Vocational Training Institutions and Foreign Direct Investment in Nigeria

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ABSTRACT

This study assesses the effects of Foreign Direct Investment (FDI) on vocational skills enhancement in Nigeria, spanning the years 1985 to 2023, employing the Autoregressive Distributed Lag (ARDL) methodology. The empirical outcomes reveal a notable, yet negative, short-term effect, while a stable long-term correlation was not observed. These results imply that the mere attraction of FDI is inadequate; instead, policy interventions must strategically channel investments into sectors exhibiting more robust human capital connections and explicitly incorporate vocational training obligations within investment agreements. This study enriches the existing empirical literature by illustrating that the efficacy of FDI in fostering vocational skills is dependent on the state of institutional preparedness, thereby highlighting the necessity for focused policy coordination to harmonise foreign investment with national human development objectives.

Keywords: Foreign direct investment, vocational skill training, and Autoregressive distributed lag

INTRODUCTION

Globally, foreign direct investment (FDI) has been a significant driver of economic expansion and human capital formation, although its impact varies considerably between developed and emerging economies. Developed nations such as the United States, Japan, and European Union countries continue to attract large FDI inflows due to stable institutions, advanced infrastructure, and a highly skilled labor force. These countries have strategically leveraged FDI not only for capital accumulation and technological advancement but also to enhance human capital through staff training, research and development, and institutional capacity building (Adegbite & Onyekachi, 2024). In countries like China and India, FDI has played a central role in expanding vocational skills through industry-linked training programs, professional certification, and collaborations with multinational firms, thereby improving productivity, innovation, and competitiveness (Ogunleye & Akintola, 2019).

In Africa, the relationship between FDI and vocational training is complex, shaped by the host country's institutional environment, sectoral focus, and absorptive capacity. While FDI has supported economic growth and infrastructure development in countries such as South Africa, Kenya, and Egypt, its contributions to vocational skill formation have been uneven. In Kenya, FDI inflows into the ICT sector facilitated the development of innovation hubs such as Konza Technopolis, which serve as centers for vocational training and entrepreneurship for youth (Ibrahim & Yusuf, 2022). Similarly, in South Africa, FDI in automobile manufacturing and mining has included technical training programs and apprenticeships for local workers (Eze & Musa, 2024). Nonetheless, many African countries continue to face limited FDI spillovers into skill development due to weak linkages between foreign firms and domestic suppliers, inconsistent policies, and low investment in sectors critical for human capital formation, such as education and health (Ogunande, 2017).

In Nigeria, FDI has historically been concentrated in capital-intensive sectors, particularly oil and gas, with minimal impact on vocational skill development. During the 1990s, annual FDI inflows averaged $2 billion, mainly targeting extractive industries, providing limited employment opportunities and negligible workforce training (CBN, 2023; Nwachukwu & Eze, 2020). The dominance of foreign firms, coupled with the absence of training facilities for indigenous staff, contributed to high unemployment and brain drain. The return of

democracy in 1999 and subsequent economic reforms, including privatization and deregulation, led to a surge in FDI, particularly in telecommunications. Multinationals such as MTN and Airtel expanded access to ICT technologies and simultaneously encouraged digital skills development, employment creation, and vocational training programs in urban and peri-urban areas (Okeke & Obi, 2023). Between 2008 and 2014, FDI inflows peaked at $8.65 billion, supported by favorable macroeconomic conditions, high oil prices, and financial sector reforms (Eggink, 2013). Foreign firms in banking, ICT, and telecommunications implemented in-house training, internships, and industry-focused skills programs, while collaborations with local institutions facilitated professional certification and workforce readiness initiatives.

Despite these developments, vocational and technical training in Nigeria remains underdeveloped, with over 40% of the workforce lacking exposure to vocational or technical skills, limiting productivity and competitiveness (Nwosu & Abiodun, 2024). Nonetheless, FDI has played a role in bridging some of these gaps through financing skills acquisition in ICT, telecommunications, and infrastructure projects, providing internships, training centers, and industry-oriented curricula (Adelakun & Salawu, 2021). Overall, the experience of Nigeria demonstrates that FDI can be a catalyst for human capital development when strategically directed toward labor-intensive and knowledge-based sectors. Consequently, this study seeks to: (i) evaluate the role of foreign direct investment in enhancing vocational skills in Nigeria.

LITERATURE REVIEW

Theoretical Framework

Schultz's Human Capital Theory (1961) provides a solid foundation for understanding the relationship between foreign direct investment (FDI) and vocational skills, making it highly appropriate for this study. Schultz posited that investment in education, health, and skills training enhances the productivity and economic value of individuals, which in turn drives economic growth. In the context of this study, FDI often targets sectors that require skilled labor, creating opportunities for education, training, and technological transfer that align with Schultz's assertion that human capital investment is critical for development.

