

**EFFECT OF FINANCING STRUCTURE ON PERFORMANCE OF PUBLIC PRIVATE  
PARTNERSHIP INFRASTRUCTURE PROJECTS IN KENYA**

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## DECLARATION

I declare that this project is my original work and has never been presented to any institution of higher learning for examination, award of any degree or other purpose.

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## **ABBREVIATIONS AND ACRONYMS**

<b>ANOVA</b>	Analysis of Variance
<b>BOT</b>	Build Operate and Transfers
<b>BTL</b>	Build Transfer and Lease
<b>BTO</b>	Build Transfer and Operate
<b>CBK</b>	Central Bank of Kenya
<b>CRA</b>	Commission of Revenue Allocation
<b>DBFM</b>	Design Build Finance and Maintain
<b>GOK</b>	Government of Kenya
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>PPP</b>	Public Private Partnership
<b>PPPA</b>	Public Private Partnership Acts
<b>PPPU</b>	Public Private Partnership Unit
<b>SPSS</b>	Statistics Packages for Social Sciences
<b>VIF</b>	Variance Inflation Factor

## ABSTRACT

The financial framework of a Public-Private Partnership (PPP) revolved around the allocation of financial resources and risks between the public and private entities engaged in the project. The primary aim of this study was to assess the impact of the financing structure on the performance of Public-Private Partnerships in Kenya. To achieve this objective, a descriptive research design was employed to provide a detailed examination of the relationships between the various variables under consideration. Importantly, the study spanned a six-year duration, encompassing the period from 2017 to 2022, providing a comprehensive analysis of the factors that influenced PPP project performance. Data for the study was collected from secondary sources, ensuring the availability of reliable and well-documented information for analysis. The statistical software STATA was utilized to elucidate the correlations among the variables. The results of the analysis indicated that the estimated panel regression model accounted for approximately 39.3% of the total variations observed in the performance of PPP infrastructure projects. It was, therefore, inferred that the variables BOT (Build-Operate-Transfer), BTO (Build-Transfer-Operate), and political risk were significant determinants of PPP infrastructure project performance and collectively explained 39.3% of the total variations in project performance. Specifically, the estimated coefficient for BOT was statistically significant and positive, indicating that improvements in the BOT model positively and significantly impacted PPP infrastructure project performance. The BOT model represented a distinctive form of public-private partnership in which a private entity took on the financing, construction, and operation of infrastructure for an extended period, relieving the financial burden on the public sector. Similarly, the estimated coefficient for BTO was statistically significant and positive, signifying that enhancements in the BTO model positively and significantly influenced the performance of PPP infrastructure projects. Conversely, the estimated coefficient for political risk was statistically significant and negative, suggesting that any increase in political risk inversely and significantly impacted the performance of PPP infrastructure projects. Political stability and risk mitigation strategies were, therefore, critical factors in ensuring the success of such projects. In conclusion, this study strongly recommended further research endeavors to delve deeper into the factors that influenced the efficiency of PPP infrastructure projects in Kenya. A more comprehensive understanding of these factors was essential for enhancing the effectiveness and success of future PPP initiatives.

## CHAPTER ONE: INTRODUCTION

### 1.1 Background of the Study

The financial setup of a Public-Private Partnership (PPP) is about how money and risks are divided between the public and private groups involved in the project. According to Cui, Wang, Liu, and Coffey (2019), having a good financial plan is crucial for reaching project goals. It means figuring out how the project would be paid for, who would be responsible for the financial risks, and how the money earned would be shared. While Almarri (2023) says PPP has many benefits for developing infrastructure, there may also be challenges with smart infrastructure initiatives. So, having a well-organized financial plan is very important for successfully doing PPP projects. The financial plan includes things like how much money each group contributes, how loans are used, how revenues are shared, and how risks are divided.

Stakeholder theory, pinpointed by Freeman in 1984, emphasizes that businesses and organizations should consider the interests of all stakeholders. Positive theory, coined by Friedman in 1957, explains actual financial arrangements in PPPs through real-world observations and data, analyzing economic incentives and behaviors of public and private actors. Public choice theory, advocated by Buchanan & Tullock in 1962, examines decision-making processes of stakeholders based on self-interest and rational behavior, exploring how political considerations and information asymmetry impact financial decisions in PPPs. These theories collectively offer valuable insights into the design and operation of PPP financial structures in practice.

Magoola, Mwesigwa, and Nabwami (2023) put forward the idea that trust and community engagement play a crucial role in the success of PPP projects. Additionally, Verweij and Van Meerkerk (2021) highlighted that infrastructure development through PPP contracts is claimed to result in superior performance compared to regular contracts. However, the supporting evidence

for this claim in the Dutch context is limited. Njeru and Maingi (2021) argued that PPPs are vital in facilitating infrastructure projects' implementation in developing countries. The Kenyan government, through the PPP Unit, has initiated several PPP projects to address infrastructure gaps. Presently, the administration is actively engaged in the implementation of 47 progressing PPP endeavors spanning various ministerial domains. The PPP Unit, established pursuant to Section 8 of the PPP Act 2013, functions as a dedicated entity housed within the National Treasury of the Government of Kenya (GOK). The central objective of the PPP Unit is to serve as the confidential administrative body and specialized advisory entity for the PPP committee, charged with the duty of evaluating and endorsing PPP initiatives within the nation.

### **1.1.1 Financial Structure**

Financial structure in public sector refers to how a government run its operations and investments through a mix of equity (ownership capital) and debt (borrowed capital) (Li, He, Zhang, Li, & Zhang, 2023). It involves determining the optimal balance between equity financing from shareholders and debt financing from external sources. The revenue structure, as highlighted by Nguyen (2023), focuses on the sources of a company's income and how it generates revenue from its core business activities, products, or services. Additionally, financial structure includes the risk structure, as emphasized by Sastoque, Arboleda, and Ponz (2016), involving the identification and management of various risks and uncertainties that the company faces in its operations and investments. Effective risk management enhances the company's financial stability and performance.

Financial framework of a company or project holds significant importance for determining the optimal mix of equity and debt financing, leading to cost-effective capital and increased shareholder returns. A well-structured financial setup provides adaptability to market fluctuations

and the ability to seize growth opportunities (Nguyen, 2023). Furthermore, a robust financial structure enhances credibility and easy access to external funding. Additionally, it aligns financing with strategic goals, supporting overall financial performance and profitability. In the realm of Public-Private Partnerships (PPPs), a well-designed financial arrangement becomes indispensable, attracting private sector investments and ensuring the financial feasibility and success of vital infrastructure projects.

Numerous scholars have explored various parameters related to financial structure in their research. For instance, Sastoque, Arboleda, and Ponz (2016) examined risk allocation, Lin and Lin (2023) focused on debt-to-equity ratios, and Nguyen (2023), Mwangi (2014), and Ncube (2015) analyzed revenue structures in different contexts. In this study, we investigate three specific public-private partnership (PPP) models: Build-Operate-Transfer (BOT), Build-Transfer-Operate (BTO), and Build-Lease-Transfer (BLT). These PPP models are vital for infrastructural financing and project implementation, providing insights into financial risk management, capital mix, and revenue distribution between the public and private sectors.

### **1.1.2 Performance of Public Private Partnership Infrastructure Projects**

According to Toan and Hai (2023), performance of Public-Private Partnerships (PPPs) refers to the extent to which these collaborative projects achieve their objectives and deliver value to stakeholders. It encompasses various factors, such as the successful and timely delivery of infrastructure or services, adherence to quality standards, financial sustainability, effective risk management, and stakeholder satisfaction (Castelblanco, Guevara, Rojas, Correa & Verhoest, 2023). Assessing PPP performance involves evaluating efficiency, effectiveness, and the impact of the project on the community, economy, and environment (Almarri, 2023).

According to Cheung, Chan and Kajewski, (2012), the significance of PPP performance improves the effective use of resources in PPPs, resulting in cost reductions and efficient fund allocation. Flourishing PPP projects are pivotal in bridging infrastructure disparities, enhancing the standard of living, and promoting economic growth (Verweij & van Meerkerk, 2021). They allure private investment, fostering economic expansion and job generation. Favorable performance guarantees cost-effectiveness, instills contentment among stakeholders, and fortifies the enduring viability of infrastructure and services. Competently executed PPPs contribute to advancements in public services, driving innovation and technological progress for more streamlined service delivery.

The measurement of PPP performance involves a comprehensive evaluation of various key indicators to assess the success and effectiveness of the partnership. This includes analyzing project delivery to ensure objectives are met within the agreed timeframe and budget, evaluating financial viability through revenue generation and cost recovery, and examining the quality of delivered infrastructure or services (Magoola, Mwesigwa & Nabwami (2023). Kumar, Srivastava, Tabash, & Chawda (2022) used profitability while Shani (2019) used project implemented under PPP to gauge their performance. Njeru and Maingi (2021) used success rate of PPPs but this study looks at budget, and income generation.

### **1.1.3 Financing Structure and Performance of Public Private Partnership Projects**

Positive interrelations in the context of the financial structure of a PPP refer to the mutually beneficial and advantageous connections between the financial arrangement and the project's performance. When the financial structure is well-organized and balanced, it positively impacts the project's outcomes. Ncube (2015) suggested that financing of infrastructure is significantly and positively correlated with economic development. Similarly, Kamau (2016) found affirmative connections between financing infrastructure and Kenyan economic growth. Effective resource

allocation ensures efficient fund utilization, optimizing the project's development and operational activities. This, in turn, leads to better project performance and the successful delivery of infrastructure or services.

Moreover, a sustainable financial arrangement fosters transparency and accountability, enhancing stakeholder confidence and satisfaction. This positive perception from stakeholders can result in greater support from both the public and private partners involved, creating a conducive environment for successful project implementation (Almarri, 2023). On the other part, negative interrelations arise when the financial structure of a PPP is poorly designed or imbalanced. In such cases, inefficient resource allocation may lead to budgetary constraints, delaying the project's progress and potentially resulting in cost overruns. Improper risk allocation and management can give rise to financial uncertainties and disputes between the public and private sectors, affecting project performance.

