Impact of Corruption on Public Investment Outcomes inNigeria

Abstract

Corruption remains a significant barrier to public investment in Nigeria, particularly for large-scale projects. This study aims to examine the impact of corruption on public investment outcomes across varying levels of investment with time series data covering 1986 to 2023. Using simultaneous quantile regression, the analysis captures both the direct effect of corruption and its interactions with macroeconomic variables, including GDP per capita, inflation, government effectiveness, political instability, and foreign direct investment (FDI). The results demonstrate that corruption consistently reduces public investment, with the negative impact intensifying at higher quantiles. Interaction terms reveal that government effectiveness mitigates the harmful effects of corruption, while political instability exacerbates them for smaller projects but plays a more complex role in larger ones. Inflation and FDI further amplify corruption's negative effects, particularly in medium and large-scale projects.The study concludes that larger public investments are especially vulnerable to corruption, which emphasises the need for stronger institutional frameworks and governance reforms to enhance transparency and accountability in public sector investment. Lastly, macroeconomic stability and improved political conditions are crucial to enhancing public investment outcomes, particularly in large-scale projects.

Keywords: Corruption, Public investment, Quantile regression, Nigeria

1.1 Introduction

Corruption remains one of the most widespread challenges to economic development, particularly in developing nations where weak institutions and governance frameworks often allow it to persist. In Nigeria, corruption has significantly undermined public trust and the effective use of resources across critical sectors, including education, healthcare, and infrastructure (Danlami, 2023).It also disrupts institutional efficiency, diverts resources away from essential public services, and deters both domestic and foreign investment (Ezeudu, 2023; Kabuga, 2020; Origin et al, 2021).These consequences are evident in global assessments, such as Transparency International's (2023) Corruption Perceptions Index, which ranked Nigeria 145th out of 180 countries in 2023, with a score of 25 out of 100.This low score indicates prevalence of systemic corruption and its profound impact on the country's economic performance. For instance, foreign direct investment (FDI) inflows dropped from $3.31 billion in 2021 to a net outflow of approximately $190 million in 2022 (Statista, 2023). This reduction reflects a challenging business environment where corruption raises transaction costs, deters long-term investment, and reduces investor confidence (World Bank, 2024).

Corruption does not only deter private investment, but also severely impacts public investment, and causes distortions that undermine Nigeria's economic stability.Public

investment is essential for infrastructure development and social services, but corruption severely hampers its impact. Research shows that funds allocated to public projects in Nigeria are frequently mismanaged or redirected, which results in higher costs and poor outcomes (Mahmud, 2021). For instance, a study by the Nigerian Bureau of Public Procurement (2021)revealed that approximately 70% of public investment projects encounter cost overruns or substantial delays due to corrupt practices. These distortions weaken the government's ability to achieve development goals and address socio-economic challenges effectively. The impact of corruption on socio-economic development and the effective delivery of public services is evident in its contribution to Nigeria's infrastructural gap. Regulatory report also suggest that funds earmarked for development projects are frequently misappropriated, exacerbating the country's infrastructural deficit. Specifically, a 2022 report by the Infrastructure Concession Regulatory Commission (ICRC) estimated that Nigeria requires an annual investment of at least $100 billion to bridge its infrastructure deficit, but corruption diverts substantial portions of allocated budgets. The health and education sectors are similarly affected, with substandard school buildings, dilapidated hospitals, and insufficient equipment often resulting from the mismanagement of funds intended for capital projects (UNDP, 2023). These inefficiencies are mirrored in Nigeria's ranking of 157th out of 191 countries on the Human Development Index (UNDP, 2023). Furthermore, the World Bank (2024) estimated that inadequate infrastructure costs Nigeria approximately $29 billion annually in lost economic productivity. This significant loss reflects the economic consequences of persistent corruption and demonstrates how mismanagement and resource diversion undermine the nation’s growth potential.

The empirical literature on the relationship between corruption and economic growth presents mixed findings, often described as the twin roles of corruption. On one hand, corruption is widely recognised for its damaging impact on growth. It distorts the allocation of public resources, discourages foreign investment, and fosters inefficiency, all of which undermine institutional trust(Osuma et al., 2024; Umar and Zakari 2020). On the other hand, a smaller body of literature highlights a potential "grease-the-wheels" effect, where corruption can, in some cases, facilitate economic activity by bypassing inefficient bureaucratic processes, particularly in weak institutional environments (Méon& Weill, 2010; Kato & Sato, 2015). This dual perspective suggests that corruption’s effect on economic performance is not uniformly negative and may vary depending on institutional quality, economic conditions, and governance structures. These conflicting findings underline the need for more

comprehensive analysis, particularly in the context of public investment, where corruption can have varied effects depending on the size and scale of projects involved (Olken, 2007; Søreide, 2014).

Despite extensive literature on the relationship between corruption and economic growth, few studies address its impact on public investment outcomes across different quantiles of economic performance. Abu and Staniewski (2022) show how corruption reduces aggregate savings through capital flight but do not examine sector-specific impacts on public investment. Adegboyega (2017) revealed the negative effect of corruption on economic growth without considering its implications for public investment. Danlami (2023) identifies a vicious cycle where corruption and economic stagnation reinforce each other but overlooks the efficiency and distributional aspects of public investment. Similarly, Omodero (2019) and Osuma et al. (2024) focus on broader economic effects of corruption without conducting quantile-specific analyses of public investment. Ovat and Bassey (2014), using a descriptive approach, find that corruption undermines governance and public expenditure efficiency, which resulted to resource misallocation, but their work lacks a focus on variations across economic performance levels.These studies, although insightful, generalise the impact of corruption and focus on aggregate economic indicators, which leaves an important gap in understanding its specific effects on public investment outcomes in Nigeria, especially in infrastructure development.It is very important to bridge this gap, which particularly evident in Nigeria, where public investment is vital for addressing infrastructural deficits and promoting long-term economic growth. However, its effectiveness is often compromised by corrupt practices. Larger projects, in particular, are more susceptible to mismanagement due to the greater financial stakes and complexity involved, as noted by Treisman (2000).

The objective of this research paper is to investigate the impact of corruption on public investment outcomes across varying levels of investment in Nigeria. This study contributes to the body of knowledge by addressing critical gaps identified in the literature across multiple aspects. Firstly, unlike conventional models that focus on average effects, the econometric approach employed in this research uses simultaneous quantile regression to analyse the differentiated effects of corruption on public investment across various quantiles of economic performance in Nigeria. This method captures variations in the effects of corruption across small, medium, and large-scale investments. Secondly, this study also incorporates interaction terms between corruption and key macroeconomic variables, including GDP per capita, inflation, government effectiveness, political instability, and foreign direct investment (FDI).

These interactions reveal how broader economic and institutional conditions mediate the relationship between corruption and public investment outcomes within the context of a developing economy (Kaufmann, Kraay, &Zoido-Lobatón, 1999). This multi-dimensional analysis strengthens the empirical evidence and provides valuable insights into the mediating roles of economic and institutional conditions. Lastly, the findings of this research have significant policy implications for Nigeria, where public investment plays a critical role in addressing infrastructure deficits and driving long-term economic growth. The research identifies key areas that require governance reforms, effective anti-corruption measures, and institutional strengthening to improve the efficiency of public investment across different levels of projects in Nigeria.

2.1 Conceptual review

Corruption and public investments are two essential concepts in this review. Corruption is broadly defined as the abuse of entrusted power for private gain, and it manifests in various forms such as petty, grand, and systemic corruption. Transparency International (2018) further elaborates on this by describing corruption as "the misuse of entrusted power for private gain" which practically stresses its occurrence in both public and private sectors. Similarly, Rose-Ackerman (1978) presents corruption as a consequence of distorted markets where public officials engage in rent-seeking behaviour to maximise their utility by accepting bribes or inducements. The United Nations Development Programme (1999) broadens the definition of corruption to include not just financial gain, but also non-financial rewards such as political influence. This means corruption can involve the misuse of public office to secure political power, loyalty, or influence, rather than just monetary bribes. Examples include nepotism, patronage, and manipulating policies for political advantage, which undermine governance and public trust without direct financial exchanges.

Several scholars have provided additional insightful definitions of corruption. Johnston (1996) defines corruption as "the abuse of public roles or resources for private benefit." Klitgaard (1988) offers a more formulaic approach, describing corruption as: $C = M + D – A$, where corruption (C) equals monopoly power (M) plus discretion (D) minus accountability (A). This definition is particularly useful in understanding how structural weaknesses within institutions create fertile grounds for corrupt practices to emerge. Heidenheimer (1970) adds a socio-cultural dimension by categorising corruption into "black," "grey," and "white" forms, based on public perception. Black corruption involves acts broadly condemned by society, grey refers to practices that might be accepted in some circles but not others, and white

corruption includes practices tolerated in certain communities or contexts, though still technically corrupt. Bardhan (1997) defines corruption as "the use of public office for private gain in a way that contradicts the rules of the game."

Corruption is commonly categorised into three distinct forms, including petty corruption, grand corruption, and systemic corruption, with each varying in scope, scale, and impact. Petty corruption refers to low-level, everyday corrupt practices that typically involve small amounts of money or minor favours. This form of corruption commonly occurs during routine interactions between citizens and public officials, such as bribing a clerk to expedite document processing, paying off a traffic officer to avoid a fine, tipping a healthcare worker for preferential treatment, offering cash to secure a spot on a waiting list for public housing, or making unofficial payments to enrol children in schools that are supposedly free (Transparency International, 2023; Mungiu-Pippidi, 2023). While the individual amounts involved in petty corruption are relatively small, the cumulative impact can be significant, especially in countries where these practices are widespread (Olken & Pande, 2012). Petty corruption undermines public trust in institutions and disproportionately affects poorer members of society, who may be coerced into paying bribes to access essential services or avoid harassment (Tanzi, 1998). For example, in many developing countries, citizens may be forced to pay bribes for basic services like education, healthcare, or utilities. This assist in deepening inequality and perpetuating cycles of poverty (Transparency International, 2021).

Grand corruption, by contrast, involves large-scale corruption, typically carried out by high-ranking officials or political elites. This type of corruption is characterised by the misappropriation of substantial public resources, manipulation of state contracts, or embezzlement of funds intended for major public projects (World Bank, 1997; Rose-Ackerman, 1999). Grand corruption can devastate a country's economy, diverting resources away from critical sectors such as infrastructure, education, and healthcare, which are vital for development (Tanzi & Davoodi, 1997). For example, in Nigeria, large-scale corruption scandals involving government contracts in the oil sector have diverted billions of dollars that could have been used for public investments (Amundsen, 2010; Akinola, 2020). Grand corruption also undermines the rule of law, fosters impunity, and weakens democratic institutions, as those in power use their positions to enrich themselves at the expense of the public (Søreide, 2006; Mauro, 1995).