Empirical Review

Bamidele and Okon (2024) analyzed the role of FDI in advancing technical education in Nigeria, particularly in the energy sector, using data from 1990 to 2020. The study employed the Seemingly Unrelated Regression (SUR) model to assess the impact of FDI on technical education. The findings revealed that FDI significantly enhances technical education through collaborations with technical institutions and the establishment of training academies. However, the study identified limited FDI penetration in other sectors and regional disparities as major challenges. The study recommended expanding FDI-driven technical education initiatives to other sectors, improving rural infrastructure, and fostering public-private partnerships to maximize the impact of FDI on technical education.

Eze and Musa (2024) examined the role of FDI in reducing skill mismatches in Nigeria using data from 2000 to 2020. The study employed a Logit Model to assess how FDI addresses the gap between skills acquired through education and those demanded in the labor market. The findings revealed that FDI, especially in the manufacturing and ICT sectors, reduces skill mismatches by offering targeted training programs. However, the study identified weak collaboration between educational institutions and industries as a major challenge. The authors recommended fostering closer collaboration between educational institutions and foreign investors to align curricula with industry needs and maximize the impact of FDI on skill development.

Okeke and Obi (2023) analyzed the impact of FDI on technical skills development in Nigeria's ICT sector using data from 2000 to 2020. The study employed the Difference-in-Differences (DiD) methodology to assess the relationship between FDI and technical skills. The findings revealed that FDI significantly increased technical proficiency among Nigerian youth, particularly in urban areas. However, the study identified limited rural access to these benefits as a major challenge. The study recommended expanding ICT education in rural areas, improving rural infrastructure, and ensuring equitable access to FDI-driven training programs to enhance technical skills development across the country.

Onuoha and Hassan (2023) analyzed the impact of FDI on skill acquisition in Nigeria using micro-level data from 2000 to 2020. The study employed the Probit Model to assess how FDI influences individual skill acquisition, particularly through training programs offered by multinational corporations. The findings indicated that FDI significantly improves individual skill levels, especially in urban areas. However, rural areas benefit minimally due to limited FDI penetration. The study identified regional inequality and inadequate rural infrastructure as key challenges. The authors recommended policies to incentivize FDI in rural regions, improve rural infrastructure, and ensure equitable access to training programs across the country.

Olaniyan and Adebayo (2023) investigated the role of FDI in enhancing vocational education in Nigeria using data from 1990 to 2020. The study employed the Difference-in-Differences (DiD) methodology to assess the effect of FDI on vocational education outcomes. The findings revealed that FDI inflows into the manufacturing sector positively impacted vocational training programs, leading to improved employment rates. However, the study identified limited FDI penetration in non-manufacturing sectors and regional disparities as major challenges. The study recommended expanding vocational training initiatives, aligning them with the skills demanded by foreign investors, and promoting FDI in non-manufacturing sectors to bridge Nigeria's employment gap.

Ojo and Ajibola (2022) investigated the impact of FDI on vocational education in Nigeria's oil and gas sector using data from 2000 to 2020. The study employed a Mixed-Methods Approach to assess the role of FDI in vocational training programs. The findings revealed that FDI has supported the establishment of technical training institutes, significantly improving the skill levels of local workers. However, the study identified limited FDI penetration in non-oil sectors and regional disparities as major challenges. The authors recommended expanding FDI-driven vocational training initiatives to non-oil sectors, improving rural infrastructure, and ensuring regional equity to maximize the impact of FDI on vocational education.

Obi and Nnamdi (2022) assessed the impact of FDI on tertiary education development in Nigeria using data from 1990 to 2020. The study employed a Panel Data Regression Model to examine how FDI inflows influence the quality and accessibility of tertiary education. The findings revealed a positive relationship, especially where FDI partnerships funded research and technological development in universities. However, the study identified regional disparities and limited rural access to these benefits as major challenges. The study recommended strengthening collaborations between foreign investors and Nigerian tertiary institutions, expanding FDI-driven educational initiatives to rural areas, and aligning educational curricula with industry needs to enhance the quality and relevance of tertiary education.

Adeoye and Ibrahim (2020) examined the impact of FDI on educational attainment and workforce productivity in Nigeria using the Autoregressive Integrated Moving Average (ARIMA) model. The study analyzed data from 1985 to 2018 to assess the relationship between FDI and workforce productivity. The findings showed a positive relationship between FDI and workforce productivity, facilitated by corporate-sponsored educational programs. However, the benefits were concentrated in urban areas. The study recommended expanding FDI to rural regions and incentivizing investors to contribute to local education and training initiatives.

