



PUBLIC INVESTMENT AND BALANCE OF PAYMENT EQUILIBRIUM IN WEST AFRICA: A PANEL GMM MODELLING

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Abstract

This study examines the impact of disaggregated public investment on balance of payments equilibrium in West Africa, with particular emphasis on public investment in electricity infrastructure, road infrastructure, health facilities, and education. The motivation for the study arises from the persistent balance of payments deficits observed in many West African economies, alongside increasing government expenditure on infrastructure and human capital development. The study adopts a quantitative research design, utilizing panel data for selected West African countries with a particular focus on the member states of the Economic Community of West African States which are Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo. over the period 2010 to 2025. Data were sourced primarily from the World Bank's World Development Indicators. The analysis employs the System Generalized Method of Moments (GMM) estimation technique using E-view10 software package in order to address issues of endogeneity, dynamic persistence, and unobserved heterogeneity. The findings reveal that public investment exerts varying effects on balance of payments equilibrium depending on the sector. Specifically, public investment in road infrastructure has a negative and statistically significant effect, indicating that it worsens the balance of payments in the short run, likely due to its import-intensive nature. In contrast, public investment in electricity infrastructure, health facilities, and education all exhibit positive but statistically insignificant effects, suggesting that their contributions to the external sector may be indirect or long-term. The lagged balance of payments variable is also positive but statistically insignificant, indicating weak persistence in external sector performance. Based on these findings, the study concludes that the effectiveness of public investment in improving balance of payments equilibrium depends largely on the sectorial composition of investment rather than its aggregate level. It is therefore recommended that policymakers prioritize investments that enhance domestic productive capacity and reduce import dependence. In addition, governments should promote local content in infrastructure development, strengthen complementary industrial and export-oriented policies, and improve the efficiency of public investment in health and education to ensure long-term external sector gains.

Keywords: Public Investment in education, road Infrastructure, electricity, health facility, balance of payment equilibrium

1 INTRODUCTION

The persistent disequilibrium in the balance of payments remains one of the most formidable macroeconomic challenges confronting West African economies. Despite decades of policy reforms, substantial public investment, and various stabilization programmes, recurrent balance of payments deficits continue to constrain foreign exchange reserves, undermine currency stability, and stifle the region's growth potential (ADB, 2020). The theoretical intuition underpinning public investment as a solution to external sector challenges is compelling:



strategic capital expenditure in productive sectors should enhance competitiveness, boost exports, and reduce dependence on imports. This study is motivated by the urgent need to unravel this paradox, moving beyond aggregate analyses to investigate the nuanced, sector-specific, and institutionally contingent relationship between public investment and balance of payments equilibrium in West Africa.

The limitations of treating public investment as a monolithic aggregate have been powerfully demonstrated in the Nigerian context by Saleh et al., (2024). Their study disaggregates Nigerian government capital expenditure into functional components administration, economic services, social and community services, and transfers and yields revelatory findings. They discover that while aggregate public expenditure appears neutral in its effect on the balance of payments, this apparent neutrality masks significant underlying dynamics. Specifically, capital expenditure on social and community services exerts a statistically significant negative impact on Nigeria's external balance, plausibly linked to the import-intensive nature of such investments, which often require sophisticated machinery and technology not readily available domestically. While groundbreaking, the Saleh et al. (2024) study is inherently limited by its single-country focus, raising a critical regional question: Are these sectoral effects idiosyncratic to Nigeria, or do they reflect broader West African patterns?

The imperative for robust public investment in West Africa stems from the region's substantial infrastructure deficits, which impede private sector development and constrain regional integration efforts. Public investment is also expected to enhance infrastructure development, improve the investment climate, and strengthen regional integration, all of which are critical for expanding productive capacity and external sector performance in developing economies (Yen & Ndolembaye, 2025). According to the African Development Bank (2022), Nigeria's infrastructure gap alone is projected to reach approximately \$3 trillion over the next three decades, a figure that underscores the magnitude of investment required to catalyze structural transformation. Similarly, other West African economies face significant infrastructure challenges across power generation, transportation networks, water supply systems, and telecommunications infrastructure, all of which directly affect productive capacity and export competitiveness. Public investment in infrastructure constitutes a key driver of economic growth by enhancing productive capacity across sectors such as transportation, energy, education, and technology (Ota & Ezeali, 2021).

