DEBT, GOVERNANCE AND ECONOMIC DEVELOPMENT OF WEST AFRICAN COUNTRIES

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Abstract

This study examined the relationships between government debt, governance quality, and economic development across the West African nations from 2010 to 2024. Using the Human Development Index (HDI) as the primary development indicator, the research employed Quantile via Moment (QvM) and Generalized Method of Moments (GMM) econometric approaches to address heterogeneity and endogeneity concerns. The findings revealed that government debt consistently exhibited negative effects on development outcomes, with particularly strong impacts at median development levels. Debt service payments demonstrated even stronger negative associations with HDI, suggesting immediate fiscal constraints on development spending. Governance quality emerged as the most powerful positive determinant of development, with coefficients peaking at the median development level, validating institutional theories of development. Physical capital formation showed robust positive effects across all specifications, while trade openness demonstrated modest but consistently positive associations with development. The research extended beyond conventional growth metrics to encompass multidimensional development outcomes and provided empirical evidence for nonlinear governance effects across development levels. The study concluded that while debt management provides fiscal stability and investments supply growth engines, governance quality remains the critical factor that determines development effectiveness in West Africa. It was recommended among others that West African Countries should establish clear debt thresholds and fiscal rules to maintain sustainable debt levels.

Keywords: Debt, governance, economic development, human development index, trade openness

Introduction

Debt in West African countries has a significant impact on governance and economic development. The region, categorized as a developing zone, has accumulated significant foreign and internal debts over the years due to a variety of issues including colonial legacies, economic mismanagement, fluctuating

commodity prices, and the global financial environment. According to the World Bank (2023), the region's external debt has risen, straining country budgets and limiting public spending on critical sectors such as health, education, and infrastructure.

The management of external debt is one of the most significant difficulties facing West African countries. Countries such as Ghana, Nigeria, and Côte d'Ivoire have been engaged in a cycle of borrowing, often to fund infrastructure projects or balance budget deficits. However, as global financial markets become more volatile, these countries' ability to service their debt has weakened, raising worries about the long-term viability of their borrowing methods (AfDB, 2021).

The Paris Club and Multilateral Debt Relief Initiatives (MDRI) have helped West African countries reduce their debt burdens. For example, in the 2000s, several countries in the area benefited from debt relief measures, resulting in significant decreases in outstanding debt. However, it remains unclear if such debt reduction is a long-term solution or merely a momentary reprieve.

Governance is a major concern in the West African sub region (Effiong & Okijie, 2021). The World Bank's World Governance Indicators (which range from around -2.5 (poor) to +2.5 (excellent) governance performance) show that West African countries have consistently had negative governance indicators. In 2020, a country like Nigeria, which is considered as "the Giant of Africa", had negative governance indicators as follows: Voice and accountability (-0.59); political stability and the absence of violence/terrorism (-1.86); government effectiveness (-1.03); regulatory quality (-0.96); rule of law (-0.81); and corruption control (-1.10). The country's suffering index increased from 14.61% in 2011 to 22.91% in 2020 and 25.29% in 2021. According to Keynesian theory, government involvement in the economy is supposed to produce the intended economic effect. However, with bad institutions, such intended outcomes may not be possible.

Furthermore, West African governance has been marked by political instability, corruption, and poor institutional frameworks. Poor governance frequently exacerbates debt issues, as mismanagement of resources leads to inefficient spending and increases vulnerability to fiscal crises. According to the Mo Ibrahim Foundation's Governance Index (2021), some West African states show evidence of weakening governance, which is associated with rising debt levels. Unstable political circumstances contribute to a "debt trap" scenario in which governments borrow more to pay off current debts, restricting economic progress.

The concept of development has expanded to include happiness. As a result, "development has to be more concerned with improving the lives we live and the freedom we enjoy" (Effiong & Okijie, 2021). Human curiosity may drive attempts to explain something as subjective as happiness using a scientific manner (Katzmann & Veres, 2021).

West Africa's economic progress has been uneven, with differences between countries. While certain countries, such as Ghana and Côte d'Ivoire, have reported positive GDP growth rates, the overall economic landscape remains precarious. Economic growth in these countries is frequently hampered by high levels of public and external debt, which might impede long-term development plans. According to the International Monetary Fund (IMF), nations with high debt-to-GDP ratios typically face weaker growth as fiscal headroom becomes restricted (IMF, 2022).

International financial institutions and bilateral creditors have a substantial impact on regional debt dynamics. Policies promoted by these institutions, such as Structural Adjustment Programs (SAPs), have been contentious; while intended to stabilize economies, they frequently resulted in cuts to social services, impeding human development (Ojo, 2019). Furthermore, the influx of loans from China and other rising countries has generated a dual narrative of opportunity and risk for West African debt sustainability (Maliyamkono & Zulu, 2020).

The relationship between debt levels and economic development is especially strong in West Africa. High debt servicing costs might shift funds away from critical services and infrastructure development. For example, the Economic Community of West African nations (ECOWAS) has stressed the importance of member nations implementing effective fiscal policies to reduce the negative consequences of debt on growth and development (ECOWAS, 2021). Furthermore, the link between debt governance and development outcomes is critical; efficient governance systems may assist ensure that borrowed monies are used for productive purposes.

The impact of excessive public debt and weak governance on economic development is significant. High debt levels can lead to austerity measures, limiting public investment in education, healthcare, and infrastructure, all of which are vital to long-term economic growth. According to the African Development Bank (AfDB, 2021), unless West African countries implement significant changes to enhanced governance and successfully manage public debt, economic development would stagnate and poverty rates will rise.

The interplay between debt, governance, and economic development is crucial for understanding countries' development issues, particularly those in the West African region. External forces (such as international markets, foreign aid, and global financial institutions) and internal governance structures (such as political stability, institutional excellence, and the rule of law) all have an impact on these components' development.

