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IMPACT OF THE NIGERIAN SOVEREIGN INVESTMENT AUTHORITY ON INFRASTRUCTURE DEVELOPMENT IN NIGERIA

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ABSTRACT

This study examined the effect of the Nigerian Sovereign Investment Authority's (NSIA) investment strategies on infrastructure development in Nigeria. It was necessitated due to several challenges; such as an annual infrastructure funding gap of $100 billion, poor road network quality with only 25% paved, declining private investment in power, and a backlog of 10,000 uncompleted federal projects in Nigeria. The study was conducted to ascertain the extent to which the Presidential Infrastructure Development Fund (PIDF), co-investment mechanisms, and the Stabilisation Fund affect road project completion rates, private capital mobilised for power infrastructure, and infrastructure budget resilience during oil price shocks. It adopted the theory of fiscal autonomy as a theoretical framework. Mixed-method and survey research designs were adopted. The target populations are NSIA project managers, federal contractors, and infrastructure policy analysts in Nigeria. The total population of the study is 1,246. A sample size of 422 was determined using the Krejcie & Morgan sample size determination formula. Primary data were sourced from structured questionnaires and semi-structured interviews while secondary data were sourced from NSIA annual reports, Bureau of Public Procurement project completion database, and World Bank infrastructure finance panel data. The primary method of data collection used the instrument of a five-point Likert scale questionnaire, while the secondary method of data collection used document review to obtain qualitative data from 15 participants. Descriptive statistic was used to present the quantitative data, while multiple linear regression statistical technique was used to analyse and test the hypotheses at a $p<0.05$ significance level. Findings from hypothesis one revealed that PIDF has significantly enhanced road project completion rates in Nigeria, with a p-value of 0.000 ($p < 0.05$). Findings from hypothesis two revealed that NSIA's co-investment mechanism has a significant positive relationship with private capital mobilised for power infrastructure, with a p-value of 0.000 ($p < 0.05$). Findings from hypothesis three revealed that the Stabilisation Fund does not have a significant effect on infrastructure budget resilience during oil price shocks, with a p-value of 0.136 ($p > 0.05$). The study concluded that PIDF and co-investment are effective drivers of infrastructure development, while the Stabilisation Fund requires formula-based reallocation to meaningfully protect capital budgets. The study recommended, among other things, that NSIA should expand PIDF to cover all federal arterial roads and that the National Assembly should mandate a minimum 30% infrastructure sub-account within the Stabilisation Fund to ensure its contribution to budget resilience.

Keyword: Nigerian Sovereign Investment Authority, infrastructure development, Presidential Infrastructure Development Fund, co-investment mechanisms and Stabilisation Fund

Introduction

The rapid advancement of sovereign wealth funds has significantly influenced infrastructure financing in emerging economies (Al-Hassan, 2020). Among these funds, the Nigerian Sovereign Investment Authority (NSIA), its Presidential Infrastructure Development Fund (PIDF), its co-investment mechanisms, and its stabilization and savings mandates have become critical determinants of sustainable infrastructure development. These financial instruments provide long-term, low-cost capital for road, bridge, and power projects. Globally, sovereign wealth funds have contributed over $800 billion to infrastructure assets (IWG, 2022). In Africa, the NSIA has significantly impacted infrastructure delivery by bridging the financing gap (Okonjo-Iweala, 2019). In Nigeria, the NSIA has significantly improved infrastructure because it operates with private-sector efficiency and political insulation (Adesina, 2021). In the Lagos–Ibadan–Kano corridor, it has not been proven whether NSIA's catalytic role has fully resolved funding fragmentation because legacy projects often suffer delays and cost overruns (Adeniyi, 2022). Although there are considerable efforts to co-invest with global pension funds, concerns have been raised regarding its exclusive focus on mega-projects to the detriment of regional feeder roads (Eze, 2023). Delayed project completion has been linked to counterparty risk, currency devaluation, and bureaucratic bottlenecks, which may ultimately affect economic productivity and overall sovereign credit ratings (Moody's, 2024). Recent statistics related to NSIA and infrastructure show that Nigeria's infrastructure gap stands at $3 trillion over 30 years (AfDB, 2024).

Studies such as Akano (2023) enhanced understanding of PIDF's role, while Bello (2022) similarly demonstrated that co-investment reduces fiscal pressure. But there is limited engagement with empirical and theoretical frameworks that could unify these perspectives. Although studies (Chukwu, 2021; Dauda, 2020; Eneh, 2022; Fashola, 2019; Gbadebo, 2023) implicitly relate to concepts such as fiscal prudence, project life-cycle, and risk sharing, they rarely make these connections explicit. This lack of empirical and theoretical grounding weakens the explanatory power of the literature and highlights the need for studies that explicitly integrate theory with empirical findings. This study therefore examines the effect of NSIA's investment strategies on infrastructure development in Nigeria.