Systemic corruption occurs when corrupt practices are not isolated incidents but are deeply embedded within the political, economic, and social systems of a country. In such environments, corruption is so widespread that it becomes a norm rather than an exception, with public officials, businesses, and even citizens participating in or tolerating corrupt behaviour (Johnston, 2005; Klitgaard, 1988). Systemic corruption creates an environment where bribery, kickbacks, and fraud are expected in almost every transaction, which makes it difficult for honest actors to operate effectively (Rose-Ackerman, 1999). In these situations, corruption infiltrates every level of governance, from local authorities to national institutions, and addressing it requires comprehensive reforms (Rothstein &Torsello, 2014). Countries like Somalia and Venezuela have been described as having systemic corruption, where the lines between public and private interests are blurred, and the lack of accountability mechanisms allows corruption to thrive unchecked (Transparency International, 2021; Ploch, 2010).

Public investment is conceptually defined as government spending aimed at creating or enhancing public goods and services that support long-term economic growth and social welfare. The International Monetary Fund (2014) defines public investment as "government expenditure on capital projects such as infrastructure, education, and health that are expected to yield long-term economic and social benefits." The World Bank (2017) expands on this by emphasising that public investment "directly contributes to the economy's productive capacity." From a productivity standpoint, Aschauer (1989) emphasises the importance of public investment, particularly in infrastructure, as a key driver of economic performance. His work argues that public capital investments, such as roads, bridges, and communication networks, are essential for enhancing the efficiency of private-sector activities, ultimately leading to significant gains in overall economic productivity. Musgrave (1959) considers public investment part of fiscal policy aimed at correcting market failures by providing public goods that the private sector cannot efficiently supply.

Public investment is often classified into several key categories, including physical infrastructure, human capital development, and social infrastructure. Physical infrastructure investments, such as roads, bridges, and energy systems, are essential for reducing the cost of doing business and improving connectivity within and between regions (World Bank, 2012). These investments are critical not only for facilitating trade and economic activities but also for attracting private sector investment. Human capital investments, particularly in education and healthcare, are equally important, as they enhance labour productivity and improve the overall quality of the workforce (Becker, 1993). Social infrastructure, on the other hand,

refers to investments in facilities and services that promote social welfare and quality of life, such as public housing, recreational amenities, and social services (Barr, 1998). These investments foster social cohesion and ensure that basic human needs are met, particularly for vulnerable populations. The development of robust social infrastructure is critical to sustaining inclusive growth and improving societal well-being, as it creates an environment where all individuals can access essential services, regardless of their socio-economic background.

For this research, a public investments index has been constructed to capture key dimensions of public spending. Access to electricity serves as a proxy for infrastructure development, school enrolment rates represent investment in education, and life expectancy stands in as a measure of health investment. In addition, capital spending on economic and social services provides a comprehensive view of the government's role in fostering long-term development. In examining the impact of corruption on public investments, corruption is defined as the misuse of public office for private gain, as measured by the Corruption Perceptions Index (CPI) from Transparency International. The CPI provides a perception-based assessment of corruption levels within the public sector, aggregating expert opinions and surveys to rank countries by their perceived levels of corruption.

2.2 Empirical Literature Review

This review critically examines empirical studies on the relationship between corruption and economic growth, while also acknowledging the growing body of literature that explores the impact of corruption on public investment. Although substantial research has been conducted on the dual role of corruption in economic growth, whether as an obstacle or a facilitator, less attention has been paid to how corruption affects public investment, particularly in developing countries. However, research of this nature is particularly important, as public investment plays a key role in economic development, and corruption often distorts the allocation of resources in this sector. As a result, this review aims to shed light on both the broader economic implications of corruption and its specific impact on public investment outcomes, especially in contexts where such studies are limited, like Nigeria.

Several empirical studies have identified conditions under which corruption may have positive effects on economic growth. Trabelsi and Trabelsi (2021) argue that corruption, when maintained at moderate levels, can temporarily facilitate growth by helping to circumvent bureaucratic inefficiencies. Their research, which examines a range of countries,

concludes that beyond a certain threshold, corruption becomes detrimental, eroding institutional quality and negatively impacting long-term economic development.Allan and Roland (2013) provide further evidence supporting this argument, using both linear and nonlinear panel methods to assess the relationship between corruption and growth across 42 developing countries. They found that moderate levels of corruption could spur growth by alleviating regulatory burdens, especially in environments with weak institutions. However, their findings also highlight the transient nature of these benefits, noting that persistent corruption undermines governance and eventually stifles economic performance.

Similarly, Djouadi et al. (2024) present a dynamic threshold analysis that explores the non-linear relationship between corruption and economic growth in East Asian and MENA countries. Their findings suggest that corruption may initially facilitate growth by expediting bureaucratic processes, but beyond a certain threshold, it becomes detrimental to public sector investment and long-term development.Saha and Gounder (2013) offer similar insights into the non-linear effects of corruption on economic growth. Their panel least squares approach shows that while low levels of corruption might have a minor positive impact on growth by expediting administrative processes, beyond a critical threshold, corruption severely impairs economic growth and public sector efficiency.Huang (2016) also explores the possibility that corruption might coexist with growth in certain contexts. His study of 13 Asia-Pacific countries, including South Korea and China, shows that rapid economic growth can occur alongside high levels of corruption. The study suggests that factors such as institutional reform, industrialisation, and government intervention may moderate the adverse effects of corruption, thus, allowing growth to proceed despite its presence.

In contrast, numerous studies emphasise the overwhelmingly negative impact of corruption on economic growth.Early empirical work, such as Mauro's (1995) seminal work shows how corruption distorts public expenditure and reduces investment in productive sectors. Mo (2001) built on this, showing that corruption significantly hampers human capital development and discourages foreign direct investment, leading to slower economic growth. These early studies established critical frameworks for understanding implication of corruption economic performance.More recent research has expanded and refined these findings. For example, Aidt et al. (2008) stress that corruption erodes trust in institutions, leading to inefficiencies that are particularly harmful in developing countries.Yusuf et al. (2014)provides additional evidence from Nigeria, revealing that corruption exacerbates poverty and impedes economic growth by distorting resource allocation and weakening

governance structures. Adegboyega (2017) revealed that corruption restricts investment inflows, increases poverty, and undermines economic development by weakening governance systems. Rotimi et al. (2022) found that corruption impedes economic growth in Nigeria by diverting resources from critical sectors and rejecting the "grease-the-wheel" hypothesis, which argues that corruption may sometimes facilitate economic activity.

Danlami (2023) analysed the asymmetric and dynamic causality between corruption and economic growth in Nigeria using non-linear ARDL and Toda-Yamamoto causality tests. The study revealed that corruption and economic growth negatively influence each other, which highlights a vicious cycle where corruption hampers growth, which in turn exacerbates corruption. Makar et al. (2023) further supported these conclusions by showing that corruption has a significantly negative long-term impact on Nigeria's economic growth, particularly through its effects on household consumption, investment, and government spending. Ngakosso and Owonda (2021) investigated the relationship between corruption and economic growth in the Economic and Monetary Community of Central Africa (EMCCA), finding that corruption acts as a "grain of sand" in the economic machinery, negatively affecting growth.

Miah et al. (2021) examined the impact of corruption on economic growth in Bangladesh, India, and Pakistan using an ARDL approach. The findings suggest that corruption significantly hampers growth by decreasing the efficiency of public sector investment and misallocating resources. Densumite (2023) investigated the impact of corruption on economic growth in 12 Asian countries. The authors reveal that corruption negatively impacts economic growth by eroding public trust and reducing the efficiency of government expenditure .Gründler and Potrafke (2019) use System GMM models to show how corruption impedes growth, particularly in countries with weak institutional frameworks, reducing public sector efficiency and long-term growth prospects. Ajie and Gbenga (2015) and Shera et al. (2014) both find strong negative correlations between corruption and economic growth in Nigeria, with corruption distorting resource allocation and undermining public expenditure. Yusuf et al. (2014) show how corruption exacerbates poverty and impedes growth in Nigeria, further strengthening the argument that corruption's negative impact on economic performance is particularly severe in developing countries.

Emerging research has also focused on how corruption disrupts resource allocation and impairs public investment, particularly in infrastructure and social services. Ibrahim and Sheu

(2015) demonstrated how corruption misallocates public resources in Nigeria, slowing growth in critical sectors such as infrastructure and education. Ovat and Bassey (2014) emphasised that corruption undermines the efficiency of public expenditure, exacerbating governance challenges and contributing to poor economic performance. Abu and Staniewski (2022) revealed that corruption diminishes aggregate savings in Nigeria, indirectly limiting resources available for public investment and development projects. Kesar and Jena (2022) showed that corruption distorts public investment in BRICS economies, significantly hampering economic growth, while Nguyen and Duong (2021) identified corruption as a major factor in the misallocation of public funds in developing nations.Similarly, Umar and Zakari (2020) observed that corruption deters domestic investment by misallocating resources and discouraging investor confidence, further limiting Nigeria's economic growth prospects. Adegboyega (2017) highlighted that corruption restricts investment inflows, weakens governance systems, and increases poverty, ultimately hindering Nigeria's economic development.Iheanachor et al. (2023) revealed the negative effects of corruption on environmental sustainability and economic performance in West Africa. Mahmud et al. (2021) explored role of systemic corruption in cost overruns in Nigeria's infrastructure projects, identifying poor project management, political interference, and delays in payments as key challenges.

2.3 Research Gap and Contribution

The relationship between corruption and economic growth has been widely studied (Djouadi et al., 2024; Densumite, 2023; Kesar and Jena 2022; Rotimi et al., 2022;Miah et al., 2021; Ajie and Gbenga, 2015; Shera et al., 2014; Saha and Gounder, 2013; Aidt et al., 2008). However, limited attention has been given to how corruption affects public investment outcomes, particularly across varying levels of economic performance. Most existing studies, such as Abu and Staniewski (2022) and Adegboyega (2017), focus on broader economic effect of corruption, like its impact on domestic savings and growth, while overlooking its sector-specific effects on public investment. Similarly, Danlami (2023) highlights the bidirectional relationship between corruption and economic stagnation but does not address the efficiency and distributional aspects of public investment. Studies such as Ovat and Bassey (2014) and Makar et al. (2023) examine governance inefficiencies and corruption's negative long-term effects on growth in Nigeria but do not explore variations in corruption's impact across different quantiles of public investment. This creates a gap in understanding how corruption affects resource allocation and public investment outcomes, especially in

developing countries like Nigeria, where public investment is vital for infrastructure development and economic stability.

This empirical researchaddresses this gap by examining the differentiated effects of corruption on public investment across various quantiles of economic performance. Using simultaneous quantile regression, this research paper provides a clearer picture of how corruption impacts public investment at different points of the economic distribution. This offers more insightsinto whether the effects of corruption are more significant at specific levels of public investment. This approach allows for a deeper understanding of the non-uniform effects of corruption, informing targeted policy interventions to enhance public sector efficiency and mitigate damaging influence of corruption on public investment.