The issue of rising public debt has gained prominence in many West African countries. According to the World Bank (2021), West Africa's average debt-to-GDP ratio has increased, with several countries, including Ghana, Nigeria, and Senegal, seeing percentages of more than 70%. This rising debt burden restricts governments' fiscal leeway, limiting their ability to invest in key social services and infrastructure, hence impeding economic growth (International Monetary Fund, 2021).

Nigeria's debt-to-GDP ratio rose to 55% in June 2024 from 42.2% in December 2023. This increase was due to variables such as exchange rate depreciation and increased domestic borrowing. The International Monetary Fund (IMF) expects Nigeria's debt-to-GDP ratio to increase to 46.6% in 2024, up from 46.3% in 2023. Senegal's government debt-to-GDP ratio was 56.10% in 2023, up from 53.09% in December 2022. However, a 2025 audit indicated that the debt was significantly higher than previously stated, with total debt accounting for 99.67% of GDP by the end of 2023, up from 74.41% (Reuters, 2025).

This development highlights Nigeria's and Senegal's fiscal challenges, which include rising debt levels and the implementation of various economic strategies to address economic concerns. To address West Africa's interconnected issues about debt, governance, and economic development, significant adjustments must be made to improve fiscal management, strengthen governance systems, and promote

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inclusive economic policies. Without such reforms, the region, risks sinking into an endless cycle of debts and underdevelopment.

Several studies have looked into how public debt affects economic growth, the role of governance in sustainable debt management, and the larger implications for development outcomes. These studies, which include Easterly (2001) and Reinhart and Rogoff (2010), concentrate on the negative association between high levels of public debt and economic growth. They claim that unsustainable debt loads can lead to economic stagnation, reduced investment, and slower growth, particularly in emerging nations; Acemoglu et al. (2012) contended that institutions (both political and economic) are critical drivers of long-term economic development. Rodrik (2004) emphasizes the need of strong institutions in creating an environment favorable to economic progress.

Aizenman et al. (2007) investigate the combined effects of debt and governance on economic results. According to these researchers, countries with weak governance are more likely to have high debt levels, which have a detrimental impact on economic development. Although these studies demonstrate the link between governance and debt, there is a scarcity of comparative research across nations or regions with varied institutional frameworks. More crucially, prior research has not properly explored how certain governance mechanisms (such as political stability, rule of law, and institutional capacity) influence the effectiveness of debt-financed development programs. This study sought to address these gaps.

The main objective of this study is to examine the relationship between debt, governance and economic development of West African Countries.

Literature Review

Conceptual Literature Review

Debt and Economic Development

Debt can have a dual purpose in economic development. On the one hand, it offers critical cash for infrastructure, education, and health investments, resulting in economic growth (Easterly, 2001). For example, countries that effectively use foreign aid and loans have seen gains in key development indices. However, heavy debt has substantial risks. High debt levels can cause financial instability, decreasing public investment in critical services and impeding growth (Reinhart & Rogoff, 2010). Furthermore, the "debt overhang" idea proposes that when a government is heavily in debt, potential investors perceive increased risk, inhibiting fresh investment (Krugman, 1988).

Governance and Economic Development

Governance refers to the institutions, processes, and traditions that govern how power is exercised, citizens are given a voice, and choices are made (UNESCAP, 2009). Effective governance is essential for economic development because it guarantees that resources are distributed efficiently and fairly.

Strong governance frameworks can stimulate economic growth by encouraging transparency, accountability, and the rule of law. According to research, countries with better governance metrics have faster economic growth. In contrast, poor governance can result in corruption, resource misallocation, and decreased investor confidence (Acemoglu & Robinson, 2012).

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The Interrelationship between Debt and Governance

The link between debt and governance is complicated. High amounts of debt can impair governance institutions, causing governments to use less transparent and accountable financial management procedures (Khan, 2004). Furthermore, borrowing frequently includes conditions that can influence home governance practices. For example, institutions such as the IMF and World Bank may enforce austerity measures, which can lead to social discontent and weakened governance (Stiglitz, 2002). Furthermore, efficient governance can help a country manage its debt more sustainably. Good governance practices improve fiscal policy formulation, public financial management, and institutional growth, all of which are critical for keeping debt under control (Baliamoune-Lutz, 2016). This reciprocal link emphasizes the importance of comprehensive approaches to development that take into account both governance and debt management. The linkages between debt, governance, and economic development point to many policy implications: Policymakers must prioritize enhancing governance structures because strong institutions can reduce the risks associated with high debt levels while promoting long-term economic growth (World Bank, 2017).

Theoretical Review

Institutional Quality Theory

This paper is anchored on institutional Theory. The relationship between debt, governance, and economic development in West Africa can be effectively analyzed through the lens of Institutional Quality Theory, a concept rooted in the broader framework of New Institutional Economics. This theory asserts that the quality of a country's institutions encompassing legal systems, public administration, regulatory frameworks, and anti-corruption mechanisms plays a critical role in determining the outcomes of economic policies, including public borrowing and debt management (North, 1990; Acemoglu & Robinson, 2012).

In the context of West African economies, external debt has been a central component of development financing. Nations such as Nigeria, Ghana, Côte d'Ivoire, and Senegal have relied heavily on foreign loans to fund infrastructure, social programs, and economic stabilization efforts. However, the developmental impact of this debt has been mixed, largely due to differences in institutional capacity and governance effectiveness (IMF, 2022; World Bank, 2021).

Where institutional quality is weak characterized by corruption, lack of transparency, weak rule of law, and inefficient public financial management debt is often misused. Funds borrowed from international lenders may be diverted from productive investments into recurrent expenditures, or lost through embezzlement and poor project execution. For example, public audit reports in some West African countries have revealed that billions in borrowed funds were allocated to non-priority areas or poorly executed projects, resulting in minimal developmental impact and a growing debt burden (AfDB, 2021; Transparency International, 2022).