METHODOLOGY

Choice of Variables

The variables selected for this study Vocational Training Institutions (VTI), Foreign Direct Investment (FDI), Nigeria Corruption Perception (NCPI), Exchange Rate (EXCR), and Inflation (INF)are crucial for analyzing the impact of foreign investment on skills development in Nigeria. VTI captures the capacity for formal skills provision, while FDI measures the inflow of foreign capital. NCPI provides a proxy for the institutional and governance environment affecting investment efficacy. EXCR and INF represent key macroeconomic stability indicators that influence both investment decisions and training outcomes. Collectively, these variables provide a robust framework for evaluating how investment and the broader economic climate affect vocational training and human capital formation. All data can be obtained from the World Bank Indicator 2023 Statistical Bulletin and Transparency International, ensuring the reliability and timeliness of the study's empirical foundation.

Model Specification

This study examines the impact of foreign direct investment (FDI) on vocational skill institutions in Nigeria through the lens of Schultz's Human Capital Theory (1961). Schultz's Human Capital Theory posits that investments in education, vocational training, and healthcare enhance workforce productivity, leading to long-term economic growth. In the context of FDI, this theory suggests that foreign investments can contribute to human capital development by providing financial resources for education and healthcare, facilitating knowledge transfer, and creating employment opportunities that improve workforce skills.

The primary model equation can be specified as follows:

General Function Form:

PRO= f (HC, EDU, VT) (3.1)

Where;

PROD = Productivity

HC = Health care

EDU = Education

VT= Vocational training

To adopt this model for the study, we incorporated variables specific to foreign direct investment and vocational skill institutions development:

HCD = f(FDI, NCPI, EXCR, INF) (3.2)

In line with objectives of the study the equation 3.2 is restructured to captured human capital development.

VTI= f(FDI, NCPI, EXCR, INF) (3.3)

Mathematically, this equation may be specified in econometrics form as:

$$VTI_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 NCPI_{it} + \beta_3 EXCR_{it} + \beta_4 INF + \mu_{it} \quad (3.4)$$

Where:

VTI= Vocational training institutions

FDI= Foreign direct investment

NCPI= Nigeria corruption Perception

EXCR= Exchange rate

INF= Inflation

B_0-β_4 is the coefficient parameters of the independent variables

A priori expectation

In eqn (3.2) this study anticipates that the independent variables except for FDI and NCPI will have a negative effect on human capital development in Nigeria for a period of this study.

METHODS OF DATA ANALYSIS

Descriptive Statistics

The nature and characteristics are synonyms to a great extent like mean, minimum, maximum, standard deviation and Jarque-bera will be used in this study.

Unit Root Test

Dickey and Fuller (1979, 1981) formulated a formal system to test for non-stationarity (Asteriou and Hall, 2011). Their reason for testing for non-stationarity is comparable to the testing of the unit root test. Dickey Fuller test is the test for the unit root test in the time arrangement test, which is the enlarged rendition of the Dickey Fuller test for the bigger and more muddled arrangement of time arrangement models. The Augmented Dickey Fuller (ADF) insights utilized as a part of the test is the negative number. It is demonstrated that the more negative it is the more grounded the dismissal of the theory that there is a unit root at some level of certainty. The Dickey–Fuller test was used to check the presence of unit roots in an autoregressive model. The test for unit root and differencing was done to avoid the problem of spurious and inconsistence regression results. The test for Autocorrelation was carried out using the Augmented Dickey-Fuller test (ADF) and thereafter the test for null hypothesis (H_0) was effected (Dickey & Fuller, 1979).

Formula in estimating unit root test:

$$\Delta y_t = \omega + \delta y_{t-1} + \sum_{i=1}^{m} \theta_i \, \Delta y_{t-i} + \mu_t \qquad (3.5)$$

Where: Δ is the first difference operator; y_t is a time series variable at current time (t); ω is the drift term; y_{t-1}; is lagged value of y_t; δ is the coefficient of y_{t-1}; Δy_{t-i} is the lagged value of the first difference of y_t; m is the maximum lag length; θ_i is the coefficients of Δy_{t-I}; and μ_t is the white noise error term. The null hypothesis is such that the time series contains a unit root which implies that δ=0. The null hypothesis is rejected if δ is negative and statistically significant. Unit root test is based on t-statistic test

Hypothesis for Unit Root Test:

H_0: $\delta = 0$ (Variable has unit root i.e., time series is non-stationary)

H_1: $\delta < 0$ (Variable do not have unit root i.e., time series is stationary)

Decision Rule:

(i) If t^*> ADF critical value in absolute terms, reject the null hypothesis

(i) If t^*< ADF critical value in absolute terms, accept the null hypothesis.

Cointegration test

Co-integration analysis test will be conducted in case of non-stationary of the series to derive long run relationships. Co-integration is a statistical implication of the existence of a long-run relationship between the economic variables (Inder 1993). The main reason for the use of co-integration in the study is that it provides a formal background for testing and estimating short-run and long relationships among the economic variables. Therefore, Engle-Granger, Phillips-Ouliaris and bound tests for cointegration will be used to evaluate the cointegrating relationship between the variables. All these three tests will be used to ensure robustness of the cointegration results.