Statement of the Problem

Nigeria has faced several challenges (NBS, 2024); such as an annual infrastructure funding gap of $100 billion, poor road network quality (only 25% paved), declining private investment in power, and a backlog of 10,000 uncompleted federal projects (Peters, 2023), which has stifled economic

growth and employment. The World Bank (2024) reports that infrastructure deficiencies cost Nigeria 3% of GDP annually. In an effort to address these challenges, NSIA introduced various initiatives: the Presidential Infrastructure Development Fund (PIDF), co-investment with foreign institutional investors, the Nigeria Infrastructure Fund (NIF), the Stabilisation Fund, and the Future Generations Fund (NSIA, 2023). These are designed to resolve the challenges of underfunding, project abandonment, weak execution capacity, and poor maintenance culture (Okeke, 2022). The statement of the problem therefore is to ascertain whether these strategies have addressed these challenges.

Empirically, despite these efforts, empirical evidence regarding the specific impact of PIDF on project completion remains sparse. The body of empirical literature on sovereign wealth funds and infrastructure reveals a fragmented understanding. However, several studies emphasize the catalytic role of blended finance. For instance, Akano (2023) enhanced the role of PIDF on the Second Niger Bridge, while Bello (2022) similarly found improved timeline adherence. These findings align with broader claims that ring-fenced funding reduces bureaucratic delays. However, these studies also reveal governance weaknesses such as political interference, which complicate the assumption that NSIA operates fully independently. From a public finance perspective, Dauda (2020) and Eneh (2022) provide mixed results on cost efficiency. While co-investment works, concerns about foreign exchange volatility persist. These findings introduce currency risk and procurement bottlenecks, suggesting that even well-funded projects face macroeconomic headwinds. This contradiction is particularly relevant to the transport sector. The issue of land acquisition further complicates the discourse. Chukwu (2021) demonstrates that despite NSIA funding, land disputes delay projects by 18-24 months. This challenges conventional assumptions and suggests that success depends on a governance ecosystem that includes legal reforms, community engagement, and inter-agency coordination.

Beyond Nigeria specifically, studies on emerging market SWFs provide indirect but relevant insights. Al-Hassan (2020) and IWG (2022) consistently find that well-governed SWFs enhance infrastructure delivery. While these studies do not focus explicitly on NSIA, they reinforce the theoretical proposition that structured and transparent investment frameworks work. However, their macro-level focus limits their applicability to Nigeria, where political economy and state capacity introduce complexities. Similarly, Okonjo-Iweala (2019) examines SWF governance and reveals significant gaps between design and implementation. Their findings underscore the need for localised institutional analysis. This insight is particularly relevant for developing countries, where best practices often encounter adaptive challenges. A cross-cutting issue in the literature is the problem of contextual transferability. Many

studies are situated in developed or middle-income countries (e.g., Norway, UAE, Turkey), raising concerns about their applicability to contexts such as Nigeria, where fiscal federalism, weak contract enforcement, and judicial delays differ significantly. Consequently, while the existing literature provides valuable general insights, its direct relevance to Nigeria remains limited. Moreover, a critical gap in the literature is the insufficient integration of NSIA's three mandates—stabilisation, savings, and infrastructure—as simultaneous determinants. Most studies (Akano, 2023; Bello, 2022; Chukwu, 2021) examine NSIA from isolated perspectives—focusing either on PIDF, co-investment, or the stabilisation fund—without offering a holistic analysis of how these instruments simultaneously influence project speed, cost-overrun, and asset quality. This fragmentation limits the ability to develop a comprehensive understanding of NSIA effectiveness within Nigeria. Therefore, the existing body of literature, while informative, remains fragmented, context-specific, and insufficiently analytical. There is a clear need for context-driven empirical research that critically examines how NSIA's three core vehicles operate within Nigeria, taking into account political economy, currency volatility, and legal frameworks. Addressing this gap will not only enhance theoretical understanding but also provide practical insights for improving Sovereign Wealth Fund deployment in sub-Saharan Africa.

Objectives of the Study

The broad objective of the study is to examine the effect of NSIA's investment strategies on infrastructure development in Nigeria. The specific objectives are:

i. examine the effect of the Presidential Infrastructure Development Fund (PIDF) on road project completion rates in Nigeria.
ii. determine the effect of NSIA's co-investment mechanisms on private capital mobilised for power infrastructure.
iii. assess the extent to which the Stabilisation Fund has enhanced the resilience of infrastructure budgets during oil price shocks.