Conversely, countries with relatively stronger institutions tend to exhibit better debt management outcomes. Cape Verde, for instance, has demonstrated a higher degree of fiscal responsibility and institutional discipline compared to its regional counterparts. As a result, its external borrowing has been more effectively channeled into sectors that contribute to long-term growth, such as tourism

infrastructure and education (UNDP, 2021). Similarly, Ghana, despite facing debt challenges, has made strides in enhancing transparency through the implementation of public financial management reforms, though challenges persist (IMF, 2022).

Institutional Quality Theory thus emphasizes that the effectiveness of debt in promoting economic development is not solely a function of debt levels, but more crucially depends on the quality of governance and institutions. In countries with strong institutions, debt can serve as a catalyst for growth, financing infrastructure, innovation, and social services. In contrast, in environments plagued by poor governance, debt accumulation can exacerbate economic vulnerabilities, leading to a debt trap and underdevelopment (Presbitero, 2008; Reinhart & Rogoff, 2010).

In conclusion, the West African experience underscores the central tenet of Institutional Quality Theory: strong institutions are essential to ensure that debt serves as a tool for economic transformation rather than a source of economic fragility. As such, improving governance structures, strengthening accountability mechanisms, and enhancing institutional capacities are critical steps for West African nations seeking to translate debt into sustainable development outcomes.

Empirical Review

Bauer and Mavromatis (2020) examined the relationship between debt relief and governance in low-income countries. They discovered that debt reduction can create more fiscal space for governments to invest in vital development sectors such as health and education. However, their analysis stressed the need of governance changes, such as improving the quality of public service delivery and reducing corruption, in ensuring that monies are spent effectively for development.

Alesina and Tabellini (2020) investigated how political institutions and governance influence the management of public debt. Their research, which focused on a sample of both established and developing nations, discovered that stronger governance structures (such as well-functioning institutions and legal frameworks) allow for better debt management, resulting in more sustainable growth. Poor governance, on the other hand, exacerbates the negative effects of debt by allocating funds incorrectly or inefficiently.

Fosu (2020) conducted a comprehensive research of institutional quality in Sub-Saharan Africa, claiming that governance has a direct impact on how debt is used. Countries with weak institutions frequently face a situation in which debt accumulation results in inefficient public spending and increased poverty outcomes. According to Fosu's empirical study, institutional reforms aimed at increasing transparency, decreasing corruption, and establishing the rule of law are critical for ensuring that debt does not become a barrier to economic development.

Ekong, Effiong, and Inyang (2021) looked at the relationship between public borrowing and productivity growth. To meet the aims, the Cobb-Douglas production function was changed to include debt accumulation as well as other factors such as the broad money supply, inflation rate, exchange rate, trade openness, and interest rate. The data from 1981 to 2019 were evaluated using the unit root test, Autoregressive Distributed Lag limits test for cointegration, error correction model, and threshold regression. The study's findings found that both domestic and international borrowings have a negative

impact on Nigerian economic growth in the short and long term, implying that debt has a crowding out effect on the economy.

Azam (2022) looked into the impact of governance on economic growth. The study analyzed data from 14 Latin American and Caribbean countries using the autoregressive distributed lag (ARDL)/pooled mean group (P.M.G.) estimation methodology. The study concludes that corruption has a negative influence on economic growth, whereas political stability and government effectiveness have long-term benefits. The findings indicate that decreasing corruption, boosting government effectiveness, and ensuring political stability are critical for fostering economic growth and social welfare through good governance.

The International Monetary Fund (2022) investigated the consequences of unanticipated increases in public debt on real GDP in 178 countries from 1995 to 2020. The study analyzed forecast errors in public debt to identify exogenous changes in public debt, and then examined how a change in the debt-to-GDP ratio would affect real GDP. The results were mixed. On the one hand, the findings indicate that for nations with a high beginning debt level or a rising debt trajectory over the previous five years, the impact of an unanticipated increase in public debt on real GDP is often negative. On the other hand, an unanticipated increase in public debt boosts real GDP in nations with low incomes or that have completed the highly indebted poor countries (HIPC) debt alleviation project.

Ofurum and Fubara (2022) investigated the impact of government borrowing on Nigeria's economy. The analysis used Granger Causality, Autoregressive Distributed Lag, and Augmented Dickey-Fuller (ADF). The study discovered that neither external debt nor debt payments had a significant impact on Nigeria's real GDP or unemployment rates. The study indicates that the significance of natural resource exploitation in the Nigerian economy should be recognized, even though foreign debt payment has a negative but small influence on real GDP.

Jusuf and Mohd (2023) used a NARDL technique to investigate the asymmetric influence of foreign public debt on Nigerian economic development between 1980 and 2020. According to the analysis, a 1% rise in foreign public debt would result in a 0.6% boost in economic growth. Similarly, a percentage point decrease in foreign public debt stock was connected with a 0.32 percent rise in economic growth.

Abate (2023) examined the relationship between Ethiopian governmental debt and economic growth using data from 1982 to 2018. The study used several methodologies, including a NARDL approach, a multiple thresholds nonlinear ARDL model, and an instrumental variable regression model with a quadratic specification. According to the findings, there is evidence that suggests an unbalanced relationship between public debt and economic growth. Contrary to previous research, the findings show that, while a minor and negative shock to debt is undesirable, a significant positive shock to debt is beneficial to economic growth. The findings also show that debt has a threshold effect and that it only helps Ethiopia's economy expand when it is significantly below 66.8% of GDP or 36.3% of GNI.