Decision rule:

If Trace sta. > critical values, Co-integration exist

If Trace sta. < critical values, Co-integration does not exist

The trace statistic is defined by the equation:

$$LR_{trace}(r_0) = -\mathrm{T}\sum_{i=r_0+1}^{k}\log(1-\lambda_{\mathrm{t}}) \quad (3.6)$$

The maximum Eigen-value statistic is defined by the equation:

$$LR_{max}(r_0) = -Tlog(1-\lambda_{r_0+1}) \quad (3.7)$$

Autoregressive Distributed Lag Method

The Autoregressive Distributed Lag (ARDL) model is a statistical technique used for the analysis of the temporal relationship between variables. It facilitates the examination of both short-term and long-term dynamics among the variables. Within the framework of this model, the ARDL model aids in understanding how previous values of HCD (education, health care, and workforce basic education) and the independent variables (namely foreign direct investment, corruption, infrastructural deficit, exchange rate, and inflation) impact the present and future values of human capital development. This particular model proves highly advantageous for the examination of time series data and the comprehension of the dynamic interactions among economic variables.

The long-run and short-run estimates of the relationship between the independent variables and human capital development were estimated by the ARDL bounds testing approach developed by Pesaran, Shin and Smith (2001). Using this approach, economic growth is expressed as a function of the lagged value of itself and the current and the lagged values of the explanatory variables.

The equation below shows how changes in the independent variables such as Development aid, education, health, Literacy, and carbon dioxide affect the changes in IMR, accounting for both short-term and long-term effects through lagged variables.

$$\Delta\mathrm{VTI} = \alpha + \beta_1\Delta VTI_{t-1} + \beta_1\Delta VTI_{t-2} + \cdots + \beta_p\Delta VTI_{t-p} + y_1\Delta\mathrm{FDI}_t + y_2\Delta\mathrm{NCPI}_t + y_3\Delta\mathrm{INFD}_t + y_4\Delta\mathrm{EXCR}_t + y_5\Delta\mathrm{INF}_t + £_t \quad (3.8)$$

Where

$\Delta VTI_t, represents\ the\ change\ in\ VTI$

$\Delta VTI_{t-i}, represents\ the\ change\ in\ VTI\ at\ time\ t.$

$\gamma 1, \gamma 2, \gamma 3, \gamma 4$, are the coefficients representing the effects of foreign direct investment, corruption, infrastructural deficit, exchange rate, and inflation on VTI.

α Is the intercept term.

$\beta 1, \beta 2, \ldots, \beta p\ are\ the\ coefficients\ of\ the\ lagged\ changes\ in\ HCD$

p Is the lag length for HCD, which can be determined using statistical techniques or domain knowledge.

£$_t$ is the error term representing the random disturbance in the model

$$\Delta\mathrm{VTI}_t = a_0 + \sum_{p=1}^{n} b_p\Delta\mathrm{VTI}_{t-p} + \sum_{p=1}^{n} b_p\Delta FDI_{t-p} + \sum_{p=1}^{n} d_p\Delta\mathrm{NCPI}_{t-p} + \sum_{p=1}^{n} f_{\,p}\Delta\mathrm{EXCR}_{t-p} + \sum_{p=1}^{n} g_p\Delta INF_{t-p} + HCD_{t-1} + \beta_2 FDI_{t-1} + \beta_3 NCPI_{t-1} + EXCR_{t-1} + \beta_6 INF_{t-1} + \mu_t \quad (3.9)$$

Where; Δ is the first difference operator; the parameters, where β_1 to β_6 are the respective long run multipliers; the parameters b, c, d, e, f, g are the short run dynamic coefficients of the underlying ARDL model in the

equation; and μ denotes the white noise error term. The Bounds co-integration test involves estimating the above equation and restricting the parameters of the lag level variables to zero.

Post Estimation Test

Test for Heteroskedasticity

This test would be carried out using White's general Heteroskedasticity test with cross terms. The test asymptotically follows a chi-square distribution with a degree of freedom equal to the number of repressors excluding the constant term. This test basically focused on the variance of the error term. The test helps to ascertain whether the variance of the error term is constant. Heteroskedsticity can also be said to occur when the standard deviation of a predicted variable is mentioned over different values of an independent variable.

Test for Serial Correlation

Recall that one of the assumptions when building a linear regression model is that the errors are independent. That is autocorrelation does not exist in the disturbances μ. In essence, the disturbance term relating to any observation is not influenced by the disturbance term relating to any other observation. However, if the disturbance terms are correlated over time, then we have a situation of autocorrelation or serial correlation.