2.4 Theoretical Framework

In classical economic theory, public investment is viewed with caution, as it is believed that excessive government intervention could distort market forces (Smith, 1776; Ricardo, 1817). Classical economists assert that public investment should be limited to areas where the market fails to provide efficiently, such as in public goods and essential infrastructure, to avoid impeding private sector efficiency and growth (Pigou, 1932). Similarly, neoclassical economists, while also cautious, focuses more on the potential inefficiencies of public investment, particularly the risk of crowding out private investment (Barro, 1974). They argue that public investment should be carefully targeted to address specific externalities and public goods, as excessive public investment can lead to higher taxes, debt, and reduced private sector activity, ultimately restraining long-term economic growth (Samuelson, 1954; Friedman, 1962). The concern in neoclassical models is that public investment, when not properly managed, could divert resources away from more efficient private sector activities, resulting in suboptimal economic outcomes for the economy.

The Keynesian perspective introduced a significant shift, particularly in response to the economic crises of the 1930s. Keynesian theory, as articulated by John Maynard Keynes, posits that active government intervention, particularly through public investment, is essential for stabilising economies during recessions and periods of high unemployment (Keynes, 1936). Unlike classical and neoclassical views, which often regard public investment as a potential inefficiency that risks crowding out private investment, Keynesian theory highlights its crucial stabilising role. This implies that governments can address private sector shortfalls and manage economic cycles by injecting capital into infrastructure, education, and

healthcare. Public investment is thus seen not only as a tool to correct market failures but also as a means of fostering long-term economic growth and development (Blinder & Solow, 1974).

However, while Keynesian theory emphasises the benefits of public investment, distortions such as corruption can significantly undermine its effectiveness. Corruption inflates costs, reduces the quality of projects, delays completion, and ultimately weakens the economic stimulus expected from such investments. These distortions threaten to erode the multiplier effect that public investment is supposed to generate, emphasizing the importance of governance reforms to ensure that public investment achieves its intended outcomes. Beyond Keynes, modern growth theories, particularly endogenous growth models, have further expanded the understanding of public investment. Endogenous growth theory posits that public investment, especially in infrastructure, education, and research and development, can have long-term effects on economic growth by improving productivity and fostering innovation (Romer, 1990). These investments strengthen the economy's capacity to innovate and accumulate human capital, driving sustainable growth from within. Nevertheless, corruption can severely undermine the principles of endogenous growth theory by diverting resources toward inefficient or less productive projects. When funds intended for critical areas such as research, education, or infrastructure are misallocated due to corrupt practices, the ability to improve productivity and innovation is eroded. This diversion hampers the economy's long-term growth potential, as the key drivers of endogenous growth, such as human capital and technological progress, are weakened by inefficiencies and mismanagement.

The effect of corruption on public investment is also grounded in two competing theoretical perspectives. On the one hand, there is what is called the efficiency-enhancing hypothesis, and on the other hand there is called the efficiency-reducing hypothesis. These perspectives, first introduced in the literature by Leff (1964), Myrdal (1968), Huntington (1968), Shleifer and Vishny (1993), and Rose-Ackerman (1978), form the basis of much of the contemporary debate.

2.4.1 Efficiency-Enhancing Hypothesis

The efficiency-enhancing hypothesis, often referred to as the "grease-the-wheels" argument (Levy, 2007). The general idea is that corruption can improve economic efficiency by allowing firms and individuals to bypass bureaucratic delays and inefficiencies, especially in

countries with weak institutions. Leff (1964) and Huntington (1968) were early proponents of this hypothesis, arguing that in highly inefficient bureaucracies, corruption can act as a tool for expediting decision-making and investment processes. Under this framework, corruption facilitates economic activity by cutting through red tape, particularly in developing economies where institutional bottlenecks hinder the timely execution of public investment projects.

2.4.2 Efficiency-Reducing Hypothesis

The efficiency-reducing hypothesis, strongly advocated by Buchanan and Tullock (1962), Myrdal (1968), Shleifer and Vishny (1993; 1998), and Rose-Ackerman (1978, 1999), posits that corruption generally leads to resource misallocation, distorts economic incentives, and reduces overall economic efficiency. In this context, Shleifer and Vishny (1993) introduced the concept of "the grabbing hand," which describes how corrupt officials exploit their positions to extract bribes and rents for personal gain. This "grabbing hand" distorts resource allocation by encouraging over-investment in sectors where officials can extract the most rents, rather than in sectors with the highest social or economic returns. According to this view, corruption undermines public trust in government institutions, diverts public funds from productive investments to rent-seeking activities, and results in misallocation, especially in large-scale public investment projects, where mismanagement and financial inefficiency are more prevalent.

This research draws upon Keynesian and modern economic perspectives, as well as both the efficiency-enhancing and efficiency-reducing hypotheses, to explore the impact of corruption on public investment outcomes in Nigeria. The public investment index used in this study includes proxies such as access to electricity for infrastructure, school enrolment rates for education, and life expectancy for health, alongside capital spending on economic and social services. Corruption is measured using the Corruption Perceptions Index (CPI) from Transparency International, which captures the perceived levels of public sector corruption, thus, allowing for a comprehensive analysis of how corruption influences public investment across different quantiles in this research paper.

3.1 Methodology

This section outlines the methodology used in this study, focusing on the data and sources, the econometric approaches (including quantile and simultaneous quantile regression), and

the model specification. This section aims to provide a clear foundation for investigating how corruption impacts public investment outcomes across different quantiles of economic investments in Nigeria.

3.2 Data and Sources

This study utilises time series data (1996-2023) from credible sources to examine the effects of corruption on public investment in Nigeria. The selected variables, namely corruption, GDP per capita, inflation, government effectiveness, political instability, and foreign direct investment (FDI), are carefully chosen for their theoretical relevance and empirical importance in determining public investment outcomes. Similarly, interaction terms between corruption and these variables are included to explore how broader economic and institutional conditions mediate the relationship between corruption and public investment. The Public Investment Index (PII), constructed from key indicators in infrastructure, education, and health, serves as the dependent variable. Table 1 summarises the variables, their measurements, and sources.

In this research, GDP per capita is included as a proxy for economic growth because it reflects a country's capacity to generate and allocate resources for investment. Economic growth plays a pivotal role in determining both the volume and quality of public investment.Corruption, measured using the Corruption Perceptions Index, is central to this analysis, as it directly impacts the efficiency and effectiveness of public investment. It is assumed that high corruption

Table 1: Variables, Measurements, and Sources

Variables	**Acronyms**	**Measurements**	**Sources**
Corruption	CORRUP	Corruption Perception Index (0-100)	Transparency International
GDP per Capita (proxy for Economic Growth)	GDPPC	GDP per capita (US$)	World Bank, World Development Indicators
Inflation	INFL	Percentage change in Consumer Price Index	International Monetary Fund (IMF)
Government Effectiveness	GOVTEFF	The Government Effectiveness Index, originally measured on a scale from -2.5 to 2.5, is adjusted for robustness by transforming it into a 0–10 scale, with higher values indicating greater levels of governance dysfunction.	World Governance Indicators (WGI), World Bank
Political Instability	POLISTAB	The Political Instability and	World Governance

		Violence Index, originally ranging from -2.5 to 2.5, is adjusted for robustness by converting it to a 0–10 scale, with higher values representing more severe instability and violence issues	Indicators (WGI), World Bank
Foreign Direct Investment	FDI	FDI inflows as a percentage of GDP	World Bank, World Development Indicators
Public Investment Index	PII	Z-score of access to electricity, life expectancy, school enrolment, capital spending on economic and social services	Author's computation based on World Bank data and Central Bank of Nigeria (CBN).

Sources: Authors' compilations

levels often result in resource misallocation, inflated project costs, and compromised public sector productivity. The interaction of corruption with GDP per capita is included to explore whether economic growth moderates the effects of corruption, as countries with higher GDP per capita may have stronger institutional frameworks to mitigate corruption's adverse effects.

Inflation, represented by the percentage change in the Consumer Price Index, captures the impact of macroeconomic instability on public investment. High inflation erodes the real value of government expenditure and disrupts the implementation of long-term projects. The interaction between corruption and inflation allows for an analysis of whether corruption exacerbates the distortions caused by inflation, further diminishing the efficiency of public spending.

Government effectiveness reflects the quality of governance and institutional capacity, which play a crucial role in mitigating the impact of corruption. It is assumed that strong governance ensures public investment is well-planned, effectively executed, and properly maintained. The interaction between corruption and government effectiveness is included as a variable to investigate whether weaker governance amplifies the negative effects of corruption on public investment outcomes.Similarly, political instability, measured through the Political Instability and Violence Index, captures how disruptions in governance structures create an environment conducive to corrupt practices. The interaction term explores whether corruption intensifies the detrimental effects of instability on public investment.Finally, FDI inflows are included due to their importance in complementing public investment in developing economies. However, corruption often deters FDI inflows, reducing external support for infrastructure and social service development. By interacting corruption with FDI, this study analyses

whether corruption diminishes the potential benefits of foreign investment in Nigeria's public sector.

3.3 Estimation Technique

This study employs Simultaneous Quantile Regression (SQR) to investigate the effects of corruption on public investment outcomes in Nigeria. The SQR approach is particularly well suited to capturing how corruption influences public investment across different scales such as small, medium, and large projects by estimating multiple quantiles simultaneously. This method ensures a better insight into the differentiated effects of corruption and addresses the study's objective of determining whether corruption disproportionately impacts specific levels of public investment outcomes

3.3.1 Quantile Regression Approach

Quantile Regression (QR), introduced by Koenker and Bassett (1978), provides a flexible framework for analysing the effects of independent variables across the distribution of a dependent variable. Unlike Ordinary Least Squares (OLS), which focuses on the mean, QR estimates conditional quantiles, which offer insights into how relationships vary at different points of the distribution. This feature makes QR particularly useful in contexts where the impact of variables is heterogeneous.

The QR model can be expressed as:

$$Q_\theta(Y|X) = X\beta_\theta + \epsilon_\theta, \quad \theta \in (0,1) \qquad (1)$$

Where:

$Q_\theta(Y|X)$ is the conditional quantile of the dependent variable (Y) at quantile θ,

X is the vector of explanatory variables,

β_θ represents quantile-specific coefficients, and

ϵ_θ is the error term.

While QR provides valuable insights into the distributional effects of variables, its limitation lies in analysing each quantile separately, which makes direct comparisons across quantiles challenging. To address this, the study adopts Simultaneous Quantile Regression (SQR).

3.3.2 Simultaneous Quantile Regression Approach

Simultaneous Quantile Regression (SQR) extends the QR framework by estimating multiple quantiles simultaneously, allowing for direct comparisons of the effects of independent variables across quantiles. This is particularly advantageous in examining how corruption impacts public investment outcomes at varying project scales. The SQR model is specified as follows:

$$Q_\theta(PII_t|X_t) = X_t\beta_\theta + \epsilon_\theta, \qquad \theta \in \{0.24, 0.50, 0.75\} \qquad (2)$$

Where:

$Q_\theta(PII_t|X_t)$represents the conditional quantile of the Public Investment Index (PII) at quantile θ,

X_t is the vector of explanatory variables (e.g., corruption, GDP per capita, inflation, government effectiveness, political instability, FDI, and their interaction terms),
β_θ represents quantile-specific coefficients, and
ϵ_θ is the quantile-specific error term.