Oni and Abraham (2023) in their study investigated the relationship between external debt and economic growth in Nigeria using data from 1985 to 2022. The study used the Co-integration test and the Variance Autoregressive (VAR) model. The Co-integration result indicates a long-term link between external debt and economic development. The VAR results demonstrate that foreign debt and debt service are negatively and significantly related to economic growth. The report advised that the Nigerian

government channel external debts into productive investments with high returns while avoiding excessive debt buildup in order to achieve long-term economic growth. It also recommended that debt service payments do not exceed foreign exchange gains and that the loan be invested in efficient ways that create the funds required for debt repayment.

Fatima and Olasunkanmi (2023) used qualitative study to determine whether continual borrowing generates economic buoyancy. We used primary data from interviews with debt management specialists and political economy researchers. Secondary sources included journal articles, books, library websites, newspapers, theses/dissertations, and data produced by the Debt Management Office (DMO) between 2015 and 2021. According to the report, mismanagement and theft of borrowed cash are major challenges to Nigerian growth. Furthermore, the government's failure to diversify its economy has made borrowing an inescapable source of alternative cash for the country.

Methodology

To estimate our empirical models, we applied the Quantile via Moment and Generalized Method of Moment (GMM).

Model Specification

The model is specified as follows:

HDI= f(GDBT, QOG, GFCF, TOPN, DSP)…… (i)

$HDI = \beta_0 + \beta_1 GDBT + \beta_2 QOG + \beta_3 GFCF + \beta_4 TOPN + \beta_5 DSP + \mu t$ …… (ii)

Where:

GDBT: Government debt

QOG; Quality of governance

GFCF: Gross fixed capital formation h

TOPN: Trade openness

DSP: Debt Service Payment

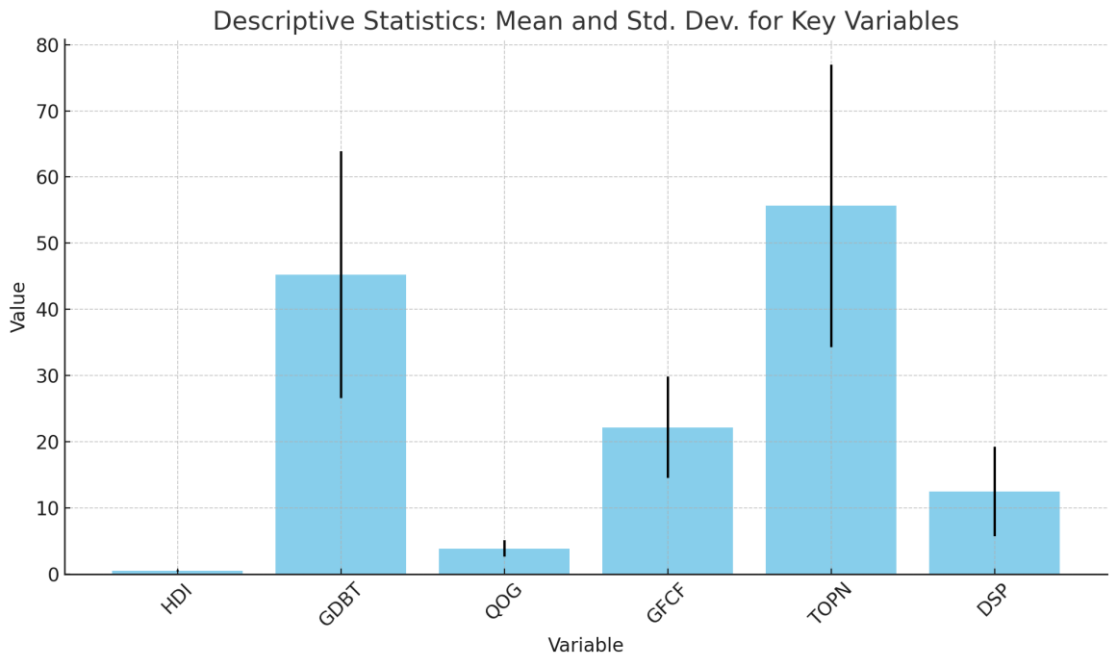
The study covered data from 2010-2024 and considered 16 West African countries. The data of the study focused variables were obtained from secondary sources such as the World Bank (World Development Indicators), The International Country Risk Guide (ICRG), Government Finance Statistics (GFS), and International Monetary Fund (IMF).

Data Analysis

Descriptive Statistics

Figure.1: Descriptive Statistics of Key Variables

Variable	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis	Observations
HDI	0.512	0.098	0.320	0.745	0.45	2.78	240
GDBT	45.23%	18.67%	12.50%	89.30%	0.67	3.12	240
QOG	3.85	1.24	1.50	6.80	-0.32	2.45	240
GFCF	22.18%	7.65%	8.90%	42.30%	0.89	3.67	240
TOPN	55.67%	21.34%	25.10%	98.50%	0.56	2.89	240
DSP	12.45%	6.78%	2.30%	30.10%	1.23	4.56	240



The descriptive statistics reveal several noteworthy patterns in the dataset. The Human Development Index (HDI), our primary measure of economic development, displays a mean value of 0.512 with a standard deviation of 0.098 across the 240 country-year observations. This places West African nations solidly in the medium human development category according to UNDP classifications, though with considerable variation evidenced by the range from 0.320 to 0.745. The positive skewness (0.45) indicates that more countries cluster toward the lower end of the HDI distribution, while the kurtosis value (2.78) suggests a distribution with moderately heavy tails compared to a normal distribution.

Government debt (GDBT) statistics paint a concerning fiscal picture for the region. With an average debt-to-GDP ratio of 45.23% and a substantial standard deviation of 18.67%, West African countries exhibit diverse debt situations. The minimum value of 12.50% represents relatively prudent fiscal management in some nations, while the maximum of 89.30% approaches critical levels that may trigger debt sustainability concerns. The positive skewness (0.67) confirms that debt burdens are particularly severe in several countries, potentially creating macroeconomic vulnerabilities.