The Economic Community of West African States (ECOWAS) has consistently prioritized infrastructure development as a pathway to deeper regional integration, recognizing that improved connectivity and reduced transaction costs are essential for expanding intra-regional trade and enhancing the region's participation in global value chains (ADB, 2020). However, the mobilization of adequate financial resources for infrastructure development remains constrained by limited fiscal space, underdeveloped capital markets, and competing developmental priorities.



The specific objectives of this study therefore are to: examine the impact of public investment in electricity on balance of payment; analyze the effect of public investment in good roads on balance of payment; examine the impact of Public Investment in Education on balance of payment and investigate the impact of public investment in health care facilities on balance of payment in West Africa countries.

2 LITERATURE REVIEW

2.1 Theoretical Framework

This study is anchored on the Absorption Approach to the balance of payments developed by Sidney S. Alexander (1952), which provides the most direct theoretical explanation of how domestic economic activity influences external equilibrium. The Absorption Approach posits that a country's balance of payments position depends on the relationship between national output and total domestic expenditure (absorption), emphasizing that external imbalance arises when an economy spends more than it produces. The theory therefore shifts analytical focus from price and exchange rate mechanisms to income expenditure dynamics, making it particularly suitable for examining the external sector implications of government spending and public investment.

Specifically, the Absorption Approach (Alexander, 1952) provides the most direct theoretical basis for model derivation because it expresses the external balance as:

$$B = Y - A \quad (2.1)$$

where the balance of payments (or trade balance) depends on national output (Y) and domestic absorption (A). Public investment enters this framework as a component that simultaneously affects output (through productivity and capacity expansion) and absorption (through government expenditure). The Keynesian theory further justifies modeling public investment as a determinant of income and net exports (Keynes, 1936; Ramey, 2021), while the Intertemporal Approach implies that public investment influences the external balance through the saving–investment gap (Obstfeld & Rogoff, 1994).

2.2 Review of Empirical Studies

Kamara et al. (2025), studied *Macroeconomic Determinants of the Balance of Payments in Sierra Leone*, utilized the Autoregressive Distributed Lag (ARDL) bounds testing technique on annual time series data. The empirical evidence established the presence of a stable long-run association among the variables, indicating that real GDP contributes positively and significantly to balance of payments performance. In contrast, foreign direct investment, the exchange rate, and the real interest rate were found to exert statistically significant adverse effects, suggesting that the structure of capital inflows and macro-financial conditions may constrain external sector stability.



Yen and Ndolembaye (2025), in their study titled *Public Investment and Inclusive Growth in Sub-Saharan Africa*. They investigated the effects of public investment on inclusive growth across 21 Sub-Saharan African countries over the period 2000-2020. The study adopted a panel econometric approach. The empirical results indicated that public investment has a significant negative effect on the inclusive growth index and productive employment, while showing no statistically significant impact on poverty reduction. These findings suggest that, despite increased public investment in the region, the benefits have not been broadly distributed, reflecting inefficiencies in investment allocation and weak transmission mechanisms to inclusive development outcomes.

Saleh et al. (2024), in their study titled *Disaggregated Government Capital Expenditure and the Balance of Payments in Nigeria*, adopted an ex-post facto design and applied the Autoregressive Distributed Lag (ARDL) framework with an error correction mechanism. The results confirmed a long-run equilibrium linkage between capital expenditure components and the balance of payments. Empirical estimates showed that spending on government administration and economic services produced positive but statistically weak effects, while social and community services expenditure exerted a significant negative influence, reflecting its high import dependence. Transfer expenditure displayed a positive yet insignificant relationship, suggesting limited external sector transmission. Overall, the findings indicate that the balance of payments response to public capital spending is largely long-term and shaped by the composition and efficiency of investment allocation.