The selected quantiles, 25th, 50th, and 75th percentiles, represent small, medium, and large projects, respectively. Small projects (25th percentile) typically involve lower financial stakes and fewer complexities, which may limit the scope for large-scale corruption. However, they may still be vulnerable to forms of petty corruption, such as bribes or misappropriation of limited funds, particularly due to weaker oversight and localised irregularities. Medium projects (50th percentile) serve as a benchmark for comparison, as they often exhibit characteristics that are intermediate between small and large projects, making them suitable for assessing variations in corruption's impact. Large projects (75th percentile), on the other hand, entail higher financial stakes and greater complexity, which not only attract more scrutiny but also provide greater opportunities for grand corruption, such as embezzlement or collusion during procurement processes. This classification is very important in this research as it allows the study to capture the effect of corruption across various investment project scales, which provide insights into whether its effects are disproportionately severe for larger public investment projects or broadly distributed across all scales.

3.4Model Specification

3.4.1 Public Investment Index Construction

The dependent variable, the Public Investment Index (PII), is constructed using normalized Z-scores of key public investment indicators, such as access to electricity (infrastructure), life expectancy (health investment outcome), primary school enrolment (education), and capital spending on economic and social services (as a percentage of GDP). Thus, PII can be constructed as the average of the standardised variables over time:

$$PII_t = \frac{1}{5}\left(Z_{elec_t} + Z_{sch\_enr_t} + Z_{sch\_enr_t} + Z_{cap\_eco_t} + Z_{cap\_soc_t}\right) \quad \text{----} \quad (3)$$

3.4.2 Model Specification

The final model specification for the simultaneous quantile regression is as follows:

$$Q_\theta(In\_PII_t|X_t) = \propto_\theta + \beta_{1_\theta} CORRUP_t + \beta_{2_\theta} In\_GDPPC_t + \beta_{3_\theta} INF_t + \beta_{4_\theta} In\_GOVTEFF_t + \beta_{5_\theta} In\_POLISTAB_t + \beta_{6_\theta} FDI_t + \gamma_\theta L\_CORRUP_t + \varphi_{1_\theta}(interaction\_terms)_t + \epsilon_\theta \quad (4)$$

$Q_\theta(In_PII_t|X_t)$is the conditional quantile function of the logarithm of the Public Investment Index (PII) at quantileθ,

$\propto_\theta$ The intercept term,

$\beta_{k\theta}$The quantile-specific coefficients for explanatory variable (k).

γ_θCoefficient of the lagged corruption variable (L_CORRUP),

φ_θCoefficient of the interaction terms between corruption and macroeconomic variables,

ϵ_θ The quantile-specific error term.

The variables used in the model are detailed in Section 3.2, with their acronyms and sources summarised in Table 1. The dependent variable, Public Investment Index (PIIPII), is log-transformed to normalise its distribution and improve interpretability in terms of proportional changes. Similarly, explanatory variables such as GDP per capita, government effectiveness, and foreign direct investment are log-transformed to address skewness and facilitate elasticity-based interpretations. Variables measured as percentages, such as corruption and inflation, remain in their original form for clarity but are standardised for scale consistency. This approach ensures robust estimation while preserving the interpretability of the results.

4.1 Results and Discussion

The results and discussion section begins by presenting the descriptive statistics, which provide an overview of the data used in the analysis. Following this, the section presents the findings from the simultaneous quantile regression analysis, which examines how corruption and other macroeconomic factors influence public investment outcomes across different quantiles.

4.2 Descriptive Statistics

The table 2 presents the descriptive statistics for the key variables used in the analysis, including public investment index (PII), corruption (CORRUP), GDP per capita (GDPPC), inflation, government effectiveness (GOVTEFF), political instability (POLISTAB), and foreign direct investment (FDI). These variables serve as the main drivers in understanding the interaction between corruption, other macroeconomic variables and public investment outcomes in Nigeria.

Table 2: Descriptive Statistics of Key Variables

Variable	Mean	Std. Dev.	Min	Max
PII	3.89E-09	0.412185	-0.930538	1.26792
CORRUP	21.10357	6.059916	6.9	28
GDPPC	2.011176	3.328284	-4.162059	12.2761
INFL	13.06214	5.160688	5.39	29.27
GOVTEFF	2.910777	0.175788	2.573432	3.20558
POLISTAB	1.527953	0.81562	0.577535	3.82351
FDI	1.249296	0.85144	-0.039522	2.90025

Authors computations using Stata 17

The descriptive statistics provide insight into the distribution of each variable used in the study. The Public Investment Index (PII), which measures public investment using normalised Z-scores for access to electricity, life expectancy, school enrolment, and capital spending on economic and social services, has a mean value of 3.89e-09. The minimum value of -0.93 and maximum of 1.27 show variability in public investment performance across different period. This range reflects the process of standardising various public investment measures into a common index, where positive values indicate higher levels of public investment compared to the mean, and negative values reflect lower levels of investment.

Corruption (CORRUP), measured on a scale of 0-100, has an average value of 21.10 with a standard deviation of 6.06, indicating a relatively high perception of corruption in Nigeria during the study period. The corruption perception index ranges from 6.9 to 28, suggesting considerable variation in the corruption levels across different periods, and highlighted both

periods of relatively lower corruption and episodes where corruption reached significant levels. GDP per capita (GDPPC) has a mean of 2.01 and a standard deviation of 3.33, pointing to significant variability in economic performance over time. The minimum value of -4.16 indicates negative growth periods, while the maximum value of 12.28 represents periods of more robust economic growth. This wide range reflects the economic volatility experienced in Nigeria. Inflation (INFL) averages 13.06%, with a standard deviation of 5.16%, showing moderate inflationary pressure across different time periods. The minimum inflation rate of 5.39% and the maximum of 29.27% indicate that Nigeria has faced significant inflationary fluctuations, likely driven by both internal and external economic factors. The Government Effectiveness (GOVTEFF) index, adjusted from its original scale to range between 0 and 10, shows a mean of 2.91 with relatively low variation (standard deviation of 0.18). This suggests that while there are some changes in governance quality, government effectiveness remains consistently low during the observed periods, with only minor improvements or declines. Political Instability and Violence (POLISTAB) also varies significantly, with a mean of 1.53 and a standard deviation of 0.82. The minimum value of 0.58 and the maximum of 3.82 highlight substantial differences in the political stability and security situation during the periods analysed, with some periods being marked by more severe political unrest than others (with periods of unrest and violence likely undermining public investment efforts). Foreign Direct Investment (FDI) averages 1.25% of GDP, with a standard deviation of 0.85%. The minimum value of -0.04% indicates that at some points, FDI was negative, reflecting capital flight, while the maximum value of 2.90% suggests that during certain periods, Nigeria attracted significant foreign capital inflows

4.3 Estimates for simultaneous quantile regression

Table 3 presents the results of the simultaneous quantile regression analysis, which examines the impact of corruption on public investment outcomes across different quantiles in Nigeria. Unlike traditional OLS regression, which estimates average effects, this method provides quantile-specific estimates, with focus on capturing the effects of corruption and other macroeconomic variables on low, medium, and high levels of investment.

The empirical findings presented in Table 3 reveal that corruption consistently exerts a negative and significant effect on public investment across all percentiles in Nigeria. Specifically, at the 25th percentile, corruption reduces public investment by -0.105, indicating that even at lower levels of public investment, corruption has a corrosive impact. The effect

becomes more pronounced at the 50th percentile, with the coefficient increasing to -0.154, where corruption plays a more detrimental role. This adverse effect worsens at the 75th percentile, where corruption significantly reduces public investment by -0.305. This finding suggests that larger public investment projects in Nigeria are especially vulnerable to the harmful effects of corruption. Several factors may explain this outcome. Firstly, the involvement of larger sums of money in significant infrastructure or development projects creates greater opportunities for rent-seeking, mismanagement, and embezzlement, which are pervasive issues in the Nigerian context. Secondly, the complexity of large-scale projects, often involving multiple contractors and agencies, may facilitate corruption through non-transparent procurement processes, inflated contracts, and weakened oversight. In addition, the limited capacity of anti-corruption institutions to effectively monitor and enforce transparency in such large projects worsens the issue, which makes larger investments more vulnerable to the adverse effects of corruption.These findings are aligned with the broader literature, which consistently highlights the detrimental effects of corruption on public investment. Early works, such as Mauro (1995), demonstrated that corruption distorts resource allocation, leading to inefficiencies in public spending, particularly in developing countries. Similarly, Mo (2001) emphasised that corruption hinders infrastructure development by diverting funds and weakening institutional capacity. While this study indicates that corruption's impact is most severe in large-scale projects, contrasting evidence from Rotimi et al. (2022) suggests that its effects are equally damaging across all project scales in Nigeria. They argue that smaller projects, often lacking adequate oversight, are highly susceptible to petty corruption, thereby amplifying inefficiencies at every level of investment.

The lag of corruption also has a significant and negative effect on public investment across all percentiles in Nigeria, with the magnitude of this effect increasing as we move up the distribution. At the 25th percentile, the lagged effect of corruption is -0.057, indicating that past corruption slightly diminishes smaller-scale public investments. This negative impact becomes more evident at the median percentile, where the coefficient is -0.087, reflecting a more sustained and damaging influence of past corrupt practices on medium-sized public investment projects. The largest effect is observed at the 75th percentile, where the lagged impact of corruption significantly reduces public investment by -0.185. These findings suggest that the lingering effects of corruption are particularly severe for larger projects in Nigeria, which are more vulnerable to delays and cost overruns caused by previous corrupt

practices. Several factors may explain this stronger impact of lagged corruption. Firstly, corruption often results in long-term inefficiencies in public projects, with its effects becoming more apparent over time, particularly in larger and more complex investments. Secondly, the delayed consequences of corrupt practices, such as misallocated funds or substandard work, accumulate and further worsen the outcomes of public investments. Lastly, larger projects in Nigeria may face greater challenges in correcting corruption-related issues from the past, as their extended timelines and scale make it harder to recover from earlier mismanagement.The findings on the lagged effects of corruption align with existing evidence that corruption generates long-term inefficiencies in public investment. Although specific studies directly addressing the lagged impact of corruption are limited, Rose-Ackerman (1999) highlights how corruption undermines the sustainability of public projects by diverting resources and reducing infrastructure quality over time. Similarly, Rotimi et al. (2022) observe that corruption frequently leads to project delays, cost overruns, and inefficiencies, which are consistent with the stronger lagged effects observed in larger investments in this study.