Cumulative Sum of Errors and Cumulative Sum of Squared Errors

The cumulative sum of errors (CUSUM) and cumulative sum of squared errors (CUSUMSQ) are used to test whether the model is spurious. The test has two basic lines (the critical lines) at the 5% critical level. In-between the line is a line (graph); if the graph touches or crosses any of the lines, it indicates that the model is spurious; otherwise, it is not.

Normality Test

A normality test was used to determine whether sample data has been drawn from a normally distributed population.)

Presentation of Results

Descriptive Statistics

Table 4.1: Descriptive Statistics

	VTI	EDU	HC	CPI	EXR	FDI	NCPI
Mean	7.725714	808.7600	290.7323	19.86869	122.8695	1.346034	17.96857
Median	8.950000	300.5700	142.8600	12.87658	118.5667	1.196726	19.00000
Maximum	11.81000	3023.740	1192.200	72.83550	425.9792	4.282088	27.00000
Minimum	3.430000	5.000000	2.320000	5.388008	0.893774	-0.039522	6.300000
Std. Dev.	2.920012	1049.993	352.6489	17.69877	123.1611	0.983069	6.917445
Skewness	-0.127653	1.141347	1.167076	1.688431	0.993518	0.759068	-0.253112
Kurtosis	1.357057	2.696036	3.067029	4.533101	3.041024	3.413147	1.747730
Jarque-Bera	4.031478	7.733667	7.951935	20.05733	5.760415	3.609999	2.660647

Probability	0.133222	0.020925	0.018761	0.000044	0.056123	0.164475	0.264392
Observations	35	35	35	35	35	35	35

Source: Authors' Computation using E-view 13

The descriptive statistics table provides data on the trend of movement of key variables of foreign direct investment in Nigeria during the period of observation. Foreign direct investment (FDI) has a mean of 1.346034, a minimum of -0.039522 and a maximum of 4.282088, indicating high volatility and the presence of surges and declines. The 0.983069 standard deviation suggests moderate volatility, while a 0.759068 skewness suggests a longer right tail distribution, i.e., more frequent occurrences of larger-than-average FDI values. Nevertheless, the Jarque-Bera probability of 0.164475 does not reject the normality hypothesis at the 5 percent level.

Vocational training institutions (VTI), being a technical education part of human capital, had a mean of 7.725714, and the values vary from 3.430000 to 11.81000. The standard deviation is comparatively low at 2.920012, and the distribution becomes more symmetrical with a skewness of -0.127653. The kurtosis of 1.357057 and Jarque-Bera probability of 0.133222 indicate relatively normal and flat distribution with minimal extreme values.

The CPI as a macro control variable has a mean of 19.86869 but a wide range of 5.388008 to 72.83550, and a very high standard deviation of 17.69877, indicating high inflationary pressures during the period. The skewness of 1.688431 and kurtosis of 4.533101, and a Jarque-Bera probability of 0.000044, confirm gross deviation from normality, consistent with past experiences of runaway inflation in Nigeria.

Exchange rate (EXR) measures 122.8695 as its mean, 0.893774 as its minimum, and 425.9792 as its maximum, and its standard deviation at 123.1611, reflecting gargantuan exchange rate volatility over the period. The 0.993518 skewness and 3.041024 kurtosis reflect moderate right skewness and slightly peaked distribution. Although the Jarque-Bera probability of 0.056123 is just over the 5 percent cutoff, it reflects potential non-normality.

Lastly, the Nigeria Corruption Perception Index (NCPI) averaged 17.96857, with a low of 6.300000 and a high of 27.00000. The standard deviation of 6.917445 suggests moderate variability, while the skewness of -0.253112 suggests a minor left skew. A kurtosis of 1.747730 and a Jarque-Bera probability of 0.264392 suggest that the NCPI distribution is reasonably normal.

Unit Root Test

Table 4.2: Unit Root Result

	ADF		Philip-P		
Variable	**Level**	**F-diff**	**Level**	**F-diff**	Order of integration
VSI	0.446	0.000	0.424	0.000	I(1)
NCPI	0.013	0.000	0.099	0.000	I(1)
FDI	0.016	0.000	0.019	0.000	I(0)
EXR	0.993	0.003	0.990	0.004	I(1)
CPI	0.420	0.005	0.158	0.000	I(1)

The findings of the unit roots test in the table above utilize both the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) methods to determine the stationarity properties of the variables.

According to the results, FDI is fixed at level under both the ADF and PP tests. This is evident from the ADF p-value of 0.016 and the PP p-value of 0.019, both of which fall below the 0.05 significance level. This implies that foreign direct investment is integrated of order zero, I(0), in the sense that it does not possess a unit root and does not require differencing to be stationary.