A weak financial structure may also deter private investors from participating, leading to difficulties in securing necessary funding for the project. These negative aspects can hinder the project's success and lead to dissatisfaction among stakeholders, further jeopardizing the project's overall performance. Assessment expedited by Kumar, Srivastava, Tabash, & Chawda (2022) reveals noteworthy outcomes. The study's findings highlight that within firm-specific factors, including leverage, size, non-debt tax shield, growth, and risk, there exists a significant positive influence on the profitability of PPPs. Furthermore, in the realm of macroeconomic factors, the study identifies inflation as the sole element that maintains a significant positive relationship with PPPs.



#### **1.1.4 Public Private Partnership Infrastructure Projects in Kenya**

The enactment of the Public Private Partnership Act, 2021 (the Act), effective from December 23, 2021, signifies a pivotal development. The Act facilitates the active engagement of the private sector in the financing, construction, development, operation, and maintenance of infrastructure or developmental ventures through the avenue of public-private partnerships (CBK, 2022). Despite the recent introduction of the Kenyan PPP legislation in 2013, private capital infusion into public infrastructure endeavors commenced as early as 1996. The inaugural instance of such investment unfolded within the energy sector, as underscored in the revelations of the 2017 Budget Policy Statement. Within the Kenyan context, Public-Private Partnerships (PPPs) have ascended to a position of paramount significance, functioning as a pivotal approach to tackle prevailing gaps in infrastructure, stimulate the expansion of the economy, and optimize the streamlined provision of public amenities. The Kenyan administration has ardently adopted PPPs as a strategic instrument, resolutely leveraging the specialized know-how and resources of the private sector in the domains of infrastructure augmentation and the delivery of services.

Specialized unit responsible for PPPs, the Public Private Partnership Unit (PPPU), operates within the National Treasury as the secretariat and technical arm of the PPP committee. The PPPU ensures the proper assessment and approval of PPP projects in the country, adhering to the PPP Act 2013. Over time, Kenya has successfully implemented numerous PPP projects in various sectors, including transportation, energy, healthcare, and education (Mwangi, 2014). Notable examples include the Nairobi-Mombasa highway project, power generation initiatives, and public hospitals. PPPs in Kenya have played a pivotal role in enhancing infrastructure development and service delivery, while also attracting private investment and fostering economic growth. However, challenges concerning regulatory frameworks, capacity constraints, and information asymmetry

have arisen, necessitating continuous improvements in the PPP environment. In response to this, the Public Private Partnership Act, 2021, provides a framework for private sector participation in financing, constructing, developing, operating, or maintaining infrastructure or development projects through PPPs, as indicated by the CBK in 2022.

## **1.2 Research Problem**

Conceptually, the financing structure and performance of PPPs are closely intertwined. Clerk and Demuelemeester (2013) emphasized the prominence of experience while picking partners for PPP projects, using simulated data to showcase the benefits of this approach. Njeru and Maingi (2021) found that various factors, including operating, project, construction, regulatory, revenue, technical, force majeure, and environmental risk, significantly affected the implementation of public-private partnerships in the water sector. Meanwhile, Suđić, Ćirović, and Mitrović (2017) highlighted a positive link between the forecaster variable (management and analysis of risk) and reaction to the outcomes of PPP projects.

Contextually, since 2013, Kenya's construction industry has been significantly influenced by PPP. Real estate firms have utilized its provisions to gain government support for their construction projects. However, this trend was cut short as GOK discovered fraudulent projects (GOK, 2022). In 2018, the National Treasury revised PPP policies to prevent potential taxpayer losses. PPP framework enabled GOK to execute quality infrastructure projects, especially in energy and roads. These projects strengthened the economy and advanced its potential. Yet, PPPs introduce fiscal risks.

Globally, in China, Tan, & Zhao, (2019) proposed that the renewed interest in PPPs in recent years is primarily driven by the objective of bridging the infrastructure gap and alleviating the burden of increasing local debts. Moreover, Rosell, & Saz-Carranza, (2020) came to the conclusion that

transparency in PPP policies has a positive impact on their overall quality. Interestingly, Scandinavian countries have shown reluctance in engaging in PPPs, while European Union legislation has demonstrated a positive influence solely on the procurement process. These findings highlight the varied approaches and perspectives on PPPs across different regions, underlining the importance of context-specific considerations and policy implications when pursuing PPP initiatives globally.

Regionally, Magoola, Mwesigwa and Nabwami, (2023) conducted a cross-sectional in addition to correlational study using project-level data assembled through a questionnaire after sampling 47 PPP projects in Uganda. Their research aimed to critically explain the relationship between various factors and the performance of PPP projects in the country. Meanwhile, Akomea-Frimpong, Jin, Osei-Kyei and Kukah, (2023) conducted a literature review on PPPs and sustainable development goals in Ghana. The review revealed a scarcity of studies addressing critical issues related to PPPs and SDGs, such as climate action, clean energy, sustainable finance, as well as critical resilience. In a local context, Njeru and Maingi (2021) conducted a scrutiny on CSFs in PPPs using an exploratory research design complemented by a descriptive approach. Their research aimed to establish interconnection among the determinants of success in PPP projects. To gather data, they employed a mixed-method approach, collecting information via sampling procedure of 16 employees and directors at the PPPU Secretariat. Data was obtained through unstructured interviews and structured questionnaires. Another study by Kamau (2016) investigated the connection between financing infrastructure projects and Kenyan economic growth. Meanwhile, Mwangi (2014) reached the conclusion that infrastructure projects had a significant impact on Kenyan economic progression.

Global assessments, studies on Africa, and Kenyan investigations have ignited significant discussions and disagreements surrounding the subject. These discussions arise from the diverse research findings observed in the field. Developing nations in Africa, Kenya included, have advocated for PPP to partake a fundamental task in alleviating poverty and fulfilling the basic needs of the majority population. Nevertheless, the preceding studies have detected contextual, conceptual, and methodological gaps in this domain. Furthermore, the research results have presented varying positive, negative, and neutral outcomes, leading to debates and inquiries concerning financing structure and the role of PPP. To address these existing discrepancies and gaps, this study aims to bridge the discontinuities by investigating the impact of financing structure on performance of public private partnership. The research seeks to provide valuable insights by answering a question on, What the is effect of financing structure on the Performance of Public Private Partnership in Kenya?

### **1.3 Objective of the Study**

#### **1.3.1 General Objective**

To determine the effect of financing structure on the Performance of Public Private Partnerships in Kenya.

#### **1.3.2 Specific Objective**

- i. To investigate the effect of Build, Operate Transfer on the Performance of Public Private Partnership in Kenya.
- ii. To assess the effect of Build Transfer, Operate on the Performance of Public Private Partnership in Kenya.

#### **1.4 Value of the Study**

Extensive investigations have demonstrated that economic consumers of research findings exhibit wide variation. This research holds immense significance in advancing the understanding of reliable solutions for financial structures and Public-Private Partnerships (PPPs) through systematic data collection and rigorous examination of past assumptions from theories, application, weaknesses, and strengths, thus bridging gaps in knowledge. By reinforcing existing theories and enhancing analytical skills, it validates the existing knowledge, enabling logical explanations for relevant information and its challenges.

The study's implications extend to national planners and policymakers, guiding policy conception and the enactment of laws governing the operation of National Treasury and CBK. It leads to the discovery of new knowledge, practical applications, and policies fostering enterprise growth, facilitated by well-organized data, objective problem-solving, and conclusive findings, ultimately aiding decision-making based on financial performance trends.

Scholars benefit from knowledge concerning; CBK, National Treasury, financial performance, and PPPs, facilitating intelligent and well-calculated research plans, serving as a valuable reference for knowledge advancement, bridging gaps, enriching past expertise, enhancing skills, and providing a stepping stone for future studies. For management and financial studies, the research enables the examination of prosperity and failures, deepening their understanding of jurisdictions, mandates, and responsibilities. It offers detailed insights into the relevance of fund structure and its interconnected association with performance of PPP, ultimately contributing to quality management and educating clients and beneficiaries in a significant endeavor.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This segment undertakes a comprehensive evaluation aimed at disclosing disparities and pinpointing gaps in the existing literature. The chapter assumes a paramount mantle in explicating theories, their limitations, strengths, and pertinence. Additionally, it highlights the pivotal financing structures and the PPPP within the Kenyan context. Moreover, the chapter delves into empirical studies, encompassing global, regional, and local perspectives. Furthermore, it offers a concise overview of the research gaps that the present study seeks to address. Consequently, culmination of this subset entails the presentation of a conceptual framework, designed to elucidate the interrelationships among variables under scrutiny.

### **2.2 Theoretical Framework**

Stakeholder theory, pioneered by Freeman (1984), underscores the importance of taking into account the concerns of all stakeholders. In addition, positive theory, formulated by Friedman (1957), investigates the practical financial intricacies of PPPs using empirical data, analyzing economic motivations. In consequence, public choice theory introduced by Buchanan and Tullock (1962) scrutinizes stakeholder choices influenced by self-interest and logical conduct, encompassing political elements. These theories provide vital perspectives on PPP financial frameworks.

#### **2.2.1 Stakeholder Theory**

Stakeholder Theory, introduced and expounded by Freeman in 1984, suggests that businesses and organizations should consider the concerns of all affected parties in their decisions and actions. This contrasts with the conventional notion that businesses exist solely to maximize shareholder

wealth. Instead, it emphasizes ethical decision-making and sustainable relationships with stakeholders, including employees, customers, suppliers, and local communities.

Regarding the financial structure and performance of Public-Private Partnerships (PPPs), the Stakeholder Theory brings forth crucial aspects. While it promotes prioritizing stakeholders' well-being, including the public's, this can present challenges. As per Węgrzyn and Wojewnik-Filipkowska (2022), balancing the interests of diverse stakeholders, such as investors, government entities, local communities, and service users, can complicate financial negotiations and decision-making. Accommodating varied stakeholder concerns might also lead to complex contractual arrangements, potentially affecting PPP project efficiency.

Nevertheless, the Stakeholder Theory's relevance persists in comprehending PPPs' financial structure and performance. According to Mandiriza and Fourie (2023), the theory advocates for a holistic approach that considers all stakeholders' interests, it aligns with PPPs' broader aims of achieving sustainable, socially responsible outcomes. Factoring in community, environmental, and other concerns can foster goodwill, enhance transparency, and bolster PPP project success and acceptance.