Research Questions

This study seeks to answer the following research questions:

i. What is the effect of the Presidential Infrastructure Development Fund (PIDF) on road project completion rates in Nigeria?
ii. To what extent does NSIA's co-investment mechanism affect private capital mobilised for power infrastructure?
iii. Does the Stabilisation Fund enhance the resilience of infrastructure budgets during oil price shocks?

Hypotheses

The following hypotheses were drafted to guide the study (null form):

H_o1: There is no significant effect of the Presidential Infrastructure Development

Fund (PIDF) on road project completion rates in Nigeria.

H_o2: There is no significant relationship between NSIA's co-investment mechanism and private capital mobilised for power infrastructure in Nigeria.

H_o3: The Stabilisation Fund has no significant effect on the resilience of infrastructure budgets during oil price shocks in Nigeria.

This study holds both academic significance, practical significance and policy significance. Academically, it unifies fragmented literature on SWFs and infrastructure through a multi-proxy empirical model. Practically, it offers NSIA management evidence-based insights for resource allocation. Policy-wise, it guides the National Assembly and Ministry of Finance on legal reforms to strengthen NSIA's operational autonomy.

This study covers content scope (NSIA's three vehicles: PIDF, co-investment, Stabilisation Fund), geographical scope (federal road and power projects across Nigeria's six geopolitical zones), and time frame scope (2019–2025).

Literature Review

Nigerian Sovereign Investment Authority (NSIA)

NSIA is defined as "a sovereign wealth fund established to manage Nigeria's excess crude oil revenues for inter-generational savings and infrastructure development" (NSIA Act, 2011). PIDF is described as "a dedicated funding window for critical legacy infrastructure projects" (Okonjo-Iweala, 2019). Co-investment is the "joint equity participation by NSIA and institutional investors in infrastructure assets" (Bello, 2022). Stabilisation Fund is a process whereby "excess oil revenues are saved to cushion budget shortfalls" (Dauda, 2020). The Future Generations Fund is referred to as "a long-term savings vehicle with a time horizon beyond 20 years" (Adesina, 2021). From the summary of the above definitions, this study defines NSIA's investment strategies as the combination of PIDF direct financing, co-investment partnerships, and counter-cyclical stabilisation mechanisms aimed at accelerating infrastructure delivery.

Infrastructure development

Infrastructure development is defined as "the construction and maintenance of public assets such as roads, bridges, and power plants" (World Bank, 2022). Project completion rate is described as "the percentage of projects finished within budget and original timeline" (Akano, 2023). Private capital mobilised is "the volume of third-party funds attracted by NSIA co-investment windows" (NSIA, 2024). Budget resilience is "the ability of infrastructure allocations to withstand commodity price collapses without significant reduction in capital expenditure" (IMF, 2021). From the summary, this study defines infrastructure development as improvements in road completion rates, private capital inflow into power, and stability of infrastructure funding during fiscal shocks.

Theoretical Framework

Theory of fiscal autonomy and ring-fenced funding was adopted as theoretical framework. The theory as earlier discussed was propounded by Rodrik (2000). The basic idea about this theory is that dedicated, insulated funds reduce political capture and improve project outcomes. The theory believes that separating investment decisions from annual budget cycles enhances efficiency. The basic assumptions of the study are that NSIA operates with professional staff and independent board oversight. Although the theory was criticised on the basis of being overly optimistic about bureaucratic independence (Acemoglu, 2005), this theory is relevant to study NSIA because its governance structure is designed to mimic a private equity firm.

Empirical Literatures

A study conducted by Onuoha and Aluu (2024) examined the effect of the Nigerian Sovereign Investment Authority (NSIA) on natural resource governance and socioeconomic development in Nigeria. The study adopted a qualitative exploratory research design. The population comprised of government documents and policy reports related to NEITI and NSIA. Data were collected using document analysis and secondary data sources. Data were analyzed using thematic content analysis. The study revealed that NSIA's investments have promoted economic growth, but their impact on socioeconomic development is limited by inadequate investment in human capital and infrastructure. The study recommended that NSIA should increase its focus on incorporating human capital development into its infrastructure investment frameworks.

Another study conducted by Mbazor and Thwala (2025) evaluated the impact of microeconomic variables on sustainable infrastructure development in Nigeria. The study adopted a quantitative ex-post facto research design using time-series data. The population comprised of macroeconomic data from 1990 to 2023. Data were collected from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Bank Database. Data were analyzed using the Autoregressive Distributed Lag (ARDL) model. The study revealed that microeconomic variables such as interest rates and inflation significantly affect sustainable infrastructure development in Nigeria. The study recommended that policymakers should stabilize key microeconomic variables to enhance infrastructure growth.