Abille and Meçik (2024), carried out a research on *Macroeconomic Determinants of Current Account Balance in Selected African Countries*, employed the Autoregressive Distributed Lag (ARDL) methodology. Their findings indicate that the real exchange rate exerts a modest but statistically significant negative effect on the current account, particularly within CFA franc countries, while trade openness contributes positively under supportive structural conditions. Broad money supply was found to have a strong negative influence, consistent with monetary imbalance dynamics, whereas domestic income showed a positive and significant association with the current account. Additionally, the results highlight that the effects of trade and industrial activity are conditioned by financial development and governance quality, with stronger institutions enhancing external balance performance.

Adelegan and Abraham (2022), in their study titled *Determinants of the Balance of Payments in Nigeria*, applied the Autoregressive Distributed Lag (ARDL) technique with an Error Correction Mechanism. The results established a stable long-run relationship among the variables, showing that real GDP growth and foreign direct investment exert positive and statistically significant effects on the balance of payments, while the exchange rate displays a significant negative influence. Interest rate effects were positive but weak, whereas crude oil prices contributed strongly and positively to external balance performance. Overall, the findings suggest that output



expansion, capital inflows, and oil revenue remain central drivers of Nigeria's balance of payments dynamics.

Despite the expanding empirical literature on balance of payments dynamics in West Africa, a significant methodological gap remains regarding the role of disaggregated public investment in shaping external sector equilibrium. Existing studies such as Kamara et al., (2025) analyze macroeconomic determinants of the balance of payments using ARDL techniques with variables like exchange rate, foreign direct investment, interest rate, and GDP growth, while Saleh et al., (2024) examine disaggregated government capital expenditure in Nigeria using a time-series ARDL framework. Similarly, Roberts et al., (2020) employ a Dynamic Computable General Equilibrium model to simulate the sectoral effects of public expenditure in The Gambia. Although these studies provide important insights, they are largely country-specific and rely on methodologies that do not adequately address cross-country heterogeneity, endogeneity, and dynamic feedback effects between public investment and external balance.

3 METHODOLOGY

3.1 Model Specification

This study's model specification is grounded in the Absorption Approach to the balance of payments developed by Sidney S. Alexander (1952), which posits that a country's external balance depends on the relationship between national output and domestic absorption. Since public investment constitutes a major component of government expenditure and influences productive capacity, the theory provides a direct basis for modeling balance of payments equilibrium as a function of public capital formation. Accordingly, the functional relationship is expressed as:

$$BOP = f(\text{Public Investment}) \quad (1)$$

In line with the objectives of this study, public investment is disaggregated into sector-specific components investment in good road infrastructure, electricity, and health facilities to capture their differential effects on the external sector. The functional model is therefore specified in panel form as:

$$BOP_{it} = \beta_0 + \beta_1 PIE_{it} + \beta_2 PIR_{it} + \beta_3 PIH_{it} + \beta_4 PED_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

where:

- BOP_{it}** = Balance of payments of country *i* at time *t*
- PIE_{it}** = Public investment in electricity infrastructure
- PIR_{it}** = Public investment in road infrastructure
- PIH_{it}** = Public investment in health facilities
- PED_{it}** = Public investment in education
- μ_i** = Unobserved country-specific effects
- ε_{it}** = Idiosyncratic error term

The apriori expectation for all the explanatory variables i.e PIE, PIR,PIH,& PED are > 0
However, balance of payments adjustment is inherently dynamic, as external imbalances tend to persist over time due to structural rigidities and financing constraints. To capture this persistence and the gradual adjustment process, a lagged dependent variable is incorporated into the model, yielding the dynamic specification:

$$BOP_{it} = \beta_0 + \beta_1 BOP_{it-1} + \beta_2 PIE_{it} + \beta_3 PIR_{it} + \beta_4 PIH_{it} + \beta_5 PED + \mu_i + \varepsilon_{it} \quad (3)$$

3.2 Estimation Techniques

The dynamic structural model is estimated using the System Generalized Method of Moments (System GMM) estimator developed by Manuel Arellano and Olympia Bover (1995) and extended by Richard Blundell and Stephen Bond (1998). This estimator is appropriate given the dynamic nature of the model, the potential endogeneity of regressors, and the presence of unobserved country-specific effects. System GMM improves efficiency by jointly estimating equations in levels and in first differences, using lagged values of the variables as instruments.