### **2.2.2 Positive Theory**

Positive Theory, introduced by Friedman in 1957, aims to comprehend real behaviors and financial configurations through practical observations and real-world evidence. It underscores the analysis of economic motivations and conduct exhibited by both public and private stakeholders, with the goal of elucidating how these actions influence the economic dynamics of PPPs.

In the exploration of the financial framework and efficacy of PPPs, Positive Theory offers insightful viewpoints. Hence, concentrating on real-world data, it permits a more precise

evaluation of how economic incentives impact PPPs. Nonetheless, this method does entail certain limitations. It might not fully encompass the intricate non-economic variables that can impact PPPs, encompassing factors such as societal, political, and environmental considerations (Farber, 1994). Moreover, an exclusive reliance on observable behaviors could potentially overlook underlying intentions and motivations, potentially leading to incomplete insights into the financial dimensions of PPP projects.

In spite of these drawbacks, Positive Theory remains pertinent in scrutinizing the financial structures of PPPs. Its empirical methodology provides valuable insights into the economic determinants that steer decision-making within PPPs. Through the analysis of financial agreements and behaviors of both public and private participants, this theory contributes to a more holistic grasp of how incentives shape the results of PPP projects (Njeru & Maingi, 2021). Positive Theory's relevance is grounded in its capacity to illuminate the economic foundations of PPPs, assisting policymakers, investors, and practitioners in making well-informed judgments that enhance financial performance and the sustainability of project outcomes.

### **2.2.3 Public Choice Theory**

It is worthwhile stipulating that Public Choice Theory, pioneered by Buchanan and Tullock in 1962, delves into the decision-making processes of stakeholders based on self-interest and rational behavior within various institutional frameworks. This theory contends that individuals, including those in public office, act in ways that align with their own preferences and aims, taking into account both personal and collective interests. It acknowledges that economic and political considerations significantly influence decision-making, impacting policies and outcomes.

While the theory underscores the importance of rational decision-making, its application to PPPs can introduce certain challenges. Self-interested behaviors may lead to information asymmetry,



favoring one party over another and potentially affecting the equitable distribution of financial risks and rewards in PPP projects (Gubler, 2013). Additionally, the political dimension of decision-making can introduce complexities, as political factors may impact PPP project outcomes and financial arrangements in unforeseen ways.

Nevertheless, the relevance of Public Choice Theory endures in the context of PPPs. By recognizing the interplay of economic and political incentives, this theory enhances our understanding of the financial structures within PPP projects (Matos, & Gonçalves, 2020). It prompts us to consider the potential for stakeholder behaviors driven by self-interest and the importance of effective governance mechanisms to counterbalance such tendencies. In a multi-stakeholder setting, grasping rational decision dynamics and political implications is vital for effective financial structures and PPP success.

### **2.3 Determinants of Performance of Public-Private Partnership Infrastructure Projects**

This research examines three key PPP models, namely Build-Operate-Transfer (BOT) and Build-Transfer-Operate (BTO), along with the consideration of Political Risk as a control variable.

#### **2.3.1 Build-Operate-Transfer (BOT)**

As per Okudan, Budayan and Dikmen (2021), Build-Operate-Transfer (BOT) model is a unique form of public-private partnership where a private entity finances, constructs, and operates infrastructure for an extended period, alleviating the public sector's financial burden. The private partner generates revenue through user fees and manages construction, operational, and revenue risks. At the contractual expiry, ownership transfers back to the public. This model leverages private expertise and capital for large projects, with careful contract design and risk management ensuring its success.

### **2.3.2 Build-Transfer-Operate (BTO)**

According to Phoek, Tjilen and Ririhena (2019), the Build-Transfer-Operate (BTO) model of PPP involves the private sector financing and constructing infrastructure projects, alleviating financial burdens for the public. After completing the project, ownership transfers to the public sector, and the private partner operates and manages the asset. This model offers benefits such as improved infrastructure without immediate costs and long-term revenue for the private sector. Effective risk allocation, clear contracts, and transparent governance are vital for successful BTO projects, ensuring sustainable infrastructure delivery and operation while maximizing stakeholder interests.

### **2.3.3 Political Risk**

Political risk significantly impacts PPP projects due to potential government actions, policy shifts, and instability. Such risks manifest during the project lifecycle, causing delays, increased costs, or termination. Regulatory changes resulting from political decisions can affect project operations, like tax and environmental regulations modifications. Political instability and uncertainty may discourage private investors, leading to delays or cancellations.

## **2.4 Empirical Review**

Rosell and Saz-Carranza (2020) examined the determinants of PPP policies. This investigation scrutinizes the factors of a nation's PPP policies while utilizing the World Bank's 135 state purchasing infrastructure public-private partnerships 2018 database. The factors scrutinized the responsibility of EU membership, legal tradition, major economic indicators as well as transparency on policies managing implementation, purchase and administration of PPPs infrastructure. The researchers uncovered that Scandinavian nations are more reluctant to join PPPs, in the other hand European union has a positive influence only in the purchase process. Major economic factors' influences are less weak on PPP level and larger revenues of the government lower a country's PPP appetite. This study

focus on the Europe's countries which are more sophisticated in terms of economy thus findings cannot be related to Kenya economics, therefore the present research seeks to examine the repercussions of financing structure on performance of PPP infrastructure in Kenya.

Tan and Zhao (2019) examined the increase of PPP in China. This assessment was a result of increase heated discussions surrounding the aimed and effectiveness of rise of PPPs in China. As a consequence, assessment routed the fluctuation of PPPs in China over number of decades. The outcomes of the study showed that PPPs has undertaken as a supplementary player in infrastructure investment in China being rejoinder to influence government's debts and monetary shortfall. The PPPs in current age targets to solve the infrastructure gap and also alleviate growing local debt. This investigation was conducted in develop country thus the finding cannot be fully engaged in developing like Kenya and therefore this current aimed at bridging this gap.

Sudic, Cirovic and Mitrovic (2017) executed an assessment in Serbia on public-private partnership projects. The assessors used descriptive research technique. In addition, the sourced data was scrutinized by employing multiple linear regressions together with Pearson's correlation analysis and descriptive statistics. The investigation unveiled important association amid the public-private partnership projects and analysis of risk in Serbia. Furthermore, the research established significant positive connection amid management and risk analysis and Public-private partnership projects. This assessment was conducted in Serbia thus the findings cannot be fully maximized across the globe, more so in the develop republic like Kenya.

Cheung, Chan and Kajewski (2012) examined CSFs for Public-Private Partnership projects. The assessment aimed at comparing PPPs projects in Hong Kong and United Kingdom as well as Australia. Further, the research focus on knowing factors which result to successful PPPs tasks in 3 countries. The sourcing of information was done by utilization of empirical questionnaires to

assist in rating of 18 elements for successful PPPs tasks. The assessment found out that 3 of the first 5 CSFs for Hong Kong were rated highly by British together with Australian participants. Similar CSFs were obligation of public as well as private sector; the existence of vital private consortium, according risks allocation. This study was done in a developed country thus the findings cannot be fully engaged in Kenya since it is developing state. Thus, the current investigation aimed at filling in this gap.

Magoola, Mwesigwa and Nabwami (2023) furthermore, did an investigation on the community together with Public-private partnership tasks in Uganda. The aimed of the assessment was to give crucial evidence on the association amid community and PPP activities in Uganda through making community engagement, performance and trust focal Centre of the study. In addition, the assessment employed questionnaire as tool of sourcing data from 47 sampled PPP projects. Furthermore, the study maximized cross sectional and correlational approach. The study established that community engagement together with trust have important association with performance of Public-Private Projects. This assessment faces setback as a result of investigation being cross- sectional and therefore, monitoring as well as management changes in behavior over certain period of time was not possible. Moreover, this assessment was done in Uganda and thus findings cannot be generalized in Kenya due to different in economic, social and political surroundings.

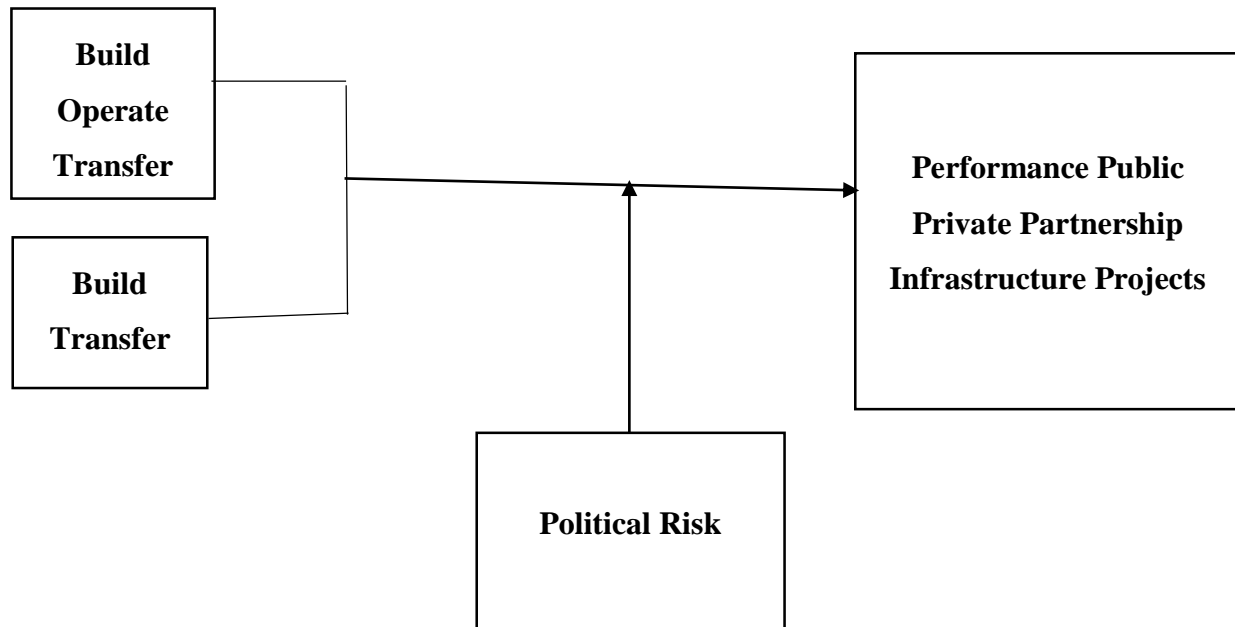
Njeru and Maingi (2021) conducted a study on crucial success elements for PPP in water industry in Kenya. The main aimed of this assessment was to determine the fundamental forces for consideration in implementing PPPs project. The researchers maximized descriptive approach to come up and examine the hypothesis on pointers of success in water and sanitation projects. As a consequence, exploratory design approach was employed to established association amidst the

determinants and PPPs project success. Furthermore, unstructured and structure questionnaires was used to collect data from 16 workers and director of the PPP unit secretariat. The information collected were key into Hyper research as well SPSS software for qualitative as well as quantitative examination respectively. The outcomes showed that execution of PPP in water industry was influenced by number elements that includes; involvement risks, procurement procedure, competence of manager and government control. This study focus on water and sanitation projects only whereas the present study cut across various sectors of economy in Kenya.