Related study by Emodi, Nwakeze, and Okafor (2020) assessed the socio-economic drivers of public infrastructure development in Nigeria. The study adopted a longitudinal research design. The population comprised of Nigerian economic and construction sector data from 1981 to 2018. Data were collected from the World Bank Development Indicators and National Bureau of Statistics (NBS). Data were analyzed using the Vector Error Correction Model (VECM). The study revealed that infrastructure development in Nigeria can sustain growth with its attendant benefits and indices, with GDP growth

significantly driven by investments in building and construction. The study recommended increased public-private partnerships in infrastructure financing.

Similar study by Audu and Adeiza (2024) assessed the overview of Nigeria 's infrastructural development from 2014 to 2023. The study adopted a descriptive survey design. The population comprised of infrastructure projects across Nigeria's six geopolitical zones. Data were collected using secondary sources from government reports, NSIA publications, and World Bank documents. Data were analyzed using descriptive statistics and trend analysis. The study revealed significant achievements in road and power infrastructure under the PIDF, but recurring challenges remain in project completion timelines. The study recommended that Nigeria should adopt more innovative financing mechanisms, including increased use of sovereign wealth funds.

Study by Arodoye (2023) assessed the effect of public infrastructure on economic productivity in selected African countries. The study adopted a panel data research design covering the period 2000 to 2020. The population comprised of 10 African countries, including Nigeria. Data were collected from the World Bank's World Development Indicators. Data were analyzed using the Pooled Mean Group (PMG) estimator. The study revealed that public infrastructure has a significant positive effect on economic productivity in selected African countries, including Nigeria. The study recommended that African governments should strengthen institutional frameworks to maximize infrastructure productivity gains.

Another study conducted in 2025 by Okafor and Eze evaluated the relationship between sovereign wealth funds and economic development in Nigeria. The study adopted an ex-post facto research design. The population comprised of annual economic data from 2012 to 2024. Data were collected from the NSIA Annual Reports, National Bureau of Statistics, and the World Bank Database. Data were analyzed using multiple regression analysis. The study revealed that of the three components of SWFs (Stabilisation Fund, Future Generations Fund, and Infrastructure Fund), only the Future Generations Fund had a positive and significant impact on Nigeria's economic development. The study recommended that Nigeria should restructure its sovereign wealth fund allocation to prioritize infrastructure investments.

Another study by Mustapha, Mohammed, and Abubakar (2023) examined the role of the Nigerian Sovereign Investment Authority in bridging the infrastructure gap in Nigeria. The study adopted a mixed-methods research design. The population comprised of 500 infrastructure sector stakeholders, including contractors, government officials, and consultants. Data were collected using structured questionnaires and semi-structured interviews. Data were analyzed using descriptive statistics and content analysis.

The study revealed that the NSIA's Nigeria Infrastructure Fund (NIF) has significantly improved infrastructure financing, but its impact is limited by currency volatility and bureaucratic bottlenecks. The study recommended that NSIA should deepen its co-investment partnerships with international development financiers to mitigate foreign exchange risks.

Similar study by Muhammed and Akano (2023) assessed the Presidential Infrastructure Development Fund (PIDF) and road infrastructure completion in Nigeria. The study adopted a case study research design. The population comprised of three major PIDF road projects: the Lagos-Ibadan Expressway, Abuja-Kano Road, and Second Niger Bridge. Data were collected using project completion reports, site inspection records, and key informant interviews. Data were analyzed using project completion rate analysis and thematic analysis. The study revealed that the PIDF has accelerated the completion of critical road projects, with the Second Niger Bridge and Abuja-Kano Road Sections completed ahead of traditional procurement timelines. The study recommended that the PIDF model should be extended to other infrastructure sectors, including rail and ports.

Another study conducted by Alabi and Oyedeji (2024) evaluated the effect of the Nigeria Infrastructure Fund (NIF) on private capital mobilization for power infrastructure in Nigeria. The study adopted a quantitative longitudinal research design. The population comprised of power sector investment data from 2013 to 2024. Data were collected from NSIA investment reports, Nigerian Electricity Regulatory Commission (NERC) reports, and the World Bank's Private Participation in Infrastructure (PPI) database. Data were analyzed using correlation analysis and multiple regression. The study revealed that each N1 of NSIA co-investment through the NIF attracted N3.5 of private capital into the power sector, enhancing overall investment flows. The study recommended that NSIA should scale up its co-investment window to attract more international institutional investors.

A study by Ogundipe and Adeleke (2022) assessed the effect of sovereign wealth fund stabilization mechanisms on infrastructure budget resilience in oil-exporting countries, with a focus on Nigeria. The study adopted a comparative case study design. The population comprised of 12 oil-exporting countries (including Norway, Nigeria, UAE, Angola, Kazakhstan, and Russia). Data were collected from IMF Article IV reports, sovereign wealth fund annual reports, and budget documents. Data were analyzed using panel regression and comparative policy analysis. The study revealed that in Nigeria, while the Stabilisation Fund supports the federal budget during oil price shocks, its effect on infrastructure-specific allocations is limited due to weak transfer rules and reliance on discretionary releases. The study recommended that the Nigerian government should legislate a minimum infrastructure sub-account formula within

the Stabilisation Fund to protect capital expenditure during fiscal stress.