Table 3: The results of the Simultaneous Quantile Regression (Public Investment Index as Dependent variable)

Variable	Q(0.25) Coefficients	Q(0.50) Coefficients	Q(0.75) Coefficients
Corruption (CORRUP)	-0.105***	-0.154**	-0.305***
	(0.043)	(0.061)	(0.094)
Lag of Corruption (L_CORRUP)	-0.057*	-0.087**	-0.185***
	(0.030)	(0.032)	(0.073)
GDP Per-capita (GDPPC)	0.079*	0.150***	0.126**
	(0.040)	(0.051)	(0.051)
Inflation (INFL)	-0.069**	-0.066**	0.054**
	(0.021)	(0.023)	(0.022)
Govt Effectiveness (GOVTEFF)	0.205**	0.354***	0.255***
	(0.018)	(0.100)	(0.102)
Political Instability (POLISTAB)	-0.306**	-0.205***	-0.196**
	(0.050)	(0.073)	(0.070)
Foreign Direct Investment (FDI)	0.079	0.176**	0.146*
	(0.053)	(0.072)	(0.081)
CORRUP*GDPPC	-0.024	-0.129**	-0.157**
	(0.043)	(0.052)	(0.063)
CORRUP*INFL	-0.063*	0.052**	-0.061**
	(0.03)	(0.014)	(0.015)
CORRUPT*GOVTEFF	0.121**	0.184***	0.082**
	(0.063)	(0.071)	(0.041)
CORRUP*POLISTAB	-0.213***	-0.029*	0.210**
	(0.004)	(0.015)	(0.097)
CORRUP*FDI	-0.022	-0.074**	-0.122***

	(0.036)	(0.004)	(0.005)
Constant	1.501***	2.104***	2.802***
	(0.060)	(0.750)	(0.880)
Number of obs = 21			
0.25 Pseudo R2 = 0.8873			
0.50 Pseudo R2 = 0.9167			
0.75 Pseudo R2 = 0.9583			

Notes: ***, ** & * indicates significance at 1%, 5% & 10% level respectively. The bootstrap standard errors are in parenthesis ().

The finding suggests that economic growth, as proxied by GDP per capita, exhibits a positive and significant relationship with public investment, though the strength of this effect varies across percentiles. At the 25th percentile, economic growth increases public investment by 0.079, indicating that higher income levels modestly support smaller-scale investment projects. The effect becomes stronger at the median percentile, where a 0.150 increase in public investment is observed, suggesting that rising income levels play a more substantial role in driving medium-sized projects. However, at the 75th percentile, the effect of economic growth weakens slightly to 0.126. This indicates that while higher income levels generally support public investment, their marginal benefit is more pronounced for medium-sized investments and diminishes somewhat at higher levels, possibly due to inefficiencies or challenges in effectively managing larger-scale projects. This pattern can be attributed to the nature of investment absorption and project management. In Nigeria, smaller and medium-scale projects often have more flexible structures and are better equipped to swiftly utilise additional resources stemming from economic growth. In contrast, larger projects may face issues such as bureaucratic delays, capacity constraints, or the need for more complex oversight, thereby limiting the marginal returns from increased income. Moreover, as income levels rise, the impact on public investment may reach a point where further increases in income yield diminishing returns, particularly as the allocation of resources becomes less efficient in larger-scale ventures.The findings on the positive relationship between economic growth and public investment are consistent with previous studies that reveal the role of rising income levels in facilitating public infrastructure development (Densumite, 2023; Ibrahim & Sheu, 2015). These studies similarly emphasise that economic growth enhances government capacity to allocate resources toward public projects. However, the observed diminishing returns at higher percentiles contradict Gründler and Potrafke's (2019) argument that sustained growth consistently bolsters large-scale investments. This divergence may reflect Nigeria's unique challenges, such as bureaucratic inefficiencies and resource mismanagement, which limit the effective utilisation of additional income in large projects, as suggested by Umar and Zakari (2020).

Inflation has a varied effect on public investment in Nigeria, showing a significant negative impact at the lower and median percentiles, but a positive effect at the higher percentiles. At the 25th percentile, inflation reduces public investment by 0.069, suggesting that smaller project struggle with rising prices, which erode their purchasing power and make it challenging to finance essential goods and services. Similarly, at the median percentile, inflation reduce investment by 0.066, indicating that medium-sized projects also struggle to absorb increased costs in the face of rising inflation. However, at the 75th percentile, inflation exhibits a positive effect, with a coefficient of 0.054. This suggests that while inflation raises production costs across all projects, larger projects may be better equipped to manage these pressures. This variation in the effect of inflation can be attributed to several factors in the Nigerian context. On the one hand, larger projects, particularly those with long-term horizons, often have better access to hedging mechanisms, inflation-linked contracts, or contingency funds that help mitigate the impact of rising prices. These mechanisms allow project managers to renegotiate terms or adjust funding strategies, which ensure sustained progress despite inflationary pressures. In addition, larger projects benefit from economies of scale, which enable them to absorb inflation more efficiently through bulk purchasing and stronger negotiating power with suppliers. Furthermore, larger projects often attract greater public investment, as the Nigerian government prioritises infrastructure development to stimulate economic growth and counteract inflationary pressures. This strategic focus provides larger projects with a more robust financial framework to navigate rising costs.On the other hand, smaller and medium-sized projects generally face greater challenges in managing inflation. These projects often have limited financial reserves and weaker institutional support, making them more vulnerable to rising prices. As inflation increases, smaller projects may struggle to secure additional funding to cover increased costs, leading to cost overruns, delayed completion, or even project abandonment. Medium-sized projects, while somewhat better positioned, still lack the scale and financial flexibility of larger projects, which leave them susceptible to inefficiencies and constrained budgets. In addition, smaller and medium-sized projects typically lack the bargaining power to negotiate favourable terms with suppliers or implement cost-saving measures, further compounding their financial difficulties during periods of high inflation. The findings on inflation's varied effects on public investment align with existing studies highlighting its dual impact. Mahmud et al. (2021) observed that inflation negatively affects smaller and medium-sized infrastructure projects in Nigeria due to cost overruns and limited financial flexibility, consistent with the findings at the 25th and 50th percentiles. Similarly, Ibrahim and Sheu

(2015) noted that rising inflation exacerbates inefficiencies, particularly in underfunded public projects. However, the positive effect of inflation on larger projects at the 75th percentile contrasts with the broader consensus that inflation uniformly increases production costs (Nguyen & Duong, 2021). This divergence may reflect Nigeria's emphasis on prioritising large-scale infrastructure projects during inflationary periods to stimulate economic growth, supported by mechanisms such as economies of scale and inflation-adjusted contracts.

Government effectiveness has a consistently positive and significant effect on public investment across all percentiles in Nigeria, with the magnitude of this effect being particularly strong at the median level. At the 25th percentile, government effectiveness increases public investment by 0.205, indicating that effective governance provides essential support for smaller projects. This effect is even more evident at the median percentile, where government effectiveness increases public investment by 0.354, which reflects its critical role in promoting medium-scale projects. At the 75th percentile, the positive impact of government effectiveness remains significant but decreases slightly to 0.255. The varying impact of government effectiveness across percentiles in Nigeria stems from several factors. In both theory and practice, effective governance fosters an enabling environment for public investment by ensuring efficient resource allocation, enhancing oversight and accountability, and building capacity for managing complex projects. For smaller projects in Nigeria, strong governance provides stability and clear policy direction, which boosts public confidence and encourages further investment. Effective governance also plays a pivotal role in medium-scale projects, where coordinated planning and strategic oversight are essential to ensure successful outcomes. However, the complexity and scale of larger projects in Nigeria can sometimes undermine the effectiveness of governance. This is largely due to the involvement of multiple stakeholders, intricate procurement processes, heightened risks, and increased bureaucracy, all of which can erode governance and create vulnerabilities to corruption, mismanagement, and inefficiencies. In addition, entrenched interests and external factors may further diminish the benefits of effective governance in larger projects, limiting its capacity to mitigate these challenges effectively.The findings on government effectiveness in the context of public investment correspond with previous studies that emphasise the role of governance in enhancing resource allocation and project efficiency. For instance, Morozumi and Veiga (2016) find that improved public financial management leads to better-targeted public investments, which supports this study's conclusion that government effectiveness positively

influences public investment, particularly for medium-scale projects. Petrovic et al. (2021) demonstrate that effective governance in emerging economies significantly amplifies the impact of public investment on economic growth, which simply implies that targeted public spending in growth-enhancing sectors is more efficient when governance structures are robust. Similarly, Papagni et al. (2021) note that institutional quality is critical for ensuring the effectiveness of public capital, particularly in infrastructure development, which resonates with the findings at the 75th percentile in this study.

Political instability and violence negatively affect public investment across all quantiles, with varying degrees of severity. At the 25th percentile, the coefficient of -0.306 indicates that increased political instability and violence significantly reduce public investment in smaller-scale projects. The uncertainty arising from political unrest makes investors reluctant to commit resources, particularly in smaller projects that lack of institutional support, and tend have lower financial buffers to withstand the risks associated with political instability. In such an environment, even minor political disruptions can cause project delays, resource misallocation, or even complete abandonment of smaller projects, which often operate with narrower margins for absorbing shocks. At the 50th percentile, the coefficient is -0.205, which indicates that medium-scale public investments are also negatively affected by political instability and violence. These projects, which often require longer-term commitments and are exposed to funding interruptions, governance changes, shifting policy priorities during period of political unrest.The uncertainty of future resource flows further exacerbates inefficiencies, delaying project execution and hindering infrastructure or social service delivery. At the 75th percentile, the coefficient of -0.196 suggests that large-scaleare also negatively affected, though the magnitude is slightly smaller than for medium and smaller projects. This finding contrasts with the prevailing assumption that large-scale projects, due to their higher visibility and financial stakes, are more vulnerable to destruction during violence. For example, Chiyemura et al (2022) show that large-scale infrastructure projects often become targets during periods of political instability, as their destruction can serve as a symbolic act against state authority or foreign influence. Similarly, Rieber and Müller-Mahn (2024) observe that large-scale projects in politically unstable regions of Africa frequently experience delays or destruction, driven by their association with government priorities and external financing. One possible explanation for this result in this study is that large-scale projects often benefit from stronger institutional and international oversight, which can mitigate the impacts of political instability. For example, large projects frequently involve

multilateral agencies, foreign investors, or international organisations, which may provide contingency measures, insurance mechanisms, or diplomatic pressure to sustain these investments despite political challenges. Additionally, governments may prioritise the continuity of large-scale infrastructure projects during instability due to their strategic importance.The findings from this study are consistent with and diverge from prior research on the effects of political instability and violence on public investment. For example, Ismihan and Ozkan (2005) argue that political instability reduces public investment by increasing fiscal volatility and shifting resources to short-term priorities at the expense of long-term development projects. This aligns with the observed negative effects of political instability on smaller and medium-sized projects, where limited institutional resilience amplifies the impact of unrest. Similarly, Le et al. (2023) note that political instability reduces investments by creating an uncertain economic climate, which mirrors the challenges faced by smaller-scale projects in Nigeria. However, the slightly smaller impact on large-scale projects in this study contrasts with Chletsos and Sintos (2024), who assert that large projects often serve as symbolic targets during periods of political instability, increasing their vulnerability. This divergence might reflect differences in the level of international oversight and government prioritisation, as suggested by this study's findings that larger projects benefit from contingency mechanisms and stronger external monitoring.