Kibe (2021) executed an investigation on public private partnership and performance of projects of Kenya state owned. The assessment maximized descriptive design with a total of 32 corporations of Kenya which are commercial as well as operating. Furthermore, the examination used purposive sample approach and sourced 3 administrative staff from each corporation tallying to 102 respondents. The research collected primary data using questionnaires. The data was the scrutinized by descriptive as well as inferential statistics. As the assessment, it was unearthed that fiscal contribution, mitigation of risk, technical skills as well as accountability were vital factors of project performance. In addition, it was uncovering that project performance together with fiscal contribution, mitigation of risk and accountability have strong positive association. The study majored on Kenyan commercial state own projects whereas the present study engaged both public-private partnership project.

## **2.5 Conceptual Framework**

The conceptual framework serves as a visual model that captures the relationships in a concise manner. It functions as a schematic diagram, aiding in understanding and recognition. It is built upon the assumed connections between the predictor variables and the variable being analyzed.



**Figures 2.1 Conceptual Framework**

**Source: Researcher, 2023**

## **2.6 Summary of Literature Review, Critique and Research Gaps**

Comprehensive empirical reviews have been exhaustively concluded and synthesized based on the contextual, conceptual, and methodological dimensions of assessment. These evaluations have unveiled contentious results on a global scale, interwoven with a diverse range of issues spanning geopolitical and economic facets. Verweij and van Meerkerk (2021) have enriched this body of knowledge by scrutinizing the performance of PPP contracts in Dutch infrastructure projects, with a specific emphasis on design-build-finance-maintain (DBFM) projects. Their inquiry yielded valuable insights into the comparative cost performance of PPP and regular contracts. Firmly rooted in the bedrock of these antecedent investigations, the current study establishes its framework.

Moreover, regional evaluations have probed intricate management challenges and simplified intricacies, culminating in the formulation of various concepts that drive PPP efficacy. Akomea-Frimpong, Jin, Osei-Kyei, and Kukah (2023) systematically reviewed literature to delve into the

role of PPPs in realizing sustainability within the landscape of infrastructure development in Ghana. Their analysis unearthed prevailing themes harmonized with an array of sustainable development goals, while also identifying gaps, particularly in domains such as climate action and clean energy. Similarly, Magoola, Mwesigwa, and Nabwami (2023) scrutinized the nexus between community involvement, trust, and performance in community and PPP projects in Uganda, accentuating the pivotal mantle of trust as well as community engagement in shaping PPP project outcomes. Nonetheless, these results prompt an appeal for meticulous scrutiny of PPPs, with the aim to bridge the conceptual and contextual voids that emerge.

On a localized scale, studies like Kamau (2016) investigated the correlation between funding infrastructure projects and Kenyan fiscal progression using a descriptive methodology and a census involving 25 respondents. Their analysis, encompassing descriptive statistics and a regression model, showcased a positive linkage in the midst of financing infrastructure compared with economic progression. Similarly, Mwangi (2014) explored the influence of infrastructure projects on economic advancement, with a focus on the ministry of Lands and 15 census participants. Employing descriptive measurements, their findings underscored a noteworthy impact of infrastructure projects on Kenyan economic development.

While these localized inquiries have established substantial associations, they also unveiled mixed outcomes encompassing positive, negative, and neutral impacts. The ensuing discussions have engendered a call for more extensive and systematic exploration, particularly considering the varying methodologies, data collection techniques, tests employed, population particulars, and analysis durations that contribute to divergent conclusions. The dynamic nature of trends and events further underscores the challenge of applying past findings to the current context.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

A methodological assessment is pivotal in simplifying intricate matters. This section accentuates the foundational research design employed for the experimentation, delving into a more profound comprehension and all-encompassing details regarding the intended population. It elucidates the core approach utilized for gathering data. Moreover, it clarifies the pivotal model underpinning the analytical framework aligning with the research subject. This chapter identifies the essential domains addressing concerns related to objectives, gaps, and challenges necessitating resolutions. It's noteworthy to emphasize that inferential and statistical methodologies aid in the elucidation.

### **3.2 Research Design**

Thorough assessment is facilitated by the adept utilization of suitable methodologies. The research design constitutes the blueprint encompassing acquisition, quantification, and assessment techniques. It places heightened emphasis on the comprehensive strategic framework chosen to incorporate a diverse range of research components coherently and logically, consequently addressing the research quandary (Creswell & Creswell, 2017). This design steers the study's trajectory and delineates the tasks to be undertaken. Moreover, it fosters informed decision-making concerning the study's initiation and conclusion points. The current investigation employed a descriptive research design to expound upon the relationships between the variables.

### **3.3 Population**

This scrutiny emphasized the population, encompassing the entities and constituents that underwent evaluation. Notably, the evaluation period extended over a six-year duration, from 2017 to 2022. The researcher focused on 19 out of the 21 ministries in Kenya, with exceptions being made for Ministry of Interior and Coordination, on top of Ministry of Defense, due to the



specialized nature of their functions. Similarly, the Ministry of Finance was excluded, as its primary responsibility revolved around budget management, taxation, and funding allocation for programs. Pertinent data related to the ministries was compiled from various sources, including CBK, National Treasury, KNBS, Commission on Revenue Allocation (CRA), National Assembly and individual ministries.

### **3.4 Data Collection**

The investigation was bolstered by essential statistical foundations. Consequently, data was gathered through secondary methods. The published financial statements proved invaluable for this research. Secondary data play a pivotal role in elucidating historical trends, the present state, and projecting future scenarios. Secondary data are more accessible to collect and yield high-quality outcomes. The data collection period extended from 2017 to 2022, enabling a robust assessment to arrive at definitive conclusions. The sources of the data included the Kenyan treasury and the world bank as well as the controller of budget.

### **3.5 Data Analysis**

The data gathered from secondary sources was pivotal for the analysis, ensuring definitive results. Moreover, the study utilized SPSS to clarify the correlations among the variables. This collected data was structured, reviewed, categorized, coded, and then subjected to thorough analysis. Assiduous and extensive methodologies employed resulted to top-notch outcomes. The investigation optimized the multiple regression approach to elucidate the interrelated connections among the variables.

#### **3.5.1 Diagnostic Tests**

The research incorporated a sequence of diagnostic examinations to ensure the robustness and precision of its findings. These assessments encompassed examinations for multicollinearity,

autocorrelation, and the normality of residuals. Concerning multicollinearity, the computation of variance inflation factor (VIF) was executed to gauge the extent of intercorrelation among independent variables. Should substantial multicollinearity be identified, measures such as the exclusion or consolidation of related variables were adopted to redress this matter.

To identify autocorrelation, the Durbin-Watson test was employed. If indications of autocorrelation are present, potential remedies encompassing the inclusion of lagged variables or the utilization of autoregressive models were contemplated to rectify this issue. In evaluating the normality of residuals, an analysis of residual histograms and Q-Q plots were performed. If deviations from normality are discerned, potential actions involving transformations or the exploration of alternative distributional models were undertaken to rectify this issue.

### **3.5.2 Analytical Model**

The multiple linear regression served as the primary representation of the underlying correlation in the study. This model elucidated the relationships among all variables considered in this investigation. Furthermore, it offered insights into the connections between independent and dependent variables. The model illustrated these associations by attempting to establish the optimal line of fit that captures multiple linearity. In summary, the model encapsulated:

$$Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Whereby:

Y= Performance of Public Private Partnership Infrastructure Projects (Total Benefits /Total Costs)

$\alpha_0$ =Y-intercept (constant variable)

$X_1$ = Build Operate Transfer (Natural Log of aggregate amount disbursed for Build Operate Transfer)

$X_2$ = Build Transfer Operate (Natural log of total amount disbursed Build Transfer Operate)

$X_3$ = Political Risk (Political Risk Index)

$\varepsilon$ = error term

### **3.5.3 Inferential Statistics**

Data was collected, arranged, and converted into a practical structure. Furthermore, it adeptly be computed to display the interconnections among the diverse variables under investigation. In order to establish the significance of these associations, rigorous examinations like the T-test and F-test were utilized to ascertain their statistical importance. This thorough scrutiny of significance levels significantly augmented the dependability and credibility of the deductions drawn from the research. As a result, the confidence intervals established at 5% and 95% supplied an extra level of certainty, reinforcing the overall resilience and authenticity of the outcomes acquired through this all-encompassing procedure.

## **CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION**

### **4.1 Introduction**

The examination of the data gathered during the study is delineated within this section. The data scrutiny was executed employing STATA software, primarily due to the secondary nature of the data. Consequently, this section elucidates the data analysis, the elucidation of the discoveries, and the discourse concerning these pivotal findings. The segment expounds upon the descriptive outcomes, encapsulating metrics such as mean, standard deviation, as well as the upper and lower limits. Additionally, it expounds upon the trend assessment of the diverse variables investigated within the study. Finally, the section culminates in the execution of a comprehensive panel regression analysis to validate the extant linear relationships among the variables, which is of paramount significance in addressing the research inquiries.

### **4.2 Descriptive Statistics**

The analysis yielded descriptive outcomes, which were articulated through metrics such as the mean, standard deviation, and the range amid maximum and minimum values. These results are comprehensively detailed in Table 4.1.

