPs Financial sustainability Quality in respective of specifications	(GroBer, Riediger and Jurien, (2022); PMI, (2015); Whang et al. (2017); Mulcahy (2013); Harvey, (2010); Larson and Gray (2018); Bely et al. (2022); Mulcahy, (2013); PMI, (2015); Gatti (2014); Chan et al., 2010).	4	5-point LS; 1= a very weak, 5= a very strong.
Social performance	Social acceptance of the project Ability of the users to pay for the PPP projects provided Cost benefit analysis Effective stakeholder consultations	(Larson and Gray (2018); Mladenovic et al., (2013); Chan and Adabre (2019); Makgopa (2019); Srinivasan and Dhivya (2019); McErlane et al. (2016); Mulcahy, (2013); PMI, 2015)	4	5-point LS; 1= a very weak, 5= a very strong.
Independent Variables (public entity project organisational resources)				
Resilient business case	There is a needs assessment prior to invitation of private parties There is project economic viability, determined by project committee There is sufficient consideration for various procurement options for PPP contracting There is available innovation desk for business case development	(Liu et al. 2016; PMI, 2015; Mulcahy, 2013; Rose et al., 2014; Zhoa et al (2017; Spoann et al., 2019; Hueskes et al., 2017; Soliño and Gago de Santos, 2016; Chan and Adabre , 2019).	4	5-point LS; 1=strongly disagree, 5= strongly agree
Quality Project Brief	Clarity of project brief and client requirements on PPP projects The goal(s) of the project is clearly stated	(Simon et al., 2020; Cui et al., 2019; KPMG, 2010; Velotti et al., 2012; Ren et al., 2019; Liu et al., 2016; Xiong et al., 2015; Osei – Kyei and Chan, 2016).	5	5-point LS; 1=strongly disagree, 5= strongly agree

	Processes and procedures employ to achieve objectives are clearly stated Final project outcome meets user acceptance criteria of (quality, cost and schedule) There are references on corporate experiences and past projects (good or bad)			
Project's value	Accurate cost estimation strategies for successful PPPs Value for money auditing for current projects Reasonable cost-risk allocation and sharing among the parties Overall economic value disclosure for effective PPPs Overall social value disclosure for effective PPPs Overall financial value disclosure for effective PPPs Clarity of revenue streams determination in PPP contracts Sustainable mechanism on future project funding Tender Evaluation including Value for Money comparison Emphasis on technical efficiency and effectiveness for clients and shareholders	(Dennehy et al., 2017; ui et al., 2019; (Siemiatycki and Farooqi, 2012; Simon et al., 2020; Dewulf and Garvin, 2020; Gatti (2014); Chan et al. (2010); Hovy (2015); Zhoa et al (2017); Silverio-Fernadez et al. (2019); Gupta et al. (2012); Chan and Adabre (2019); Cui et al., (2019); Makgopa, 2019).	11	5-point LS; 1=strongly disagree, 5= strongly agree

	Detail appraisal audit systems are implemented in post project cost evaluation			
Public sector capacity	Sufficient public sector experience and knowledge Sufficient technical capacity for promoting PPPs at the local level Public sector leadership and involvement of various entities are encouraged Capacity to manage risk at the local level Public sector personnel monitor performance at each project level of PPPs Ability to conduct in-depth market survey prior to PPPs engagement Competencies to structure, implement and evaluate the project considering its financial, legal and technical aspects Constant dialogue with key advisory on resource guarantee and risk allocation strategies Support for continuous process improvement for further training, knowledge, and skills in PPPs	(Spoann et al., 2019; Cristofoli et al., 2021; Verhoest et al., 2016; Hueskes et al., 2017; Martins et al., 2011; Ojelabi et al., 2020; Khalifa et al. ,2015).	9	5-point LS; 1=strongly disagree, 5= strongly agree
Risk-sharing model	Sufficient public decision-making on risks	(PMI, 2015; Mulcahy, 2013; Rose et al., 2014; Chan et al.,	12	5-point LS; 1=strongly

	identification, assessment, and management for effective PPPs Land acquisition is available in mitigating PPP risks Alternate guarantees available for mitigating PPP risks Sufficient project approvals and permit obtain for effective PPPs Force majeure determination are assessed and mitigated in the PPPs long-term contractual relations in managing PPP risks identify Tax regulation change and fiscal management for successful PPPs Inflation and exchange rate volatilities have been considered Under dealings, corrupt activities in PPPs Risk allocation strategies and knowledge are shared adequately Technical design efficiency in PPPs Client responsiveness to climate change in eliminating PPP risks	2010); Hovy, 2015; Zhoa et al., 2017; Silverio-Fernadez et al., 2019; Gupta et al.,2012; Chan and Adabre,2019; Cui et al., 2019; Dewulf and Garvin, 2020).		disagree, 5= strongly agree
Quality corporate governance Structure	Sound legal environment that supports effective PPPs Prescribed rules and procedures are provided	(Li et al., 2005; Cruz and Marques, 2011; Chan et al. 2010[a]; Hueskes et al., 2017; Martins et al., 2011; Cruz and Marques, 2011; Verhoest et al.,	12	5-point LS; 1=strongly disagree, 5= strongly agree

	Strong political support for successful PPPs clearly defined coordination mechanism for co-existence between private and public sectors Loyalty to the project objectives among PPP partners Trust among parties in promoting effective PPPs Commitment among parties for successful PPPs Clear dispute resolution structures in place There are institutional capacities of public officers Responsibilities and the roles of various entities are clearly defined at each stage of PPP Availability of well-resourced leadership structure for both private and public towards effective PPPs Sound fiscal management in the PPP process	2016; Ren et al., 2019; Liu et al., 2016; Cabrera et a., 2015).		
Control variables (PPP Tendering Process)				
Competitiveness & Transparency)	Transparency in the PPP tendering process PPP tendering process is not competitive standardized documents to all parties in the tendering process	(Liu et al., 2016; Mulcahy, 2013; Rose et al., 2014; Solino and Gago, 2016; Guilen, 2022; Casady et al., 2019; Palcic et al., 2019; Reeves et al., 2017).	7	5-point LS; 1=strongly disagree, 5= strongly agree

	Availability of post evaluation/auditing for all tender documents PPP tendering processes are recorded on the tendering day for future documentation and lesson learnt, fairness and openness to both locals and foreign bidders in the PPP process, Strict adherence to the regulations and Acts			

5.8 DATA COLLECTION

5.8.1 Sources of data

The primary sources of data were collected from the 500 project participants drawn from the eighteen administrative districts in the Volta Region of Ghana (VRCC, 2021), who willing responded to the instrument designed (questionniare) used for the study.

5.8.2 Research instrument design

According to Hancook and Algozzine (2021), a questionnaire is helpful during survey research design for data collection. In this study, structured questionnaire was used to collect numeric data from the project participants based on research objectives and literature review for analysis (Brinkmann and Kvale, 2015; Saunders et al., 2016). The questionnaires were grouped into four main sections. Section A: made up of demographic characteristics of participants. Section B: competitive and transparent tendering for successful PPPs. Section C: Organisational Resources for successful PPPs. Section D: Successful PPPs Performances. A sample data collection instrument can be found in Appendix III.

5.8.3 Data collection procedure

In the first place, an introductory letter was obtained from the Department of Business Support, Faculty of Management Science, Central University of Technology introducing the researcher to the Volta Regional Coordinating Council (VRCC) and to the district and municipal assemblies for their assistance to participate freely in the study. The letter assured the confidentiality of the participants responding to the questionnaires. Prior to the admission, the questionnaire was moderated and sent to the Ethics Committee for vetting and approval. The structured instrument design was self-administered by the researcher and assisted by eighteen coordinators from the study area.

The participants were first contacted via e-mail and telephone. Also, a face-to-face technique was later used in gathering the final data for analysis with strict adherence to Covid-19 protocols. The data collected were self-administered and coordinated by eighteen research assistants within each respective district and municipal assembly in the Volta region, Ghana. In all, a total of 500 questionnaires were sent out for data collection. The data collection was between July, 2021 and December, 2021. In all, 453 participants completed the surveys for analysis with response rate of 92%.

5.8.4 Pilot study

Prior to data collection a pilot study was conducted. Pilot study was done to assure of reliability, validity, and responsiveness among the selected participants (experts) who are into PPP projects within the study area. A small-scale preliminary study conducted before any large-scale quantitative study in order to evaluate the potential, full scale project, is a pilot study (Junyong, 2017; Morin, 2013). The pilot study is essential for improvement of the quality and efficiency of the main study. In another words, it is conducted to assess the safety of treatment or interventions

of the variables in the construct to either accept or review (Junyong, 2017; Morin, 2013).

The pilot study was conducted among 50 selected respondents from the study area. The questionnaires administered or pretested by the researcher helped in removing the items that were not suitable were. The findings from the pilot study were excluded from the main findings. To ensure there is internal consistency for the selected variables, the pilot study was done to check for reliability and validity. Cronbach's alpha Reliability test was computed for the variables in SPSS. This is to ensure the results are reliable. The result of the test for the construct were indicated in Table 5.4.

Table 5.4 Cronbach's alpha reliability test statistics

Construct and variables	Cronbach's alpha	Cronbach's Alpha Based on Standardized Items	Number of items
Competitiveness and transparency (CT)	.855	.860	7
Quality governance (QG)	.910	.905	12
Quality Project Brief (QR)	.719	.743	6
Public Sector Capacity (PSC)	.875	.880	9
Project value (PV)	.933	.934	10
Resilience Business Case (RBC)	.897	.899	12
Risk Sharing model (RSM)	.890	.895	12
Financial Performance (cost and time)	.951	.934	2
Summary of all items	.973	.974	70

Cronbach's alpha test of Reliability indicated that the reliability is above α >.70. The rule of thumb for Cronbach's alpha Reliability is α>. 70. If less than 10 items, it should be α >0.5 for Cronbach's alpha Reliability test. Here test items are acceptable as they were above α>.70. (Source). Also, the inter-item correlation matrix was also positive and close to 1.000. Whilst the correlation of each item with all other items combined were above >0.40. Cronbach's alpha Reliability test of .973 summarized all the items tested in the construct. The test items were 70 tested and it was highly acceptable. Cronbach's alpha test of Reliability of .973. The reliability is above α >.70. Also, the inter-item correlation matrix is also positive and

close to 1.000. The correlation of each item with all other items combined were above α >0.40.

5.9 DATA ANALYSIS

5.9.1 Unit of analysis

Project participants drawn from 18 administrative districts in the Volta Region, Ghana made up the unit of analysis for this study. In this study, the unit of analysis were mainly project paticipants involved in public private partnership project implementation. The unit responses were drawn from information in relation to organisational resources and tendering process affecting public-private partnership project management efforts. Various aspects of PPPs such as competitive tendering (CT), Tendering transparency (TT), project value (PV), quality project brief (QPB), Public sector capacity (PSC), Governance structure (GS), Risk sharing model (RSM), Resilience business case (RBC), stakeholder engagement (SE) and project communication (PC) were measured and analysed using five-point Likert scale. The unit of analysis is carefully selected to ensure each element provides the right information needed for interpretation.

5.10 ANALYSIS PROCEDURE

The Statistical Package for Social Science (SPSS) version 27 was used to analyze the data collected. The response rate was 91 percent indicating good fit for analysis. SPSS software is created for the management and statistical analysis of social science data, and set interrelation between dependent variables and independent variables. SPSS helps in conducting both non-parametric and parametric comparison analysis, test the assumptions, validate variables of the items, and perform frequency analysis (Pallant, 2013; Tabachnick and Fidell, 2012).

Also, Smart PLS version 27 was used to examine both the measurement and structual model of the study. This generates the reliability, convergent and discriminant validity of the variables in assessing the model (Hair et al., 2017; Pallant, 2013; Tabachnick and Fidell, 2012). The Partial Least Square Structural Modelling (PSL-SEM) is a data science software technique commonly used in project and construction management research (Hair et al., 2017; Azila-Gbettor and Abiemo, 2020). The technique has been subjected to numerous reviews, both confirmatory and exploratory. PLS adopted in this study, lately evolved as a medium ground between exploratory and confirmatory contexts (Kante et al., 2018). As a result, the study employs PSL-SEM in project management in exploratory contexts while preserving the interpretability of the variables. The study used Samrt Partial Least Square Structural Modelling (PSL-SEM) for the analysis of the data to determine the relationship between organisational resources and tendering for successful PPP performance on cost and within time. Further descriptive statistics and inferential analysis were carried out and presented in a tabular format for ease of understanding.

5.10.1 Justification for adopting PSL-SEM

Structural Equation Modelling (SEM) is a statistical technique that uses statistical data and qualitative causal assumptions to test and estimate causal relationships. The Partial Least Square (PLS) and Covariance Based SEM are the two basic approaches used in SEM (CB). While Structural Equation Modelling-Covariance Based (CB) frequently necessitates a sound theory framework and confirmatory research, Partial Least Square (PLS) does not necessitate a sound theory base and supports either confirmatory or exploratory research (Hair et al., 2017; Azila-Gbettor and Abiemo, 2020).

According to Urbach and Ahlemann (2010), PLS can be adequate alternative to Structural Equation Modelling-Covariance Based (CB). With a high number of LVs and indicator variables, the structural equation model is complicated. When the links between the indicators and the LVs have to be modelled in distinct modes (for example, formative and reflective measurement models) (Wagner and Yates,

2013; Bartelt and Dennis, 2014; Wong, 2014). Furthermore, the sample size, independence, and normal distribution requirements were not met. A large sample size is not required for PLS. PLS is highly recommended if the sample size is minimal (Wong, 2014; Hair et al., 2017).

More so, due to its ability to estimate complex route models between latent variables, Partial Least Square Structural Modelling, one of the fundamental methods of Structural Equation Modelling (SEM), has gained a lot of interest as a statistical tool in recent years (Wong, 2016; Hair et al., 2017). When compared to regression analysis, this statistical method allows researchers to answer a series of interrelated research questions in a single, systematic, and thorough analysis by modelling relationships between variables, such as independent and dependent constructs, at the same time.

Partial Least Square Structural Modeling's capability for simultaneous analysis differs significantly from linear regression, ANOVA, MANOVA, and LOGIT, which only looked at one layer of the construct's links between independent and dependent variables (Kante et al., 2018; Gefen et al., 2000). Structural equation modelling is used in quantitative project management research because it allows researchers to capture latent constructs, observations, and their relationships in a single statistical model (Evermann and Tate, 2014). The justification for adopting Partial Least Square Structural Equation Modelling (PLS-SEM) technique was to establish the relationship between organisational resources: resilient business case, quality project brief, project value, public sector capacity, risk sharing model and quality governance structure, on one end, and tendering process affecting successful PPP performance on cost and within time, on the other hand.

The most modern statistical technique, Partial Least Square Structural Equation Modelling (PLS-SEM), is recognized as the most fully developed and general system for analysis (Henseler et al, 2016; Hair et al., 2017; Kante et al., 2018). In most top journals, the approach is widely employed for quantitative data analysis. The approach has been subjected to numerous evaluations (Evermann and Tate, 2014; Henseler et al, 2016; Kante et al., 2018). The reviews' findings provided

more guidance on how to employ the approach for exploratory or explanatory (confirmatory) research.

PLS-SEM (Partial Least Square Structural Equation Modelling) was created to bridge the gap between predictive and causal models (Kante et al., 2018). This current duality, combining predictive and causal models, allows decision makers to accept a predictive model if it can be interpreted plausibly (Evermann and Tate, 2014). In this setting, plausible causal-explanatory model interpretations do not necessitate formal statistical testing of all stated linkages and model constraints (Evermann and Tate, 2014). As a result, Partial Least Square Structural Equation Modelling (PLS-SEM) was developed to fill the gap in the middle, providing causal-explanatory and predictive modelling for a credible substantive interpretation of the findings. The goal is to keep predictability while working with predictive models (Evermann and Tate, 2014).

Furthermore, the PSL-SEM in terms of model specification requirement, can handle both reflective and formative constructs easily while the factor-based SEM can handle only reflective constructs. This further enables PLS-SEM having the ability to achieve both explanatory and predictive modelling of constructs compared to factor-based SEM which can only achieve explanatory modelling, having the limitation of predictive modelling of construct or contract relationship (Hair et al., 2017). The PSL-SEM estimates model parameters so that they explain whether the variance of the inner construct is being maximized whilst factor-based SEM, estimation of model parameters is done for the discrepancy between the estimated and the sample covariance matrices if they are being minimized (Hair et al., 2017).

The path model is a diagram showing hypothesis and variables relationships to the estimated matrices in a SEM analysis. Constructs also called latent variables (LVs) are concepts in the statistical models that are theoretical models that are defined by the researchers in their conceptual framework. Constructs are shown by ovals in the path model joined by single headed arrows that represent predictive relationships. The items that measure the construct also called indicators are

observed variables that represent respondents' responses from the field survey (raw data) for analysis. The items are represented by rectangles and joined with arrows to their respective constructs in the path model.

The path model of Partial Least Square Structural Equation Modelling (PLSSEM) consists of two sections: structural and measurement models. The structural model also called inner model is the link between the constructs whilst measurement model represents the link between the items or indicators and the constructs.

5.10.2 Construct reliability

This reliability measured the outcomes of the same variable's items for consistency. It determines how much the MVs load at the same time as the LV grows (Garson, 2016; Kante et al., 2018). A Cronbach's alpha (CA) value of > 0.6 or a Cronbach's CR value of 0.7 to 0.9 is regarded appropriate. While CR values below 0.6 indicate that items lack internal consistency reliability; CR values above 0.6 indicate that they do..what? (Hair et al., 2017).

5.10.3 Convergent validity

Convergent validity denotes the degree to which individual items reflecting a construct converge in comparison to items measuring different constructs. Both outer loadings of indicators and average variance extracted (AVE > 0.5) established validity that is convergent. It calculates the percent of variance captured by a construct by dividing the sum of the construct's variance and the measurement variance. (Bartelt and Dennis, 2014; Wong, 2014; Hair et al., 2017).