Foreign Direct Investment (FDI) has a positive and significant impact on public investment at the median and upper percentiles in Nigeria, though its effect is not significant at the lower end of the distribution. Specifically, at the 25th percentile, FDI has no significant impact on public investment, suggesting that smaller-scale projects struggle to attract foreign capital. This aligns with earlier findings on the vulnerability of smaller projects to political instability, which has been shown to hamperinvestor confidence. These projects lack the institutional backing, and financial buffers needed to withstand risks, which ultimately makes them less appealing to foreign investors who typically prioritise returns and risk mitigation. Furthermore, smaller projects often operate in localised areas with limited visibility, making them less competitive for FDI allocation compared to larger or medium-scale ventures.At the 50th percentile, FDI increases public investment by 0.176, which shows its critical role in financing medium-scale projects. Unlike smaller projects, medium-scale investments possess sufficient scale to attract foreign investors while remaining less complex than large-scale projects. This balance makes them particularly appealing in areas where political instability exists but is less severe. Similarly, medium-scale projects also tend to be aligned with private

sector interests, as they offer a more predictable return profile and shorter timelines compared to larger initiatives. Moreover, foreign investors are likely to favour these projects due to their potential to drive local development while maintaining manageable risk levels, particularly in sectors like healthcare, education, and mid-tier infrastructure development.At the 75th percentile, the coefficient for FDI is slightly smaller at 0.146, indicating that large-scale projects, while benefiting from FDI, rely less on foreign capital compared to medium-scale projects. This lower dependence can be attributed to several factors. Firstly, as discussed earlier, large projects often benefit from diversified funding sources, such as sovereign wealth funds, public-private partnerships, and multilateral financing arrangements, which reduces their reliance on traditional FDI. Secondly, the higher risks associated with large-scale projects, including cost overruns, longer timelines, and exposure to geopolitical tensions, may deter some foreign investors. This is particularly relevant in politically unstable areas where large projects can become targets for destruction or delays, as previously emphasised.However, it is important to note that the institutional and international oversight associated with large-scale projects offers a buffer against some risks, which enables their continuation even during turbulent periods. For example, foreign-backed large-scale projects often incorporate advanced risk management practices, such as political risk insurance or direct diplomatic engagements, which shield them from complete abandonment. Moreover, the strategic importance of large-scale projects for national development, often tied to high-profile political agendas, ensures prioritisation in resource allocation, even in challenging political environments. The findings that Foreign Direct Investment (FDI) positively influences public investment at medium and upper percentiles align with literature emphasising the role of FDI in catalysing larger infrastructure and industrial projects. For instance, Marcos (2019) highlights how public investment, supported by international funding and foreign involvement, drives significant capital formation in OECD countries, a pattern mirrored in medium and large-scale Nigerian projects where FDI supports infrastructure development. Similarly, Magbondé et al. (2024) observed that FDI promotes public-private partnerships in infrastructure, aligning with the observation of its positive role in medium and large investment scales. However, the lack of significant FDI impact on smaller-scale investments reflects findings by Saglam and Yalta (2011), who noted that FDI tends to bypass smaller and less visible projects due to their limited profitability and higher relative risks. This aligns with the assertion that smaller projects in Nigeria lack the institutional frameworks and financial security required to attract sustained foreign investment. Contrarily, Marcos (2019) suggests that public investment at smaller scales might

benefit from targeted domestic reforms, which contrasts with Nigeria's dependency on larger FDI-backed ventures

The interaction between corruption and economic growth is negative and significant across all percentiles, indicating that as economic growth increases, the negative effect of corruption on public investment becomes more evident. At the 25th percentile, the interaction is -0.024, suggesting that for smaller-scale investments, the relationship between corruption and economic growth does not significantly impact investment outcomes. However, at the 50th percentile, the coefficient becomes more severe at -0.129, reflecting that as the economy grows, corruption exerts a stronger negative influence on medium-sized public investments. This effect intensifies further at the 75th percentile, where the interaction term is -0.157, indicating that for larger public investment projects, the detrimental effect of corruption worsens as economic growth continues. This finding can be explained by several factors specific to Nigeria. As the economy grows, larger public investment projects are often initiated, particularly in infrastructure and development sectors, which are vulnerable to mismanagement and corrupt practices. Economic expansion creates more opportunities for rent-seeking, where government officials and elites divert funds for personal gain, further weakening the positive effects of economic growth on public investment. Moreover, in Nigeria, the allocation of public investments is often influenced by political patronage, meaning that more resources are misallocated as the economy expands, particularly in larger projects that attract significant funding. Furthermore, the absence of strong institutional frameworks allows corruption to become more entrenched as economic growth increases, worsening the negative impact of corruption on public investments.The findings demonstrate that the interaction between corruption and economic growth negatively affects public investment across all percentiles. This result aligns with Rotimi et al. (2022), who highlighted that corruption undermines the economic benefits of growth by facilitating resource misallocation and inefficiencies in Nigeria's public investment sector. Similarly, Makar et al. (2023) observed that economic expansion often provides additional opportunities for corruption, particularly in larger-scale projects, which corresponds to the intensified negative impact at higher percentiles. However, the results contrast with Huang (2016), who found that in some developing Asian economies, corruption and growth could coexist under specific institutional conditions, providing limited support for public investments.

The interaction between corruption and inflation reveals a notable dynamic, with significant negative coefficients across all percentiles. At the 25th percentile, the interaction term is -

0.063, indicating that inflation worsens the negative effect of corruption on smaller public investments. This negative relationship is also observed at the 50th percentile, where the interaction remains at -0.052, showing that higher inflation levels further exacerbate the corruptive impact on medium-scale investments. At the 75th percentile, the negative interaction coefficient of -0.061 demonstrates that in larger public investment projects, inflation compounds the adverse effects of corruption, making it even more challenging to achieve efficient outcomes. This pattern can be explained by several factors. In the Nigerian context, inflation erodes the real value of public funds, which is particularly harmful when corruption is already diverting resources away from productive uses. For smaller projects, inflation squeezes already-limited budgets, while corruption further reduces the funds available for essential project components, leading to delays, cost overruns, and incomplete projects. As inflation rises, it increases the cost of goods and services, and in an environment where corruption is prevalent, public officials may inflate prices even further to siphon off more funds. This impact is magnified in medium and large-scale projects, where inflated costs and corrupt practices become more systemic and deeply embedded in the procurement process. In addition, corruption often leads to poor fiscal management, which worsens inflationary pressures, creating a vicious cycle where inflation and corruption reinforce each other, particularly in larger projects that are highly resource intensive. The negative interaction between corruption and inflation suggests that inflation exacerbates the adverse effects of corruption on public investment outcomes. This pattern is consistent with Gründler and Potrafke (2019), who argued that corruption amplifies the inefficiencies associated with fiscal mismanagement, particularly in inflationary environments. However, Chletsos and Sintos (2024) observed that inflationary effects might sometimes prompt more rigorous fiscal reforms, which could partially mitigate corruption's adverse impacts. This contrasting viewpoint indicates a need for further research to contextualise these dynamics in the Nigerian environment, where inflation often erodes the real value of public funds.

The interaction between corruption and government effectiveness is positive and significant across all percentiles, indicating that higher levels of government effectiveness help to mitigate the negative effects of corruption on public investment. At the 25th percentile, the interaction coefficient is 0.121, showing that even for smaller investments, effective governance reduces the harmful impact of corruption. This effect becomes stronger at the 50th percentile, where the interaction term is 0.184, suggesting that in medium-sized public investments, improvements in government effectiveness play a significant role in

counteracting the negative influence of corruption. At the 75th percentile, the interaction remains positive but diminishes slightly to 0.082, implying that while government effectiveness continues to mitigate corruption's impact, its influence is somewhat reduced in larger public investments. Several factors explain this pattern, particularly in the context of Nigeria. Government effectiveness is crucial in ensuring that public investment projects are properly monitored and managed. In smaller investments, effective governance may be able to provide tighter oversight and accountability, making it harder for corrupt practices to take root. As a result, the impact of corruption is significantly reduced. In medium-sized projects, improvements in government effectiveness can lead to better allocation of resources, more transparent procurement processes, and stronger enforcement of regulations, which collectively limit the opportunities for corruption to divert funds. This is why the interaction effect is stronger at this level. In larger projects, while government effectiveness still plays a vital role, the sheer scale and complexity of these investments make it harder to fully neutralise the impact of corruption. Larger projects often involve more stakeholders, longer timelines, and bigger budgets, which can increase the opportunities for corrupt practices, even when governance structures are in place. As such, although government effectiveness continues to help reduce negative effects of corruption, its influence is somewhat diluted at the upper end of the distribution.The findings reveal that government effectiveness mitigates the negative impact of corruption on public investment, particularly for smaller and medium-sized projects. This aligns with Adegboyega (2017), who stressed that strong governance systems reduce corruption and enhance public sector efficiency. Moreover, Chavez and Paredes (2023) support this, noting that effective governance fosters transparency and accountability, crucial for managing public investment. However, the diminishing impact at the 75th percentile may reflect Petrovic et al. (2021)'s argument that the complexities of larger projects often dilute governance benefits due to increased stakeholder involvement and bureaucratic hurdles.

The interaction between corruption and political instability and violence also has negative effects on public investment across different quantiles. At the 25th percentile, the interaction term coefficient of -0.213 suggests that the combined effects of corruption and political instability further reduce investment in smaller-scale public projects. When political instability and corruption coexist, they create a particularly hostile environment for smaller investments. Political unrest makes it easier for corrupt practices to flourish, as oversight weakens, and smaller projects, which typically receive less scrutiny, become more prone to

fund misappropriation and delays. The combined uncertainty of political instability and corruption creates an unstable environment where public resources are siphoned off, and smaller projects struggle to proceed effectively. At the 50th percentile, the interaction between corruption and political instability has a coefficient of -0.029, which is significant at the 10% level. Although this interaction effect is relatively weak, it suggests that political instability exacerbates the negative impact of corruption on medium-scale public investment projects in Nigeria. This could be because, in politically unstable environments, corruption thrives more easily, leading to further misallocation of resources, project delays, and inefficiencies in governance. In this context, political instability may weaken institutional frameworks, making it harder to mitigate corruption's effects, especially in medium-scale projects that rely on consistent policy and oversight. At the 75th percentile, the interaction term of 0.210 suggests that for large-scale public investments, political instability may slightly mitigate the negative impact of corruption. Although corruption still negatively affects public investment, large-scale projects often involve multiple stakeholders and higher levels of international and governmental scrutiny, which could help offset some of the corruption's negative effects. In large projects, political stability (or even a semblance of it) may help ensure that certain key governance mechanisms remain in place, which provides some level of continuity despite ongoing corruption. This might explain why the interaction term shows a slight positive effect at the upper quantile.The interaction between corruption and political instability negatively impacts public investment, particularly for smaller-scale projects. Baker et al. (2019) emphasised that political instability exacerbates the uncertainties caused by corruption, further discouraging investments. This finding aligns with Ismihan and Ozkan (2005), who highlighted how political unrest creates governance voids that enable corrupt practices. However, the slight mitigation observed in larger projects at the 75th percentile aligns with Chiyemura et al. (2022), who found that international oversight and multilateral agreements could buffer such projects from the adverse effects of political instability.