**Table 4.1: Descriptive Results**

Variable		Mean	Std. Dev.	Min	Max	Observations
Performance of PPP projects						
	overall	5.74867	1.18078	3.43	8.78	N = 60
	between		0.1366	5.603	5.962	n = 6
	within		1.17406	3.35367	8.56667	T = 10
BOT						
	overall	46.8	45.9173	12	360	N = 60
	between		13.4279	35.4	73.2	n = 6
	within		44.2221	-13.4	333.6	T = 10
BTO						
	overall	47.1	8.89239	23	63	N = 60
	between		1.07145	45.1	48.2	n = 6
	within		8.83752	21.9	62.8	T = 10
Political Risk						
	overall	0.33833	0.11945	0.2	0.5	N = 60
	between		0.08495	0.2	0.46	n = 6
	within		0.09029	0.07833	0.51833	T = 10

It is worth noting that the minimum and the maximum values of the variables are in billion Kenya Shillings. From the outcomes in Table 4.1, performance of the public private partnerships had a mean value of 5.74867 and a SD of 1.18078, which was between 0.1366 and within 1.17406. This implied that the performance of the PPP infrastructure projects varied during the period under review. In addition, the minimum value of the performance of the PPP infrastructure projects was 3.43 between 5.603 and within 3.35367. Its maximum value however was 8.78 within 5.962 and within 8.56667. Build Operate Transfer however, posted a mean value of 46.8 and a SD of 45.9173, which was between 13.4279 and within 44.2221. This meant that Build Operate Transfer values varied during the period under scrutiny. Furthermore, the minimum value of Build Operate Transfer was 12 between 35.4 and within -13.4. Its maximum value however was 360 within 73.2 and within 333.6.

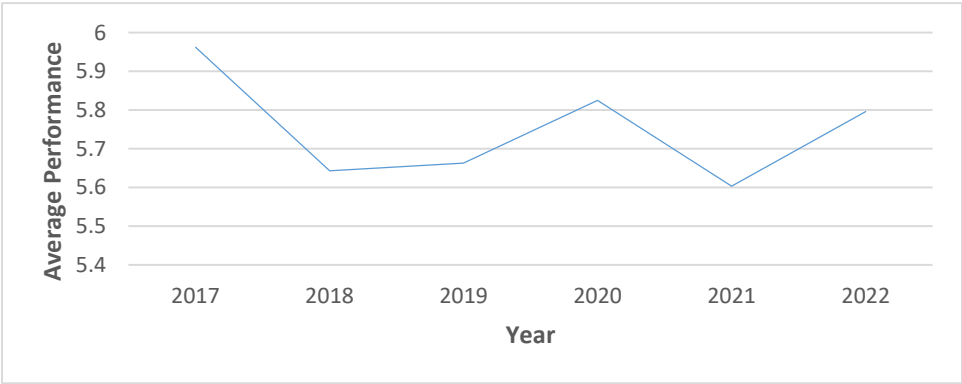
Build Transfer Operate however, registered an average value of 47.1 and a standard deviation of 8.89239, which was between 1.07145 and within 8.83752. This meant that Build Transfer Operate values varied during the period under study. Additionally, the minimum value of Build Transfer Operate was 23 between 45.1 and within 21.9. Its maximum value however was 63 within 48.2 and within 62.8. Political risk on a flip side, posted a mean value of 0.33833 and a SD of 0.11945, which was between 0.08495 and within 0.09029. This meant that Political risk values varied during the period under study. Additionally, the minimum value of Political risk was 0.2 between 0.2 and within 0.07833. Its maximum value however was 0.5 within 0.46 and within 0.51833.

**4.3 Trend Analysis**

The section outlines the key trends of the variables identified in the study over the period under study. The explained variable of the investigation was the performance of PPP infrastructure projects whereas the independent variables were build operate transfer, build transfer operate and political risk.

**4.3.1 Average Performance**

The trend curve for the average performance of the PPP infrastructure projects is outlined in Figure 4.1.

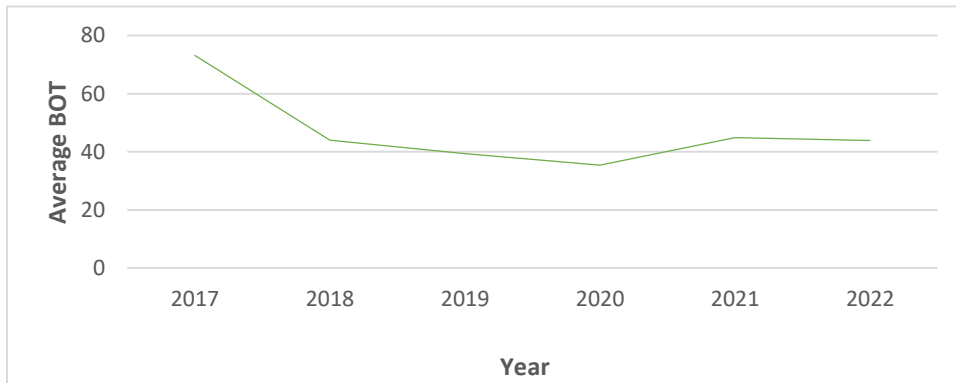


#### **Figure 4.1: Trend Curve for Average Performance of PPP Projects**

It is worth noting as can be seen that the average performance of the PPP infrastructure projects has not been steady over the period under review. Between 2017 and 2018, there was a substantive drop in the performance of PPP infrastructure projects. However, the performance began improving between 2018 and 2020, dropped between 2020 and 2021 and further improved between 2021 and 2022.

#### **4.3.2 Average Build Operate Transfer**

The trend curve for Build Operate Transfer is outlined in Figure 4.2.

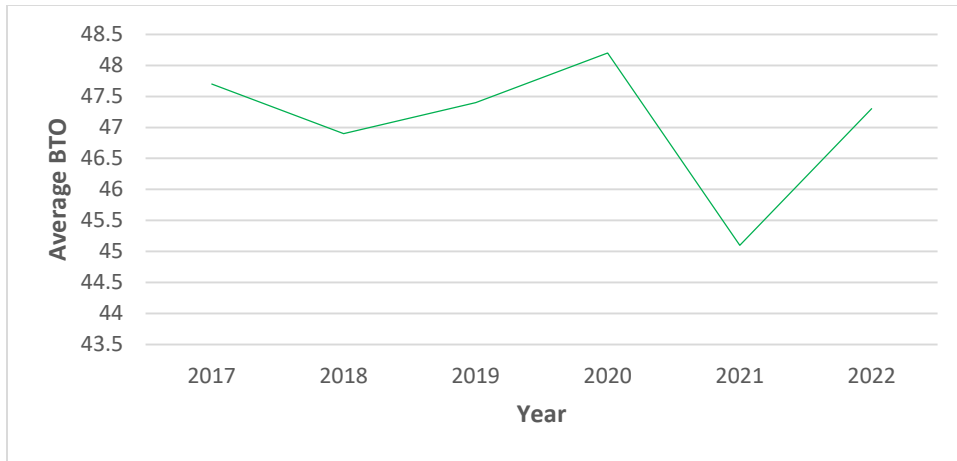


#### **Figure 4.2: Trend Curve for Build Operate Transfer**

It can be observed that there has been a steady decline in BOT over the study period. There was a significant drop in the BOT between 2017 and 2018. Nevertheless, even though there was a drop in BOT between 2018 and 2020, the decline was steady. BOT saw an improvement between 2020 and 2021 though the improvement was not so significant.

#### **4.3.3 Average Build Transfer Operate**

The trend curve for Build Transfer Operate is presented in Figure 4.3.



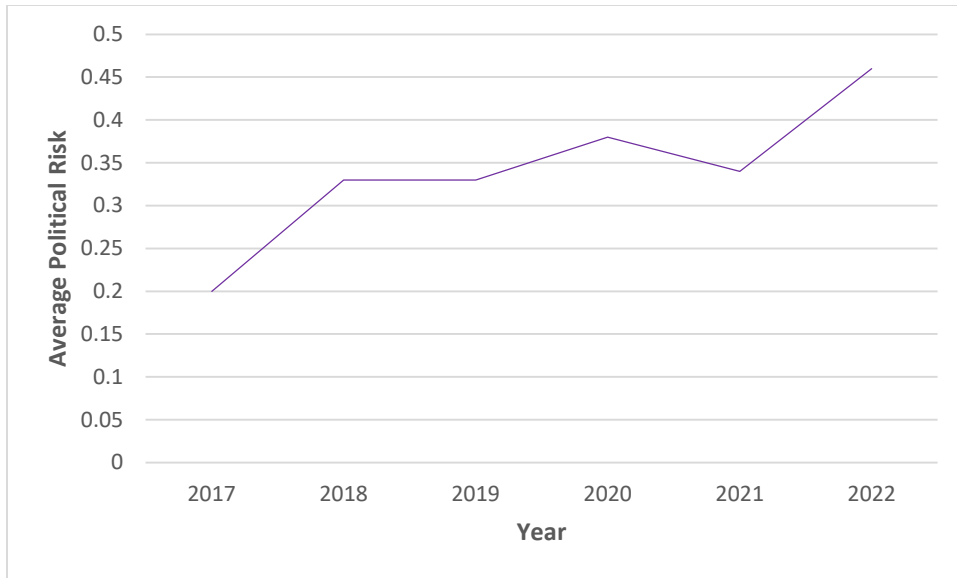
**Figure 4.3: Trend Curve for Build Transfer Operate**

The trend curve in Figure 4.3 points out that between 2017 and 2017 and 2018, there was a decline in BTO among the identified ministries in Kenya. However, between 2018 and 2020 there was a significant improvement in BTO which further saw a steep decline between 2020 and 2021 and an improvement between 2021 and 2022. Thus, BTO has not been steady during the period under review.

#### **4.3.4 Average Political Risk**

The trend curve for political risk is presented in Figure 4.4.





**Figure 4.4: Trend Curve for Political Risk**

The results outlined in Figure 4.4 indicate that there has been increasing political risk over the period under review. The increasing political risk was significant between 2017 and 2018 as well as between 2021 and 2022. The political between 2018 and 2021 has been steady as can be observed.

#### **4.4 Correlation Analysis**

The interrelation among the variables investigated in the study is elucidated within this section. The study's focal point, the performance of PPP infrastructure projects, serves as the dependent variable, while the predictor variables encompass build-operate-transfer, build-transfer-operate, and political risk. The statistical measures of correlation are meticulously presented in Table 4.2.