5.10.4 Discriminant validity

Discriminant validity refers to the extent which a variable is distinct from other variables. Thus, it involves the degree to which the measures of different constructs differ from one another. While convergent validity tests whether the

items measure the construct it is supposed to measure, discriminant validity tests whether the items do not unintentionally measure different things (Hair et al., 2017; Kante et al., 2018). In PSL-SEM, Cross Loading Criterion and Fornell-Larker are two common discriminant validity which are used (Urbach and Ahlemann, 2010; Hair et al., 2017; Kante et al., 2018). According to the Cross Loading Criterion, each indicator's loading on its build must be higher than the cross loadings on other constructs. An LV must share more variance with its assigned indicators than any other LV, according to Fornell-Larker (..). As a result, each LV's AVE should be higher than its highest squared correlation with any other LV (Bartelt and Dennis, 2014; Wong, 2014; Hair et al., 2017).

According to recent research, the above measure of discriminant validity is no longer appropriate, leading to the suggestion of the heterotrait-monotrait (htmt) correlation ratio (Hair et al., 2017). The mean value of item correlations across constructs is compared to the mean average correlations for items measuring the same construct to calculate HTMT (Hair et al., 2017). The value of 0.9 for the HTMT threshold has been proposed. The Heterotrait-Menotrait Ration (HTMT) is the geometric mean of the heterotrait-monotrait correlations (htmt). It is the correlations of indicators across construct measuring different phenomena divided by the average of the montrait-hero-method correlations (the correlations of indicators within the same construct) (Garson, 2016; Kante et al., 2018).

5.11 EXPLORATORY FACTOR ANALYSIS

The exploratory factor analysis was conducted on PPP performance and measured as a dimensional scale on cost performance and time performance. Four items measure the two dimensions. Exploratory Factor Analysis (EFA) was conducted in SPSS version 25 (Pallant, 2013). Thus, factor loadings, Kaiser-Meyer-Olkin (KMO), and Bartlett’s Test of Sphericity were reported. The suitability of factor analysis was evaluated based on the sample size and strength of the relationship among the items (Pallant, 2013).

According to Tabachnick and Fidell (2012), a sample size of 150 is sufficient for factor analysis; thus, 453 responses in this study is adequate. Correlation coefficients were greater than 0.3 among the four items which suggests the suitability of factor analysis. Additionally, Bartlett's test of sphericity and the KMO measure of sampling adequacy were used to evaluate the factorability of the data set. A significant test of sphericity ($p < 0.05$) and a KMO value of > 0.60 indicate that the data is appropriate for factor analysis (Tabachnick et al., 2012). Exploratory factor analysis was conducted using Principal Components Analysis (PCA) and an Oblimin Rotation. The decision on the number of factors was based on the examination of the scree plot in line with the number of factors produced with an eigenvalue of 1.0 or greater. Additionally, Parallel Analysis (PA) using Monte Carlo PCA (Watkins, 2006) was conducted to determine the number of factor structures to retain.

The suitability of data for factor analysis of the 4-item PPP financial performance scale revealed KMO value was 0.70, exceeding the recommended value of 0.6 and Bartlett's Test of Sphericity reached statistical significance ($\chi^2 = 541.41$, df= 6, $p < 0.000$), supporting the factorability of the variable. PCA revealed the presence of two components with eigenvalues exceeding 1, explaining 59.40%, and 20.92% of the variance respectively. An inspection of the scree plot revealed a clear break after the second component. PCA results showed two components with eigenvalue exceeding the corresponding criterion value for a randomly generated data matrix of 1000 replicated simulations (See Table 5.5; 5.6 & 5.8). Following Oblimin rotation, the rotated solution revealed the presence of two structures with two items each showing strong loadings on either component. Thus, all four items were retained as a two-dimensional scale for the study (See Table 5.6). This is in line with the original scale which was a two-factor scale.

Table 5.5: Comparison of eigenvalues and criterion values for TL scale

Component number	Actual eigenvalue from PCA	Criterion value from parallel analysis	Decision
1	2.376	1.104	Accept
2	1.837	1.028	Accept

Table 5.6: Rotated factor loadings for PPP Performance scale items

	Items	Loadings	
		1	2
1	Cost effectiveness in PPPs	.737	
3	Financial sustainability of PPP projects	.945	
2	Completing PPP project on Schedule (Time)		.974
4	Quality PPP Projects		730

Eigenvalues = 2.376 and 1.837, % of Variance = 80.311.

Table 5.7: KMO and Bartlett's test for PPP performance

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.696
Bartlett's Test of Sphericity	Approx. Chi-Square	541.410
	df	6
	Sig.	.000

Table 5.7 revealed Kaiser-Meyer-Olkin Measure of Sampling Adequacy of 0.696, exceeding the recommended value of 0.5 indicating that the factor was appropriate. Bartlett's Test of Sphericity Approx. Chi-Square value of 541.410 with a p-value of 0.00 indicating satisfactory correlations.

Table 5.8: Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.376	59.393	59.393	2.376	59.393	59.393
2	1.837	20.917	80.311	.837	20.917	80.311
3	.458	11.442	91.753			
4	.330	8.247	100.000			
Extraction Method: Principal Component Analysis.						

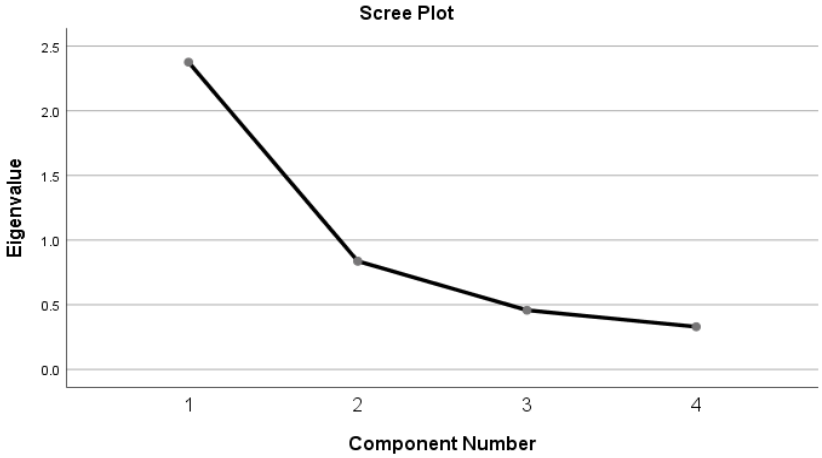

Figure 5.1: Scree plot for PPP performance.

5.12 DATA NORMALITY TEST

Normality test was run for the constructs (Field, 2013; Osborne and Walters, 2002). The normality result is presented in Table 6.9.

Table 5.9: Kolmogorov-Smirnov and Shapiro-Wilk statistics

Constructs	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	*df*	Sig.	Statistic	*df*	Sig.
QG	0.149	453	0.000	0.938	453	0.000
QB	0.126	453	0.000	0.963	453	0.000
PSC	0.124	453	0.000	0.967	453	0.000
PV	0.103	453	0.000	0.971	453	0.000
RBC	0.134	453	0.000	0.961	453	0.000
RSM	0.135	453	0.000	0.963	453	0.000
Trans	0.135	453	0.000	0.952	453	0.000
Comp	0.256	453	0.000	0.890	453	0.000
CP	0.241	453	0.000	0.871	453	0.000
TP	0.278	453	0.000	0.871	453	0.000

NB: QG = Quality Governance; QB = quality project brief; PSC = public sector capacity; PV = project value; RBC = Resilience business case; RSM = risk sharing model; TT = Tendering transparency; CT = competitive tendering; CP = cost performance; TP = Time performance.

The results show from Table 5.9 that the Kolmogorov-Smirnov and Shapiro-Wilk statistics were significant ($p<0.05$), and therefore the conclusion was that the data

was not normally distributed. Thus, in this study, since the normality assumption is not met, further statistics should be computed using non-parametric tests (Field, 2013; Bates et al., 2014; Osborne and Walters, 2002) like PLS-SEM.

5.13 MEASUREMENT MODEL ASSESSMENT

The measurement assessment model (outer model) includes composite reliability (CR) that assesses internal consistency, individual indicator reliability, and average variance extracted (AVE) assesses convergence validity and discriminant validity (outer model) (Hair et al., 2017). Cronbach's alpha (CA) is a criterion for assessing internal consistency dependability, with a high alpha value implying that all items with the same construct have the same range and meaning (Cronbach, 1951), as mentioned by Kante et al. (2018). Garson (2016), on the other hand, claimed that Composite reliability is a better alternative to Cronbach's alpha (CA). Composite reliability may lead to higher estimates of real dependability than Cronbach's alpha (CA) (Kante et al., 2018). Values above.700 are preferable for exploratory research, regardless of whatever coefficient is used to determine internal consistency (Urbach and Ahlemann, 2010).

Here, the validity and reliability of latent variables are discussed. Measurement models are first evaluated in this investigation (Hair et al., 2019; Shmueli et al., 2019). Hence, the findings of the reliability, convergent and discriminant validity were generated using the SmartPLS 3.3.5 which was used for reliability, convergent and discriminant validity (Ringle, Wende, and Becker, 2015). An iterative procedure is used to eliminate the weak indicators, taking into account the suggestions of Henseler et al. (2009), Fornell and Larcker (1981), Nunnally and Bernstein (1994), and Hair et al (2010), amongst other experts. As a result of this iteration procedure, the model's weaker components were removed. The analysis comprised two iterations, each of which was analysed separately. The reliability and convergent validity of the measures were assessed. This includes the item loadings with their significance, construct reliability and average variance extracted (AVEs) (Hair et al., 2019). And in terms of construct reliability, all the three measures (i.e. Cronbach's alpha, the coefficients rho_A, and the composite

reliability) were applied (Hair et al., 2019). The results were pretended in the Table 5.10.1 (first iteration results) and Table 5.10.2 (final iteration results) and Figure 5.1 respectively.

Table 5.10.1: Reliability and convergent validity – final iteration

Indicator	Loading	t-statistics	p-values	CA	rho_A	CR	AVE
CP	1.000	-	-	1.000	1.000	1.000	1.000
Comp1	0.965	173.221	0.000	0.925	0.925	0.964	0.93
Comp2	0.964	154.556	0.000				
PSC1	0.834	56.344	0.000	0.939	0.946	0.949	0.675
PSC2	0.859	55.453	0.000				
PSC3	0.724	25.754	0.000				
PSC4	0.860	47.483	0.000				
PSC5	0.853	56.106	0.000				
PSC6	0.833	49.744	0.000				
PSC7	0.888	80.409	0.000				
PSC8	0.815	42.522	0.000				
PSC9	0.708	27.766	0.000				
PV1	0.729	22.935	0.000	0.893	0.927	0.917	0.649
PV2	0.805	37.589	0.000				
PV3	Omitted						
PV4	0.865	66.086	0.000				
PV5	0.882	65.756	0.000				
PV6	0.852	57.821	0.000				
PV7	0.683	19.222	0.000				
PV8	Omitted						
PV9	Omitted						
PV10	Omitted						
QG1	Omitted			0.919	0.927	0.932	0.605
QG2	0.763	34.050	0.000				
QG3	0.808	39.672	0.000				
QG4	0.756	28.763	0.000				
QG5	0.755	34.842	0.000				
QG6	0.793	43.567	0.000				
QG7	0.743	23.878	0.000				
QG8	0.764	37.009	0.000				
QG9	0.843	65.250	0.000				

Indicator	Loading	t-statistics	p-values	CA	rho_A	CR	AVE
QG10	Omitted						
QG11	0.768	43.337	0.000				
QG12	Omitted						
QR1	Omitted						
QR2	0.865	46.276	0.000				
QR3	0.888	67.696	0.000	0.749	0.774	0.858	0.671
QR4	0.691	20.438	0.000				
QR5	Omitted						
RBC1	0.872	72.954	0.000				
RBC2	0.886	91.786	0.000				
RBC3	0.808	29.330	0.000	0.9	0.931	0.923	0.707
RBC4	0.804	28.403	0.000				
RBC5	0.830	47.055	0.000				
RSM1	0.843	58.124	0.000				
RSM2	0.865	73.855	0.000				
RSM3	0.756	28.070	0.000				
RSM4	0.714	23.479	0.000				
RSM5	0.695	21.196	0.000				
RSM6	0.821	46.196	0.000	0.923	0.93	0.935	0.569
RSM7	0.718	22.059	0.000				
RSM8	0.713	24.627	0.000				
RSM9	Omitted						
RSM10	0.717	23.425	0.000				
RSM11	0.721	24.114	0.000				
RSM12	0.712	27.041	0.000				
TP	1.000	-	-	1.000	1.000	1.000	1.000
Trans1	Omitted						
Trans2	0.889	63.231	0.000				
Trans3	0.896	67.150	0.000	0.918	0.922	0.942	0.802
Trans4	0.910	77.749	0.000				
Trans5	0.886	68.979	0.000				

NB: QG = Quality Governance factors; QB = quality project brief factors; PSC = public sector capacity factors; PV = project value factors; RBC = Resilience business case factors; RSM = risk sharing model factors; Trans = Tendering transparency factors; CT = competitive tendering; CP = cost performance; TP = time performance; CR = composite reliability; AVE = average variance extracted; CA = Cronbach's alpha.

Table 5.10.1 shows the final iteration results. Finally, the findings suggest that the construct reliability and convergent validity of all reflectively measured constructs are satisfactory. More specifically, all the items have significant loadings ($p<0.001$), the average variance extracted values (AVEs) are higher than the critical value of 0.50, and all the construct reliabilities have values above 0.7 (Hair et al., 2019; Shmueli et al., 2019). Therefore, construct reliability and convergent validity of all the latent variables are satisfactorily established in this study.

Table 5.10.2: Reliability and convergent validity – first iteration

Indicator	Loading	CA	rho_A	CR	AVE
CP	1.000	1.000	1.000	1.000	1.000
Comp1	0.965	0.925	0.925	0.964	0.930
Comp2	0.964				
PSC1	0.834	0.939	0.946	0.949	0.675
PSC2	0.859				
PSC3	0.724				
PSC4	0.860				
PSC5	0.853				
PSC6	0.833				
PSC7	0.888				
PSC8	0.815				
PSC9	0.708				
PV1	0.715	0.883	0.919	0.900	0.485
PV2	0.780				
PV3	0.657				
PV4	0.814				
PV5	0.848				
PV6	0.837				
PV7	0.727				
PV8	0.488				
PV9	0.518				
PV10	0.425				
QG1	0.372	0.909	0.928	0.924	0.512
QG2	0.769				
QG3	0.816				
QG4	0.721				

Indicator	Loading	CA	rho_A	CR	AVE
QG5	0.735				
QG6	0.762				
QG7	0.728				
QG8	0.771				
QG9	0.837				
QG10	0.693				
QG11	0.765				
QG12	0.465				
QR1	0.233				
QR2	0.828				
QR3	0.865	0.711	0.803	0.793	0.464
QR4	0.730				
QR5	0.546				
RBC1	0.872				
RBC2	0.886				
RBC3	0.808	0.900	0.931	0.923	0.707
RBC4	0.804				
RBC5	0.830				
RSM1	0.839				
RSM2	0.861				
RSM3	0.750				
RSM4	0.705				
RSM5	0.686				
RSM6	0.810	0.919	0.931	0.931	0.536
RSM7	0.720				
RSM8	0.726				
RSM9	0.431				
RSM10	0.727				
RSM11	0.728				
RSM12	0.713				
TP	1.000	1.000	1.000	1.000	1.000
Trans1	0.291				
Trans2	0.890				
Trans3	0.895	0.844	0.918	0.896	0.655
Trans4	0.905				
Trans5	0.881				

NB: QG = Quality Governance factors; QB = quality project brief factors; PSC = public sector capacity factors; PV = project value factors; RBC = Resilience business case factors; RSM = risk sharing model factors; Trans = Tendering transparency factors; CT = competitive tendering; CP = cost performance; TP = time performance; CR = composite reliability; AVE = average variance extracted; CA = Cronbach's alpha.

Table 5.10.2 shows that in the first iteration thirteen (13) items loading less than 0.708 and two latent variables (i.e., PV and QR) have AVEs less than 0.50. However, a careful look at the composite reliability, indicates satisfactory values. This result led to the elimination of the indicators with low loadings as demonstrated in Table 5.10.2 (Hair et al., 2019). Nevertheless, the reliability (using Cronbach's alpha, rho_A and composite reliability) of the latent variables were all above 0.7 (ranging from 0.711 to 0.939) for the constructs. The indication is that assessing construct reliability using composite reliability is superior to Cronbach's alpha which established adequate reliability (Hair et al., 2019). The convergent validity of the constructs, the average variance extracted were beyond the threshold ranging from (0.464 to 0.930), suggesting that the measures were adequate reliable and valid (Hair et al., 2019).

5.13.1 Discriminant validity test

The final model is tested for discriminant validity once the construct reliability and convergent validity have been established. Discriminant validity was established using the newest approved criterion, Heterotrait-Monotrait (HTMT) technique (Hair (Jr.) et al., 2017; Henseler et al., 2015). Table 6.11 illustrates the outcome of this test.

Table 5.11: Discriminant analysis (Heterotrait-Monotrait Ratio)

Constructs	1	2	3	4	5	6	7	8	9
CP									
Comp	0.801								
PSC	0.801	0.710							
PV	0.502	0.532	0.716						
QG	0.738	0.753	0.774	0.571					
QR	0.844	0.899	0.790	0.675	0.781				
RBC	0.739	0.674	0.718	0.573	0.701	0.696			
RSM	0.793	0.686	0.888	0.654	0.718	0.757	0.761		
TP	0.834	0.788	0.768	0.478	0.718	0.824	0.727	0.793	
Trans	0.798	0.874	0.704	0.444	0.740	0.857	0.614	0.659	0.785

Table 5.11 reports the HTMT values which should be less than 0.90 (Hair (Jr.) et al., 2017; Henseler et al., 2015) to determine the discriminant validity of the constructs. As discovered in Table 5.11, all the values were below the recommended maximum limit of 0.90 (HTMT0.90). Therefore, all of the concepts now have been proven to be discriminantly valid (Hair et al., 2019; Henseler et al., 2015; Saari et al., 2021).