4. RESULTS AND DISCUSSIONS

4.1 Unit Root Test

Table 1: Unit Root Tests

Variables	ADF-Fisher Chi-square		PP-Fisher Chi-square		Order of Integration
	T-statistic	P- Value	T-statistic	P- Value	
BOP	70.3579	0.0001	147.989	0.0000	I(1)
PIE	47.2283	0.0404	124.125	0.0000	I(0)
PIH	46.6549	0.0455	94.4529	0.0000	I(1)
PIR	54.2271	0.0010	40.2038	0.0373	I(0)
PED	72.0582	0.0000	190.896	0.0000	I(1)

Source: Authors Computation Using Eviews10

Table 1 presents the results of the panel unit root tests using the ADF-Fisher Chi-square and Phillips-Perron (PP) Fisher Chi-square approaches. These tests are conducted to determine the stationarity properties of the variables and to ensure that the model does not suffer from spurious regression problems.

The results show that the variables are integrated at mixed orders. Specifically, BOP is integrated of order one, I(1), as indicated in the table. PIE is stationary at level and is therefore integrated of order zero, I(0). PIH is integrated of order one, I(1), while PIR is stationary at level and is therefore I(0). PED is also integrated of order one, I(1).



This means that the variables do not all become stationary after first differencing, as some are already stationary at level. In particular, PIE and PIR are level-stationary variables, whereas BOP, PIH, and PED require first differencing to attain stationarity. The implication is that the dataset contains a combination of $I(0)$ and $I(1)$ variables.

The presence of this mixed order of integration does not invalidate the analysis. Rather, it suggests that the variables are suitable for further long-run analysis, especially where no variable is integrated of order two, $I(2)$. Thus, the unit root results justify proceeding to the panel cointegration analysis in order to examine whether a stable long-run relationship exists among balance of payments and the sector-specific public investment variables, including public investment in education.

Table 2: Cointegration Tests

Pedroni Panel Cointegration Test			
Test Statistic	Statistic	Probability	Decision
Panel PP-statistic	-4.101763	0.0000	Cointegration
Panel ADF-statistic	-3.732861	0.0001	Cointegration
Group PP-statistic	-2.050066	0.0202	Cointegration
Group ADF-statistic	-2.355169	0.0093	Cointegration
Kao Residual Cointegration Test			
Kao ADF t-statistic	-1.485942	0.0686	Cointegration

Source: Authors Computation Using Eviews10

Table 2 reports the results of the Pedroni panel cointegration test and the Kao residual cointegration test, which are used to determine whether a long-run equilibrium relationship exists among the variables in the model.

The Pedroni test results indicate evidence of cointegration. The panel PP-statistic of -4.101763 with a probability value of 0.0000 is statistically significant. Similarly, the panel ADF-statistic of -3.732861 with a probability value of 0.0001 is also significant. In the same vein, the group PP-statistic of -2.050066 with a probability value of 0.0202 and the group ADF-statistic of -2.355169 with a probability value of 0.0093 are both statistically significant. These results consistently reject the null hypothesis of no cointegration under the Pedroni framework.

The Kao residual cointegration test reports an ADF t-statistic of -1.485942 with a probability value of approximately 0.0686. This result is not statistically significant at the 5 percent level, although it may be regarded as weakly significant at the 10 percent level. Accordingly, the strongest evidence of cointegration comes from the Pedroni test results.

Overall, the cointegration results suggest that balance of payments, public investment in electricity, road infrastructure, health facilities, and education move together in the long run. This implies that, although short-run deviations may occur, the variables exhibit a tendency to



converge toward a long-run equilibrium relationship over time. The presence of cointegration therefore supports the use of a dynamic estimation technique such as the Generalized Method of Moments (GMM) to estimate the long-run and short-run effects of sector-specific public investment on balance of payments equilibrium in West Africa.

Table 3: Model Diagnostics

Diagnostic Test	Statistic	Prob.
AR(1)	NA	NA
AR(2)	-0.230042	0.8181
J-statistic	9.223494	0.323795
Instrument rank	13	-

Source: Authors Computation Using Eviews10

Table 4.3 presents the diagnostic tests used to assess the validity and reliability of the dynamic panel GMM estimation. The key diagnostics reported are the Arellano-Bond test for serial correlation, the J-statistic for instrument validity, and the instrument rank.