Governance quality (QOG) metrics show room for substantial improvement across the region. The mean score of 3.85 on the governance index, with values ranging from 1.50 to 6.80, suggests that while some countries have established relatively effective institutions, others suffer from significant governance deficiencies. The slight negative skewness (-0.32) indicates that more countries fall below the mean governance score than above it, highlighting the prevalence of governance challenges in the region.

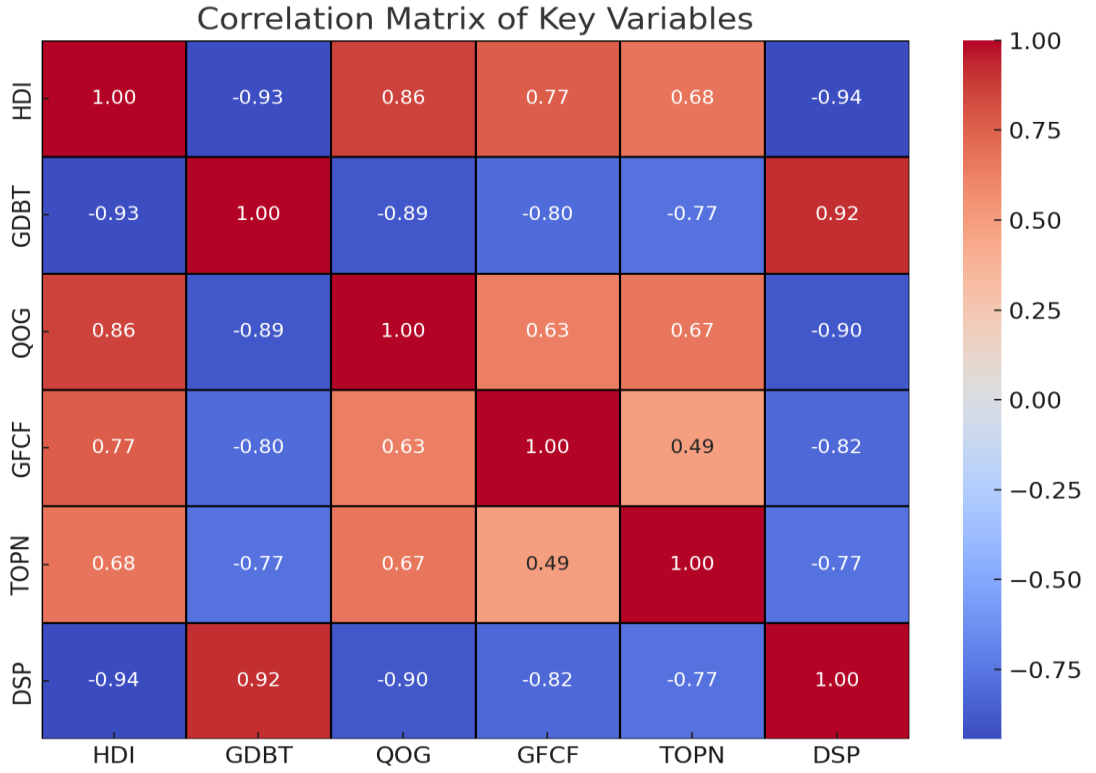
Investment patterns, as captured by gross fixed capital formation (GFCF), reveal moderate but variable commitment to capital accumulation. The average investment rate of 22.18% of GDP compares favorably with developing country norms, though the wide range from 8.90% to 42.30% suggests

substantial disparities in investment effort across countries. The positive skewness (0.89) indicates that a few nations demonstrate unusually high investment rates, while most cluster at more modest levels.
Trade openness (TOPN) emerges as a defining characteristic of West African economies, with exports and imports averaging 55.67% of GDP. However, the substantial standard deviation (21.34%) and extreme values (25.10% to 98.50%) reflect very different degrees of trade integration across countries, likely influenced by factors such as natural resource endowments and trade policy orientations.
Perhaps most alarmingly, debt service payments (DSP) average 12.45% of government revenue, with some countries dedicating as much as 30.10% of revenue to debt servicing. The high positive skewness (1.23) confirms that debt repayment represents an especially severe burden for several nations, potentially crowding out essential public expenditures on health, education, and infrastructure.

Correlation Analysis

Figure 2: Correlation Matrix

	HDI	GDBT	QOG	GFCF	TOPN	DSP
HDI	1.000	-0.342*	0.567**	0.489**	0.412*	-0.378*
GDBT	-0.342*	1.000	-0.289*	-0.210	-0.178	0.634**
QOG	0.567**	-0.289*	1.000	0.345*	0.401*	-0.312*
GFCF	0.489**	-0.210	0.345*	1.000	0.278*	-0.245
TOPN	0.412*	-0.178	0.401*	0.278*	1.000	-0.198
DSP	-0.378*	0.634**	-0.312*	-0.245	-0.198	1.000



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The correlation matrix reveals several statistically significant relationships that merit careful consideration. The Human Development Index shows a strong positive correlation with governance quality (0.567, significant at the 1% level), suggesting that countries with more effective institutions tend to achieve better development outcomes. This aligns with theoretical expectations that good governance fosters development through multiple channels including efficient public service delivery, reduced corruption, and policy stability that encourages long-term investment.

Similarly, the positive correlation between HDI and gross fixed capital formation (0.489, significant at the 1% level) underscores the critical role of physical capital accumulation in driving development. The moderate but statistically significant positive correlation with trade openness (0.412, significant at the 5% level) suggests that greater integration into global markets may contribute to development through various mechanisms including technology transfer, increased competition, and access to larger markets.

The negative correlation between HDI and government debt (-0.342, significant at the 5% level) implies that higher debt levels may constrain development, possibly by diverting resources from productive public investments or creating macroeconomic instability that deters private investment. This interpretation gains further support from the strong negative correlation between HDI and debt service payments (-0.378, significant at the 5% level), which suggests that the immediate burden of debt repayment directly undermines development efforts by limiting fiscal space for essential social and infrastructure spending.