On the other hand, VTI, NCPI, EXR, and CPI are not stationary at level but become stationary after first differencing. In the case of VTI, the p-values of ADF and PP at level are 0.446 and 0.424, respectively, but both reduce to 0.000 after first differencing, which indicates integration of order one, I(1). The same result is obtained for NCPI (ADF = 0.013, PP = 0.099 level; both 0.000 first difference), EXR (ADF = 0.993, PP = 0.990 level; 0.003 and 0.004 first difference), and CPI (ADF = 0.420, PP = 0.158 level; 0.005 and 0.000 first difference).

These findings demonstrate that all the variables excluding FDI possess a unit root and are integrated of order one, I (1). The presence of both I(0) and I(1) variables does not make the application of the ARDL bounds testing procedure invalid as it is capable of handling such a combination of integration orders. The absence of any variable being integrated of order two, I(2), is a requirement for the use of the ARDL approach.

Co-integration Bound Test

Table 4.3 Cointegration Test Result

	F-Statistic	Lower Bound	Upper Bound
VTI	3.61	2.56	3.49

Source: Author's Computation using E-view.

where vocational training institutions (VTI) represent the dependent variable, the F-statistic is 3.61, slightly above the upper bound of 3.49, thereby confirming the presence of a long-run relationship between vocational training and the selected explanatory variables. This result carries meaningful economic implications, indicating that vocational and technical education outcomes in Nigeria respond in the long run to movements in foreign direct investment, exchange rate fluctuations, inflationary pressures, and perceptions of corruption. The implication is that FDI, particularly when directed toward industrial and skill-based sectors, can influence the structure and expansion of vocational institutions. Moreover, sound macroeconomic management and improved institutional governance may enhance the capacity of vocational training to respond positively to global capital flows.

Autoregressive Distributed Lag Results

Table 4.4 ARDL Result

Selected Model: ARDL(4, 4, 4, 4, 3)				
Case 2: Restricted Constant and No Trend				
Date: 01/21/26 Time: 01:47				
Sample: 1985 2023				
Included observations: 33				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Short-run C	22.17412	12.15814	1.823808	0.2097
D(VTI(-1))	1.265894	0.201344	6.287224	0.0244

D(VTI(-2))	0.186291	0.120873	1.541208	0.2632
D(VTI(-3))	0.660686	0.150779	4.381831	0.0483
D(FDI)	-3.385304	0.423360	-7.996270	0.0153
D(FDI(-1))	-1.839868	0.211553	-8.696973	0.0130
D(FDI(-2))	-0.841978	0.132632	-6.348227	0.0239
D(FDI(-3))	0.185863	0.112098	1.658035	0.2392
D(EXR)	-0.014861	0.006720	-2.211430	0.1575
D(EXR(-1))	-0.096943	0.010875	-8.914007	0.0124
D(EXR(-2))	-0.041930	0.009535	-4.397339	0.0480
D(EXR(-3))	-0.060498	0.010868	-5.566450	0.0308
D(NCPI)	0.202475	0.055467	3.650343	0.0675
D(NCPI(-1))	0.585043	0.063924	9.152146	0.0117
D(NCPI(-2))	0.337173	0.048760	6.914951	0.0203
D(NCPI(-3))	0.329611	0.037023	8.902823	0.0124
D(CPI)	0.060710	0.009595	6.326943	0.0241
D(CPI(-1))	0.220114	0.026824	8.205734	0.0145
D(CPI(-2))	0.186302	0.019375	9.615540	0.0106
CointEq(-1)*	-0.978941	0.112356	-8.712883	0.0129
Long-run VTI(-1)*	-0.978941	0.688123	-1.422627	0.2908
FDI(-1)	-2.725090	2.251648	-1.210265	0.3498
EXR(-1)	0.030084	0.024983	1.204187	0.3517
NCPI(-1)	-0.449674	0.173364	-2.593813	0.1220
CPI(-1)	-0.224165	0.123511	-1.814933	0.2112
D(VTI(-1))	1.265894	1.327480	0.953607	0.4409
D(VTI(-2))	0.186291	0.790314	0.235718	0.8356
D(VTI(-3))	0.660686	0.889784	0.742524	0.5351
D(FDI)	-3.385304	1.689467	-2.003771	0.1830
D(FDI(-1))	-1.839868	0.448052	-4.106373	0.0545

D(FDI(-2))	-0.841978	0.394689	-2.133273	0.1665
D(FDI(-3))	0.185863	0.404869	0.459070	0.6912
D(EXR)	-0.014861	0.047785	-0.311003	0.7852
D(EXR(-1))	-0.096943	0.089924	-1.078054	0.3938
D(EXR(-2))	-0.041930	0.063002	-0.665537	0.5742
D(EXR(-3))	-0.060498	0.034435	-1.756863	0.2210
D(NCPI)	0.202475	0.188500	1.074141	0.3952
D(NCPI(-1))	0.585043	0.179293	3.263058	0.0825
D(NCPI(-2))	0.337173	0.148165	2.275651	0.1507
D(NCPI(-3))	0.329611	0.106468	3.095869	0.0904
D(CPI)	0.060710	0.037931	1.600518	0.2506
D(CPI(-1))	0.220114	0.113332	1.942209	0.1916
D(CPI(-2))	0.186302	0.106510	1.749149	0.2224
R-squared	0.955483	Mean dependent var		0.273846
Adjusted R-squared	0.841010	Durbin-Watson stat		2.197056