5.13.2 Formative model assessment

The degree to which an indicator correlates favourably with other indicators of the same construct is known as convergent validity (Hair et al., 2017; Azila-Gbettor and Abiemo, 2020). If the variables are highly linked, the researcher must employ the formatively measured concept as an exogenous latent variable to predict an endogenous latent variable. When the formative indicators' correlate highly the issue of multi collinearity occurs and this means that two or more indicators are measuring the hypotheses in the same way (Hair et al., 2017). This needs to be checked as two indicators correlates perfectly and the value should be 0.7 or higher.

In the context of nomological validity within the formative construct, the links between the formative construct and other models' constructs should be strong

and significant to the hypotheses (Kante et al., 2018; Henseler et al., 2016; Straub et al. 2004). Urbach and Ahlemann (2010), indicated that discriminant validity can be used to measure construct validity. Correlations of less than .700 between formative and all other constructs suggest appropriate discriminant validity (Urbach and Ahlemann, 2010). The variance inflation factor (VIF) is normally used to measure the collinearity of the indicator. VIF value of 5 and above indicates high collinearity among the formatively measured constructs. The ideal VIF value should be 3 or lower (Shmueli et al., 2016; Hair et al., 2019).

Statistical significance or relevance of formative measurement models' assessment is the third measure of formatively measured constructs which evaluate the outer weights respondents of the constructs. The outer weight is measured by running a multiple regression with the LV score as the dependent variable and the formative indicators as the independent variables (Bartelt and Dennis, 2014; Wong, 2014; Hair et al., 2017). As PLS-SEM is a nonparametric, bootstrapping is used to determine the statistical significance. When confident internal of the indicator weight include zero, then the weight is not statistically significant, so the indicator can be removed from the measurement model. Significant loading of 0.50 indicates that they should be removed unless there is strong justification for its continuous existence (Hair et al., 2019).

As the measurement model is done, assessment of the structural model requires to estimate the relations between constructs and test the hypotheses of the study. Each structural path was assessed if they were significant and in the hypothesized direction (Hair et al., 2019; Ringle et al., 2020). The measurement model assesses the reliability and the validity of the LV, the next is to assess the structural model or the inner model to see if the exogenous and endogenous variables are related.

The path coefficient, which is used to evaluate the significance and relevance of the model relationship, is one of the estimates to measure in PLS-SEM under the structural model. R^2 value estimates the model predictive accuracy; Q^2 evaluates the model's predictive relevance, and f^2 evaluates the substantial impact of the exogenous variable on an endogenous variable (Hair et al., 2017; Azila-Gbettor & Abiemo, 2020). A higher value the R^2 indicates higher exploratory power. The rule

of thumb states that R^2 values of 0.75, 0.50 and 0.25 indicate substantial, moderate and weak. The R^2 value a function of the number of predictor construct and as a result the higher the number of predictor constructs, the higher the R^2 (Hair et al., 2019; Ringle et al., 2020).

The predictor accuracy can be measured and assessed using the f^2 effect size. This evaluates the change in R^2 value when a specified exogenous variable is omitted from the model. When the rank order of the construct' relevance in explaining an endogenous construct in the structural model varies in comparison, to the size of the path coefficient and the f^2 effect size, the researcher may report the f^2 effect size to explain the presence of partial or full mediation. The rule of thumb states that values higher than 0.02, 0.15 and 0.35 are used to estimate the small, medium, and large f^2 effect size (Hair et al., 2019; Ringle et al., 2020).

The Q2 assesses the model's predictive relevance using a blindfolding technique that removes single points from the data matrix, assigns them to the mean, and estimates model parameters (Hair et al., 2019; Ringle et al., 2020; Tsetse et al., 2021). According to Hair et al. (2019), by performing the blindfolding procedure with an omission distance of 7 yielded cross-validated redundancy Q^2 of all endogenous variables. Predictive accuracy is obtained when small difference between the predicted and the original value gives a higher Q^2 value (Hair et al., 2019; Ringle et al., 2020; Tsetse et al., 2021). The rule of thumb states that Q^2 values should be larger than zero for a specific endogenous construct to indicate predictive accuracy of the structural model for that construct. Thus; Q^2 values higher than 0, 0.25 and 0.50 indicates small, medium and large predictive relevance of the PLS path model (Hair et al., 2019; Ringle et al., 2020; Tsetse et al., 2021).

5.13.3 Mediation and moderation analysis

A mediator (or mediating variable) account for the relationship between the predictor and the criterion (Baron and Kenny, 1986). Garson (2016), refers to this as an intervening variable. The intervening variable mediates and transmits the

effects of an independent variable to a dependent variable (Hair et al., 2017). To assess the mediating effect, there is the need to determine the direct and indirect effect. The direct effects are the relationship between the two constructs (independent and dependent variables), with a single arrow joining them. Indirect effects are the relationships that involve a number of relationships with at least one intervening construct and represented visually with multiple arrows.

In addition, the mediating variable changes the strength or direction of the relationship between two constructs in the model. In this study, the moderating variables are competitive tendering (CT) and transparent tendering (TT) which are mediating variables influencing PPP project performance (Hair et al., 2017). The moderation is conducted to determine if the relationship between public entity project organisational resources (Or) and PPP (3Ps) performance is within time and on cost, depending upon competitive tendering (CT) and transparent tendering (TT). Furthermore, the moderation model is estimated using PLS-SEM Software (SmartPLS 3.3.8) due to its vigorous ability to determine moderating effects (Ringle et al. 2014). There are two types of moderation. Continuous and categorical moderation (Ringle et al. 2014). Moderating continuous effect is measured metrically and affects the linear relationship; categorical effect is measured when the moderating variable is categorical (gender). However, moderating continuous effect has been used in this study to measure the effect that occurs when a third variable changes the nature of the relationship between a predictor variable [organizational resources (Or)] and the outcome variable [PPP (3Ps) performance] within time and cost.

Having established the adequacy of the measurement model, assessment of the structural model was done to estimate the relations between constructs and test the hypotheses of the study. Each structural path was assessed if they were significant and in the hypothesised direction (Hair et al., 2019; Ringle et al., 2020). The results include the VIF (i.e., collinearity check), path coefficients, standard errors, *t*-statistics, *p*-values, R^2 (i.e., predictive power), Q^2 (i.e., predictive relevance) values and SRMR (i.e., the model fit). The results are presented in Tables 6.12 and 6.13 and Figure 6.4.

5.13.4 Collinearity diagnostics

Variance inflation factor (VIF) values more than 5 indicate possible collinearity difficulties among the predictor constructs, according to Hair et al. (2019). Table 5.12 shows the VIF statistics.

Table 5.12: Results of Variance inflation factor (VIF)

Path	VIF
Comp => CP	3.866
Comp => TP	3.866
PSC => CP	4.611
PSC => TP	4.611
PV => CP	1.968
PV => TP	1.968
QG => CP	2.883
QG => TP	2.883
QG => Comp	1.000
QG => Trans	1.000
QR => CP	2.855
QR => TP	2.855
RBC => CP	2.561
RBC => TP	2.561
RSM => CP	4.006
RSM => TP	4.006
Trans => CP	3.539
Trans => TP	3.539

NB: Trans = transparency; Comp = competitiveness; CP = cost performance; TP = time performance; QG = Quality Governance; QB = quality project brief; PSC = public sector capacity; PV = project value; RBC = Resilience business case; RSM = risk sharing model; CT = competitive tendering; VIF= Variance inflation factor. Source: Field Survey, 2021

As shown in Table 5.12, all the VIF values are below 5 ranging from 1.000 to 4.611. This suggests absence of multicollinearity issues (Hair et al, 2019). In other words, multicollinearity is not a problem in study's data (O'Brien, 2007; Rosen and Hochwarter, 2014).

5.14 THE IMPORTANCE-PERFORMANCE MAP ANALYSIS (IPMA)

This study conducted a complementary analysis to delve into the empirical outcomes obtained, called the IPMA technique (Ringle and Sarstedt, 2016). This analysis was done to show the relevance of the most critical antecedent constructs (i.e., organisational resources) while in defining a specific target construct (i.e., cost and time performances). The results of this analysis are presented in Tables 5.13 and 5.14 whilst Figures 5.4 and 5.5 show the representation of the variables in the IPMA diagrams.

Table 5.13: IPMA results for cost performance

Predictors	Total Effects (Importance)	Performance Index
Comp	0.166	67.882
PSC	0.283	66.758
PV	-0.132	54.963
QG	0.360	63.483
QR	0.192	68.844
RBC	0.223	64.436
RSM	0.219	64.145
Trans	0.207	66.558

NB: Trans = transparency; Comp = competitiveness; CP = cost performance; TP = time performance; QG = Quality Governance; QB = quality project brief; PSC = public sector capacity; PV = project value; RBC = Resilience business case; RSM = risk sharing model; CT = competitive tendering; IPMA= Importance-performance analysis.

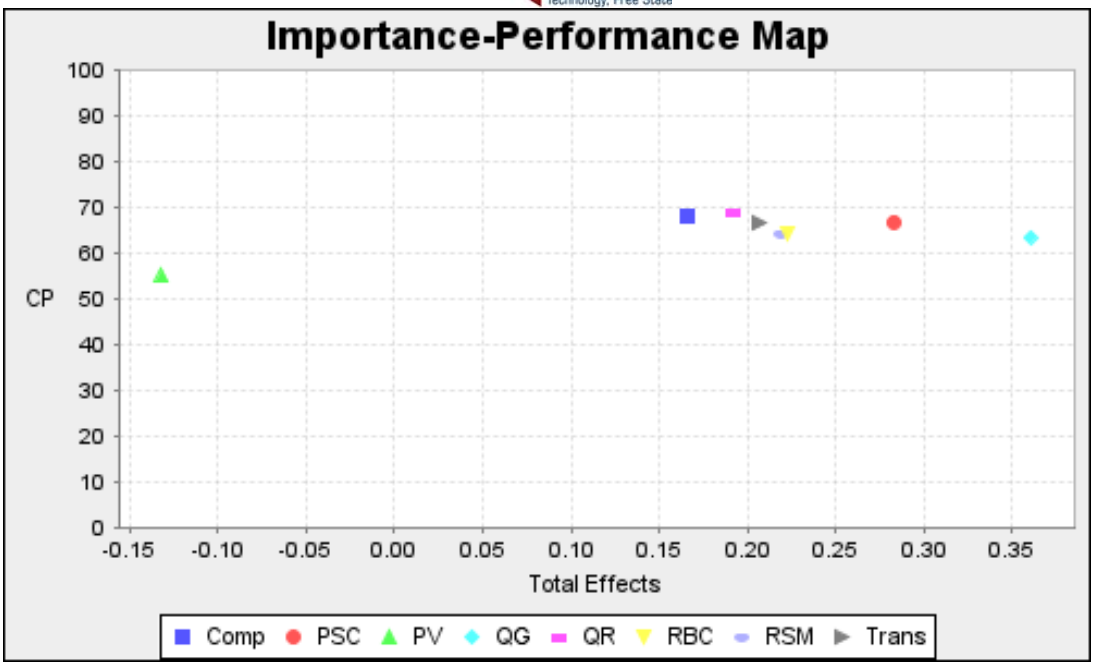

Figure 5.2: IPMA on cost performance

As shown in Table 5.13 and Figure 5.4, in terms of the total effects, QG (0.360) has the highest total effect on cost performance, followed by PSC (0.283), RBC (0.223), and RSM (0.219). Regarding the performance values, QR (68.844) displays the highest values, whereas PV (54.963) and QG (63.483) show the lowest values. Thus, QG has the highest importance for cost performance but at the same time a low performance. There is therefore the need to prioritise the activities of QG to enhance cost performance.

Table 5.14: IPMA results for time performance

Predictors	Total Effects (Importance)	Performance Index
Comp	0.151	67.882
PSC	0.148	66.758
PV	-0.153	54.963
QG	0.347	63.483
QR	0.208	68.844
RBC	0.224	64.436
RSM	0.350	64.145
Trans	0.220	66.558

NB: Trans = transparency; Comp = competitiveness; CP = cost performance; TP = time performance; QG = Quality Governance; QB = quality project brief; PSC = public sector capacity; PV = project value; RBC = Resilience business

case; RSM = risk sharing model; CT = competitive tendering; IPMA= Importance-performance analysis. Source: Source: Field Survey, 2021

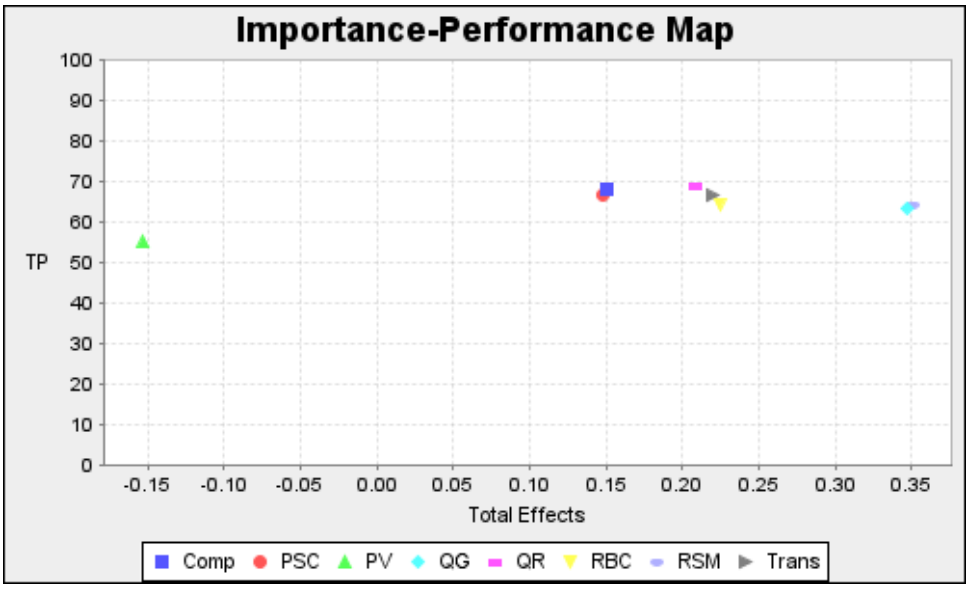

Figure 5.3: IPMA on time performance

As shown in Table 5.14 and Figure 5.5, for the total effects (importance), RSM (0.350) has the highest total effect on time performance, closely followed by QG (0.347), RBC (0.224), and Trans (0.220). Concerning the performance values, QR (68.844) displays the highest values, whereas PV (54.963), QG (63.483) and RSM (64.145) show the lowest values. Thus, RSM and QG have the highest importance for time performance but at the same time a low performance. Hence, in order to improve time performance, RSM and QG operations must be prioritised.

5.15 ETHICAL CONSIDERATIONS

In the case of response to the questionnaire, the respondents were informed earlier and permission sought from their unit heads prior to administering of the instrument designed. The respondents were made to understand the purpose of the study, and their consent to participate in the study was obtained, and ithey were also assured that the information they give would not to be compromised. The researcher ensured participants' confidentiality and identities were guaranteed and preserved. Appropriate references and acknowledgements from numerous sources were professionally and sufficiently referenced to ensure professional

conduct in research. As a result, authors and publications, articles, and transcripts were fully acknowledged. Thus; confidentiality, data anonymity, data preservation, and dissemination of the results were free of inaccuracies in data collection and reporting.

5.16 CHAPTER SUMMARY

The critical area of every research is the research methodology indicating how the study was conducted. The research paradigm or philosophy adopted for this study was the positivist philosophy. A positivist research philosophy is based on the principle that the social world exists externally and must be viewed objectively by an independent researcher, as it is in the natural sciences (Neuman, 2011:520). The study adopted positivist paradigm and deductive approach. Ethical standard was strictly observed from the Ethics Committee for vetting and approval of this work.

Epistemologically, the researcher believes that organizational resources and PPP performance within time and on cost exist objectively. And that using theory and concepts with a developed conceptual framework, hypotheses can be tested using statistical methods. The implication is that the researcher adopts quantitative technique in analyzing the data. There is therefore a single objective reality out there for everybody to see for testing ontologically.

Methodologically, a set of objectives, formulated research questions and hypotheses were tested using statistical technique processes. The survey data of the respondents were coded, defaulted, and captured electronically using PLS-SEM Software (SmartPLS 3.3.8). Sample characteristics were presented using descriptive statistics. Partial Least-Square Equation Modelling (PSL-SEM) has been used for data analysis. An estimated sample of 453 respondents was selected. For quantitative research, a sample above 300 is acceptable (Hair et al., 2017). Respondents were mainly drawn from PPP expertise in the Volta Region, Ghana based on the sampling criteria defined. Structural questionnaires were designed using five-point Likert scale to cover [organizational resources (Or) and

PPP (3Ps) performance] within time and on cost. The Structural Equation Modelling was used to analyze the data for discussion. The next chapter discussed the findings of this study based on the hypotheses testing condicted.

CHAPTER 6

RESULTS AND DISCUSSION

6.1 INTRODUCTION

This chapter presents the statistical analysis' findings. The organisation of this chapter is as follows: Sections 6.2, 6.3, and 6.4 analyse the descriptive statistics of the respondents' profile, the construct descriptive statistics analysis, the measurement (i.e., reliability and validity tests), and the structural models (i.e., hypothesis testing). The findings on the tested hypotheses were described in Section 6.5. Along with the findings analysis and discussion. In the context of Ghana's constructed project management environment, the chapter gives a thorough knowledge of organisational resources and tendering and discusses the relationships between the variables (organisational resources) and PPP performance. The debate in Section 6.5 was founded on the goals of the research, its effects on organisational resources, and how the procurement procedure affected PPP performance in terms of cost and timeliness.

6.2 FREQUENCY ANALYSIS

A total of 453 people completed the surveys, and this section provides information on their demographics. The results are depicted in Table 7.1.