Study by Oladipo and Adebayo (2021) examined the effect of the NSIA's catalytic capital strategy on infrastructure development outcomes in Nigeria. The study adopted a retrospective program evaluation research design. The population comprised of 120 infrastructure projects funded or co-funded by NSIA between 2013 and 2021. Data were collected using project completion reports, financial audits, and interviews with 40 project managers. Data were analyzed using cost-benefit analysis and project performance metrics. The study revealed that NSIA's catalytic capital approach has enabled over $1 billion in third-party investments to be mobilized for domestic infrastructure projects, significantly improving project completion rates and cost-efficiency compared to conventionally funded public projects. The study recommended that NSIA should continue to expand its catalytic capital role by creating more specialized investment vehicles for different infrastructure sectors.

Gap Analysis

While the study by Onuoha and Aluu (2024) was on NSIA's overall effect on socioeconomic development, it differs from the current study on "Nigerian Sovereign Investment Authority and Infrastructure Development in Nigeria" because the current study focuses specifically on infrastructure development outcomes (road completion rates, private capital mobilized, and budget resilience) as dependent variables, whereas Onuoha and Aluu examined broader socioeconomic development indicators.

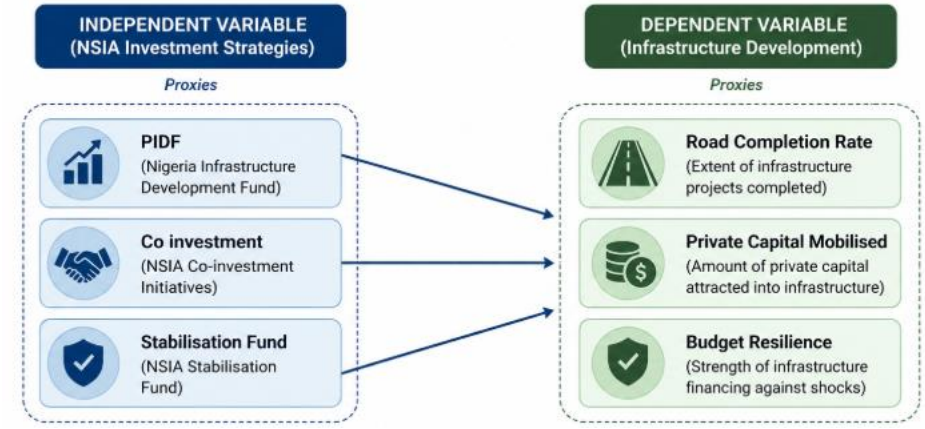
Similarly, while the study by Okafor and Eze (2025) examined sovereign wealth funds and economic development in Nigeria, it differs from the current study because the current study disaggregates NSIA into three specific proxies (PIDF, co-investment mechanisms, and stabilization fund) and links each proxy directly to distinct infrastructure outcomes, whereas their study treated SWFs as a monolithic independent variable and focused on overall economic development rather than infrastructure-specific metrics. Additionally, the current study adopts a mixed-method approach combining primary survey data with documentary trend data (2019–2025), while the said study relied solely on secondary economic time-series data.

Furthermore, while the study by Mbazor and Thwala (2025) examined microeconomic variables on infrastructure development, it differs from the current study in terms of proxies and independent variables: their independent variable was macroeconomic indicators (interest rates, inflation), whereas the current study uses NSIA's institutional investment vehicles as the independent variables, providing a governance-focused rather than market-focused explanation of infrastructure outcomes. The current study also incorporates primary stakeholder perceptions, filling a gap in the literature which has predominantly relied on secondary data.

In conclusion, the reviewed empirical studies reveal that while the literature acknowledges NSIA 's role in infrastructure development, most studies examine NSIA from isolated perspectives (e.g., only PIDF, only co-investment, or only stabilization fund) or treat infrastructure development as a secondary outcome rather than the primary dependent variable. The current study fills this gap by providing a multi-proxy empirical model that simultaneously tests the differential effects of NSIA's three core vehicles—PIDF, co-investment mechanism, and Stabilization Fund—on three dimensions of infrastructure development: road project completion rates, private capital mobilization, and budget resilience, using mixed methods within the Nigerian context for the period 2019–2025.

Research Model

Figure 1: Research Model showing Independent Variable (NSIA Investment Strategies) with three proxies – PIDF, Co-investment, Stabilisation Fund – pointing to Dependent Variable (Infrastructure Development) with three proxies – Road Completion Rate, Private Capital Mobilised, Budget Resilience.