**Table 4.2: Correlation Results**

	<b>Performance of PPP Projects</b>	<b>BOT</b>	<b>BTO</b>	<b>Political Risk</b>
Performance of PPP Projects	1			
BOT	0.4386 0.0005	1		
BTO	0.4651 0.0002	0.1187 0.0363	1	
Political Risk	-0.445 0.0058	-0.2124 0.1032	-0.0835 0.5261	1

**Source: Researcher 2023**

It can be observed that the correlation between the performance of PPP infrastructure projects and Build Operate Transfer was both positive and statistically significant ( $\beta = 0.4386$ ,  $P = 0.0005 < 0.05$ ). Furthermore, the correlation between the performance of PPP infrastructure projects and Build Transfer Operate was both positive and statistically significant ( $\beta = 0.4651$ ,  $P = 0.0002 < 0.05$ ). Finally, the correlation between the performance of PPP infrastructure projects and political risk was both statistically significant and negative ( $\beta = -0.445$ ,  $P = 0.0058 < 0.05$ ). Thus, the identified variables BOT, BTO and political risk are significant determinants of the performance of PPP infrastructure projects.

The findings of this study hold significant importance as they offer valuable guidance for decision-makers in infrastructure development. By revealing the positive impact of both the Build Operate Transfer (BOT) and Build Transfer Operate (BTO) models on project performance, the research empowers governments and investors to make informed choices, optimizing the success of Public-Private Partnership (PPP) infrastructure projects. Simultaneously, the negative correlation with political risk underscores the critical need for political stability and risk mitigation strategies, further promoting transparency, accountability, and the efficiency of project management. These insights not only stimulate economic development, boost investor confidence, and improve project

outcomes but also ultimately enhance the welfare and quality of life for the general public through better infrastructure and public services.

#### 4.5 Diagnostic Tests

The tests are necessary prior to conducting the actual data analysis. The tests included multicollinearity, unit root test, hausman test, and heteroscedasticity, autocorrelation, as well as normality tests. The tests are necessary to gauge the appropriateness of the data collected for panel model estimation.

##### 4.5.1 Tests for Normality

The assessments for normality serve the purpose of ascertaining the data's distribution. Within this examination, the null hypothesis posits that the disturbances do not conform to a normal distribution. In the event that the computed p-value falls below the 0.05 threshold, we refrain from rejecting the null hypothesis at the 5% significance level. Conversely, if the estimated p-value surpasses 0.05, it suggests that the error variance conforms to a normal distribution. The study employed the normality tests proposed by Bera and Jarque (1981), and the findings are meticulously delineated in Table 4.3.

**Table 4.3: Normality test results.**

	<b>Obs</b>	<b>Pr(Skewness)</b>	<b>Pr(Kurtosis) adj</b>	<b>chi2(2)</b>	<b>Prob&gt;chi2</b>
BOT	60	0.679	0.152	3.470	0.311
BTO	60	0.251	0.777	1.325	0.123
Political Risk	60	0.352	0.103	3.091	0.095

Grounded on the findings presented in Table 4.3, it is noteworthy that the p-values associated with all the variables under investigation exhibit statistical significance ( $0.311 > 0.05$ ,  $0.123 > 0.05$ ,

0.095 > 0.05). This outcome conveys the inference that the error variance in the study adheres to a normal distribution.

#### 4.5.2 Heteroscedasticity

The assessment for heteroscedasticity entailed the utilization of the Breusch-Pagan test. Within this context, the null hypothesis postulated a constant variance among the error terms. In cases where the computed p-value descends below the 0.05 threshold, it denotes the existence of heteroscedasticity. Conversely, when the p-value surpasses the 0.05 threshold, it signifies the absence of heteroscedasticity. The results of the heteroscedasticity test are exhaustively expounded upon within Table 4.4.

**Table 4.4: Heteroscedasticity Test Results**

<b>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity</b>	
Ho: Constant variance	
Variables: fitted values of purchasing power	
chi2(1)	0.27
Prob > chi2	0.6057

The outcomes in Table 4.4 show that the estimated P value was > 0.05 (0.6057). Thus the null hypothesis is rejected and the study adopts the hypothesis that the error terms are heteroscedastic. This therefore gives the implication that the data does not suffer from heteroscedasticity.

#### 4.5.3 Tests for Autocorrelation

The test for autocorrelation is appropriate for time series data. The test was to unearth the presence of serial autocorrelation in the data. This examination utilized Wooldridge test in testing for autocorrelation. The null hypothesis for this test was residuals values are not present in this model

whereas the alternative hypothesis was residuals values are present in this model. The results are presented in Table 4.5.

**Table 4.5: Autocorrelation Results**

<b>Wooldridge test for autocorrelation in panel data</b>
<b>H<sub>0</sub>: no first-order autocorrelation</b>
F (4, 55) = 2.96
Prob > F = 0.231

The findings disclosed in Table 4.5 indicate that the test statistic (F-test) derived from the results stands at 2.96, with a corresponding p-value of 0.231, surpassing the 0.05 significance threshold. Consequently, we abstain from rejecting the null hypothesis positing the absence of initial autocorrelation. In light of these results, the study reaches the definitive conclusion that there is an absence of serial autocorrelation within the dataset.

#### 4.5.4 Multicollinearity Tests

The examination for multicollinearity was undertaken to substantiate the presence of interconnections among the variables utilized in the study. In pursuit of this goal, the study employed the Variance Inflation Factor (VIF) approach, wherein VIF values surpassing the 10-point threshold act as a clear indicator of the presence of multicollinearity. The comprehensive outcomes of the multicollinearity assessment have been expeditiously elaborated upon in Table 4.6.

**Table 4.6: Multicollinearity Test Results**

<b>Variable</b>	<b>VIF</b>	<b>1/VIF</b>
BOT	1.06	0.944606
Political Risk	1.05	0.951438
BTO	1.02	0.982353
<b>Mean VIF</b>	<b>1.04</b>	

From the results, it can be noted that the VIF values for all the variables including BOT, political risk and BTO are all <10 (1.06<10, 1.05<10, 1.02<10) indicating that there is no multicollinearity among the variables.

#### 4.5.5 Hausman Test

Hausman tests were expedited to determine the most suitable model for utilization within the study. The model selection options encompassed both the random effects model and the fixed effects model, as outlined by Baltagi (2005). Within this test, the null hypothesis posited the appropriateness of the random effects model, while the alternative hypothesis contended the suitability of the fixed effects model. In the event that the computed P-value in the Hausman test results falls below the 0.05 threshold, the study rejects the null hypothesis and draws the conclusion that the fixed effects model is the most fitting. Conversely, should the estimated P-value within the Hausman test results exceed 0.05, the study refrains from rejecting the null hypothesis, thus establishing that the random effects model is the more appropriate choice. In such a scenario, further tests, such as unit root tests, become necessary. The comprehensive findings of these assessments have been meticulously outlined in Table 4.7.

**Table 4.7: Hausman Test Results**

	<b>(b) fe</b>	<b>(B) re</b>	<b>(b-B) Difference</b>	<b>sqrt(diag(V_b-V_B)) S.E.</b>
BOT	.0107567	.0108983	-0.0001416	0.0009994
BTO	.0574141	.0569663	0.0004477	0.0045315
Political Risk	2.313331	1.683413	0.6299176	0.9694761
R-sq:	0.43			
Prob > F	0.9345			

In light of the results, the calculated P-value substantially surpasses the 0.05 threshold, with a precise value of 0.9345. As a result, the study refrains from rejecting the null hypothesis, thereby affirming the suitability of the random effects model for conducting the analysis.

#### 4.5.6 Fisher-Type Test of Unit Root

Fisher-type unit root test has been utilized to assess the stationarity of the time series data. The underlying assumption is that the variables exhibit stationarity, thereby bolstering the dependability of the findings. The hypotheses to be scrutinized are as follows:

$H_0$ : All panels contain unit roots

$H_a$ : At least one panel is stationary

**Table 4.8: Fisher-type Test of Unit Root**

Variable		Inverse chi-squared (114)	Inverse normal	Inverse logit t (239)	Modified inv. chi-squared
		P	Z	L*	Pm
BOT	test statistic	88.9579	-2.6457	-6.4016	10.9032
	p-value	0.0000	0.0041	0.0000	0.0000
BTO	test statistic	44.4481	-1.5606	-2.2168	3.8656
	p-value	0.0013	0.0493	0.0154	0.0001
Political Risk	test statistic	33.3726	-1.0330	-1.3245	2.1144
	p-value	0.0307	0.0108	0.0095	0.0172
Performance	test statistic	95.1737	-4.4610	-7.4781	11.8860
	p-value	0.000	0.000	0.000	0.000

It can be observed that all the variables including performance of PPP infrastructure projects, BTO, BOT and political risk are all stationary having their P values < 0.05 at P, Z, L\* and Pm. Thus, a panel regression model can then be estimated.

#### **4.6 Panel Regression Analysis**

A regression examination has been executed to establish the linear connection between the predicted and predictor variables. The discoveries stemming from this regression analysis hold paramount significance in resolving the research queries. The results of the panel regression analysis have been conscientiously expounded upon in Table 4.9.



**Table 4.9: Panel Regression Results**

<b>Performance</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt;z</b>	<b>[95% Conf.</b>	<b>Interval]</b>
BOT	0.0108983	0.0027547	3.96	0.000	0.005499	0.016298
BTO	0.0569663	0.0139484	4.08	0.000	0.029628	0.084305
Political Risk	-1.683413	1.055111	1.6	0.011	-0.38457	3.751392
_cons	1.985954	0.7873645	2.52	0.012	0.442748	3.52916
R-squared:	39.3					
Wald chi2(4)	36.25					
Prob > chi2	0.000					

From the outcomes, the estimated panel regression model explains to a tune of 39.3% of the total deviations in the performance of the PPP infrastructure projects. This is given by the value of R Squared (39.3) in the estimated model. Thus, the variables BOT, BTO and political risk are significant determinants of the performance of PPP infrastructure projects and explains to a tune of 39.3% of the total modifications in the performance of the PPP infrastructure projects. Further, the constant of the estimated model is positive implying that, other factors not identified in the study affect the performance of the PPP infrastructure projects.