Table 6.1: Respondents' profile

Characteristics		Count	%
Gender	Male	379	83.7%
	Female	74	16.3%
	Total	453	100.0%
Age	Under 25	14	3.1%
	25-35	59	13.0%
	35-45	244	53.9%
	45-55	136	30.0%
	55+	0	0.0%

Characteristics		Count	%
	Total	453	100.0%
Marital Status	Married	430	94.9%
	Single	17	3.8%
	Divorced	6	1.3%
	Widowed	0	0.0%
	Total	453	100.0%
Role played in the district/municipal	Coordinating Director	36	7.9%
	Environmental Officer	33	7.3%
	Procurement Officer	166	36.6%
	Project Engineer	17	3.8%
	Budget Officer	48	10.6%
	Planning Officer	23	5.1%
	Finance Officer	36	7.9%
	Internal Auditor	19	4.2%
	Presiding Member	16	3.5%
	Project Consultant	41	9.1%
	MP/MMDCs	18	4.0%
	Total	453	100.0%
Highest level of education	Undergraduate	12	2.6%
	Masters	422	93.2%
	PhD	16	3.5%
	Professionals	3	0.7%
	Total	453	100.0%

The results in Table 6.1 above revealed that the sample was male (83.7%) dominated whilst 16.3% of the sample were females. For age, most were within the 35 to 45 year (53.9%) bracket followed by 45 to 55 years (30%), 25 to 35 years (13%) and under 25 years (3.1%). In terms of marital status, 94.9% were married, while 3.8% were single and 1.3% were divorced. Further, most (36.6%) of the respondents were procurement officers, 10.6% were budget officers, 9.1% were project consultants. Others were coordinating directors (7.9%), finance officers (7.9%), environmental officers (7.3%), planning officers (5.1%), internal auditors (4.2%), MP/MMDCs (4%) and presiding members (3.5%). Lastly, concerning educational background, 93.2% were master's degree holders, 3.5% had PhD, 2.6% were undergraduates and 0.7% were professionals.

6.3 CONSTRUCT DESCRIPTIVE ANALYSIS

The construct descriptive statistics of the measures are discussed in this section. The items were graded on a five-point scale, with one indicating significant disagreement and five indicating strong agreement. According to Castro and Martins (2010), a mean of 3.2 is a decent guideline for separating positive from possible negative judgments. The descriptive statistics are shown in Tables 6.2, and 6.3.

Table 6.2: Descriptive statistics for organisational resources

Items/Constructs	N	Min	Max	Mean	Std. Deviation	Skewness	Kurtosis
Quality of Corporate Governance (QG)							
QG1	453	1	5	3.78	0.995	-0.587	-0.390
QG2	453	1	5	3.65	0.951	-0.385	-0.623
QG3	453	1	5	3.61	1.007	-0.537	-0.258
QG4	453	1	5	3.62	0.983	-0.689	0.150
QG5	453	1	5	3.53	0.918	-0.857	0.268
QG6	450	1	5	3.49	0.940	-1.207	0.923
QG7	453	1	5	3.82	0.885	-0.673	-0.036
QG8	453	2	5	3.79	0.872	-0.393	-0.468
QG9	453	1	5	3.62	1.007	-0.273	-0.944
QG10	448	1	5	3.68	0.881	-0.716	0.224
QG11	453	2	5	3.58	0.996	-0.379	-0.946
QG12	453	2	5	3.65	0.819	0.048	-0.625
Overall Quality of corporate Governance				3.65	0.665	-0.717	-0.258
Quality of Project Brief (QR)							
QR1	453	1	5	3.34	1.007	-0.216	-1.144
QR2	453	1	5	3.74	0.962	-0.842	0.370
QR3	453	1	5	3.81	0.857	-0.919	0.853
QR4	453	1	5	3.70	0.869	-0.651	-0.119
QR5	453	2	5	3.87	0.841	-0.783	0.292
Overall of Project Brief				3.69	0.615	-0.495	0.327
Public Sector Capacity (PSC)							
PSC1	453	1	5	3.55	1.081	-0.594	-0.528
PSC2	453	1	5	3.75	1.061	-0.616	-0.297
PSC3	453	1	5	3.79	0.929	-0.609	-0.330

Items/Constructs	N	Min	Max	Mean	Std. Deviation	Skewness	Kurtosis
PSC4	453	1	5	3.76	0.941	-0.420	-0.602
PSC5	453	1	5	3.61	0.940	-0.261	-0.668
PSC6	453	1	5	3.55	1.024	-0.265	-0.885
PSC7	453	1	5	3.69	0.942	-0.484	-0.565
PSC8	453	1	5	3.68	0.942	-0.498	-0.353
PSC9	453	1	5	3.67	0.865	-0.527	-0.051
Overall Public Sector Capacity				3.67	0.797	-0.344	-0.543
Project Value (PV)							
PV1	453	1	5	3.59	1.078	-0.521	-0.632
PV2	453	2	5	3.38	0.856	-0.359	-0.871
PV3	453	2	5	3.58	0.779	-0.255	-0.316
PV4	453	2	5	3.62	1.021	-0.266	-1.041
PV5	453	2	5	3.67	0.984	-0.413	-0.827
PV6	453	2	5	3.53	1.016	-0.081	-1.096
PV7	453	1	5	3.53	0.988	-0.237	-0.945
PV8	453	2	5	3.35	1.006	-0.006	-1.155
PV9	453	2	5	3.38	1.088	0.042	-1.316
PV10	453	1	5	3.57	0.970	-0.265	-0.734
Overall Project Value				3.52	0.684	-0.281	-0.526
Resilience of Business Case (RBC)							
RBC1	453	1	5	3.66	0.976	-0.385	-0.651
RBC2	453	1	5	3.67	0.939	-0.546	-0.247
RBC3	453	1	5	3.58	0.969	-0.345	-0.691
RBC4	453	1	5	3.40	1.046	-0.175	-1.017
RBC5	453	1	5	3.48	0.983	-0.412	-0.649
Overall Resilience of Business Case				3.56	0.830	-0.307	-0.489
Risk Sharing Model (RSM)							
RSM1	453	1	5	3.52	1.086	-0.158	-1.194
RSM2	453	1	5	3.66	0.997	-0.541	-0.248
RSM3	453	1	5	3.65	0.974	-0.444	-0.667
RSM4	453	1	5	3.79	0.959	-0.835	0.019
RSM5	453	1	5	3.54	1.115	-0.584	-0.503
RSM6	453	1	5	3.66	1.004	-0.747	0.109
RSM7	453	2	5	3.77	0.916	-0.477	-0.517
RSM8	453	1	5	3.48	1.070	-0.403	-0.775
RSM9	453	1	5	3.52	1.134	-0.460	-0.675

Items/Constructs	N	Min	Max	Mean	Std. Deviation	Skewness	Kurtosis
RSM10	453	1	5	3.47	1.071	-0.231	-0.953
RSM11	453	1	5	3.51	0.958	-0.339	-0.798
RSM12	453	1	5	3.53	0.944	-0.662	0.010
Overall Risk Sharing Model				3.59	0.738	-0.339	-0.781

NB: QG = Quality Governance factors; QB = quality project brief factors; PSC = public sector capacity factors; PV = project value factors; RBC = Resilience business case factors; RSM = risk sharing model factors; Max = Maximum; Min = Minimum; N = Number; Std = standard deviation.

The statistics in Table 6.2 above indicates that all the items have means greater than the average of 3.2. This suggests that most of the respondents had positive perceptions of all the items. Further, the composite mean values range from 3.52 to 3.69, suggesting positive perception of the constructs. Specifically, among the six organizational resources, QR was rated higher (M = 3.69; SD = 0.615), followed by PSC (M = 3.67; SD = 0.797), QG (M = 3.65; SD = 0.665), RSM (M = 3.59; SD = 0.738), RBC (M = 3.56; SD = 0.830) and PV (M = 3.52; SD = 0.684). These imply that most of the respondents had positive perceptions about the organizational resources.

Table 6.3: Descriptive statistics for tendering process and PPP performance

Items/Constructs	N	Min	Max	Mean	Std. Deviation	Skewness	Kurtosis
Cost Performance	453	1	5	3.66	0.976	-0.270	-0.903
Time Performance	453	1	5	3.66	0.970	-0.573	-0.191
Overall Performance				3.66	0.931	-0.399	-0.559
Transparency (Trans)							
Trans1	453	1	5	3.26	1.028	-0.126	-1.258
Trans2	453	1	5	3.56	1.019	-0.398	-0.779
Trans3	453	1	5	3.68	0.943	-0.534	-0.260
Trans4	453	1	5	3.70	0.973	-0.444	-0.520
Trans5	453	1	5	3.70	1.015	-0.719	0.037
Overall Trans				3.58	0.779	-0.521	-0.428
Competitiveness (Comp)							

Items/Constructs	N	Min	Max	Mean	Std. Deviation	Skewness	Kurtosis
Comp1	453	1	5	3.72	0.949	-0.505	-0.486
Comp2	453	1	5	3.71	0.949	-0.657	-0.088
Overall Comp				3.72	0.915	-0.581	-0.252
Overall Tendering Process					0.781	-0.508	-0.263

NB: Max = Maximum; Min = Minimum; N = Number; Std = standard deviation.

The statistics in Table 6.3 signifies that both cost (M = 3.66; SD = 0.976) and time (M = 3.66; SD = 0.970) performances have means greater than the average of 3.2. The overall performance recorded mean value of 3.66 (SD = 0.931). These suggest that most of the respondents had positive perceptions of the two performance indicators, tendering competitiveness and transparency as well as the overall performance.

Also, Table 6.3 show that all the items measuring both competitiveness and transparency facets of tendering process have means greater than 3.2. The mean values range from 3.26 to 3.70 for transparency and 3.71 to 3.72 for competitiveness. The overall tendering process had mean of 3.62 (SD = 0.781). These imply general positive perceptions about the tendering process on PPP performance.

6.4: MODEL ASSESSMENT

This section presents the results of the measurement model, its fit and predictive power.

6.4.1 Measurement model

Figure 6.1 below shows the final iteration results of measurement model (outer) using CFA to examine the reliability and validity of the model according to Ringle et al. (2015). The results show that all the reflectively measured constructs'

measures have adequate construct reliability and convergent validity. More specifically, all the items have significant loadings (p<0.001), the average variance extracted values (AVEs) are higher than the critical value of 0.50, and all the construct reliabilities have values above 0.7 (Hair et al., 2019; Shmueli et al., 2019). Refer to Tables (6.10, 6.11 and 6.12) respectively. Therefore, construct reliability and convergent validity of all the latent variables are satisfactorily established in this study.

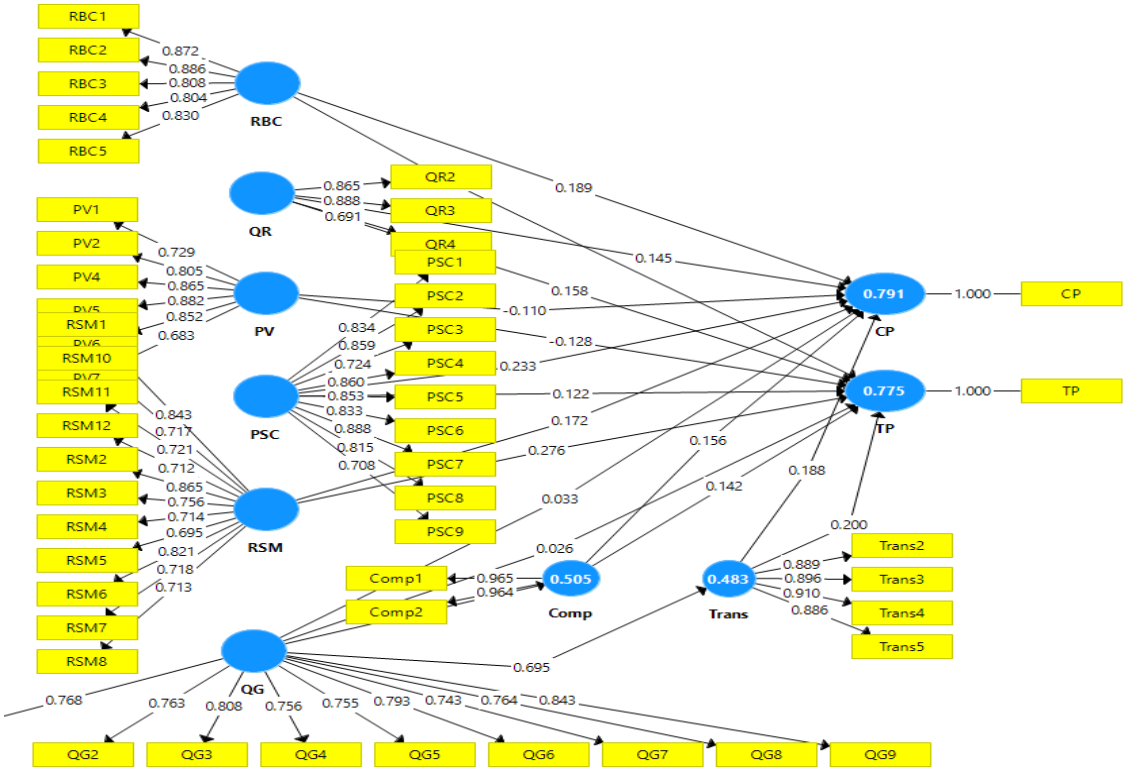

Figure 6.1: Measurement model depicting the loadings and their p-values

NB: Boxes = indicators; Circles = Construct; Lines/Arrows = Paths. Dependent variables: CP =cost performance; TP= time performance. Source: Source: Field Survey, 2021

6.4.2 Model fit, predictive power and predictive relevance

Following the recommendation of Henseler et al. (2016), the model fit was assessed. Thus, in terms of fit indices, standardised root mean square residual (SRMR) was used which needs to be smaller than 0.08 (Hu & Bentler, 1998). This

fit index must be met before the hypothesis(es) of the proposed model can be tested (Fındıklı et al., 2015).

Further, the R^2 and Q^2 criteria were used to evaluate the predictive power and predictive relevance of the structural model (Chin, 1998). As a rule of thumb, R^2 values of 0.75, 0.5, 0.25 may be considered substantial, moderate and weak, respectively (Hair et al., 2012). Blindfolding was used to cross-validate the model's predictive relevance for each of the individual endogenous variables, the Stone-Geisser Q^2 value (Hair et al., 2019). Table 6.4 shows the model fit, predictive power and predictive relevance of the structural model.

Table 6.4: Results of model fit, predictive power and predictive relevance

Construct	R^2	R^2 Adjusted	Q^2	Effect Size	SRMR
CP	0.791	0.787	0.766	Large	0.069
Comp	0.505	0.504	0.466	Large	
TP	0.775	0.771	0.753	Large	
Trans	0.483	0.482	0.381	Large	

Small: 0.0 < Q^2 effect size < 0.15; Medium: 0.15 < Q^2 effect size < 0.35; Large: Q^2 effect size > 0.35. CP=Cost Performance; Comp=competitiveness; TP=Time Performance; Trans=Transparency.

As revealed in Table 6.4, the results show that the model has a good fit as the SRMR was 0.069 which is less than the 0.08 threshold (Hu and Bentler, 1998), hence the path relations can be examined. Furthermore, the statistics indicate that the structural model is predictively relevant in an acceptable level of (Q^2>0.0) and predictive power (R^2>0.20) (Hair et al., 2019; Usakli and Kucukergin, 2018). Precisely, the R^2 values show that the quality of corporate governance (QG) explains 50.5% and 48.3% of variation in competitiveness and transparency dimensions of tendering process, respectively. Similarly, the R^2 values for main outcome variable i.e., cost performance and time performance are 0.791 and 0.775, respectively. This is an indication that the research model accounted for 79.1% and 77.5% of variance on cost performance and within time performance, respectively. These suggest that organisational resources significantly contribute to the variations on cost performance and within time performance. Also, Q^2 values

of the model range from 0.381 to 0.766 which are > 0, establishing the fact that the PLS structural model has adequate predictive relevance.

6.5: HYPOTHESES ASSESSMENT AND DISCUSSION OF FINDINGS

Having established the collinearity, predictive power, predictive relevance and the model fit, the hypotheses of the proposed model are examined and tested. This includes the direct, indirect (mediation), and moderating effects. The results are presented in Tables 6.5, 6.6 and 6.7 and Figure 6.2, 6.3 and discussed.

Table 6.5: Structural-Equation model testing on the direct effects of the variables

Hypotheses	Paths	β	SE	Bias-Corrected CI		*t*-statistics	*p*-values
				2.50%	97.5%		
H1	RBC => CP	0.189	0.042	0.113	0.278	4.497	0.000
H2	RBC => TP	0.192	0.043	0.115	0.282	4.500	0.000
H3	QR => CP	0.145	0.047	0.059	0.242	3.108	0.002
H4	QR => TP	0.158	0.048	0.066	0.254	3.277	0.001
H5	PV => CP	-0.110	0.034	-0.179	-0.044	3.208	0.001
H6	PV => TP	-0.128	0.032	-0.196	-0.069	4.001	0.000
H7	PSC => CP	0.233	0.062	0.118	0.359	3.737	0.000
H8	PSC => TP	0.122	0.062	0.007	0.252	1.970	0.049
H9	RSM => CP	0.172	0.058	0.057	0.288	2.973	0.003
H10	RSM => TP	0.276	0.053	0.173	0.380	5.222	0.000
H11	QG => CP	0.033	0.040	-0.050	0.109	0.824	0.410
H12	QG => TP	0.026	0.039	-0.050	0.104	0.658	0.511
H13	QG => Comp	0.711	0.024	0.660	0.754	29.876	0.000
H14	QG => Trans	0.695	0.027	0.637	0.742	25.741	0.000
H15	Comp => CP	0.156	0.058	0.049	0.276	2.693	0.007
H16	Comp => TP	0.142	0.056	0.039	0.264	2.526	0.012
H17	Trans => CP	0.188	0.047	0.098	0.280	4.013	0.000
H18	Trans => TP	0.200	0.046	0.114	0.293	4.394	0.000

NB: QG = Quality Governance factors; QB = quality project brief factors; PSC = public sector capacity factors; PV = project value factors; RBC = Resilience business case factors; RSM = risk sharing model factors; CP=Cost Performance; Comp=competitiveness; TP=Time Performance; Trans=Transparency. Source: Source: Field Survey, 2021.