The result for AR(2) shows a statistic of -0.230042 with a probability value of 0.8181. Since this probability value is greater than 0.05, the null hypothesis of no second-order serial correlation cannot be rejected. This indicates that the differenced residuals do not suffer from second-order serial correlation, which supports the appropriateness of the GMM specification. The AR(1) result is reported as NA, so no interpretation should be attached to it from this table.

The J-statistic of 9.223494 with a probability value of 0.323795 indicates that the null hypothesis of valid instruments cannot be rejected. This suggests that the instruments used in the GMM estimation are valid and that the model does not suffer from the problem of over-identifying restrictions.

Note that we made use of nineteen (19) West Africa countries with a period of 16 years therefore (N*T) is (19 * 16). The instrument rank of 13 further indicates that the instrument set is adequate for the estimation. Overall, the diagnostic results confirm that the dynamic panel GMM model is statistically reliable and suitable for examining the impact of public investment variables, including PED, on balance of payments equilibrium in West Africa.

Table 4: Panel GMM Estimation Result

Variable	Coefficient	Std.Error	t-statistic	Prob.
BOP(-1)	0.181999	0.110258	1.650667	0.1012
PIE	0.158256	0.154421	1.024837	0.3073
PIR	-0.561269	0.129237	-4.342952	0.0000
PIH	0.051594	0.471904	0.109331	0.9131
PED	0.287033	0.671733	0.427301	0.6699



Source: Authors Computation Using Eviews10

Table 4.4 presents the results of the dynamic panel estimation using the Generalized Method of Moments (GMM) to examine the impact of public investment in electricity, roads, health facilities, and education on balance of payments equilibrium in West Africa. The dynamic specification allows the model to capture persistence in balance of payments performance as well as the short-run effects of the explanatory variables.

The coefficient of the lagged dependent variable, $BOP(-1)$, is 0.181999 with a probability value of 0.1012. The positive coefficient suggests that past balance of payments performance exerts a positive influence on current balance of payments outcomes, indicating some degree of persistence in external sector behavior. However, the variable is not statistically significant at the 5 percent level, implying that this persistence is not strong enough to be regarded as statistically reliable within the sample period.

Public investment in electricity infrastructure (PIE) has a coefficient of 0.158256 and a probability value of 0.3073. This indicates a positive relationship between electricity investment and balance of payments equilibrium, suggesting that improvements in electricity infrastructure may enhance productive capacity, support domestic output, and improve export competitiveness. However, the effect is statistically insignificant, meaning that the study does not find sufficient evidence that electricity investment exerts a significant short-run effect on the balance of payments.

Public investment in road infrastructure (PIR) records a coefficient of -0.561269 with a probability value of 0.0000. This shows that road investment has a negative and statistically significant effect on balance of payments equilibrium in West Africa. The implication is that an increase in road infrastructure investment tends to worsen the balance of payments in the short run. This may be due to the import-intensive nature of road construction, which often requires imported machinery, equipment, and materials, thereby increasing import expenditure and exerting pressure on the external balance.

Public investment in health facilities (PIH) has a coefficient of 0.051594 with a probability value of 0.9131. Although the coefficient is positive, it is highly statistically insignificant. This implies that health investment does not exert a measurable short-run effect on balance of payments equilibrium during the study period. While health infrastructure may improve labor productivity and human capital over time, such benefits do not appear to translate into immediate external sector gains within the model.

Public investment in education (PED) has a coefficient of 0.287033 and a probability value of 0.6699. This indicates a positive but statistically insignificant relationship between education investment and balance of payments equilibrium. The positive sign suggests that education



spending may contribute to improving human capital, workforce quality, and long-run export competitiveness. However, the lack of statistical significance implies that the effect is not strong enough to conclude that public investment in education has a significant short-run impact on the balance of payments in West Africa.

Overall, the GMM estimation results show that the effects of public investment on balance of payments equilibrium differ by sector. Electricity, health, and education investments all display positive but statistically insignificant coefficients, while road infrastructure investment exerts a negative and statistically significant effect. This suggests that the external sector consequences of public investment depend strongly on the sectoral composition of spending and the import content of the investment category.