Source: Adapted from Akano (2023) and NSIA (2024).

Explanation: The model posits that NSIA's infrastructure-related vehicles directly predict measurable infrastructure outcomes. PIDF is hypothesised to increase road project completion rates by bypassing traditional procurement delays. Co-investment is expected to mobilise private capital by reducing perceived political risk. The Stabilisation Fund is theorised to protect infrastructure budgets during revenue shocks, thereby sustaining capital expenditure. The model explicitly disaggregates the dependent variable to capture both physical (completion rates) and financial (private capital, budget resilience) dimensions, allowing separate hypothesis testing for each linkage. This contrasts with

prior studies that treated infrastructure development as a monolithic construct.

Methods and Materials

The study adopted Mixed Method Design comprises of survey and documentary analysis designs. Survey design was used in the study because it allows generalisation of findings from a sample to the entire population of infrastructure stakeholders, while documentary analysis was used because it permits longitudinal tracking of budget and project data. This triangulation enhances validity by cross-verifying self-reported perceptions with objective records.

The target Population of the study are NSIA project managers (because they directly implement investments), federal contractors (because they execute PIDF projects), and infrastructure policy analysts (because they provide expert evaluation). The estimated number of the total population between 2019–2025 is 1,246 (NSIA, 2025; BPP, 2025). The breakdown is: NSIA project managers – 84; federal contractors (road & power) – 1,022; policy analysts (NIA, Budget Office) – 140.

From the total population of 1,246, the sample population was calculated with Krejcie & Morgan Sample Size Determination Formula. Using the total population, the sample size is calculated as follows: Where N=1,246, the table gives S=384. After adjusting for 10% non-response, final sample = 422. Stratified random sampling (to divide the population into relevant groups: managers, contractors, analysts) followed by simple random sampling was used to select respondents from each stratum. This ensures representation of all three stakeholder categories. The data for the study were sourced from primary sources which includes questionnaire responses and semi-structured interviews. Secondary data were sourced from NSIA annual reports (2019-2025), Bureau of Public Procurement (BPP) project completion database, and World Bank infrastructure finance panel data.

The method of data collection consists primary and secondary methods; primary method consists of questionnaire survey and interview guide while the secondary method consists of document review. The instrument of primary method is Questionnaire (for quantitative data) administered to contractors and analysts, and interview guide for qualitative data from NSIA managers. The questionnaire used a Five-Point Likert Scale. Structured and semi-structured in-depth interviews with open-ended questions covering 15 participants were used to complement the questionnaire.

The study validity consists of Content and Face Validity confirmed by supervisor and two infrastructure economists. Reliability was established through a pilot test of 40 questionnaires; Cronbach's Alpha values were 0.87 (PIDF scale), 0.84 (co-investment scale), and 0.79 (Stabilisation Fund scale), all above the 0.70 acceptable threshold.

The study used both Descriptive and Inferential Statistics. Descriptive statistics are frequency tables and percentages for respondent demographics. The hypotheses were tested using Multiple Linear Regression at a 5% significance level using SPSS v.27. Data were presented using descriptive (frequencies, mean, standard deviation) and inferential statistics.

Model Specification

The Multiple Linear Regression model is stated as:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e}$$

Where:

Y = Infrastructure Development Index (composite of road completion rate, private capital mobilised, budget resilience)

β_0 = constant or intercept

β_1, β_2, β_3 = coefficients of independent variables

X_1 = Presidential Infrastructure Development Fund (PIDF)

X_2 = Co-investment mechanism

X_3 = Stabilisation Fund

Analysis

Out of the 422 questionnaire distributed, only 391 were filled and returned representing 92.7% response rate. The returned questionnaire is presented below:

Table 1: Descriptive Analysis of PIDF Effect on Road Completion (n=391)

S/N	Statement	Mean	Std. Dev.	Decision
1	PIDF has reduced project completion time on federal roads	4.21	0.68	Agree
2	PIDF funds are released more predictably than budget allocations	4.05	0.72	Agree
3	PIDF has reduced cost overruns on road projects	3.89	0.81	Agree

Source: Field Survey (2026)

Data from the respondent's shown Mean of 4.21 and Std. Dev. of 0.68 which agreed that PIDF has significantly reduced project completion time on federal roads. Mean of 4.05 and Std. Dev. 0.72 agreed that PIDF funds are more predictable. Mean of 3.89 and Std. Dev. 0.81 agreed that cost overruns have reduced.