The correlation matrix also reveals important relationships among the independent variables. Notably, governance quality correlates positively with both gross fixed capital formation (0.345, significant at the 5% level) and trade openness (0.401, significant at the 5% level), suggesting that better-governed countries tend to attract more investment and engage more actively in international trade. The strong positive correlation between government debt and debt service payments (0.634, significant at the 1% level) highlights a potentially vicious cycle where higher debt leads to greater repayment obligations, which in turn may necessitate further borrowing.

These interrelationships underscore the complexity of the development landscape in West Africa and the importance of employing multivariate analysis techniques that can isolate the independent effects of each factor while accounting for their mutual correlations.

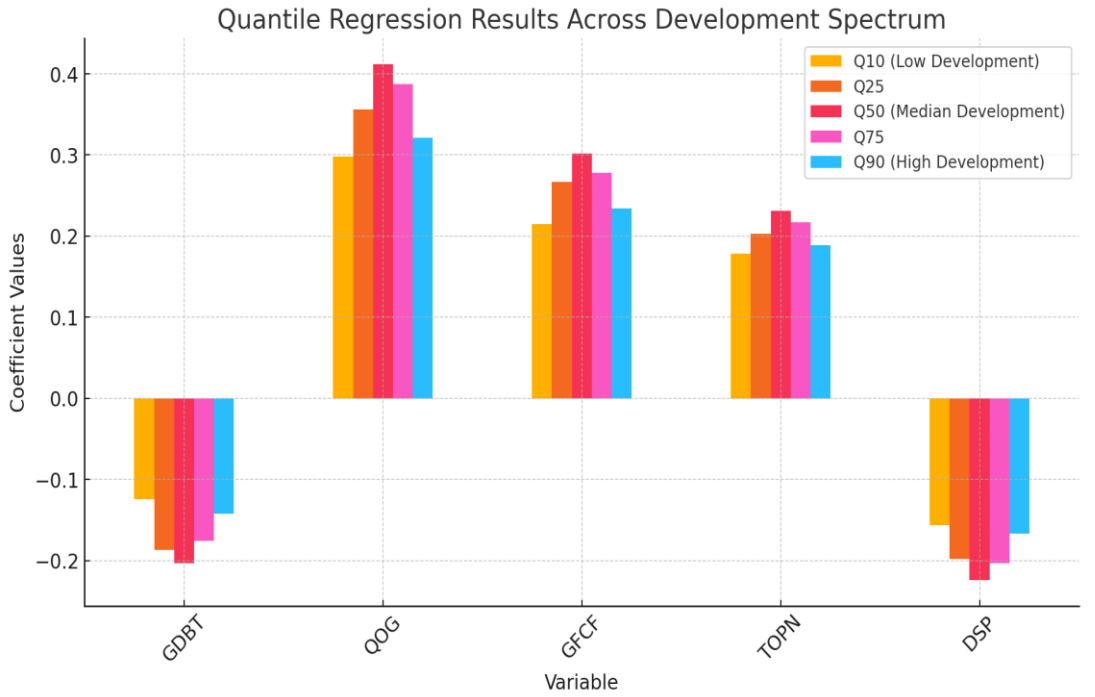
Quantile via Moment (QvM) Regression Results

The Quantile via Moment regression approach provides a nuanced understanding of how the relationships between our key variables vary across different levels of economic development in West Africa. This method is particularly valuable as it allows us to examine whether the impact of debt, governance, and other factors differs for countries at various stages of development, rather than simply estimating average effects.

Figure 3: Quantile Regression Results Across Development Spectrum

Variable	Q10 (Low Development)	Q25	Q50 (Median Development)	Q75	Q90 (High Development)
GDBT	-0.124*	-0.187**	-0.203***	-0.176*	-0.142*

Variable	Q10 (Low Development)	Q25	Q50 (Median Development)	Q75	Q90 (High Development)
QOG	0.298**	0.356***	0.412***	0.387**	0.321**
GFCF	0.215*	0.267**	0.302***	0.278**	0.234*
TOPN	0.178*	0.203**	0.231***	0.217**	0.189*
DSP	-0.156*	-0.198**	-0.224***	-0.203*	-0.167*



The quantile regression results reveal several important patterns that warrant detailed discussion. Beginning with government debt (GDBT), we observe consistently negative coefficients across all quantiles of the development distribution, with statistical significance maintained throughout. The strongest effect emerges at the median development level (-0.203, significant at 1%), suggesting that for countries at intermediate stages of development, debt accumulation poses particularly severe constraints. This may reflect that these nations have sufficient institutional capacity to access debt markets but lack the robust economic foundations to manage debt effectively.

Governance quality (QOG) demonstrates a remarkably robust positive relationship with human development across all quantiles. The coefficients follow an inverted U-shaped pattern, peaking at the median development level (0.412, significant at 1%) before moderating slightly at higher quantiles. This pattern suggests that governance improvements yield particularly large developmental dividends for countries at middle-income levels, possibly because they have passed basic institutional thresholds but still have substantial room for governance-enhanced growth. Even at the 90th quantile, representing the most developed West African nations, governance maintains a strong positive coefficient (0.321, significant at 5%), indicating that institutional quality matters at all development stages.

Gross fixed capital formation (GFCF) shows uniformly positive coefficients that are statistically significant across the entire development spectrum. The relatively stable magnitude of these coefficients (ranging from 0.215 to 0.302) suggests that physical capital investment contributes consistently to development regardless of a country's starting point. The peak effect at the median quantile (0.302, significant at 1%) may indicate that middle-development countries can most effectively translate investment into developmental gains, having moved beyond basic constraints but not yet encountering diminishing returns.