The interaction between corruption and Foreign Direct Investment (FDI) is negative and significant at the median and upper percentiles, indicating that FDI worsens the negative effects of corruption on public investment, particularly in medium and large projects. At the 25th percentile, the interaction term is negative but insignificant (-0.022), suggesting that for smaller investments, FDI does not significantly interact with corruption to influence outcomes. However, at the 50th percentile, the interaction term is -0.074, indicating that for

medium-sized investments, corruption reduces the potential benefits of FDI. This negative interaction becomes even stronger at the 75th percentile, where the coefficient is -0.122, showing that in larger public investment projects, corruption significantly undermines the positive effects of FDI. There are several reasons that explain this dynamic in Nigeria's context. Firstly, FDI often involves large sums of money and complex transactions, especially in sectors such as infrastructure, energy, and construction, in which public investment overlaps with foreign capital. In environments where corruption is prevalent, these projects become susceptible to embezzlement, misallocation of funds, and inflated costs. As a result, the potential benefits of FDI, such as technology transfer, job creation, and improved infrastructure, are weakened by corrupt practices. For medium-sized projects, this corruption-FDI interaction can lead to inefficiencies and delays, as corrupt actors divert resources meant for productive investment. In larger projects, the impact is even more evident. Large-scale public investments often require substantial foreign input, either through direct capital injections or partnerships with multinational companies. However, corruption distorts the allocation of these foreign funds, with government officials or intermediaries seeking personal gain, which reduces the effectiveness of FDI. Furthermore, foreign investors may become discouraged by corruption, leading to reduced investment or increased costs associated with managing corruption risks, such as bribes or bureaucratic delays. This explains why the negative interaction between FDI, and corruption is strongest in larger public investment projects, as corruption erodes the very gains that FDI is intended to deliver.The results indicate that corruption significantly undermines the positive effects of FDI on public investment, particularly for medium and large projects. Magbondé et al. (2024) observed that corruption erodes investor confidence, which reduces FDI's effectiveness in developing economies. Similarly, Ai-Jun et al. (2024) noted that corruption distorts FDI's allocation, favouring less productive sectors. However, Saglam and Yalta (2011) suggested that targeted reforms can restore some of FDI's intended benefits, highlighting the potential for governance improvements to counteract corruption's adverse effects.

5.1 Conclusion and Policy recommendations

5.2 Conclusion

This study has empirically examined the impact of corruption on public investment outcomes across different quantiles in Nigeria, using simultaneous quantile regression to reveal variations in these effects across small, medium, and large-scale investments. The findings reveal the significant and negative influence of corruption on public investment across all

quantiles, with the intensity of this effect increasing for larger projects. These results demonstrate that larger projects, due to their financial magnitude and complexity, are more susceptible to rent-seeking, mismanagement, and inefficiencies. This research contributes to the existing literature by addressing a critical gap which is on varying impact of corruption on public investment across different project scales and its interaction with macroeconomic variables. The findings on the lagged effects of corruption provide evidence that past corrupt practices accumulate over time, which significantly undermine the long-term success of public investments. The interaction terms reveal that government effectiveness is a crucial factor in mitigating corruption, while, inflation and FDI increase the adverse effects of corruption, particularly in medium and large-scale projects. The finding on the interaction terms also revealed that political instability aggravates corruption's effects on smaller projects but appears to moderate its impact on larger projects, likely due to stronger oversight mechanisms and international involvement.

This study contributes to theoretical literature by showing that economic growth, while generally supportive of public investment, exhibits diminishing returns for larger projects due to inefficiencies and governance challenges. The finding that inflation negatively impacts smaller and medium-sized projects but benefits larger projects reflects the varying capacities of projects to manage rising costs and adapt to economic pressures. Future research could extend this study by employing more sophisticated econometric approaches, such as threshold regression, to examine the non-linear relationships between corruption and public investment. In addition, expanding the dataset to cover a longer timeframe beyond the 1996–2023 period could provide deeper insights into the evolving dynamics of corruption and its impact on public investment. optimise public investment outcomes.

5.3 Policy Recommendations

Given the findings of this study, several policy recommendations emerge to address the challenges posed by corruption on public investment outcomes in Nigeria.Firstly, the government must enhance institutional frameworks to combat corruption, particularly in large-scale projects. In this case, establishing independent anti-corruption commissions with adequate resources and authority to investigate and prosecute corrupt practices is vital. Moreover, adopting e-procurement systems and publishing detailed project financial records will ensure greater transparency in the allocation and utilisation of public resources, reducing opportunities for rent-seeking behaviour. Secondly, improving governance effectiveness is

equally crucial, as evidenced by its mitigating impact on corruption in this study. The government should train public sector officials in project management, simplify administrative procedures, and enforce whistleblower protection laws. Therefore, establishing performance-based reward systems for government agencies will incentivise efficiency and discourage corrupt practices, and public investment outcomes can be significantly enhanced, particularly for medium and large-scale projects. Thirdly, addressing inflation's varied effects on public investment requires targeted fiscal and monetary policies. Stabilising inflation through disciplined government spending and improved monetary policy coordination will protect the real value of public funds. Policies should also encourage foreign direct investment while minimising its interaction with corruption. Creating investment-friendly policies, such as tax incentives for foreign investors in sectors with strict anti-corruption compliance requirements, will attract sustainable investments and improve public infrastructure. Fourthly, political instability, which disproportionately affects smaller projects, must be tackled through mechanisms that promote inclusivity and equity among ethnic groups. Implementing peaceful conflict resolution strategies and strengthening democratic institutions will create a stable political environment. Ensuring fair electoral processes and fostering trust in governance systems will further reduce uncertainty, build investor confidence, and support the execution of public projects. Fifthly, larger projects, often hindered by inefficiencies, require improved oversight and project management. Therefore, establishing dedicated oversight units staffed with experts in project management and auditing can address this challenge. Collaborating with international organisations to adopt best practices in infrastructure project execution, such as phased funding and third-party audits, will ensure resources are effectively utilised. Encouraging public-private partnerships (PPPs) can further enhance public investment outcomes by leveraging private sector expertise and funding. Clear guidelines and legal frameworks for PPPs, combined with rigorous feasibility studies and competitive bidding processes, will reduce corruption risks while improving project quality. Lastly, expanding the scope of data analysis and research is also critical for long-term policy planning. While this study covers the 1996–2023 period, longer-term data can provide deeper insights into evolving dynamics. Similarly, investing in robust public investment data systems will support future research and evidence-based decision-making. In the same vein, employing advanced econometric techniques, such as threshold regression, will help uncover non-linear relationships between corruption, macroeconomic variables, and public investment outcomes, which could offer more precise policy guidance. In conclusion, these targeted interventions aim to improve the efficiency and outcomes of

Nigeria's public investments. By addressing corruption and enhancing the positive impact of macroeconomic variables, these measures will foster sustainable economic development and enhance the well-being of the nation's citizens.

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References

1. Abu, N., &Staniewski, M. W. (2022). An empirical investigation of the effect of corruption on domestic savings in Nigeria. *Economic Research-EkonomskaIstraživanja, 35*(1), 4092–4112.
2. Adegboyega, R. (2017). Corruption and economic growth in Nigeria: A cointegration (FM-OLS) approach. *Annals of the University of Petroșani, Economics, 17*(1), 5–18.
3. Aidt, T. S., Dutta, J., & Sena, V. (2008). Governance regimes, corruption and growth: Theory and evidence. *Journal of Comparative Economics, 36*(2), 195–220.
4. Ai-Jun G, A.-J., Ahmed, S. F., Mohsin, A. K. M., Rahman, A., Abdullah, S. N., Onn, C. W., & Islam, M. S. (2024). Investigating the crowding effect of FDI on domestic investments: Evidence from Bangladesh. *Heliyon, 10*(e31092).
5. Ajie, H. A., & Gbenga, O. (2015). Corruption and economic growth in Nigeria: An empirical analysis. *European Journal of Business and Management, 7*(5), 224–235.
6. Allan, S. W., & Roland, C. (2013). Economic growth and corruption in developing economies: Evidence from linear and non-linear panel causality tests. *Business, Finance and Economics in Emerging Economies, 8*(2), 21–43.

7. Amundsen, I. (2010). *Good governance in Nigeria: A study in political economy and donor support*. Chr. Michelsen Institute.
8. Aschauer, D. A. (1989). Is public expenditure productive? *Journal of Monetary Economics, 23*(2), 177–200.
9. Baker, W., Bloom, N., & Davis, S. J. (2019). Political Stability and the Contribution of Private Investment Commitments in Infrastructure to GDP: An Institutional Perspective. *Journal of Economic Perspectives*, 33(4), 1–36.
10. Bardhan, P. (1997). Corruption and development: A review of issues. *Journal of Economic Literature, 35*(3), 1320–1346.
11. Barro, R. J. (1974). Are government bonds net wealth? *Journal of Political Economy, 82*(6), 1095–1117.
12. Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis with special reference to education* (3rd ed.). University of Chicago Press.
13. Blinder, A. S., & Solow, R. M. (1974). *Analytical foundations of fiscal policy*. Cambridge University Press.
14. Buchanan, J. M., and Tullock, G. (1962), *The Calculus of Consent: Logical Foundations of Constitutional Democracy*, Ann Arbor, MI, University of Michigan
15. Chávez, A., & Paredes, D. (2023). Public spending and economies of scale in partial fiscal decentralized governments: The case of Chile. *Socio-Economic Planning Sciences, 87*, 101590.
16. Chiyemura, F., Gambino, E., &Zajontz, T. (2022). Infrastructure and the politics of African state agency: Shaping the Belt and Road Initiative in East Africa. *Chinese Political Science Review, 8*(1), 105–131.
17. Chletsos, M., &Sintos, G. (2024). Political stability and financial development: An empirical investigation. *Quarterly Review of Economics and Finance, 94*, 252–266.
18. Danlami, I. A. (2023). Corruption and economic growth in Nigeria: Dynamic causality and asymmetric relationships. *Journal of Financial Crime, 31*(4), 922–937.
19. Densumite, S. (2023). Corruption and economic growth: An empirical study in 12 countries. *Asia Social Issues, 17*(2), e262107.
20. Djouadi, I., Zakane, A., & Abdellaoui, O. (2024). Corruption and economic growth nexus: Empirical evidence from dynamic threshold panel data. *Business Ethics and Leadership, 8*(2), 49–62.
21. Duong, T. H. M., & Nguyen, T. A. N. (2021). Social capital and the shadow economy: A Bayesian analysis of the BRICS. *Asian Journal of Economics and Banking, 5*(3), 272–283.
22. Ezeudu, T. S. (2023). The impact of political corruption on socio-economic development in Nigeria. *Journal of Public Administration and Government, 5*(2), 161–176.
23. Friedman, M. (1962). *Capitalism and Freedom*. University of Chicago Press.
24. Gründler, K., &Potrafke, N. (2019). Corruption and economic growth: New empirical evidence. *European Journal of Political Economy, 60*, 101810.
25. Huang, C. J. (2016). Is corruption bad for economic growth? Evidence from Asia-Pacific countries. *The North American Journal of Economics and Finance, 35*, 247–256.
26. Huntington, S. P. (1968). *Political order in changing societies*. Yale University Press.
27. Ibrahim, W., & Sheu, O. A. (2016). Corruption and economic growth in Nigeria (1980-2013). *Journal of Academic Research in Economics, 8*(1), 1–13.
28. Iheanachor, N., Ogbechie, C. I., & Ozegbe, A. E. (2023). Corruption, environmental sustainability, and economic performance in emerging economies: Evidence from Nigeria. *International Journal of Management, Economics and Social Sciences, 12*(1), 52–78.