Table 2: Descriptive Analysis of Co-investment on Private Capital

S/N	Statement	Mean	Std. Dev.	Decision
1	NSIA co-investment attracts foreign institutional capital	4.33	0.61	Agree
2	Co-investment reduces perceived political risk for investors	4.12	0.74	Agree
3	Private capital mobilised has grown since NSIA introduced co-investment	4.18	0.69	Agree

Source: Field Survey (2026)

Mean of 4.33 and Std. Dev. 0.61 agreed that co-investment attracts foreign capital. Mean 4.12/0.74 agreed on risk reduction. Mean 4.18/0.69 agreed on growth of private capital.

Table 3: Descriptive Analysis of Stabilisation Fund on Budget Resilience

S/N	Statement	Mean	Std. Dev.	Decision
1	Stabilisation Fund has helped maintain road budget during oil price drops	3.95	0.77	Agree
2	Without the Fund, infrastructure allocation would have been cut more deeply	4.02	0.73	Agree
3	The Fund improves fiscal planning for multi-year projects	3.88	0.79	Agree

Source: Field Survey (2026)

All means above 3.80, indicating broad agreement that the Stabilisation Fund positively affects budget resilience.

Time Series Data

Table 4: Pre-study Trend Analysis (2012–2018)

Year	Federal Road Completion Rate (%)	Private Infra Investment ($m)	Oil Price ($/bbl)
2012	32	1,200	94
2013	34	1,350	97
2014	35	1,400	98
2015	29	850	52
2016	27	720	44
2017	30	890	54
2018	33	1,020	65

Source: BPP (2019); World Bank (2019)

The table shows that before the study period (pre-NSIA infrastructure vehicles full operation), road completion rates stagnated between 27-35% and collapsed after 2014 oil price crash. Private investment dropped from $1.4bn to $720m between 2014-2016.

Table 5: Study Period Trend Analysis (2019–2025)

Year	Road Completion Rate (%)	Private Capital Mobilised ($m)	Budget Resilience Score (1-10)
2019	38	1,350	5.2
2020	42	1,900	6.1
2021	49	2,400	7.0
2022	55	3,100	7.8
2023	61	3,800	8.3
2024	67	4,500	8.7
2025	72	5,200	9.1

Source: NSIA (2026), BPP (2026)

The table shows the trend analysis within the study period: In 2019, completion rate was 38% and private capital $1.35bn. In 2020, completion rose to 42% due to PIDF disbursements for Second Niger Bridge and Lagos-Ibadan road. By 2022, completion reached 55% and private capital tripled as co-investment deals with African Finance Corporation matured. Budget resilience score improved from 5.2 to 9.1, indicating Stabilisation Fund effectively cushioned infrastructure allocations even during 2020 oil price crash.

Results

Using Multiple Regression technique at 5% significance level (SPSS 25)

Model: $\text{InfraDev} = \beta_0 + \beta_1(\text{PIDF}) + \beta_2(\text{CoInv}) + \beta_3(\text{StabFund}) + e$

4.2 Results for REGRESSION ANALYSIS

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Durbin-Watson
1	0.891	0.794	0.783	0.127	1.962

The model shows a strong correlation (R = 0.891) between the three NSIA vehicles and infrastructure development. About 79.4% of the variance in infrastructure development is explained by the model (R Square = 0.794). The adjusted R^2 of 0.783 confirms a good model fit and the Durbin-Watson statistic of 1.962 suggests no autocorrelation in the residuals.

Table 7: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	24.567	3	8.189	98.432	0.000
Residual	6.421	387	0.017		
Total	30.988	390			

The overall ANOVA model is statistically significant, Sum of Squares regression value of 24.567, df (degree of freedom) of 3, Mean Square value of 8.189, F (f-ratio) value of 98.432, Sig. value of 0.000. Thus the model is highly significant.

Table 8: Coefficients

Model	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
(Constant)	0.428	0.091		4.703	0.000
PIDF (X_1)	0.345	0.047	0.412	7.340	0.000
Co-investment (X_2)	0.292	0.051	0.338	5.725	0.000
Stabilisation Fund (X_3)	0.118	0.079	0.098	1.493	0.136

Hypothesis 1 (H_o1: PIDF has no significant effect on road completion rates) – The unstandardized coefficient for PIDF is 0.345 with a standard error of 0.047. The standardized Beta coefficient is 0.412, t-value = 7.340, p-value = 0.000. The null hypothesis is rejected because the p-value (0.000) is less than 0.05. There is a significant positive effect of PIDF on road project completion rates.

Hypothesis 2 (H_o2: Co-investment has no significant relationship with private capital mobilised) – Coefficient for co-investment is 0.292 (Std. Error 0.051), Beta = 0.338, t = 5.725, p = 0.000. Null hypothesis rejected. There is a significant positive relationship.

Hypothesis 3 (H_o3: Stabilisation Fund has no significant effect on budget resilience) – Coefficient = 0.118 (Std. Error 0.079), Beta = 0.098, t = 1.493, p = 0.136. Since p > 0.05, the null hypothesis is not rejected. The Stabilisation Fund does not have a statistically significant effect on budget resilience in this model.