The results as depicted in Table 6.5 indicate that five (5) out of the six factors of organisational resources have significant direct effects on both cost and time performances. Specifically, cost performance was significantly positively predicted by RBC (β = 0.189; *SE* = 0.042; CI = 0.113, 0.278; *t* = 4.497; *p* = 0.000), QR (β = 0.145; *SE* = 0.047; CI = 0.059, 0.242; *t* = 3.108; *p* = 0.002), PSC (β = 0.233; *SE* = 0.062; CI = 0.118, 0.359; *t* = 3.737; *p* = 0.000) and RSM (β = 0.172; *SE* = 0.058; CI = 0.057, 0.288; *t* = 2.973; *p* = 0.003), thereby supporting hypotheses H1, H3, H7 and H9. Similarly, RBC (β = 0.192; *SE* = 0.043; CI = 0.115, 0.282; *t* = 4.500; *p* = 0.000), QR (β = 0.158; *SE* = 0.048; CI = 0.066, 0.254; *t* = 3.277; *p* = 0.001), PSC (β = 0.122; *SE* = 0.062; CI = 0.007, 0.252; *t* = 1.970; *p* = 0.049) and RSM (β = 0.276; *SE* = 0.053; CI = 0.173, 0.380; *t* = 5.222; *p* = 0.000) significantly positively predicted time performance, thus, supporting hypotheses H2, H4, H7, H8 and H10. Below, further discussed the findings.

6.5.1 Impact of quality governance on PPP performance

The model assessments on the impact of public entity project organisational resources on PPP time and cost performances. From the Table 6.5, the results QG => CP (β = 0.033; *SE* = 0.040; CI = -0.050, 0.109; *t* = 0.824; *p* = 0.410); QG => TP (β = 0.026; *SE* = 0.039; CI = -0.050, 0.104; *t* = 0.658; *p* = 0.511), were insignificant. Meaning, Hypotheses H11, and H12 however, were rejected at significant levels of 0.000. Nevertheless, quality governance structure has significant direct (positive) bearing on both competitiveness (β = 0.711; *SE* = 0.024; CI = 0.660, 0.754; *t* = 29.876; *p* = 0.000) and transparency (β = 0.695; *SE* = 0.027; CI = 0.637, 0.742; *t* = 25.741; *p* = 0.000) facets of tendering process, thereby supporting hypotheses H13 and H14. Quality governance on PPP performance within time and on cost were insignificant compared to the hypothesis tested. The implication is that there is the need to prioritize the activities of quality governance to enhance cost and time performance for effective PPPs.

The study. however, collaborated with Kwofie et al. (2021), who earlier indicated that inefficiencies in public-private partnership are linked to deficient and poor governance practices. According to Li et al. (2005), cited by Verhoest et al. (2013), governance structures are progressively in line with the regulatory systems to avert

conflicting in contract. Whilst Martins et al. (2012), indicated that a good governance structure stimulates both transparent and competitive procurement tendering which ultimately affects project performance (Chan et al. (2010a). Zheng et al. (2008), indicated that contractual governance where formal and informal instruments are deployed ensure smooth adherence to the process thereby ensure project completed within schedule and on cost. It must be noted that effective project governance required high-level stakeholder engagement to ensure rules and regulations are complied with. PPP performances are influenced when there is mutual trust, cooperative decision-making, and process management (Verhoest et al., 2016; Hueskes et al., 2017).

The study, nevertheless, reiterated governance structures for effective PPPs are based on: sound legal environment, adherence to prescribed rule and procedures, clearly defined mechanisms for coordination, loyalty and commitment to project objectives, trust-building, clearly defined roles and responsibilities from the parties, and leadership providing quality governance structures for effective PPPs. When provided, there is flexibility in resources movement across project parties, and the teams effect PPP project performance on cost and within time. PPP projects are then completed within schedule and on cost when quality governance practices are adopted in PPP contract.

6.5.2: Impact of resilient business case on PPP performance

The result as shown in Table 6.5 above for resilient business case indicates (β = 0.189; *SE* = 0.042; CI = 0.113, 0.278; t = 4.497; p = 0.000). This implies resilient business case has significant effect on PPP time and cost performances as H1 and H2 are accepted. Thus, resilient business case described in this study as robustness of the project, when provided, is capable of attracting private investments. An effective business case provided by a well resourced team, often by the public sector, lead entities can attract private fundings. A resilient public entity can determine and justify the cost benefit analysis of the project and the risks thereof of the proposed project or portfolio. This is an asset for effective PPPs especially for public sector lead organisations. And this has likelihood of affecting

how resources are structured and mobilised for PPP project completion within time and on cost. The finding, further agreed with Liu et al. (2016), who indicated that a resilient business case must demonstrate the economic feasibility of the proposed project to invest in. It must be robust enough indicating list of the project objectives and reasons for undertaking the project, and validate the benefits the project seeks to deliver as part of overall national project investments (PMI, 2015; Mulcahy, 2013; Rose et al., 2014).

6.5.3 Impact of quality project brief on PPP performance

The result in Table 6.5 for quality project brief (β = 0.145; *SE* = 0.047; CI = 0.059, 0.242; *t* = 3.108; *p* = 0.002). The result exhibits a positive significant corelation between quality project brief and PPP time and cost performances. Thus, H3 and H4 are accepted. The statistical significance predicting private investors and public perception of what is necessary for investment. A poorly defined project brief creates difficulties in understanding what is to be provided, and affect proper cost estimation or determination for project partners. This affects partners' the ability to determine resources usage and schedule management, thereby affecting overall PPP performance (Velotti et al., 2012). Liu et al. (2016), however, noted that poor quality project brief can lead to redesigning efforts thereby delaying project completion or milestone of the project phase. This has likelihood of impacting on the cost of PPP projects.

6.5.4 Impact of public sector capacities on PPP performance

The result from Table 6.5, public sector capacities on PPP cost and time performances is (β = 0.233; *SE* = 0.062; CI = 0.118, 0.359; *t* = 3.737; *p* = 0.000). This is positive and significant as hypotheses H7 and H8 have been accepted. A well-developed public sector capacities deliberately affect PPP project performance within time and on cost for stakeholders. Public sector capacities bear a long-term resilience and stability for shaping public project performance to complete PPP project on cost, and meeting project completion dates. Wu et al

(2018), further agreed that this is an essential resource for successful project management within public sector management and control. A well-developed public sector capacities provide the needed skills, capabilities, and resources to perform policy functions, policy design, and implementation strategies for successful PPPs. Consequently, a well designed public sector capacities are governed by leadership, skills and knowledge of managers, planning, supervision and monitoring (Damoah et al., 2020). When these resources are set right from project authorities, it is essential to complete project on cost and meet project milestone dates (Damoah et al., 2020). An improved public sector capacities reduce cost of PPP administrative challenges. One of the critical elements that increases cost of tendering for PPPs is administrative challenge. Administrative challenges include lack of transparency in procurement processes, poor feasibility studies, poor communication among stakeholders, payment delays, political corruption and lack of transparency in project monitoring according to Damoah et al. (2020). These are contributing factors for increasing the cost of project and delay in PPP project payment and completion.

Further, a poor public sector that does not have the necessary skills and knowledge cannot undertake comprehensive economic, and financial feasibility studies necessary to determine project value. These inabilities, risk the national budget and potentially rob the nation and project end-users from benefiting from the PPP engagements. The general public is thereby affected as overall project cost increases.

This study believed that public sector capacities, depend on leadership. When proper trained leaderships are in place, proper guidelines are developed necessary for effective PPPs tendering. The lack of effective leadership, eventually, affects cost and time performance of a project. When Public sector capacities are developed, the leaders will provide support and commitment for PPP policies and subsequent resource for training and development at the local level of project development. The skills, knowledge and attitude gained from developing public sector capacities assist in risks identification, prioritization, quantification and management for successful PPPs. Yingying et al. (2021), further indicated that

these help in optimizing PPP project transaction structures, enhance (risks) uncertainty management as well as provide best full-spectrum on how parties can share risk in PPP transactional process. Thus, a public sector capacity developed, is resilient enough to provide a robust business case to attract private investments and fundings. This, eventually, helps in completing PPP projects without delay as well as work within budgeted cost of the project.

6.5.5 Impact of project value on PPP performance

Furthermore, the result from Table 6.5, as expected, project values significantly negatively predicted cost performance (β = -0.110; *SE* = 0.034; CI = -0.179, -0.044; t = 3.208; p = 0.001) and time performance (β = -0.128; *SE* = 0.032; CI = -0.196, -0.069; t = 4.001; p = 0.000). Thus, hypotheses H5 and H6 are also accepted. However, the direct effects of quality governance on both cost performance (β = 0.033; *SE* = 0.040; CI = -0.050, 0.109; t = 0.824; p = 0.410) and time performance (β = 0.026; *SE* = 0.039; CI = -0.050, 0.104; t = 0.658; p = 0.511) are insignificantly positive. Consequently, hypotheses H11 and H12 are unsupported. It implies the accurate project value determination is a challenge, and affecst overall cost values of PPP projects whilst delaying project completion. The impact of cost and time on project construction is very important. Inaccurate project value determination according to Doloi, (2012) may be due to design complexity and conditions, market dynamics, technical obsolescence and partner's disputes. When the overall economic and financial value of the project is at lowest cost, the public or the end-users can afford the PPP project provided. This may, however, be different when high values are quoted beyond the thresholds of the public contracting entities or authorities. Invariably, this affects the public purse and does not guaranteed value for money creation efforts in public supplies. Public Private Infrastructure Advisory Facility (2016), further noted that poor estimation could lead to shortage of funds, thereby impacting on the construction phases, increases the cost-risk of the project, and affecting cashflow sustainability of the PPPs projects.

The study opined that effective project value include, there is accurate cost estimating strategies; a reasonable cost-risk allocation formula agreed upon by the

parties; there is overall economic value disclosure; there is overall social value disclosure; there is overall financial value disclosure clarity of revenue streams determination; accurate tender valuation comparison; there is detail appraisal audit system implemented in post project evaluation; as well as sustainable funding opportunities or options available for PPP contracts. From the study it has been found that these determinants are lacking in the area under consideration, thus, affecting cost and time performances of effective PPPs. The lack of accurate project value determinations further affects competitiveness and transparency of the tendering process. The private parties may not show interest in the process due to earlier wrong information or data given. The direct attributable cause of this may be due to poor governance system. Whilst some project leaders may fail to commit resources to PPP projects since such projects might be of less interest. Transparent accurate project cost estimates and transactions may further ensure confidence in PPP tendering and procurement processes. Additionally, a successful project value determined, is based on accurate data submitted by public project authorities. When wrong data is submitted and projects are valued based such information, this can increase the cost-risk implications to PPP projects. And high-risk projects could affect national budget since the state have to mitigate this through guarantees, often in PPP contracting. This further affects future PPP engagements for sustainable contracting for the parties.

6.5.6 Impact of risk sharing model on PPP performance

More so, the result from Table 6.5, risk sharing model (β = 0.172; *SE* = 0.058; CI = 0.057, 0.288; t = 2.973; p = 0.003), thereby supporting hypotheses H1, H3, H7 and H9. Similarly, RBC (β = 0.192; *SE* = 0.043; CI = 0.115, 0.282; t = 4.500; p = 0.000), and RSM (β = 0.276; *SE* = 0.053; CI = 0.173, 0.380; t = 5.222; p = 0.000) significantly positively predicted time performance, thus, supporting hypotheses H2, H4, H8 and H10. The uncertainties in the project environment required that proper risk sharing and allocation strategies are agreed upon prior to PPP contracting. This is to prevent cost risk to the project when eventual winner of the PPP contract is bankable, having the necessary technical and economic strength

to manage the contract phases. And the parties capable of managing the project for best value are subsequently awarded the contract.

Chou and Pramudawardhani (2015), however, indicated that risk sharing and or allocation is critical for sustainability of the project and the partnership agreement. And efficient risk allocation decreases overall project cost, and provides avenue for future funding effort for sustainable PPP (World Bank, 2016; Public Private Infrastructure Advisory Facility, 2016; Liu et al., 2016; Khallaf et al., 2018). Public Private Infrastructure Advisory Facility, 2016; Liu et al., 2016), further noted that an effective risk sharing provided by the parties in the tendering process promotes private sector participation. This further ensures understanding of the project need to be procured, demonstrated by the contracting parties to gain best value. It encourages competitiveness among the tenderers in the tendering process thereby creating value for money and transparency in the tendering process. Iossa and Martimort (2012), however, noted that relying on finance and expertise enhances the benefit of building effective PPPs. Public entities interested in PPPs without having the technical expertise and initial public financial guarantees risk effective PPPs. These have been the challenge at both the local and the national levels; lack of expertise as well as financing mechanisms that can provide and support effective risk sharing and allocation strategies for PPP determinations. Poor risk sharing model and assessment increases PPP project cost and affect time performances. The contract schedules are delayed, affecting estimated cost agreed, after project successfully tendered, evaluated and awarded. A delay may increase cost and affect project performance.

Heravi and Hajihosseini (2012), however, suggested that the ways to improve risk sharing allocation of PPP is to achieve better project performance. Achieving better performance is to ensure tendering parties meet performance criteria agreed upon prior to contracting. The PPP tendering processes must be compliant enough by ensuring necessary rules and regulations enriched in the guidelines are followed to the letter. Further, literature reviewed on the best model of sharing PPP risks has indicated that the consideration of the concession period is significant. According to Carbonara et al. (2014), creating win-win solutions for both parties

and the government allow for fair risk sharing between the parties, and the concession period is the best instant due to time value of money and unstable economic indicators. Wang et al. (2018), further noted that taking both real option value (economic figures) and risk into concession period increases flexibility of the PPP negotiation. And this provides strategic importance in determining the present project values.

The study is, however, of the view that risk sharing model in PPP is done when there is sufficient public decision-making on risks identification, assessments, quantification and management provided by the public expertise. Stakeholders are assured of alternate guarantees available to mitigate PPP risks by ensuring there is sufficient stable fiscal space (stable macro-economic indicators) for effective PPPs. And that there is sufficient project permit and approvals prior to PPP contracting. More so, accurate force majeure determinations and quantification are done to determine their impact on the project are necessary. Notwithstanding, uncertainties on fiscal consolidation and tax policy, among others, are accurately cross examined to prevent further risk in managing PPP risks identified.

6.5.7 Tendering competitiveness and transparency on PPP performances

The Table 6.5, above show that competitiveness of tendering process significantly positively predicted cost performance (β = 0.156; *SE* = 0.058; CI = 0.049, 0.276; *t* = 2.693; *p* = 0.007) and time performance (β = 0.142; *SE* = 0.056; CI = 0.039, 0.264; *t* = 2.526; *p* = 0.012), so supporting hypotheses H15 and H16. Likewise, transparency of tendering process significantly predicts cost performance (β = 0.188; *SE* = 0.047; CI = 0.098, 0.280; *t* = 4.013; *p* = 0.000) and time performance (β = 0.200; *SE* = 0.046; CI = 0.114, 0.293; *t* = 4.394; *p* = 0.000), hence supporting hypotheses H17 and H18. Transparency and competitiveness in the procurement process are key qualities to building business growth and incentivize the private sector confidence in the system to provide value. Tendencies of cloudy but milky-cumbersome regulations restrict access to tendering information hence does not create opportunities for investments.

The study further supported Liu et al. (2016), that competition at the tendering stage is a key driver for value for money in PPP projects. Lack of competition may result in to less value solution for the public. More so, to be transparent is be to more accountable (Garvin, 2010; Liu et al., 2016). When the public procuring agency is not transparent and fair on equal access to tendering information, this can generate additional costs in financing infrastructure.

The impacts of competitiveness and transparency in the tendering process are enormous. For instance, the lack of transparency creates further perception of corrupt activities which negatively affect confidence in the public procurement decisions. These further increase project delay on schedule. In addition, lack of transparency in tendering process may delay transactional process for PPP projects. Such tendency discourages private investments, and negatively affects economic growth. The eventual losers are the public who may be denied enjoying quality public facilities through private financing arrangements. Competitive and transparent tendering process is vital for successful PPPs. Competitive and transparent process create an avenue for a swift response to capital projects investment without delaying funds for investment. There is elimination of public corrupt activities hence boosting commitment of the private sector fundings that result from transparent, honest, open and competitive business environment.

The outermost effects are that the transactional cost of the project and overall cost of the project considerably are reduced when the processes are competitive, open and transparent. The end-users or the public sustainably benefit as the risk involved in the PPP transactional processes are mitigated through effective but competitive and transparent tendering process being dully followed and complied with. Sustainably, the citizens are mitigated from paying high fees charged from the PPP arrangements thereby assured of continuity of public-private investments. Finally, when the tendering procedures and processes are followed competitively and transparently, without officials subverting the process, everyone benefits and value for money is created in the public procurement system and public accountability thrives. The private entities finally are assured of their investments through the partnership arrangement.

6.5.8 Mediating and moderating effects of probity in tendering (CT & TT)

This section presents the mediating and moderating effects of probity in the tendering process. To recap, two important principles that ensure probity in tendering are competitiveness and transperency. These variables were used as mediators and moderating variables in the relationship between organisational resources and PPP performance.

6.5.8.1 Mediation analysis

Table 6.6: Structural-equation model testing on total and indirect effects

Paths	β	SE	Bias-Corrected CI		*t*-statistics	*p*-values
			2.50%	97.5%		
Total Effects						
QG =>CP	0.275	0.051	0.180	0.374	5.421	0.000
QG =>TP	0.266	0.052	0.172	0.374	5.128	0.000
Indirect Effects						
QG =>Comp=>CP	0.111	0.042	0.035	0.198	2.660	0.008
QG =>Comp=>TP	0.101	0.042	0.027	0.191	2.435	0.015
QG =>Trans=>CP	0.130	0.034	0.066	0.198	3.859	0.000
QG =>Trans=>TP	0.139	0.033	0.078	0.208	4.177	0.000

CP=Cost Performance; Comp=competitiveness; TP=Time Performance; Trans=Transparency.

As revealed in Table 6.6, both total and indirect effects of QG on both cost performance and time performance are significantly positive. Specifically, QG significantly indirectly predicted cost performance through competitiveness (β = 0.111; *SE* = 0.042; CI = 0.035, 0.198; t = 2.660; p = 0.008) and transparency (β = 0.130; *SE* = 0.034; CI = 0.066, 0.198; t = 3.859; p = 0.000) of tendering process. Also, QG significantly indirectly predicted time performance through competitiveness (β = 0.101; *SE* = 0.042; CI = 0.024, 0.191; t = 2.435; p = 0.015) and transparency (β = 0.139; *SE* = 0.033; CI = 0.078, 0.208; t = 4.177; p = 0.000) of tendering process. These suggest competitiveness and transparency of the tendering process mediate the influence of quality governance structure on both cost and time performances.