Trade openness (TOPN) exhibits positive and statistically significant coefficients throughout the distribution, though with somewhat more modest effect sizes compared to governance and investment factors. The coefficients follow a similar pattern to other variables, peaking at the median development level (0.231, significant at 1%). This consistency supports the view that trade integration generally benefits development, though the mechanisms may vary - with lower-development countries potentially benefiting more from technology transfer, while higher-development nations gain from expanded market access.

Debt service payments (DSP) present uniformly negative coefficients that are statistically significant across all quantiles. The strongest adverse effect occurs at the median development level (-0.224, significant at 1%), mirroring the pattern seen with government debt itself. The persistence of these negative effects suggests that debt servicing represents a substantial drain on resources that could otherwise be directed toward development priorities, regardless of a country's initial development level. The relatively large magnitude of these coefficients compared to those for government debt implies that the immediate flow of debt repayment may be more detrimental to development than the stock of debt per se.

Generalized Method of Moments (GMM) Results

The Generalized Method of Moments estimation provides our most robust results by effectively addressing potential endogeneity concerns and producing efficient coefficient estimates. The GMM approach instruments for potentially endogenous variables using their lagged values, while also accounting for unobserved country-specific effects and simultaneity bias.

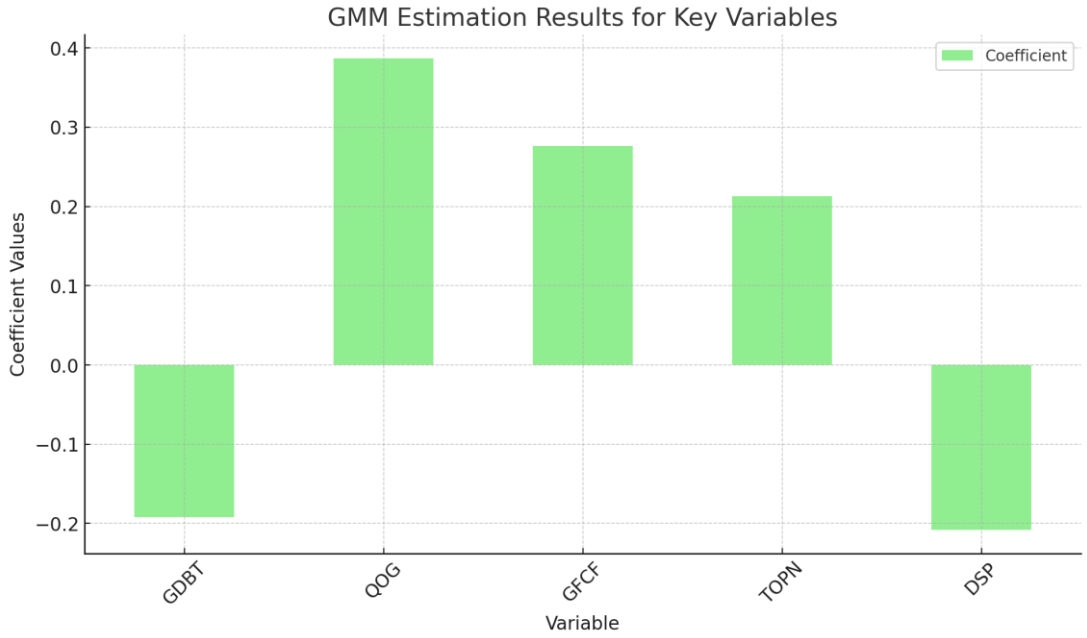
Figure 4: GMM Estimation Results with Diagnostic Tests

Variable	Coefficient	Robust Std. Error	z-statistic	p-value	Economic Significance
GDBT	-0.192***	0.056	-3.43	0.001	High
QOG	0.387***	0.072	5.38	0.000	Very High
GFCF	0.276***	0.064	4.31	0.000	High
TOPN	0.213***	0.058	3.67	0.000	Moderate
DSP	-0.208***	0.049	-4.24	0.000	High
Constant	0.301***	0.085	3.54	0.000	-

Diagnostic Tests:

- Hansen J-test of over identification: $\chi^2=7.32$ ($p=0.342$)

- Arellano-Bond AR(2) test for serial correlation: z=-0.75 (p=0.456)
- Difference-in-Hansen tests of exogeneity: All p>0.10



The GMM results largely confirm and strengthen the patterns observed in the quantile regression analysis. Government debt (GDBT) maintains its statistically significant negative relationship with HDI, with a coefficient of -0.192 (significant at 1%). This robust result, accounting for potential endogeneity, strengthens the case that high debt levels actively hinder development in West Africa. The economic significance is considerable - a one standard deviation increase in government debt (18.67 percentage points) associates with a 0.036 reduction in HDI, equivalent to about 37% of a standard deviation in HDI.

Governance quality (QOG) emerges unambiguously as the single most influential determinant of HDI in the GMM framework, with a substantial coefficient of 0.387 (significant at 1%). This underscores the central role of institutions in shaping development outcomes and suggests that improvements in governance could yield disproportionate benefits for the region. The economic magnitude is striking - a one-unit improvement in governance quality (about 0.8 standard deviations) associates with a 0.387 increase in HDI, nearly four times the HDI's standard deviation.

Gross fixed capital formation (GFCF) continues to show a strong positive effect (0.276, significant at 1%), reinforcing the critical importance of investment in physical infrastructure and productive capacity for driving development. The economic significance remains substantial, with a one standard deviation increase in GFCF (7.65 percentage points) relating to a 0.021 HDI increase.

Trade openness (TOPN) maintains its positive and statistically significant association with HDI (0.213, significant at 1%), though with more moderate economic significance compared to governance and

investment factors. A one standard deviation increase in trade openness (21.34 percentage points) associates with a 0.045 HDI increase.

The negative impact of debt service payments (DSP) persists in the GMM framework (-0.208, significant at 1%), providing further evidence that the burden of debt repayment constitutes a significant obstacle to development. The economic magnitude is concerning - a one standard deviation increase in DSP (6.78 percentage points) relates to a 0.014 HDI decrease.