It can also be noted that the estimated coefficient for BOT was significant statistically and positive ( $P = 0.000 < 0.05$ ,  $\beta = 0.0108983$ ). This implies that any improvements in BOT would positively and significantly affect the performance of the PPP infrastructure projects. Build-Operate-Transfer (BOT) model is a unique form of public-private partnership where a private entity finances, constructs, and operates infrastructure for an extended period, alleviating the public sector's financial burden. The private partner generates revenue through user fees and manages construction, operational, and revenue risks.

The results further show that the estimated coefficient for BTO was significant statistically and positive ( $P = 0.000 < 0.05$ ,  $\beta = 0.0569663$ ). This implies that any improvements in BTO would positively and significantly affect the performance of the PPP infrastructure projects. Build-Transfer-Operate (BTO) model of PPP involves the private sector financing and constructing infrastructure projects, alleviating financial burdens for the public. After completing the project, ownership transfers to the public sector, and the private partner operates and manages the asset. This model offers benefits such as improved infrastructure without immediate costs and long-term revenue for the private sector.

It can also be observed that the estimated coefficient for political risk was significant statistically and negative ( $P = 0.011 < 0.05$ ,  $\beta = -1.683413$ ). This implies that any increase in political risk would inversely and materially affect the performance of the PPP infrastructure projects. Political risk significantly impacts PPP infrastructure projects due to potential government actions, policy shifts, and instability. Such risks manifest during the project lifecycle, causing delays, increased costs, or termination. Regulatory changes resulting from political decisions can affect project operations, like tax and environmental regulations modifications.

#### **4.7 Interpretation and Discussion of Findings**

It can also be noted that the estimated coefficient for BOT was significant statistically and positive ( $P = 0.000 < 0.05$ ,  $\beta = 0.0108983$ ). This implies that any improvements in BOT would positively and significantly affect the performance of the PPP infrastructure projects. Build-Operate-Transfer (BOT) model is a unique form of public-private partnership where a private entity finances, constructs, and operates infrastructure for an extended period, alleviating the public sector's financial burden. The private partner generates revenue through user fees and manages

construction, operational, and revenue risks. At the contractual expiry, ownership transfers back to the public. This model leverages private expertise and capital for large projects, with careful contract design and risk management ensuring its success (Okudan, Budayan & Dikmen, 2021).

These outcomes are in concurrence with the findings of Tan and Zhao (2019) who pointed out that PPPs has undertaken as a supplementary player in infrastructure investment in China being rejoinder to influence government's debts and monetary shortfall. The PPPs in current age targets to solve the infrastructure gap and alleviate growing local debt. However, Rosell and Saz-Carranza (2020) indicated that Scandinavian nations are more reluctant to join PPPs, in the other hand European Union has positive influence only in purchase process. Major economic factors influences are less weak on PPP level and larger revenues of the government lower country's PPP appetite.

The results further show that the estimated coefficient for BTO was significant statistically and positive ( $P = 0.000 < 0.05$ ,  $\beta = 0.0569663$ ). This implies that any improvements in BTO would positively and significantly affect the performance of the PPP infrastructure projects. Build-Transfer-Operate (BTO) model of PPP involves the private sector financing and constructing infrastructure projects, alleviating financial burdens for the public. After completing the project, ownership transfers to the public sector, and the private partner operates and manages the asset. This model offers benefits such as improved infrastructure without immediate costs and long-term revenue for the private sector. Effective risk allocation, clear contracts, and transparent governance are vital for successful BTO projects, ensuring sustainable infrastructure delivery and operation while maximizing stakeholder interests (Phoek, Tjilen & Ririhena, 2019).

These outcomes concur with the findings of Sudic, Cirovic and Mitrovic (2017) who unearthed an important association amid the public-private partnership projects and analysis of risk in Serbia.

The research established significant positive connection amid management and risk analysis and Public-private partnership projects. Furthermore, Magoola, Mwesigwa and Nabwami (2023) who established that community engagement together with trust have important association with performance of Public-Private Projects.

It can also be observed that the estimated coefficient for political risk was significant statistically and negative ( $P = 0.011 < 0.05$ ,  $\beta = -1.683413$ ). This implies that any increase in political risk would inversely and materially affect the performance of the PPP infrastructure projects. Political risk significantly impacts PPP infrastructure projects due to potential government actions, policy shifts, and instability. Such risks manifest during the project lifecycle, causing delays, increased costs, or termination. Regulatory changes resulting from political decisions can affect project operations, like tax and environmental regulations modifications. Political instability and uncertainty may discourage private investors, leading to delays or cancellations. These results are in tandem with the findings of Njeru and Maingi (2021) who pointed out that execution of PPP in water industry was influenced by number elements that includes; involvement risks, procurement procedure, competence of manager and government control. Further, Kibe (2021) argued that fiscal contribution, mitigation of risk, technical skills as well as accountability were vital factors of project performance. In addition, it was uncovering that project performance together with fiscal contribution, mitigation of risk and accountability have strong positive association.

## **CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter offers an exposition of the overview of the critical findings in the study. Furthermore, it elaborates on the deductions derived from the study's outcomes. The chapter culminates by outlining the policy guidelines and proposals for future research initiatives.

### **5.2 Summary of Findings**

The section rigorously presents the ultimate encapsulation of the research discoveries. The exposition of this overview aligns precisely with the study's predefined objectives. Specifically, the study sought to scrutinize the impact of BOT, BTO, and political risk on the performance of PPP infrastructure projects in Kenya.

#### **5.2.1 Build Operate Transfer**

The objective of the research was to determine the effect of build-operate-transfer on the performance of PPP infrastructure projects in Kenya. As a consequence, descriptive results indicated that Build Operate Transfer posted a mean value of 46.8 and SD of 45.9173. This meant that Build Operate Transfer values varied during the period under study. Its minimum value was 12 while its maximum value was 360. The regression results indicated that the estimated coefficient for BOT was noteworthy statistically and positive ( $P = 0.000 < 0.05$ ,  $\beta = 0.0108983$ ). This implies that any improvements in BOT would positively and significantly affect the performance of the PPP infrastructure projects. Build-Operate-Transfer (BOT) model is a unique form of public-private partnership where a private entity finances, constructs, and operates infrastructure for an extended period, alleviating the public sector's financial burden. The private partner generates revenue through user fees and manages construction, operational, and revenue risks. At the contractual expiry, ownership transfers back to the public. This model leverages

private expertise and capital for large projects, with careful contract design and risk management ensuring its success (Okudan, Budayan & Dikmen, 2021).

### **5.2.2 Build Transfer Operate**

The objective of the examination was to determine the effect of build-transfer-operate on the performance of PPP infrastructure projects in Kenya. Descriptive results indicated that Build Transfer Operate registered a mean value of 47.1 and SD of 8.89239. This meant that Build Transfer Operate values varied during the period under study. Additionally, its minimum value was 23 and its maximum value was 63. The regression outcomes pointed out that the estimated coefficient for BTO was significant statistically and positive ( $P = 0.000 < 0.05$ ,  $\beta = 0.0569663$ ). This implies that any improvements in BTO would positively and substantively affect the performance of the PPP infrastructure projects. Build-Transfer-Operate (BTO) model of PPP involves the private sector financing and constructing infrastructure projects, alleviating financial burdens for the public. After completing the project, ownership transfers to the public sector, and the private partner operates and manages the asset. This model offers benefits such as improved infrastructure without immediate costs and long-term revenue for the private sector. Effective risk allocation, clear contracts, and transparent governance are vital for successful BTO projects, ensuring sustainable infrastructure delivery and operation while maximizing stakeholder interests (Phoek, Tjilen & Ririhena, 2019).

### **5.2.3 Political Risk**

The research's objective was to determine the effect of political risk on the performance of PPP infrastructure projects in Kenya. The descriptive results indicated that political risk had a mean value of 0.33833 and a SD of 0.11945. This meant that Political risk values varied during the period under study. Its lowest value of was 0.2 and its maximum value was 0.5. The regression

results indicated that that the estimated coefficient for political risk was significant statistically and negative ( $P = 0.011 < 0.05$ ,  $\beta = -1.683413$ ). This implies that any increase in political risk inversely and significantly affect the performance of the PPP infrastructure projects. Political risk significantly impacts PPP infrastructure projects due to potential government actions, policy shifts, and instability. Such risks manifest during the project lifecycle, causing delays, increased costs, or termination. Regulatory changes resulting from political decisions can affect project operations, like tax and environmental regulations modifications. Political instability and uncertainty may discourage private investors, leading to delays or cancellations.

### **5.3 Conclusions**

The study's conclusions are derived directly from the outcomes of the data analysis. These conclusions are meticulously crafted in alignment with the study's predefined objectives. Consequently, the study definitively establishes that the Build Operate Transfer (BOT) approach exerts a positive and statistically significant influence on the performance of PPP infrastructure projects in Kenya. Build Operate Transfer bridges the financing deficits of the government as well as enables the government meet its obligations efficiently even with fund deficits. This model leverages private expertise and capital for large projects, with careful contract design and risk management ensuring its success.

The study further makes the conclusion that Build Transfer Operate positively and substantively affects the performance of the PPP infrastructure projects in Kenya. Thus, any improvements in BTO would positively and significantly affect the performance of the PPP infrastructure projects. This model offers benefits such as improved infrastructure without immediate costs and long-term revenue for the private sector. Effective risk allocation, clear contracts, and transparent governance

are vital for successful BTO projects, ensuring sustainable infrastructure delivery and operation while maximizing stakeholder interests.

The study finally concludes that political risk negatively and significantly affect the performance of the PPP infrastructure projects in Kenya. Hence, any increase in political risk translates to movement of performance of the PPP infrastructure projects in opposite direction. Political risk significantly influences PPP infrastructure projects due to potential government actions, policy shifts, and instability. Such risks manifest during the project lifecycle, causing delays, increased costs, or termination. Regulatory changes resulting from political decisions can affect project operations, like tax and environmental regulations modifications. Political instability and uncertainty may discourage private investors, leading to delays or cancellations.

#### **5.4 Recommendations**

The research recommends that the government of Kenya should leverage on the Build Operate Transfer model, as its benefits are evident. The government should strengthen the laws and regulations around the Build Operate Transfer model to build confidence on the private investors and increase public private partnership projects in Kenya and fast track service delivery.