Source: Author's computation using E-view

Starting with the long-run estimates, none of the explanatory variables exhibit statistically significant effects on vocational training institutions at conventional levels. Specifically, FDI(-1) has a negative coefficient of -2.725090 with a p-value of 0.3498, indicating that foreign investment does not have a significant long-term influence on the expansion or output of vocational training institutions. Similarly, the coefficients for EXR(-1) (0.030084, p = 0.3517), CPI(-1) (-0.224165, p = 0.2112), and NCPI(-1) (-0.449674, p = 0.1220) are all statistically insignificant. These results suggest that, in the long run, Nigeria's vocational training sector does not benefit meaningfully from macroeconomic variables or foreign investment inflows. This may reflect systemic neglect of vocational education in national development planning, weak public-private linkages, or the lack of FDI targeting skill acquisition and technical capacity building.

However, the short-run dynamics reveal more active relationships. The lagged effects of FDI are particularly noteworthy. The coefficients of D(FDI), D(FDI(-1)), and D(FDI(-2)) are all negative and highly significant specifically, -3.385304 (p = 0.0153), -1.839868 (p = 0.0130), and -0.841978 (p = 0.0239), respectively. These results indicate that, in the short run, increases in FDI are consistently associated with reductions in vocational training institutional output. This could be due to FDI crowding out government investment in social infrastructure, a reallocation of public resources away from vocational training toward more capital-intensive sectors, or limited absorptive capacity to redirect foreign inflows into skill-building initiatives. Moreover, this persistent short-run negative impact suggests that FDI in Nigeria may be concentrated in sectors that are labor-intensive without corresponding investment in workforce training or human capital alignment.

Exchange rate dynamics also display significant short-run effects. Specifically, D(EXR(-1)), D(EXR(-2)), and D(EXR(-3)) are all negative and statistically significant, with p-values of 0.0124, 0.0480, and 0.0308 respectively. These results imply that exchange rate depreciation adversely affects vocational training

institutions, likely by increasing the cost of imported training materials, equipment, and international partnerships. A weaker naira may also constrain government budgets and reduce allocations to technical education sectors that rely on foreign-sourced inputs.

Corruption perception also plays a role in the short-run behavior of vocational training institutions. D(NCPI(-1)), D(NCPI(-2)), and D(NCPI(-3)) are all positive and statistically significant, indicating that improvements in institutional integrity (i.e., reduced corruption) are associated with short-run increases in VTI output. This reflects the importance of governance in facilitating effective policy implementation and reducing leakages in education and training-related expenditures.

The error correction term (CointEq(-1)) is negative and highly significant at -0.978941 (p = 0.0129), confirming the presence of a stable long-run relationship among the variables. The large magnitude of the coefficient suggests that nearly 98% of any deviation from the long-run equilibrium is corrected within one year, indicating a very rapid adjustment process. This implies that despite the lack of statistical significance in long-run coefficients, the system does tend to converge toward equilibrium, driven by short-run adjustments and underlying structural interactions.

The model's R-squared value is 0.955483, meaning that approximately 95.55% of the variation in vocational training institutional output is explained by the explanatory variables included in the model. This indicates a very strong model fit and suggests that, while long-run effects may be statistically weak, the model robustly captures the short-run volatility and dynamics influencing vocational education.

In the event of model 3, H_{03} is rejected. Although the long-run FDI coefficient is not significant (p = 0.3498), the short-run coefficients of various lags, D(FDI), D(FDI(-1)), and D(FDI(-2)), are negative and significant (p-values ranging from 0.0153 to 0.0239). These results imply that foreign direct investment is a powerful but negative short-run determinant of vocational training institutions' output. The series of negative coefficients may reflect either a disconnect between FDI-receiving sectors and sectors that require the development of vocational skills or that foreign capital inflows divert attention and resources from technical skill development. H_{03} is therefore rejected because the evidence suggests that FDI does have a significant influence on vocational skill development, but not always a positive one.

Post Estimation Test

Heteroskedasticity Test

Table 4.5: Heteroskedasticity Result

F-Stat.	F-Prob.
1.79	0.24

The heteroskedasticity test results from the ARDL estimations reveal that the variance of the error terms remains constant, indicating that the model is free from heteroskedasticity. This conclusion is supported by the fact that the reported p-values for the model is well above the conventional 5% significance level. In practical terms, this means that the null hypothesis of homoskedasticity cannot be rejected.