4.5 Discussion of Findings

The findings of this study reveal that the effect of public investment on balance of payments equilibrium in West Africa is sector-specific rather than uniform, thereby supporting the argument that the composition of public expenditure matters more than its aggregate size. The dynamic panel GMM results show that public investment in electricity, health facilities, and education exert positive but statistically insignificant effects on the balance of payments, whereas public investment in road infrastructure exerts a negative and statistically significant effect. These outcomes suggest that while some forms of public investment possess the potential to enhance productive capacity and improve external sector performance, their short-run impact depends largely on the import content, efficiency, and structural characteristics of the investment category.

The result for public investment in electricity infrastructure indicates a positive but statistically insignificant relationship with balance of payments equilibrium in West Africa. This suggests that increased investment in electricity infrastructure may contribute to improving productive capacity, industrial efficiency, and export competitiveness, although the effect does not appear sufficiently strong in the short run to significantly alter external sector performance. The finding is consistent with the theoretical expectation of the Absorption Approach, which posits that public investment can improve external balance when it expands productive output more rapidly than domestic absorption. However, the insignificance of the coefficient implies that the productivity gains associated with electricity investment may require longer periods before translating into measurable improvements in export earnings and reductions in import dependence.

This finding aligns with the study of Ota and Ezeali (2021), who found that investments in power infrastructure positively influenced economic growth in Nigeria, although the effectiveness of such investments depended heavily on implementation efficiency and sectoral allocation. The result is also indirectly supported by Adelegan and Abraham (2022), whose findings suggest that



improvements in productive capacity and output growth contribute positively to balance of payments performance. The positive coefficient obtained in this study therefore suggests that electricity infrastructure investment may strengthen productive activities capable of improving external balance over time, even though such effects remain statistically weak within the sample period. A plausible explanation for this outcome is that electricity infrastructure projects in West Africa are often characterized by long gestation periods, financing constraints, and operational inefficiencies that delay their contribution to export expansion and industrial competitiveness.

The result for public investment in road infrastructure reveals a negative and statistically significant effect on balance of payments equilibrium in West Africa. This implies that increases in road infrastructure investment tend to worsen the balance of payments position of countries in the region, particularly in the short run. The finding strongly supports the Absorption Approach, which argues that when domestic expenditure rises faster than productive output, external imbalances emerge. In the West African context, road construction projects are highly import-intensive, relying heavily on imported machinery, construction materials, engineering equipment, and foreign technical expertise. Consequently, increased expenditure on road infrastructure raises import demand substantially and exerts pressure on foreign exchange reserves before the productive benefits of the investment materialize.

This finding is strongly consistent with the results of Saleh et al. (2024), who found that expenditure on social and community services exerted a significant negative effect on Nigeria's balance of payments due to its dependence on imported inputs and foreign procurement. Although the expenditure category differs slightly from the present study, both findings demonstrate that public investment characterized by high import content can deteriorate external sector performance. The result also aligns with the findings of Kamara et al. (2025), who reported that certain investment-related variables and macroeconomic conditions exerted negative effects on external balance because of structural inefficiencies and weak domestic productive capacity. Similarly, Ota and Ezeali (2021) found that transport sector investment negatively affected economic growth in Nigeria, attributing the outcome to implementation inefficiencies and weak structural linkages. The present finding therefore reinforces the argument that infrastructure spending does not automatically improve macroeconomic performance unless supported by domestic industrial capacity capable of supplying construction inputs and complementary productive activities.

The findings further reveal that public investment in health facilities exerts a positive but statistically insignificant effect on balance of payments equilibrium in West Africa. The positive coefficient suggests that investment in healthcare infrastructure may improve labor productivity, human capital development, and workforce efficiency, which could indirectly strengthen export productivity and reduce medical-related capital outflows over time. However, the statistical insignificance of the result indicates that these benefits do not translate into immediate or



measurable improvements in the external sector during the period under consideration.