From Table 6.6 above, H16, H17, and H18 have been supported and significantly positive. Competitiveness and transparency of tendering process indirectly influence quality governance on both cost and time performances. The implication is that if there is a competitiveness and transparency in the tendering process, it prevents social mistrust in the tendering process. Aggrieved parties who are apparently not satisfied due to wrongful activities or collusion or conspiracy in the tendering processes are redressed and responded to. This prevents possible law suits and pre-judicial delay or judgement. Liu et al. (2016), discoursed that tendering efficiency is likely to be improved among the parties when there are governance structures, effective communication system, flexibility in the information sharing and adherence to the laydown guidelines. Tendering efficiency therefore encourages broader stakeholder engagement formally and informally and eliminates cost of PPP transactions. Thus, an effective tendering process is open to fair competition and transparent enough, guarantees risk mitigation in the public procurement transactional process. Project costs are controlled, and monitored preventing further schedule delays and cost overruns in PPPs (Mulcahy, 2013; Rose et al., 2014). Further, Solino and Gago (2016); Liu et al. (2017), have indicated that high cost in the preparation, bidding and delay in awarding of PPP contracts at the tendering stages are mitigated when competitiveness and transparency are adhered to in the of tendering process of PPP transactions.

Nevertheless, the Structural-Equation Model testing on Total and Indirect Effects as depicted in Figure 6.2 below significantly accounted for 77.4% (R^2 = 0.774) and 74.4% (R^2 = 0.744) variance in cost performance and time performance. The study therefore professed that cost and time PPP performances are affected when fair competition and transparency are encouraged. Competitiveness and transparency of PPPs tendering process therefore have mediating effects on time and cost performances. Alternatively, value is created, and PPPs' performances improved sustainably, when competitiveness and transparency in the PPPs tendering processes are encouraged.

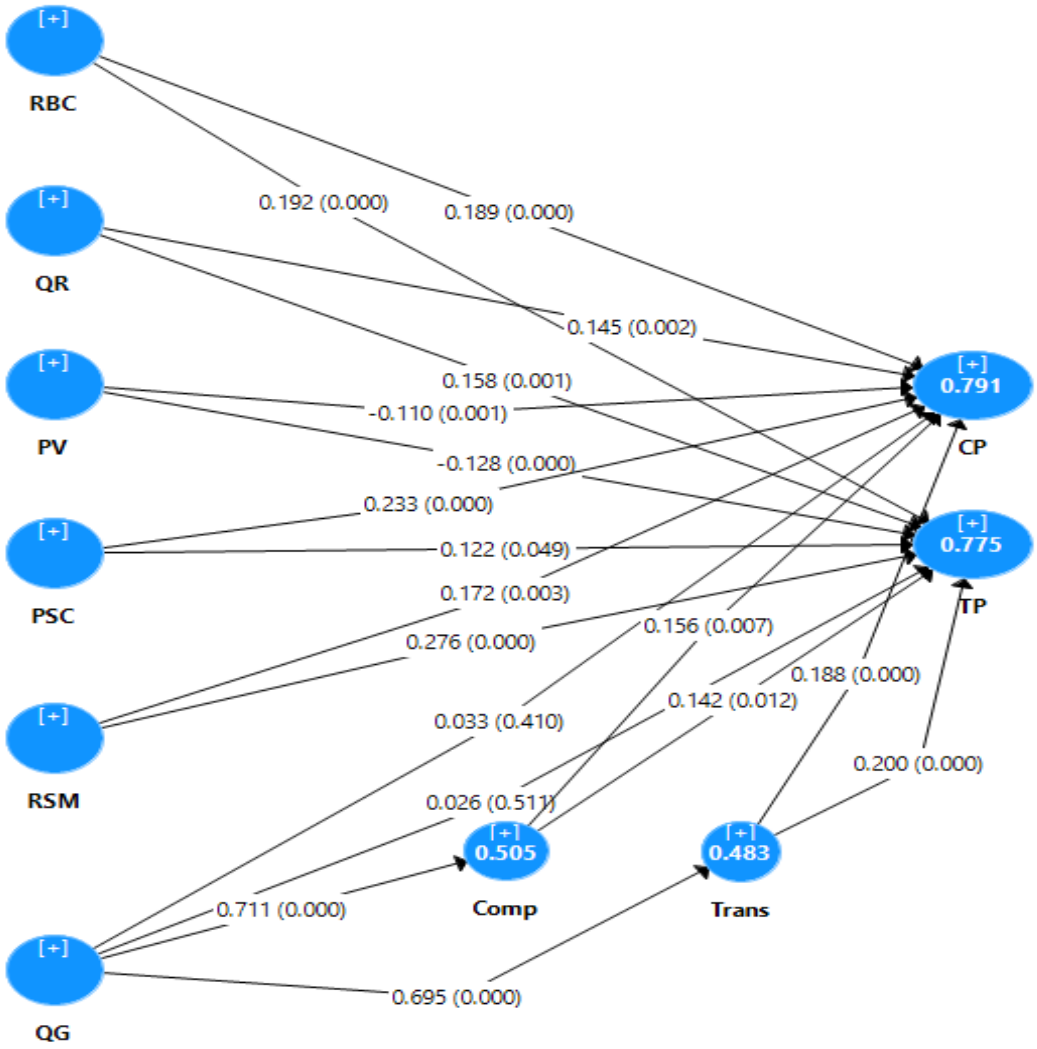

Figure 6.2: Structural model of the mediating effects of tendering process

6.5.8.2 Moderation analysis

Table 6.7: Structural-equation model testing on the moderation results

Hypotheses	Paths	β	SE	Bias-Corrected CI		*t*-statistics	*p*-values
				2.50%	97.5%		
Combined	Org.Res. => CP	0.562	0.049	0.462	0.654	11.407	0.000
	Org.Res. => TP	0.539	0.055	0.428	0.639	9.877	0.000
H19	OR*Comp=>CP	-0.022	0.063	-0.152	0.097	0.344	0.731
H20	OR*Comp=>TP	-0.074	0.061	-0.203	0.037	1.206	0.228
H21	OR*Trans=>CP	0.094	0.058	-0.009	0.218	1.617	0.106
H22	OR*Trans=>TP	0.067	0.058	-0.038	0.190	1.162	0.245

Moderation analysis was conducted to assess if competitiveness and transparency of tendering process moderate the influence of organisational resources on both cost and time performances. As presented in Table 6.7, collectively, organisational resources have significant positive influence on both cost performance (β = 0.562; SE = 0.049; CI = 0.462, 0.654; t = 11.407; p = 0.000) and time performance (β = 0.539; SE = 0.055; CI = 0.428, 0.639; t = 9.877; p = 0.000). Surprisingly, competitiveness and transparency of tendering process failed to significantly moderate the influence of organisational resources on both cost and time performances as expected. Therefore, hypotheses H19, H20, H21 and H22 are statistically rejected. Nonetheless, the moderation model as depicted in Figure 7.3 significantly accounted for 77.4% (R2 = 0.774) and 74.4% (R2 = 0.744) variance in cost performance and time performance. This implies there is significant relationships between competitiveness and transparency of tendering process, influencing organisational resources (predictor variables) and cost and time performances (outcome variables).

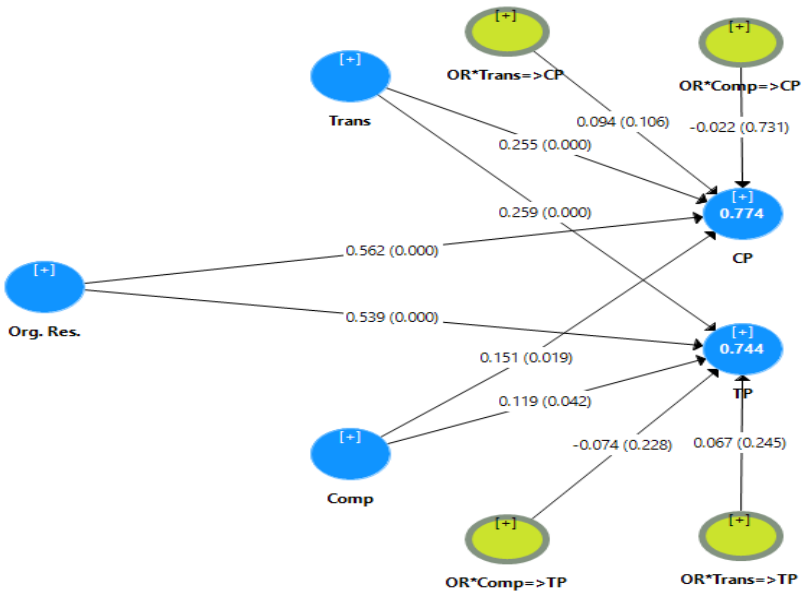

Figure 6.3: Structural model of moderating effects of tendering process

Table 6.8 Summary of formulated objectives, hypothesis testing and analysis

Objectives	Hypothesis	Significance at 0.05% level	Results	Remarks
Examine the impacts of resilient business case on cost and time performance of PPP projects in Ghana	H_1: Resilient business case has significant positive impact on PPP cost performance	Positively significant effect	Accepted	Evidently supported by literature
	H_2: Resilient business case has significant positive impact on PPP time performance	Positively significant effect	Accepted	Evidently supported by literature
Examine the impacts of quality project brief on cost and time performance of PPP projects in Ghana	H_3: Quality of project brief has significant positive impact on PPP cost performance	Positively significant effect	Accepted	Evidently supported by literature
	H_4: Quality of project brief has significant positive impact on PPP time performance	Positively significant effect	Accepted	Evidently supported by literature
Examine the impacts of project value on cost and time performance of PPP projects in Ghana	H_5: The lower the value of the project the better the PPP cost performance	Positively significant effect	Accepted	Evidently supported by literature
	H_6: The lower the value of the project the better the PPP time performance	Positively significant effect	Accepted	Evidently supported by literature
Examine the impacts of public sector capacity on cost and time performance of PPP projects in Ghana	H_7: Public sector capacity has significant positive impact on PPP cost performance	Positively significant effect	Accepted	Evidently supported by literature
	H_8: Public sector capacity has significant positive impact on PPP time performance	Positively significant effect	Accepted	Evidently supported by literature

Examine the impacts of risk sharing model on cost and time performance of PPP projects in Ghana	H_9: Risk sharing model has significant impact on PPP cost performance	Positively significant effect	Accepted	Evidently supported by literature
	H_{10}: Risk sharing model has significant impact on PPP time performance	Positively significant effect	Accepted	Evidently supported by literature
Examine quality governance structure on cost and time performance of PPP projects in Ghana	H_{11}: Quality of governance structure has significant impact on PPP cost performance	Positively significant effect	rejected	Very consistent of emerging views on literature
	H_{12}: Quality of governance structure has significant impact on PPP time performance	Positively significant effect	rejected	Mixed evidence from literature
	H_{13}: Quality of governance structure has significant impact on competitiveness of PPP tendering process	Positively significant effect	Accepted	Evidently supported by literature
	H_{14}: Quality of governance has significant impact on the transparency of PPP tendering process	Positively significant effect	Accepted	Evidently supported by literature
Examine mediating effects of competitiveness and transparency of tendering process	H_{15}: Competitiveness of tendering process has significant impact on PPP cost performance	Positively significant effect	Accepted	Evidently supported by literature
	H_{16}: Competitiveness of tendering process has significant impact on PPP time performance	Positively significant effect	Accepted	Evidently supported by literature
	H_{17}: Transparency of tendering process has significant impact on PPP cost performance	Positively significant effect	Accepted	Evidently supported by literature
	H_{18} Transparency of tendering process has significant impact on PPP time performance	Positively significant effect	Accepted	Evidently supported by literature

Investigate moderating effect of the competitiveness and transparency of the tendering process on the relationship between organisational resources and PPP time and cost performance.	H_{19}: Competitiveness of tendering process has moderating effect on the impact of organisational resources on PPP cost performance	Positively significant effect	rejected	Mixed evidence from literature
	H_{20}: Competitiveness of tendering process has mediating effect on the impact of organisational resources on PPP time performance	Negatively significant on time	rejected	Mixed evidence from literature
	H_{21}: Transparency of tendering process has moderating effect on the impact of organisational resources on PPP cost performance	Negatively significant on cost	rejected	Mixed evidence from literature
	H_{22}: Transparency of tendering process has mediating effect on the impact of organisational resources on PPP time performance	Negatively significant on time	rejected	Mixed evidence from literature

Table 6.8 above summarized the formulated objectives, hypothesis (tested/ testing) confirms and analysed what? at 5% significant level. The impact of organisational resources and tendering on PPP performance in Ghana was achieved through eight subsidiary objectives using twenty-two hypotheses. PSL-SEM (Partial Least Square Structural Modelling) a nonparametric, bootstrapping technique has been used to determine the statistical significance on PPP performance within time and on cost, the outcome variable.

6.6 CHAPTER SUMMARY

Concentrating on the impact of selected public entity organisational resources through tendering for successful PPP performance in Ghana. Chapter seven discussed the findings of the study. The chapter commenced with demographic analysis of the project participants and provide, the nature and characteristics of respondents in the study. The demographic analysis revealed that there is male domination compare to female in public project management environment contesting the issues of gender disparities in project management participation

within less mature PPP markets for which much researched have been explored. The chapter further presented a descriptive analysis on the respondents positive perceptions about the organisational resources through tendering competitiveness and transparency for successful PPP project performance. The pattern trends revealed that the public entity organisational resources are critical for successful PPP project performance in Ghana. The analysis, further confirmed the view that there are orgnisational resources (factors) critical for effective PPPs necessary to improve project performance on time and within cost (Casady et al., 2019; Liu et al., 2016; Osei – Kyei and Chan, 2016).

Further, inferential analysis using Partial Least Square Structural Modelling techniques on the data normality; measurement model estimation and structural models were assessed based on the study framework to test the hypotheses. The statistical analysis results indicated that there was a statistically significant relationship between organisational resources and tendering on PPPs performance (on time and within cost) in Ghana, especially in public sector project management. Further, from the validation survey, the findings were positive, since the respondents believed that the framework could suit the project management needs for public-private partnerships in delivering infrastructural projects when adopted. The discussion revealed that in exception of quality governance structure, all the remaining variables have significant impact on PPP project performance dimensions. Nevertheless, surprisingly, (competitiveness and transparency) of tendering process failed to significantly moderate the influence of organisational resources on both cost and time performances as expected.

In conclusion, the structural model results conducted to determine if the relationship between organisational resources through tendering impact on PPP performance within time and on cost, were positive. The study revealed that competitive tendering and transparent tendering influence PPP performance within time and on cost. And that effective and efficient uses of public entity project organisational resources through tendering will ultimately create value for money in public infrastructural project management in Ghana. Thus, based on the findings, H11, H12, H19, H20, 21, and H22 are rejected whilst H1, H2, H3, H4, H5,

H6, H7, H8, H9, H10, H13, H14, H15, H16, H17, H18 were however accepted. Conclusion and recommendations are presented in the next chapter.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

This chapter forms the final chapter of the study and is divided into two parts. the first part provides a brief background to the conclusion and recommendations to study while the second part discusses the findings of the study in relation to the research questions and hypothesis proposed at the introductory section of this study. The chapter includes introduction; the summary of the data analysis and hypothesis supported by the result. The second part highlights the contributions made in this study to the project management literature regarding organisational resources and the impact of tendering on PPPs project performance (cost and schedule). A revised framework after testing the hypotheses has been provided. Furthermore, the implications for policy decisions, management practices and further research were advanced in this chapter. The chapter ends with the study limitations.

7.2 REVISITING THE AIM AND OBJECTIVES OF THE STUDY

The focus of this study is to investigate organisational resources and tendering on successful Public-Private Partnership Project Performance in Ghana. Earlier chapters of this study have outlined the importance of applying the 3P's as innovative procurement strategy in delivering public infrastructural projects for the country. Grounded on Social Capital Exchange and Transaction Cost Economies as and, integrated with the resource-based view and the Stewardship Theory of Corporate Governance (STCG) theory, it has been argued that organisational resources and tendering influenced PPP performance (Casady et al., 2019; Zheng et al., 2018). It has also been argued that, there is relationship between the Private and Public partners' in utilising the organisational resources identified and adhering to the tendering processes create value for money and improve project performance (Lui et al., 2016; Zheng et al., 2018). Consequently; establishing the

elements as premise to contribute the understanding of PPPs within project management context (Zheng et al., 2018).

There is the need therefore to develop a construct to measure public entity project organizational resources through tendering competitiveness and transparency for successful Public-Private Partnership Project Performance especially at the local levels of infrastructural provisions. This study argued that effective project management practices ensure effective uses of public entity project organisations' resources as an asset promoting tendering process effectiveness, which ultimately impact PPPs performance within cost and on time (schedule). The study sampled 453 project participants from the 18 administrative districts and municipal assemblies from the Volta Region, Ghana with response rate of 92%.

To recap, the study has the following specific objectives.

1. To investigate the impact of organisational resources on the cost performance of PPP projects in Ghana.
2. To investigate the impact of tendering process on the time performance of PPP projects in Ghana.
3. To determine the impact of the quality of governance on competitiveness and transparency of PPP tendering process in Ghana.
4. To determine the impact of the competitiveness of tendering process on PPP time and cost performance in Ghana.
5. To determine the impact of the transparency of tendering process on PPP time and cost performance in Ghana.
6. To investigate the moderating effect of the competitive and transparent tendering process, on the relationship between organisational resources and PPP time and cost performance.
7. To investigate the mediating effect of the competitive and transparent tendering process, on the relationship between organisational resources and PPP time and cost performance.