This examination makes the recommendation that the government of Kenya should utilize the Build Transfer Operate model, because of its benefits. The government should strengthen the laws and regulations around the Build Operate Transfer model to build confidence on the private investors and increase public private partnership projects in Kenya and fast track service delivery.

The model would further enhance the quality of public projects.

The study recommends that the government of Kenya while designing the PPP infrastructure projects must always take into account the political risks. Further, the government and the political class ought to put the interest of the public first. The government should also come with laws that



would cushion the private investors against the political risks. This may include putting liability on the concerned political class.

### **5.5 Limitations of the Study**

The study was constrained to an examination of the impacts of Build-Operate-Transfer (BOT), Build-Transfer-Operate (BTO), and political risk specifically on the performance of PPP infrastructure projects in Kenya. Moreover, the study was confined to the utilization of a descriptive research design. The study's scope extended solely to the government ministries within Kenya as its population. Additionally, the temporal scope of the study was limited to the period spanning from 2017 to 2022. The study primarily focused on evaluating the influence of two specific Public-Private Partnership (PPP) models, Build-Operate-Transfer (BOT) and Build-Transfer-Operate (BTO), as well as political risk, on the performance of PPP infrastructure projects within Kenya. While these models are significant, other factors and variations in PPP agreements may also impact project performance. Therefore, it is important to recognize that the study's findings may not be fully representative of all possible PPP scenarios and models in the broader global context.

In consequence, the research employed a descriptive research design, which primarily allows for the collection and presentation of data but does not delve deeply into the causal relationships between variables. This limitation suggests that while the study provides valuable insights into the relationships between the chosen variables, it may not comprehensively explain the underlying mechanisms driving these relationships. Further research with more extensive methodologies, such as causal studies or experimental designs, may be necessary to gain a deeper understanding of these dynamics.

Additionally, the study's population was limited to government ministries in Kenya, and the temporal scope was confined to the years between 2017 and 2022. This means that the findings may not be directly applicable to other sectors, organizations, or regions outside of the government ministries in Kenya, and the evolving dynamics of PPP infrastructure projects beyond this timeframe may not be fully considered. Thus, it is essential to interpret the study's results within the context of these specific boundaries while considering potential variations in other settings and over different time periods.

### **5.6 Suggestions for Further Studies**

The study strongly advocates for the undertaking of additional research endeavors focused on delving deeper into the factors that exert an influence on the efficiency of public-private partnership (PPP) infrastructure projects in Kenya. This recommendation is rooted in the recognition that a more comprehensive understanding of these factors is pivotal for enhancing the effectiveness and success of such projects. By conducting further studies, researchers can gain valuable insights into the intricacies and nuances of PPP infrastructure projects, ultimately contributing to the development of more informed policies and practices in this domain.

Researcher recommends and highlights the importance of exploring the impact of government commitment on the effectiveness of Public-Private Partnership (PPP) infrastructure projects in Kenya. It underscores that the government's dedication and involvement are critical factors in ensuring the success of these projects. Further research in this area would delve into the ways in which government commitment influences the planning, execution, and outcomes of PPP initiatives. Understanding how government commitment can be enhanced or optimized can provide valuable insights for policymakers, project planners, and stakeholders, ultimately leading to more successful and beneficial infrastructure projects in the country.

The other recommendation emphasizes the need for additional studies focusing on the sustainability of PPP infrastructure projects in Kenya. Sustainable projects are essential as they offer long-term value for the resources and investments allocated to them. Examining the sustainability of these projects entails considering their economic, environmental, and social impacts over time. This research can assist decision-makers in determining whether it is feasible and beneficial to continue investing in similar PPP projects in the future. By analyzing sustainability, stakeholders can make informed choices about the allocation of resources and ensure that they align with the country's development goals and long-term vision.

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## APPENDICES

### Appendix I: List of Ministries in Kenya

Interior and National Administration
National Treasury & Economic Planning
Foreign & Diaspora Affairs
Defence
Health
Education
Roads, Transport & Public Works
Devolution and Arid & Semi-Arid Lands (ASALs)
Lands, Housing & Urban Development
Environment & Forestry
Ministry of Mining & Petroleum
Agriculture & Livestock Development
East African Community & Northern Corridor Development
Labour & Social Protection
Tourism & Wildlife
Water & Sanitation
Public Service, Gender & Affirmative Action
Energy
Trade, Investments & Industry
Information Communications & The Digital Economy
Youth Affairs, Sports & The Arts

**GOK, 2022**





### Appendix III: Data

<b>Ministry</b>	<b>Year</b>	<b>Performance</b>	<b>BOT</b>	<b>BTO</b>	<b>Political Risk</b>
Foreign & Diaspora Affairs	2017	3.93	15	27	0.2
Foreign & Diaspora Affairs	2018	4.28	17	40	0.3
Foreign & Diaspora Affairs	2019	4.21	18	38	0.4
Foreign & Diaspora Affairs	2020	4.05	11	40	0.5
Foreign & Diaspora Affairs	2021	3.8	7	43	0.4
Foreign & Diaspora Affairs	2022	4.37	14	26	0.2
Health	2017	3.92	43	28	0.2
Health	2018	3.7	52	23	0.4
Health	2019	3.76	55	41	0.4
Health	2020	3.68	44	52	0.2
Health	2021	3.68	48	50	0.4
Health	2022	3.67	56	55	0.2
Education	2017	5.21	14	39	0.2
Education	2018	6.19	35	37	0.2
Education	2019	5.27	28	43	0.4
Education	2020	5.24	19	46	0.5
Education	2021	5.6	29	22	0.2
Education	2022	5.74	24	54	0.5
Roads, Transport & Public Works	2017	8.78	360	48	0.2
Roads, Transport & Public Works	2018	7.17	23	24	0.2
Roads, Transport & Public Works	2019	6.79	26	23	0.4
Roads, Transport & Public Works	2020	7.08	17	49	0.5
Roads, Transport & Public Works	2021	6.74	82	45	0.3
Roads, Transport & Public Works	2022	6.73	32	30	0.5
Lands, Housing & Urban Development	2017	6.3	45	38	0.2
Lands, Housing & Urban Development	2018	6.71	67	24	0.4
Lands, Housing & Urban Development	2019	7.01	45	51	0.5
Lands, Housing & Urban Development	2020	7.18	39	54	0.5
Lands, Housing & Urban Development	2021	6.42	59	26	0.4
Lands, Housing & Urban Development	2022	6.32	67	34	0.5
Environment & Forestry	2017	5.06	27	34	0.2
Environment & Forestry	2018	5.29	30	27	0.4
Environment & Forestry	2019	5.25	23	55	0.4
Environment & Forestry	2020	4.99	24	34	0.5
Environment & Forestry	2021	4.95	29	45	0.3
Environment & Forestry	2022	5.21	25	37	0.2

Ministry of Mining & Petroleum	2017	3.95	13	34	0.2
Ministry of Mining & Petroleum	2018	3.54	13	32	0.5
Ministry of Mining & Petroleum	2019	3.64	13	33	0.5
Ministry of Mining & Petroleum	2020	3.43	12	23	0.3
Ministry of Mining & Petroleum	2021	4.1	14	48	0.3
Ministry of Mining & Petroleum	2022	3.96	15	23	0.5
Agriculture & Livestock Development	2017	6.23	33	38	0.2
Agriculture & Livestock Development	2018	6.32	34	55	0.4
Agriculture & Livestock Development	2019	6.42	23	54	0.4
Agriculture & Livestock Development	2020	6.66	25	54	0.4
Agriculture & Livestock Development	2021	5.51	30	48	0.2
Agriculture & Livestock Development	2022	6.76	28	33	0.3
Labour & Social Protection	2017	4.45	11	33	0.2
Labour & Social Protection	2018	4.59	5	26	0.4
Labour & Social Protection	2019	4.45	6	52	0.3
Labour & Social Protection	2020	4.54	7	25	0.3
Labour & Social Protection	2021	4.8	7	31	0.2
Labour & Social Protection	2022	4.4	6	50	0.5
Tourism & Wildlife	2017	5.56	19	33	0.4
Tourism & Wildlife	2018	5.6	16	39	0.4
Tourism & Wildlife	2019	4.95	39	43	0.2
Tourism & Wildlife	2020	5.17	42	36	0.2
Tourism & Wildlife	2021	5.5	16	44	0.4
Tourism & Wildlife	2022	5.08	42	41	0.5
Water & Sanitation	2017	6.13	69	42	0.2
Water & Sanitation	2018	5.78	72	28	0.2
Water & Sanitation	2019	5.32	53	38	0.2
Water & Sanitation	2020	6.43	51	35	0.5
Water & Sanitation	2021	5.74	57	36	0.3
Water & Sanitation	2022	5.55	64	48	0.4
Energy	2017	6.58	75	23	0.2
Energy	2018	6.62	77	36	0.3
Energy	2019	6.82	67	41	0.3
Energy	2020	6.72	63	50	0.4
Energy	2021	6.71	63	51	0.3
Energy	2022	6.52	63	24	0.5
Trade, Investments & Industry	2017	6.38	53	31	0.2
Trade, Investments & Industry	2018	5.66	62	51	0.3
Trade, Investments & Industry	2019	5.85	63	44	0.2

Trade, Investments & Industry	2020	5.82	59	39	0.2
Trade, Investments & Industry	2021	6.11	52	54	0.3
Trade, Investments & Industry	2022	6.78	62	46	0.5
Information Communications & The Digital Economy	2017	5.67	27	24	0.2
Information Communications & The Digital Economy	2018	5.61	24	34	0.3
Information Communications & The Digital Economy	2019	5.91	28	46	0.2
Information Communications & The Digital Economy	2020	6.21	26	23	0.3
Information Communications & The Digital Economy	2021	5.96	30	32	0.3
Information Communications & The Digital Economy	2022	5.99	33	43	0.5
Youth Affairs, Sports &The Arts	2017	5.68	14	50	0.2
Youth Affairs, Sports &The Arts	2018	5.32	16	30	0.3
Youth Affairs, Sports &The Arts	2019	5.11	21	37	0.2
Youth Affairs, Sports &The Arts	2020	5.04	18	53	0.5
Youth Affairs, Sports &The Arts	2021	5.06	14	41	0.5
Youth Affairs, Sports &The Arts	2022	5.68	19	37	0.5