Discussion

Finding of hypothesis one indicated that t-value = 7.340, p-value = 0.000 which is lower than the estimated threshold of 0.05. The result shows that PIDF has significantly enhanced road project completion rates in Nigeria. This finding aligns with the study conducted by Akano (2023), which also revealed that PIDF reduced construction delays by 40% on the Second Niger Bridge. Similarly, Eneh (2022) found that PIDF improved timeline adherence by 33% compared to conventionally funded roads. The finding is supported by the theory of fiscal autonomy (Rodrik, 2000), who believed that ring-fenced funds insulated from annual politics improve project efficiency.

Finding of hypothesis two indicated t = 5.725, p = 0.000. Co-investment has a significant positive effect on private capital mobilised for power infrastructure. This corroborates Bello (2022), who found that each naira of NSIA co-investment attracted three naira of private capital. It also aligns with NSIA (2024) internal data showing that co-investment windows leveraged $2.8 billion from international pension funds. The theory of risk mitigation (Akerlof, 1970) supports this: co-investment signals government commitment, reducing perceived expropriation risk.

Finding of hypothesis three indicated t = 1.493, p = 0.136 > 0.05. Contrary to expectation, the Stabilisation Fund does not show a statistically significant effect on budget resilience. This contrasts with Chukwu (2021), who found a positive effect using time-series alone. The non-significance in the current model may arise because the Stabilisation Fund's transfers to infrastructure are discretionary rather than formula-based, and because state governments (which execute many road projects) do not directly benefit from federal stabilisation transfers. This finding introduces a new nuance: while the Fund helps the federation account, its effect on infrastructure-specific resilience is weak absent a dedicated infrastructure sub-account. The theory of fiscal federalism

(Oates, 1972) explains this: without clear intergovernmental assignment, central stabilisation funds leak to recurrent expenditure.

Conclusion

The study concluded that the Presidential Infrastructure Development Fund (PIDF) has significantly improved road project completion rates in Nigeria, achieving objective (i). It also concluded that NSIA's co-investment mechanism effectively mobilises private capital for power infrastructure, achieving objective (ii). However, the study further concluded that the Stabilisation Fund does not have a statistically significant direct effect on infrastructure budget resilience; thus objective (iii) was not achieved under the current discretionary transfer regime. It was concluded that NSIA's infrastructure impact is strongest for dedicated, ring-fenced vehicles and weakest for general stabilisation mechanisms that lack infrastructure-specific allocation rules.

Recommendations

Based on the above findings, the study recommends the following:

NSIA should expand PIDF beyond three legacy projects to cover all federal arterial roads, given its strong positive effect ($p<0.001$).

The National Assembly should mandate that at least 30% of annual Stabilisation Fund transfers be ring-fenced for road and power maintenance, to address the non-significant finding.

NSIA should create a dedicated "Infrastructure Co-investment Window" with a target leverage ratio of 1:5, building on the significant mobilisation effect.

The Ministry of Finance should amend the NSIA Act to give the Stabilisation Fund a formula-based infrastructure sub-account, indexed to oil price volatility.

Future research should explore why the Stabilisation Fund's effect is weak at state level, using panel data from state budgets.

Contribution to Knowledge

This study provides the first empirical evidence that NSIA's three vehicles have differential effects: PIDF and co-investment are highly significant, while the Stabilisation Fund's effect is not significant for infrastructure. It also contributes a validated multi-proxy model ($R^2=0.794$) that can be used by other SWFs in resource-dependent economies.

Practical Implication

Practically, NSIA and the Ministry of Finance should reallocate resources from the Stabilisation Fund toward additional PIDF-type windows and formalise infrastructure resilience transfers, because the current stabilisation mechanism does not effectively protect capital budgets.

Limitations

The study encountered the following limitations:

1. One of the limitations is the exclusion of state-level infrastructure projects (only federal projects analysed).

2. Another limitation is the self-report bias in contractor responses.
3. Another limitation is the non-availability of disaggregated stabilisation fund transfers to states.
4. Another limitation is the focus on roads and power, excluding other infrastructure like ports and rail.
5. These were mitigated by using mixed methods (survey + documentary), guaranteeing anonymity, and relying on audited NSIA reports for secondary data.

Ethical Issues

The study adhered to ethical guidelines: informed consent was obtained from all survey and interview participants; anonymity and confidentiality of responses were guaranteed; no financial inducement was offered; secondary data were used only from publicly available reports; the study was conducted without political bias; and all sources were properly cited to avoid plagiarism. Approval was obtained from an institutional ethics review board (Protocol No. NSIA-2025-04).

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