8. To make recommendations for optimising cost and time performance of PPP projects in Ghana.

7.3 CONCLUSIONS BASED ON THE RESEARCH FINDINGS

Principally, the study aimed to examine the impact of organizational resources and tendering on successful PPP Performance in Ghana. The primary hypothesis of this research is thus: Organizational resources and tendering have significant direct and indirect impacts on PPP performance in Ghana. Attempting to justify this is to appraise twenty-two (22) hypotheses which capped into empirical and theoretical investigations revealed in the previous chapters. The key outcomes discovered from this study have been expounded in connection to prior literature on the thematic areas of this discussion. Focusing on the research objectives and hypothesis, these have been summarized in the following sections of this chapter.

Table 7.1 Conclusions on the hypotheses

Objectives	Hypothesis	Sig @ 0.05	Results	Conclusion
Examine the impacts of resilient business case on cost and time performance of PPP projects in Ghana	H_1: Resilient business case has significant positive impact on PPP cost performance	Yes	Accepted	Resilient business case has significant positive impact on PPP cost performance
	H_2: Resilient business case has significant positive impact on PPP time performance	Yes	Accepted	Resilient business case has significant positive impact on PPP time performance
Examine the impacts of quality project brief on cost and time performance of PPP projects in Ghana	H_3: Quality of project brief has significant positive impact on PPP cost performance	Yes	Accepted	Quality of project brief has significant positive impact on PPP cost performance
	H_4: Quality of project brief has significant positive impact on PPP time performance	Yes	Accepted	Quality of project brief has significant positive impact on PPP time performance

Examine the impacts of project value on cost and time performance of PPP projects in Ghana	H_5: The lower the value of the project the better the PPP cost performance	Yes	Accepted	The lower the value of the project the better the PPP cost performance
	H_6: The lower the value of the project the better the PPP time performance	Yes	Accepted	The lower the value of the project the better the PPP time performance
Examine the impacts of public sector capacity on cost and time performance of PPP projects in Ghana	H_7: Public sector capacity has significant positive impact on PPP cost performance	Yes	Accepted	Public sector capacity has significant positive impact on PPP cost performance
	H_8: Public sector capacity has significant positive impact on PPP time performance	Yes	Accepted	Public sector capacity has significant positive impact on PPP time performance
Examine the impacts of risk sharing model on cost and time performance of PPP projects in Ghana	H_9: Risk sharing model has significant impact on PPP cost performance	Yes	Accepted	Risk sharing model has significant impact on PPP cost performance
	H_{10}: Risk sharing model has significant impact on PPP time performance	Yes	Accepted	Risk sharing model has significant impact on PPP time performance
Examine quality governance structure on cost and time performance of PPP projects in Ghana	H_{11}: Quality of governance structure has significant impact on PPP cost performance	No	rejected	Quality of governance structure does not have significant impact on PPP cost performance
	H_{12}: Quality of governance structure has significant impact on PPP time performance	No	rejected	Quality of governance structure does not have significant impact on PPP time performance
	H_{13}: Quality of governance structure has significant impact on competitiveness of PPP tendering process	Yes	Accepted	Quality of governance structure has significant impact on competitiveness of PPP tendering process
	H_{14}: Quality of governance has significant impact on the	Yes	Accepted	Quality of governance has significant impact on the

	transparency of PPP tendering process			transparency of PPP tendering process
Examine mediating effects of competitiveness and transparency of tendering process	H_{15}: Competitiveness of tendering process has significant impact on PPP cost performance	Yes	Accepted	Competitiveness of tendering process has significant impact on PPP cost performance
	H_{16}: Competitiveness of tendering process has significant impact on PPP time performance	Yes	Accepted	Competitiveness of tendering process has significant impact on PPP time performance
	H_{17}: Transparency of tendering process has significant impact on PPP cost performance	Yes	Accepted	Transparency of tendering process has significant impact on PPP cost performance
	H_{18} Transparency of tendering process has significant impact on PPP time performance	Yes	Accepted	Transparency of tendering process has significant impact on PPP time performance
Investigate moderating effect of the competitiveness and transparency of the tendering process on the relationship between organisational resources and PPP time and cost performance.	H_{19}: Competitiveness of tendering process has moderating effect on the impact of organisational resources on PPP cost performance	No	rejected	Competitiveness of tendering process does not have moderating effect on the impact of organisational resources on PPP cost performance
	H_{20}: Competitiveness of tendering process has mediating effect on the impact of organisational resources on PPP time performance	No	rejected	Competitiveness of tendering process does not have mediating effect on the impact of organisational resources on PPP time performance
	H_{21}: Transparency of tendering process has moderating effect on the impact of organisational resources on PPP cost performance	No	rejected	Transparency of tendering process does not have moderating effect on the impact of organisational resources on PPP cost performance
	H_{22}: Transparency of tendering process has mediating effect on the impact of organisational resources on PPP time performance	No	rejected	Transparency of tendering process does not have mediating effect on the impact of organisational resources on PPP time performance

Based on the above conclussions on the hypotheses, the following revised conceptual framework has emerged. Figure 7.1 and 7.2 show that while individually competitiveness and transparency do not moderate the impact of organisational resources on PPP performance, collective, they have significant influence at the 0,05 level.

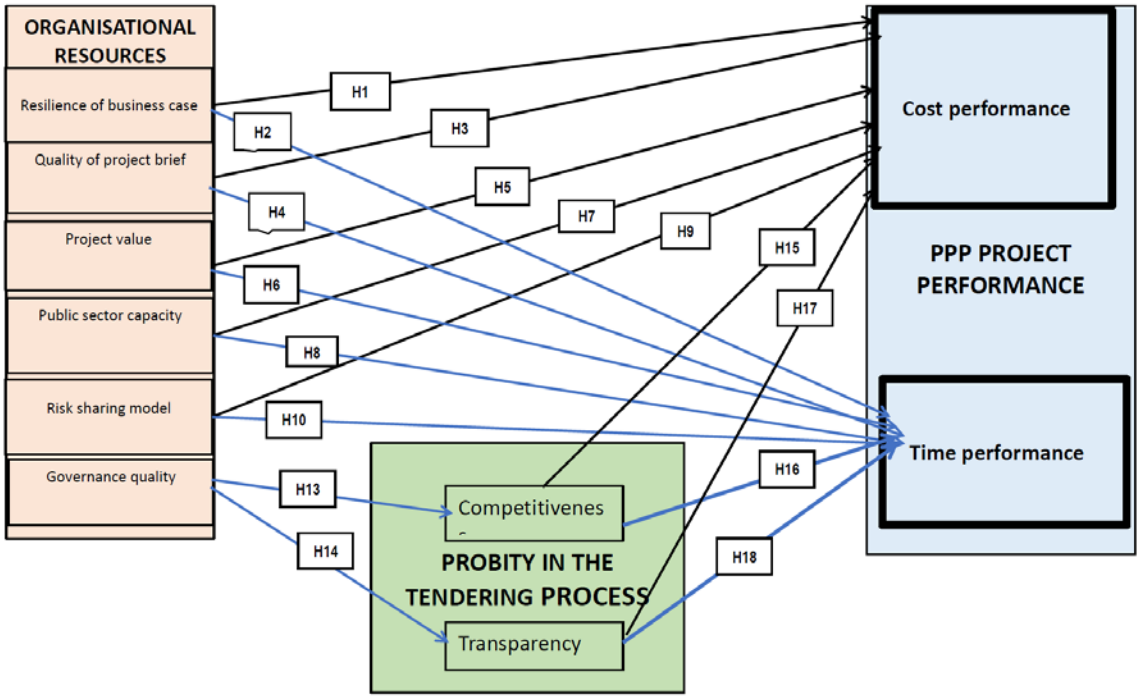

Figure 7.1: Modified organisational factors (resources) influencing PPP performance

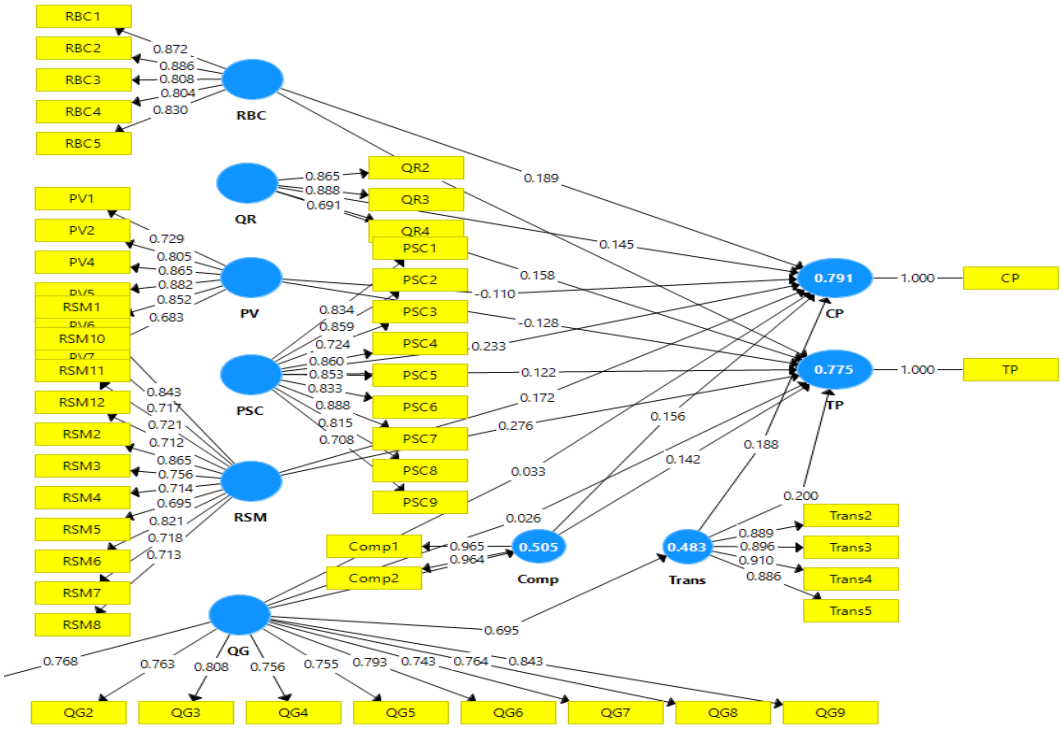

Figure 7.2: Measurement model depicting the loadings and their p-values

NB: Boxes = indicators; Circles = Construct; Lines/Arrows = Paths. Dependent variables: CP =cost performance; TP= time performance.

7.4 PRACTICE AND POLICY RECOMMENDATIONS/ IMPLICATIONS

7.4.1 Introduction

The findings of this study has various implications for practice and policy for using PPP in delivering infrastructure projects in Ghana and eslwhere. These implications are stated in the following section. However, before doing so, a recap of pertinent literature is necessary to cast the recommendations to be made in perspective.

To begin with, given the economic and social benefits of PPP projects, the Ghana government like in other countries views PPP as the optimal approach for delivering especially complex infrastructure projects (Kwofie et al., 2016). To this end, successive governments have been purposeful in their efforts to promote PPP in Ghana (Osei-Kyei and Chan, 2017; Bruchez, 2014; Tserng et al., 2012).

However, as indicated in earlier chapters, it is dissapointing that Ghana's PPP implementation success has not been good. In other words, and to put it bluntly, PPP performance is discouraging. In Ghana, complaints of public sector resource incapacity and corruption in the whole PPP process with the tendering process have attracted the most attention.

Several resasons have been adduced for lack of success in PPP projects world wide. Osei-Kyei and Chan (2016) and Carbonara, Pellengrino and Costantino (2019) agree that PPP project performance (success or failure) is primarily determined by project resources. Majchrzak et al. (2015) cited by Keers and Fenema (2018), Gatti (2014), Rao (2019), Chan and Adabre (2019), Cui et al. (2019), Makgopa (2019), believe organisations struggle to manage PPP due to poor resources usage. Lock (2016), Jha (2011), Omidvar et al. (2011), indicated quality standards; team relationship; feedback mechanism; experience of client or owner and or untrained workforce affect effective PPP management. Solino and Gago (2016) aver that there is high cost and possible delay if the required public sector capacities are not sufficient. Gatti (2014), Rao, (2019), Chan and Adabre (2019), Cui et al. (2019) suggest that financial prudence mitigate project performance. Mustaffa et al. (2022). Edum-Fotwe and McCaffer (2000), Omidvar et al. (2011), Martins et al. (2012) and Liu et al. (2017), indicated that good governance structure influence project performance. Furthermore, Lui et al. (2016) indicated that effective and efficient PPP depend upon the performance of tendering process. Debande (2002) cited by Solino and Gago (2016), Liu et al. (2017), Reeves et al. (2017) and Solino and Gago (2016) all link tendering transparency and competitiveness to PPP performance. Ahmandabadi and Heravi (2019), and Gulati et al. (2012) indicated poor stakeholder relationship management affect PPP performance. Keers and Fenema (2018), Fischer and Porath (2010) cited Rybnicek et al. (2020) believe that an integrated risk management system that takes into account all of the stakeholders' viewpoints often mitigate risks in the PPP project implementations. Therefore, so many public entity factors can affect project performance.

7.4.2 Implications/ recommendations

It is noteworthy to mention that this section should naturally be seperated iinto two subsections titled policy and practice recommendations. However, due to the nature of the topic, the recommendations have very thin lines for sepperating their classification into policy and practice categories. In otger words, each recommendation literaly has both policy and practice implications.

Having said the above, the research highlighted the influence of competition and transparency in the tendering process on PPP project performance. With the oft public complaints about corruption in the tendering process, it becomes evident that current policies may not be adequate enough to prevent unscrupulous and opportunistic practices or the policies have loopholes that are being exploited. Therefore, it is imperative for current policies to be revisited for more effective ones to be developed to promote a more competitive and transparent bidding environment to ensure the selection of the most capable and efficient private sector partner.

The findings generally indicated about average governance quality and transparency and accountability in the tendering process. Therefore, increasing transparency and competitiveness and enhancing the quality of coperate governance in municipalities become innevitable. This is because quality corporate governance is required to ensure a more transparent and competitive tendering process which can help reduce corruption, ensure fairness, and create a more level playing field for all bidders. This could involve disclosing selection criteria, providing timely and accurate project information, and open dialogue with stakeholders. Appart from policies, it is imperative that policymakers should focus on creating detailed and clear guidelines for the development, execution, and management of PPP projects. This can help reduce ambiguity and improve project performance.

Another key recommendation is developing robust accountability mechanisms that incorporate strong monitoring and evaluation. Establishing a strong monitoring and

evaluation frameworks is required to ensure accountability, effectiveness, and efficiency in PPP projects. This should be complemented with strengthening the legal and regulatory framework for PPP implementation. Policies may recommend enhancing the legal and regulatory framework governing PPPs to provide a solid foundation for their operation, ensuring private partner confidence and project success. Since the establishment of Ghana's Public Investment Division (PID), responsible for developing the legal, institutional and regulatory framework for the PPP programme to promote effective and efficiency as regards value creation, the objective has not been fully achieved. There is tendency of underutilizing project organizational resource in promoting public-private partnership for infrastructural delivery. The Unit advisory capacity must widen its scope to provide technical expertise to support PPPs at the districts and municipal levels of contracting. The expertise when available will support value creation effort for which PPPs project performance intends to achieve. Any PPP project initiated at the District and Municipal levels of contracting should be delivered on cost and within schedule when organizational resources are successfully utilized.

Also, from the study, the overall performance recorded mean value of 3.66 (SD = 0.931). This further suggests that most of the respondents had positive perceptions of the two performance indicators (cost and time) when organizational resources and tendering process are effectively and efficiently utilized. Given the findings of the study, building public sector resource capacity is highly recommended. The fact is the study looked at the impact of public sector entity resources and the results indicte direct positive impacts of resouces on PPP performance. However, the reported resource adequacy was found to be only slightly above average since the mean scores were only slightly higher then the minimum 3.2 on a 5 point scale. It is therefore imperative to strengthen public sector resource capacity to deal with the complexities of PPPs. Similarly, there is need to examine current risk sharing model to ensure fair and balanced risk-sharing mechanisms, protecting the interests of both public and private entities involved in the PPP. Ghana is currently facing deficit challenges due to poor fiscal stability of the economy, and the incessant need for infrastructural services to support the population growth (MoFEP, 2015; Rao, 2019). The country therefore needs alternative ways through

public-private partnership initiaitives to mitigate the deficit infrastructure. As policy direction, there is therefore the need to ensure value creation effort through contractual engagemeents that promote collaborative relational buildings in the used of limited resources. The activities of quality governance structure; resilient business case; quality project brief; accurate project value determination; along with effective risk sharing model enhance cost and time performance from the PPPs' engagement. These are critical project orgnisational resources unreservely that must effectively and efficiently understood and maximised for the project. More so, long-term relationships are established between parties' when competitiveness and transparency of tendering process are promoted to influence PPPs performances. These further assure private partners of future investment opportunities at the local and the national levels, when guidelines and policy initiatives are complied with.

7.4.3 Implication for future researchers

Future research can investigate the same problem but by including other variables as indicated in the Figure 7.1. In this case, future researchers can consider more probity factors as mediating or moderating the relationship between all organisational variables and three PPP performance measures (cost, time, and quality) instead of only the relationship bewtween corporate governance and and PPP two performance measures (cost and quality). In addition, since competitiveness and transparency of tendering process failed to significantly moderate the influence of organizational resources on both cost and time performances as expected this aspect should be explored further.

7.5 SIGNIFICANCE OF THE STUDY

This study makes significant contributions to knowledge, policy and practice. Moreover, it has generated implications for future research. These contributions and research implications are discussed in the following sub-sections.

7.5.1 Theoretically contributions

Generally, the study expands on existing theories regarding PPP, especially within the context of a developing country like Ghana through conceptual understanding, model development and comparison across contexts. These contributions are explicated as follows.

- ***Enhanced conceptual understanding***: The research provides a better understanding of the relationship between public sector resources, competition, transparency, and performance in public-private partnership (PPP) projects. It provides empirical evidence that researchers could use in challenging or confirming existing theories on how public sector resources impact PPP performance, contributing to ongoing academic discourse. It also provides new insights into the complex dynamics of competition and transparency in the tendering process.
- ***Model Development***: The research helps in developing a model that explains the dynamics and outcomes of PPP projects. The results of this research could be used by academics to validate or challenge existing theories about the role of resources, competition, and transparency in project performance.
- ***Comparison across contexts***: Given that the study focuses on Ghana, it contributes to theories about how context-specific factors (e.g., political, economic, cultural, institutional) shape the functioning and outcomes of PPP projects.