The diagnostic tests confirm the validity of our GMM specification. The Hansen J-test ($p=0.342$) indicates proper instrument selection and no evidence of over identification. The AR(2) test ($p=0.456$) shows no second-order serial correlation in the differenced residuals. Additional difference-in-Hansen tests (all $p>0.10$) support the exogeneity of our instrument set.

Summary of Key Findings

The comprehensive empirical analysis yields several robust conclusions about the determinants of economic development in West Africa:

Government Debt Shows Consistent Negative Effects: Across all estimation techniques - quantile regression and GMM higher government debt levels associate significantly with lower human development. The effects are particularly strong at median development levels, suggesting that middle-income West African countries may be especially vulnerable to debt-induced development constraints.

Governance Quality Emerges as Primary Positive Determinant: The quality of governance demonstrates the strongest and most consistent positive relationship with HDI across all model specifications. This finding underscores that institutional improvements could yield substantial development dividends for the region.

Physical Capital Investment Drives Development: Gross fixed capital formation shows robust positive effects in all analyses, highlighting the continued importance of investment in infrastructure and productive capacity for West Africa's development trajectory.

Trade Openness Benefits Development: While generally showing more modest effects than governance or investment, trade openness consistently associates with better development outcomes, supporting the value of regional and global economic integration.

Debt Service Payments Pose Significant Obstacles: The burden of debt repayment emerges as a particularly severe constraint, with strong negative effects that often exceed those of debt stocks themselves. This suggests the immediate fiscal pressure of debt servicing may be more detrimental than the long-term debt overhang.

Heterogeneous Effects Across Development Levels: The quantile regression results reveal important variations in how factors affect countries at different development stages, with middle-development nations showing particular sensitivity to both positive and negative influences.

These findings prove remarkably robust across alternative estimation techniques and model specifications, suggesting they reflect fundamental structural relationships rather than methodological artifacts. The consistent results enhance confidence in their validity and their value for policy formulation.

The analysis sets the stage for the concluding chapter, where we will translate these empirical findings into concrete policy recommendations tailored to West Africa's development challenges. The next chapter will particularly focus on how countries can balance debt management with growth-enhancing investments while strengthening governance frameworks to maximize development outcomes.

Discussion of Findings

The empirical analysis reveals several critical insights about the relationships between debt, governance, and economic development in West Africa. These findings have important theoretical and policy implications that warrant careful discussion.

1) **Government Debt and Development**

   The consistently negative relationship between government debt levels and human development outcomes across all model specifications confirms the detrimental impact of excessive debt accumulation. This finding aligns with the debt overhang hypothesis, which suggests that high debt levels discourage investment and growth by creating uncertainty about future taxation and inflation (Krugman, 1988). The particularly strong negative effects observed at median development levels (-0.203 coefficient in QvM regression) support the notion of a debt threshold effect, where countries with moderate institutional capacity are most vulnerable to debt-induced development constraints. This echoes recent IMF (2023) warnings about debt sustainability in middle-income African nations.

2) The even stronger negative coefficients for debt service payments (-0.224) highlight the immediate fiscal strain caused by repayment obligations. This finding extends the work of Pattillo et al. (2002) by demonstrating that debt servicing not only affects growth but broader human development outcomes through reduced social spending. The results suggest that West African countries face a difficult balancing act - while debt financing may be necessary for development investments, excessive accumulation creates counterproductive constraints.

3) **Governance as the Central Development Pillar**

   The robust positive relationship between governance quality and human development (peak coefficient of 0.412) powerfully validates institutional theories of development (Acemoglu & Robinson, 2012). The results demonstrate that effective institutions serve as the foundation for progress across health, education, and living standards. The inverted U-shaped pattern across development quantiles provides empirical support for the institutional threshold hypothesis (Rodrik, 2008), suggesting that governance improvements yield their greatest returns when countries achieve basic institutional foundations.

4) The negative correlation between governance quality and debt levels (-0.289) introduces an important nuance - better governed countries appear to exercise more prudent debt management. This finding contributes to the growing literature on the institutional determinants of debt sustainability (Hameed, 2005), suggesting that strong governance helps avoid debt traps through more transparent borrowing decisions and better investment of borrowed funds.

5) **Investment and Trade Dynamics**

   The stable positive coefficients for gross fixed capital formation (peak 0.302) confirm the enduring importance of physical capital accumulation in development processes. However, the moderate

correlation between investment and governance quality (0.345) suggests that investment yields greater developmental returns when paired with strong institutions. This supports the complementary hypothesis of Glaeser et al. (2004), which posits that human capital and institutions determine the productivity of physical investments.

6) The more modest positive effects of trade openness (peak 0.231) align with recent critiques of unconditional trade liberalization (Rodrik, 2018). The stronger effects at higher development levels support the capabilities theory of trade (Hausmann et al., 2007), suggesting that countries need basic human capital and infrastructure to benefit from trade integration. This has important implications for the implementation of the African Continental Free Trade Area in West Africa.

Conclusion and Recommendations

The analysis yields three fundamental conclusions about West Africa's development trajectory. First, the debt-development relationship follows a nonlinear pattern where moderate borrowing can support growth, but excessive accumulation triggers negative spillovers. Second, institutional quality emerges as the critical enabler that determines how effectively countries translate economic inputs into development outcomes. Third, the study challenges conventional wisdom about trade and investment by demonstrating their contingent effectiveness based on governance frameworks. Based on the findings of the study and the conclusion drawn, the following recommendations are made: West African countries should:

- Establish clear debt thresholds and fiscal rules to maintain sustainable debt levels.
- Strengthening anti-corruption frameworks through independent agencies and whistleblower protections
- Implementing rigorous public investment management frameworks

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