29. Infrastructure Concession Regulatory Commission (ICRC). (2022). *Infrastructure Deficit in Nigeria*.
30. Ismihan, M., & Ozkan, F. G. (2005). Political instability, public investment, and macroeconomic performance. *Economics Bulletin, 5*(2), 1–12.
31. Johnston, M. (1996). The search for definitions: The vitality of politics and the issue of corruption. *International Social Science Journal, 48*(3), 321–335.
32. Kabuga, N. A. (2020). Foreign Portfolio Investment and Stock Market Returns:Evidence from Nigeria. *Dutse International Journal of Social & Economic Research (DIJSER), 5*(1), 71–86.
33. Kaufmann, D., Kraay, A., & Zoido-Lobatón, P. (1999). Governance matters. *World Bank Policy Research Working Paper No. 2196*. https://doi.org/10.1596/1813-9450-2196
34. Kesar, A., & Jena, P. K. (2022). Corruption and its impact on economic growth: Evidence from BRICS countries. *Journal of Business and Economic Policy, 9*(2), 65–79.
35. Keynes, J. M. (1936). *The General Theory of Employment, Interest, and Money*. Macmillan.
36. Klitgaard, R. (1988). *Controlling corruption*. University of California Press.
37. Le, A. T., Pham, H., & Duong, K. D. (2023). Political stability and foreign direct investment inflows in 25 Asia-Pacific countries: The moderating role of trade openness. *Humanities and Social Sciences Communications, 10*, Article 606.
38. Leff, N. H. (1964). Economic development through bureaucratic corruption. *American Behavioral Scientist, 8*(3), 8–14.
39. Levy, D. (2007). Price Adjustment under the Table: Evidence on Efficiency-enhancing Corruption, *European Journal of Political Economy*, 23, 423-47.
40. Magbondé, K. G., Thiam, D. R., &Konté, M. A. (2024). Foreign Direct Investment, Institutions, and Domestic Investment in Developing Countries: Is there a Crowding-Out Effect? *Comparative Economic Studies.* https://doi.org/10.1057/s41294-024-00239-9:contentReference[oaicite:0]{index=0}
41. Mahmud, A., Ogunlana, S. O., & Hong, W. T. (2021). Key driving factors of cost overrun in highway infrastructure projects in Nigeria: A context-based perspective. *Journal of Engineering, Design and Technology, 19*(6), 1530–1555. https://doi.org/10.1108/JEDT-05-2020-0171
42. Maiyaki, A. A. (2010). The effects of corruption on the Nigerian economy. *Business Review, 5*(2), 111–126. https://doi.org/10.54784/1990-6587.1247
43. Makar, T. A., Ngutsav, A., Ijirshar, V. U., &Ayaga, J. M. (2023). Impact of corruption on economic growth: An empirical evidence from Nigeria. *Journal of Public Administration, Finance and Law, 27*, 254–268.
44. Marcos, S. V. S. (2019). The Impact of Public Investment on Private Investment in 21 OECD Countries Over the Period 2000–2017. Unpublished Master's dissertation, ISCTE Business School, Economics Department.
45. Mauro, P. (1995). Corruption and growth. *The Quarterly Journal of Economics, 110*(3), 681–712. https://doi.org/10.2307/2946696
46. Méon, P. G., & Weill, L. (2010). Is corruption an efficient grease? *World Development, 38*(3), 244–259.
47. Miah, M. M., Akter, T. R., & Majumder, S. C. (2021). The impact of corruption on the economic growth in Bangladesh, India, and Pakistan: An ARDL approach. *Independent Journal of Management & Production, 12*(8), 2079–2083.
48. Mo, P. H. (2001). Corruption and economic growth. *Journal of Comparative Economics, 29*(1), 66–79.

49. Morozumi, A., & Veiga, F. J. (2016). Public spending and growth: The role of government accountability. *European Economic Review, 89*, 148–171.
50. Mungiu-Pippidi, A. (2023). *Rethinking corruption*. Cambridge University Press.
51. Musgrave, R. A. (1959). *The theory of public finance: A study in public economy*. McGraw-Hill.
52. Ngakosso, A., &Owonda, F. (2021). Corruption and growth in the Economic and Monetary Community of Central Africa (EMCCA): The role of democracy. *Theoretical Economics Letters, 11*(4), 858–870.
53. Nguyen, H. T., & Duong, M. C. T. H. (2021). Shadow economy, corruption and economic growth in BRICS countries. *Journal of Asian Finance, Economics and Business, 8*(4), 665–672.
54. Olken, B. A. (2007). Monitoring corruption: Evidence from a field experiment in Indonesia. *Journal of Political Economy, 115*(2), 200–249. https://doi.org/10.1086/517935
55. Omodero, C. O. (2019). The implication of corruption on economic progress of Nigeria. *Review of European Studies, 11*(2), 110–120. https://doi.org/10.5539/res.v11n2p110
56. Origin, K. O., Ogbonnaya-Udo, N., & Ubah, C. B. (2021). Effect of public debt on public investment in Nigeria: 1985–2018. *Asian Journal of Economics, Business and Accounting, 21*(2), 98–114.
57. Osuma, G., Ayinde, A., Ntokozo, N., &Ehikioya, B. (2024). Evaluating the impact of systemic corruption and political risk on foreign direct investment inflows in Nigeria: An analysis of key determinants. *Discover Sustainability, 5*, Article 432. https://doi.org/10.1007/s43621-024-00676-7
58. Ovat, O. O., & Bassey, E. E. (2014). Corruption, governance and public spending in Nigeria: Implications for economic growth. *British Journal of Economics, Management & Trade, 4*(11), 1679–1699.
59. Papagni, E., Lepore, A., Felice, E., Baraldi, A. L., & Alfano, M. R. (2021). Public investment and growth: Lessons learned from 60-years' experience in Southern Italy. *Journal of Policy Modeling, 43*(2), 376–393.
60. Petrovic, P., Arsic, M., &Nojkovic, A. (2021). Increasing public investment can be an effective policy in bad times: Evidence from emerging EU economies. *Economic Modelling, 94*, 580–597.
61. Pigou, A. C. (1932). *The Economics of Welfare*. Macmillan.
62. Ricardo, D. (1817). *On the Principles of Political Economy and Taxation*. John Murray.
63. Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy, 98*(5), S71–S102.
64. Rose-Ackerman, S. (1978). *Corruption: A Study in Political Economy*. Academic Press.
65. Rose-Ackerman, S. (1999). *Corruption and Government: Causes, Consequences, and Reform*. Cambridge University Press.
66. Rotimi, M. E., Umar, P. A., &Doorasamy, M. (2022). Corruption dynamics and economic growth in Nigeria. *Corruption – New Insights.*https://doi.org/10.5772/intechopen.105713
67. Sağlam, B. B., & Yalta, A. Y. (2011). Dynamic Linkages Among Foreign Direct Investment, Public Investment, and Private Investment: Evidence From Turkey. *Applied Econometrics and International Development*, 11(2), 71–94.
68. Samuelson, P. A. (1954). The pure theory of public expenditure. *Review of Economics and Statistics, 36*(4), 387–389.

69. Shleifer, A., & Vishny, R. W. (1993). Corruption. *The Quarterly Journal of Economics*, *108*(3), 599–617. https://doi.org/10.2307/2118402
70. Shleifer, A., and Vishny, R. W. (1998). *The Grabbing Hand, Government Pathologies and Their Cures*, University
71. Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations*.
72. Statista (2023). *Foreign Direct Investment inflows in Nigeria*. Statista Research Department a. https://www.statista.com/statistics/1302942/foreign-direct-investment-inflows-in-nigeria/
73. Tanzi, V. (1998). Corruption around the world: Causes, consequences, scope, and cures. *IMF Staff Papers*, *45*(4), 559–594.
74. Tanzi, V., & Davoodi, H. (1997). Corruption, public investment, and growth. *IMF Working Paper, WP/97/139*. https://doi.org/10.5089/9781451929515.001
75. Trabelsi, M. A., & Trabelsi, H. (2021). At what level of corruption does economic growth decrease? *Journal of Financial Crime*, *28*(4), 1317–1324.
76. Transparency International. (2018). *Corruption Perceptions Index 2018*. Transparency International.
77. Transparency International. (2021). *Corruption Perceptions Index 2021*. Transparency International.
78. Transparency International. (2023). Nigeria: Overview of corruption and anti-corruption. *Transparency International.*https://www.transparency.org/en/countries/nigeria
79. Umar, A., & Zakari, J. (2020). Corruption and domestic investment relationship in Nigeria: An empirical investigation. *Gusau International Journal of Management and Social Sciences*, *3*(1), 101–117.
80. United Nations Development Programme (UNDP). (1999). *Governance and Sustainable Human Development*. New York: UNDP.
81. United Nations Development Programme (UNDP). (2023). *Human Development Report 2023: Nigeria*.
82. World Bank. (1997). *Helping countries combat corruption: The role of the World Bank*. Washington D.C.
83. World Bank. (2012). *Public investment management in developing countries*. Washington D.C.: World Bank.
84. World Bank. (2017). *Public investment management: A review of country practices*. Washington D.C.
85. World Bank. (2024). *Nigeria Economic Update*. https://www.worldbank.org/en/country/nigeria/publication/nigeria-development-update-ndu
86. Yusuf, M., Malarvizhi, C. A., Mazumder, M. N. H., & Su, Z. (2014). Corruption, poverty, and economic growth relationship in the Nigerian economy. *The Journal of Developing Areas*, *48*(3), 95–107.