7.5.2 Policy contributions

The result of the study also contributes to enhanced policy making in the following specific ways.

- ***Policy guidelines***: The results of the study could be used to inform the design of new policies aimed at improving the efficiency and effectiveness of PPP projects in Ghana with possible application in other nations across the world. Such policies could be shaped around optimal use of public sector resources, the level of competition required in the tendering process,

and the degree of transparency. To this end, the results of the study have been used to provide recommendations for increasing competition and transparency in the tendering process, which could benefit not only Ghana but also other countries with similar challenges. The results also provide insights into the optimal allocation and management of public sector resources in PPP projects, which could be useful in the formulation of better resource management policies.

- ***Risk Assessment***: The findings could guide policy-makers in assessing and managing risks associated with PPP projects, particularly those related to resource allocation, tendering process, and project performance.
- ***Regulatory framework***: The research could highlight gaps or challenges in the existing regulatory framework governing PPP projects, thus informing necessary reforms.

7.5.3 Practical contributions

The study is useful in identify practical strategies for improving the performance of PPP projects, which could be directly implemented by policymakers and practitioners in Ghana and other similar contexts with the following being some of the specifics.

- ***Capacity Building***: The findings could be used to develop training programs for public and private sector stakeholders involved in PPP projects. The training could focus on resource management, competitive tendering procedures, and transparency mechanisms.
- ***Operational efficiency***: The research could offer practical insights for enhancing the operational efficiency of PPP projects. This could include strategies for resource optimization, competitive bidding, and transparent operations.
- ***Stakeholder engagement***: The study could help improve stakeholder engagement practices because it has highlighted the role and importance of transparency in building trust among stakeholders.

These contributions could be highly valuable, given the growing interest and investment in PPPs worldwide and the ongoing efforts to improve their performance and outcomes. Overall, this research provides a more nuanced understanding of how public sector resources, competition, and transparency affect PPP project performance in Ghana. This enhanced understanding could contribute to more successful implementation of such projects, potentially leading to enhanced infrastructure development and better public services in the country.

7.5.5 Limitation of the study

This research cannot be without limitations as every aspect of PPPs as a subject matter under study has not been covered. The limitation does not make the study to be weak, but to rather strengthen it by outlining the major shortcomings that might be of interest for future studies (Tsetse et al., 2021; Azila-Gbettor and Abiemo, 2021). Notwithstanding, this study made some contributions to existing literature on organizational resources and tendering for meeting PPP project performance objectives. The limitation of the study includes absence of qualitative data design to consolidate the result of quantitative strategy adopted. Interviewing some key personnel such as political leaders might have added some further clarifications essential for PPP supports. It is therefore imperative or future studies to adopt mixed strategy that combined both quantitative and qualitative methods to gain more insight on PPP practices within the area. Finally, this study only considered one regional geographical setting in Ghana (Volta Region), thus limiting generalization of the study. In future, cross-sectional study that will consider the sixteen regional geopolitical and economic settings will provide better intuition into the impact of organizational resources on PPP project performance in the country.

7.6 CHAPTER SUMMARY

This closing chapter includes the summary of the data analysis and hypothesis supported by the result. It further includes conclussions drawn based on the results

of the study. The chapter highlights the contributions made of the study to theory, practice and policy. Additionally, the chapter some areas of further research. The chapter ends with the study limitations.

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APPENDIX 1: INTRODUCTORY LETTER

Appendix 1: Introductory Letter

TO WHOM (MFI) IT MAY CONCERN

INTORDUCTORY LETTER-MR. MOSES DICK KWASI KUSEDZI ID: A0165371

Mr. Moses Dick Kwasi Kusedzi is studying for the Doctor of Philosophy degree in Project Management in the Central University of Technology, Free State, South Africa. His study is titled: "Project Management of Public-Private Partnerships: Impact of Resources and Tendering on PPP Performance in Ghana"

We, Prof Dennis Yao Dzansi of the Central University of Technology, Free State, South Africa, and Dr. Victor Atiase of De Montfort University, Leicester, U.K are the supervisors of this study.

We are writing to encourage you to participate in this survey, which will be sent to you. By participating, you can help improve Public Private Partnership practices on the quest of finding solutions for Ghana's infrastructural challenges. All responses will be kept confidential by the Institution concern and or candidate.

Any questions about the survey or the code should be directed to the Email provided, who can be reached at: ddzansi@cut.ac.za/victor.atiase@dmu.ac.uk

All research ethics obligations would be observed without compromise including but not limited to informed consent, anonymity, confidentiality etc.

Yours faithfully,

Professor Dennis Yao Dzansi

APPENDIX 2: QUESTIONNAIRE FOR PROJECT PARTICIPANTS

CENTRAL UNIVERSITY OF TECHNOLOGY

FACULTY OF MANAGEMENT SCIENCES

DEPARTMENT OF BUSINESS SUPPORT STUDIES

QUANTITATIVE QUESTIONNAIRE FOR RESPONDENTS IN GHANA

Dear Sir/Madam

I am **Moses Kusedzi** and I am studying for the Doctor of Philosophy degree in Business at the Central University of Technology, Free State, South Africa.
I am now collecting data for my thesis titled: "Management of Public-Private Partnerships: the tendering process and the impact of resources on PPP performance in Ghana"
This survey collects data on your perception about the influencing factors essential for successful PPPs performance in meeting Ghana's infrastratural challenges
Dr Victor Atiase of De Montfort University and Prof Dennis Dzansi of the Central University of Technology are supervising this study.
I would be very grateful if you could spare 15 minutes of your time to respond to the following questions. Please you are advised not to write your name on this questionnaire as it is completely anonymous,used purposely for academic endeavour and shall be treated strictly confidential as much as possible.

If you would like to receive an executive summary of the research report, please tick the appropriate box. Yes ☐ No ☐

If you would like to participate further in this research, please tick the appropriate box. Yes ☐ No ☐

Thank you very much for your time and contributions.

FOR INTERNAL USE ONLY

Questionnaire Code:.....

Date Administered:.....

Date of Retrieval:.....

Contact of Respondent.....

District/Municipal/Metropolitan Area:.....

INSTRUCTION

You are kindly requested to tick the box that best represents your biographic nature or perspective. Please specify where appropriate.

SECTION A: BIO DATA OF RESPONDENTS

1. Gender:	Male	[1]	Female	[2]			
2. Age	Under 25	[1]	25 – 35	[2]	35 – 45	[3] 45-55	[4]
3. Marital Status	Married	[1]	Single Environmental	[2]	Divorced Procurement	[3] Widowed Project	[4]
4.What role do you play in this district/municipal?	Coordinating Director	[1]	Officer Planning	[2]	Officer	[3] Engineer Internal	[4]
	Budget Officer	[5]	Officer Project	[6]	Finance Officer	[7] Auditor	
	Presiding Memmber	[8]	Consultant	[9]	MP/MMDCs		
5. Highest level of education?	Undergraduate	[1]	2	[2]	PhD	[3] Professionals	

NB: "MP/MMDCs" Member of Parliament or Metropolitan, Municipal District Chief Executives

SECTION B: COMPETITIVE & TRANSPARENT TENDERING FOR SUCCESSFUL PPPS

6. How would you rate the following regarding *competitive & transparent tendering* for successful PPPs, "1 =Strongly Disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strongly Agree"?

Competitiveness and Transparency in PPP Tendering Process	Strongly disagree	Disagree	Neutral	Agree	
6.a. There is a transparency in the PPP tendering process in your district/municipality/region	[1]	[2]	[3]	[4]	[5]
6.b. The PPP tendering process is not competitive in your district/municipality/region	[1]	[2]	[3]	[4]	[5]
6.c. The client provides standardized documents to all parties in the tendering process	[1]	[2]	[3]	[4]	[5]
6.d. There is availability of post evaluation/auditng for all tender documents in in your district/municipality/region	[1]	[2]	[3]	[4]	[5]

6.c. The client provides standardized documents to all parties in the tendering process	[1]		[2]		[3]		[4]		[5]
6.d. There is availability of post evaluation/auditng for all tender documents in in your district/municipality/region	[1]		[2]		[3]		[4]		[5]
6.e. The PPP tendering processes is recorded on the tendering day for future documentation and lesson learnt	[1]		[2]		[3]		[4]		[5]
6.f. There is fairness and openness to both locals and foreign bidders in the PPP process	[1]		[2]		[3]		[4]		[5]
6.g. There is strict adherence to the Public Procurement Act 663, 2003 amended regulations to enhance competitivenes in the process	[1]		[2]		[3]		[4]		[5]

:TION C: ORGANISATIONAL RESOURCES FOR SUCCESSFUL PPPs

7. How would you rate the following regarding *Governance structure* for successful PPPs, "1 =Strongly Disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strongly Agree"?

Quality corporate governance Structure (QG)	Strongly Disagree		Disagree		Neutral		Agree	
7.a. There is a sound legal environment that support effective PPPs in Ghana	[1]		[2]		[3]		[4]	[5]
7.b. Prescribed rules and procedures are adhered to appropriately	[1]		[2]		[3]		[4]	[5]
7 c. There is strong political support for successful PPPs	[1]		[2]		[3]		[4]	[5]
7.d. There is a clearly defined coordination mechanism for co-existence between private and public sectors	[1]		[2]		[3]		[4]	[5]
7.e. There is loyalty to the project objectives among PPP partners	[1]		[2]		[3]		[4]	[5]
7.f. There is trust among parties in promoting effective PPPs	[1]		[2]		[3]		[4]	[5]
7.g.There is commitment among parties for successful PPPs	[1]		[2]		[3]		[4]	[5]
7.h. There is clear dispute resolution structures in place	[1]		[2]		[3]		[4]	[5]
7.i. There are institutional capacities of public officers at the local levels	[1]		[2]		[3]		[4]	[5]
7. j. There is responsibilities and the roles of various entities are clearly defined at each stage of PPP	[1]		[2]		[3]		[4]	[5]
7.k. There is availability of well-resourced leadership structure for both private and public towards effective PPPs	[1]		[2]		[3]		[4]	[5]
7.l. There is a sound fiscal management in the PPP process	[1]		[2]		[3]		[4]	[5]

8. How would you rate the following regarding *Quality Project Brief* for successful PPPs,"1 =Strongly Disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strongly Agree"?

Quality Project Brief (QR)	Strongly Disagree		Disagree		Neutral		Agree	
8.a. There is clarity of project brief and client requirements on PPP projects	[1]		[2]		[3]		[4]	[5]
8.b. The goal(s) of the project is clearly stated	[1]		[2]		[3]		[4]	[5]
8.c. The processes and procedures employ to achieve objectives are clearly stated	[1]		[2]		[3]		[4]	[5]
8.d. Final project outcome meets user acceptance criteria of (quality, cost and schedule)	[1]		[2]		[3]		[4]	[5]
8.e. There are references on corporate experiences and past projects (good or bad)	[1]		[2]		[3]		[4]	[5]

9. How would you rate the following regarding *Public sector capacity* for successful PPPs, "1 =Strongly Disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strongly Agree"?

Public Sector Capacity	Strongly Disagree		Disagree		Neutral		Agree	
9.a. There is sufficient public sector experience and knowledge	[1]		[2]		[3]		[4]	[5]

Public Sector Capacity	Strongly Disagree	Disagree	Neutral	Agree	
9.a. There is sufficient public sector experience and knowledge	[1]	[2]	[3]	[4]	[5]
9.b. There is sufficient technical capacity for promoting PPPs at the local level	[1]	[2]	[3]	[4]	[5]
9.c. Public sector leadership and involvement of various entities are encouraged	[1]	[2]	[3]	[4]	[5]
9.d. There is capacity to manage risk at the local level	[1]	[2]	[3]	[4]	[5]
9.e. Public sector personnel monitor performance at each project level of PPPs	[1]	[2]	[3]	[4]	[5]
9.g. Public sector personel conduct in-depth market survey prior to PPPs engagement	[1]	[2]	[3]	[4]	[5]
9.h. There are competencies to structure, implement and evaluate the project considering its financial, legal and technical aspects	[1]	[2]	[3]	[4]	[5]
9.i. There is constant dialogue with key advisory on resource guarantee and risk alllocation strategies	[1]	[2]	[3]	[4]	[5]
9.j. There is support for continuous process improvement for further training, knowledge, and skills in PPPs	[1]	[2]	[3]	[4]	[5]

10. How would you rate the following regarding project value (*Cost of project*) for successful PPPs, "1 =Strongly Disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strongly Agree"?

Project value (PV)	Strongly Disagree	Disagree	Neutral	Agree	
10.a. There is accurate cost estimation strategies for successful PPPs	[1]	[2]	[3]	[4]	[5]
10.b. There is value for money auditing for current projects	[1]	[2]	[3]	[4]	[5]
10.c. There is a reasonable cost-risk allocation and sharing among the parties	[1]	[2]	[3]	[4]	[5]
10. d.There is overall economic value disclosure for effective PPPs	[1]	[2]	[3]	[4]	[5]
10.e. There is overall social value disclosure for effective PPPs	[1]	[2]	[3]	[4]	[5]
10.d. There is overall financial value disclosure for effective PPPs	[1]	[2]	[3]	[4]	[5]
10.e. There is clarity of revenue streams determination in PPP contracts	[1]	[2]	[3]	[4]	[5]
10.f. There is sustainable mechanism on future project funding	[1]	[2]	[3]	[4]	[5]
10.g. There is Tender Evaluation including Value for Money comparison	[1]	[2]	[3]	[4]	[5]
10.h. There is emphasis on technical efficiency and effectiveness for clients and shareholders					
10.h. Detail appraisal audit systems are implemented in post project cost evaluation	[1]	[2]	[3]	[4]	[5]

11. How would you rate the following regarding *Resilience business case* for successful PPPs, "1 =Strongly Disagree, 2= Disagree, 3 = Nuetral, 4= Agree, 5= Strongly Agree"?

Resilience Business Case (RBC)	Strong Disagree	Disagree	Neutral	Agree	
11.a. There is a needs assessment prior to inivitation of private parties	[1]	[2]	[3]	[4]	[5]
11.b. There is project economic viability, determined by project committee	[1]	[2]	[3]	[4]	[5]
11.c. There is sufficient consideration for various procurement options for PPP contracting	[1]	[2]	[3]	[4]	[5]
11.d. There is available innovation desk for business case development at the district/municipal/regional level for effective PPPs	[1]	[2]	[3]	[4]	[5]
11.g. Public project committee compares their business case to private sector ones	[1]	[2]	[3]	[4]	[5]

12. How would you rate the following regarding *Risk sharing allocation* for successful PPP's, "1 =Strongly Disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strong Agree"?

Risk Sharing model (RSM)	Strongly Disagree	Disagree	Neutral	Agree	
12.a. There is sufficient public decision-making on risks identification, assessment, and management for effective PPPs	[1]	[2]	[3]	[4]	[5]
12. b. Land acquisition is Land acquisition is avaialble in mitigating PPP risks in mitigating PPP risks	[1]	[2]	[3]	[4]	[5]
12.c. There are alternate guarantees available for mitigating PPP risks	[1]	[2]	[3]	[4]	[5]
12.d. There is sufficient project approvals and permit obtain for effective PPPs	[1]	[2]	[3]	[4]	[5]
12.e. Force majeure determination are assessed and mitigated in the PPPs	[1]	[2]	[3]	[4]	[5]
12.f. There is long-term contractual relations in managing PPP risks identify	[1]	[2]	[3]	[4]	[5]
12.g. Tax regulation change and fiscal management influence risk sharing and allocation for successful PPPs	[1]	[2]	[3]	[4]	[5]
12.h. Inflation and exchange rate volatilities have been considered in your PPP projects at your district/municipal/regional levels	[1]	[2]	[3]	[4]	[5]
12.i. There is under dealings, corrupt activities in PPPs at your district/municipal/regional levels	[1]	[2]	[3]	[4]	[5]
12.k. Risk allocation strategies and knowledge are shared adequately among partners for successful PPPs	[1]	[2]	[3]	[4]	[5]
12.l. There is technical design efficiency among PPP partners	[1]	[2]	[3]	[4]	[5]
12.m. There is client responsiveness to climate change in eliminating PPP risks	[1]	[2]	[3]	[4]	[5]

13. How would you rate the following regarding *stakeholder engagement and project communication* for successful PPPs, "1 =Strongly Disagree, 2= Disagree, 3 = Nuetral, 4= Agree, 5= Strongly Agree"?

Stakeholder Engagement and Project Communication (SPC)	Strongly Disagree	Disagree	Neutral	Agree	
13.a. There is an early stakeholder needs identification and engagement within PPPs project at your district/municipal/regional levels	[1]	[2]	[3]	[4]	[5]
13.b. There is effective project communication among the parties for effective PPPs	[1]	[2]	[3]	[4]	[5]
13.c. There is clear framework on how public beneficiries are engaged and communicated prior to PPP supplies	[1]	[2]	[3]	[4]	[5]
13.d. Project committee assess stakeholders' behavior and predict their influence on PPPs projects outcome	[1]	[2]	[3]	[4]	[5]
13.e. There is interest groups buy-ins and support prior to PPP contract	[1]	[2]	[3]	[4]	[5]
13. f. There is sufficient procurement planning, controlling for future funding and support among parties	[1]	[2]	[3]	[4]	[5]

SECTION D: SUCCESSFUL PPPs PERFORMANCE

14. How would you rate the following regarding successful PPPs performance, "1 =Strongly Disagree, 2= Disagree, 3 = Nuetral, 4= Agree, 5= Strongly Agree"?

PPP Performance	Strongly Disagree	Disagree	Neutral	Agree	
14.a. Cost effectiveness in PPPs	[1]	[2]	[3]	[4]	[5]
14.b. Schedule effectivenes in PPPs	[1]	[2]	[3]	[4]	[5]
14.c Financial sustainability	[1]	[2]	[3]	[4]	[5]
14.c. Quality in respect to PPP project performance	[1]	[2]	[3]	[4]	[5]