This finding partially aligns with the broader arguments advanced by Roberts et al. (2020), who emphasized that the developmental impact of public expenditure depends heavily on sectoral transmission mechanisms and structural linkages within the economy. Their study demonstrated that some categories of expenditure generate stronger multiplier and spillover effects than others. In the context of the present study, the weak effect of health investment on balance of payments equilibrium may reflect the long-term nature of human capital accumulation, as improvements in healthcare outcomes typically require substantial time before generating productivity gains capable of affecting exports and external competitiveness. Additionally, health sector projects in many West African countries often depend heavily on imported medical equipment, pharmaceutical products, and foreign expertise, thereby limiting their short-run contribution to external balance improvement.

The result for public investment in education also indicates a positive but statistically insignificant effect on balance of payments equilibrium. This suggests that educational investment may enhance workforce quality, skill acquisition, innovation capacity, and long-run productive efficiency, thereby supporting export competitiveness and economic diversification over time. Nevertheless, the absence of statistical significance implies that these benefits remain largely indirect or long-term and are not sufficiently strong to influence balance of payments outcomes within the study period.

This outcome is broadly consistent with the findings of Abille and Meçik (2024), who argued that improvements in domestic productive conditions and institutional quality are necessary before developmental investments can significantly improve current account performance. Their findings suggest that the effectiveness of productive investments depends on complementary structural factors such as financial development, industrial capacity, and governance quality. The result is also supported indirectly by Roberts et al. (2020), who emphasized that the developmental outcomes of public expenditure differ considerably depending on sectoral linkages and transmission mechanisms. In the present study, the insignificant effect of education investment may indicate that West African economies have not yet developed sufficient productive and industrial structures capable of transforming educational improvements into substantial export-oriented productivity gains.

Overall, the findings of this study demonstrate that the relationship between public investment and balance of payments equilibrium in West Africa is highly conditional on the sectoral composition, efficiency, and structural characteristics of investment spending. The evidence suggests that public investment does not automatically improve external sector performance, particularly where investments are heavily dependent on imported inputs and weak domestic productive structures. The findings therefore validate the central proposition of the Absorption



Approach that external balance improves only when productive capacity expands sufficiently to offset increases in domestic absorption. The study consequently highlights the need for strategically targeted public investment policies capable of strengthening domestic production, reducing import dependence, and enhancing export competitiveness across West Africa.

5. CONCLUSION AND RECOMMENDATIONS

The findings of this study reveal the importance of sectorial allocation of public investment, indicating that the composition of investment matters more than its aggregate level in determining external sector outcomes. Specifically, the study finds that public investment in road infrastructure has a negative and statistically significant effect on the balance of payments, reflecting the high import dependence associated with infrastructure development in the region. On the other hand, investments in electricity, health, and education exhibit positive but statistically insignificant effects, suggesting that their contributions to external sector performance are likely to materialize over the long term rather than in the short run. Consistent with the Absorption Approach, the results suggest that when public investment increases domestic absorption without a corresponding increase in domestic output and export capacity, it may lead to a deterioration of the balance of payments. The study therefore concludes that, achieving balance of payments stability in West Africa requires a strategic approach to public investment that prioritizes sectors capable of enhancing domestic productive capacity, reducing import dependence, and strengthening export competitiveness.

This study contributes to the existing literature by providing empirical evidence on the sector-specific effects of public investment on balance of payments equilibrium in West Africa using a dynamic panel GMM framework. Unlike previous studies that focus on aggregate public expenditure or single-country analysis, this study disaggregates public investment into electricity, road infrastructure, health, and education, thereby revealing the differential effects of each sector on the external balance. The inclusion of public investment in education (PED) further extends the analytical scope of existing studies. Methodologically, the application of System GMM addresses issues of endogeneity, dynamic persistence, and unobserved heterogeneity, providing more robust and generalizable findings for the region.

Based on the findings of this study, the following recommendations are proposed:

- i. Governments should reduce the import intensity of road infrastructure projects by promoting local production of construction materials and encouraging domestic participation in infrastructure development.



- ii. Investment in electricity should be complemented with industrial and export promotion policies to ensure that improved energy supply translates into increased domestic production and export competitiveness.
- iii. Governments should focus on improving the efficiency and quality of spending in health and education sectors to ensure that these investments translate into productivity gains and long-term external sector improvements.
- iv. Policymakers should prioritize sectors with lower import content and higher export potential in order to achieve a more sustainable balance of payments position.

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