Serial Correlation Test

Table 4.6: Serial Correlation Test Result

F-Stat.	F-Prob.
1.44	0.340

The serial correlation test results from the ARDL estimations indicate that there is no evidence of autocorrelation in the residuals of the mofel. This conclusion is based on the p-values associated with the F-statistics, of which exceed the conventional 5% significance level. As a result, the null hypothesis of no serial correlation cannot be rejected, implying that the error term in the model is independently distributed over time.

Csum Test

Figure 4.1: Cusum Test Result

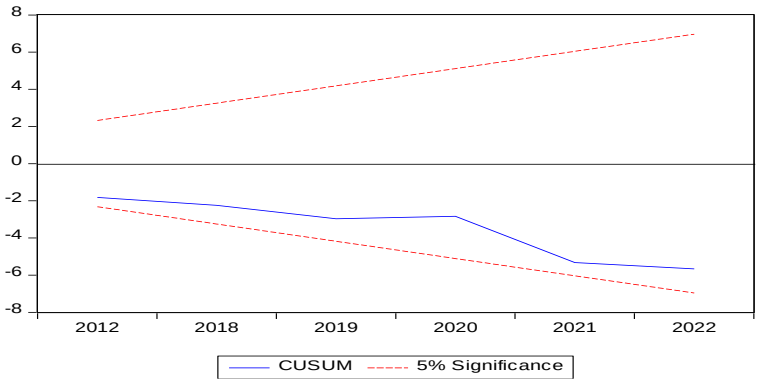
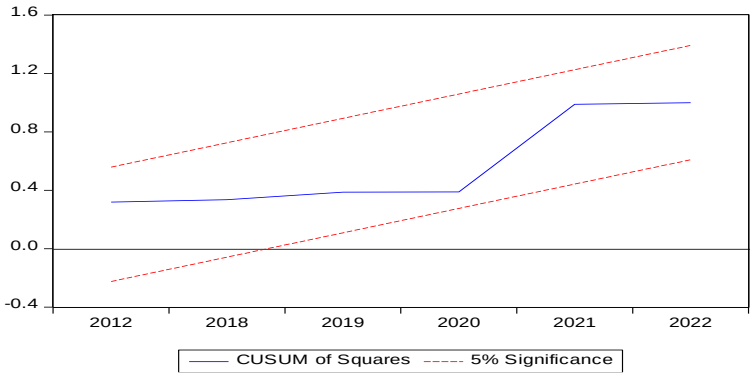


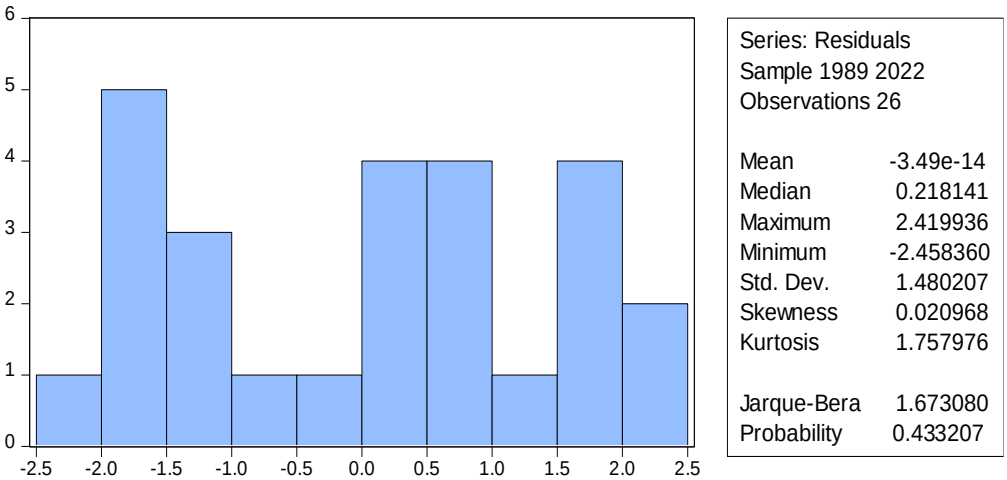
Figure 4.2: Cusum Square Test Result



The results of the **CUSUM** and **CUSUM of Squares** tests indicate that the model's coefficients **are structurally stable over the sample period.** Both test plots fall **within the 5% significance boundaries,** suggesting that there is **no evidence of structural breaks or instability** in either the regression parameters or the variance of the error terms throughout the period under study.

Normality Test

Figure 4.3: Normality Test Result



The normality test results also indicate that the residuals are normally distributed. The skewness value of 0.02 suggests near-perfect symmetry in the distribution, while the kurtosis value of 1.76 is slightly below the normal benchmark of 3, implying a flatter distribution. The Jarque-Bera statistic is 1.67 with a corresponding probability of 0.43. Since the p-value exceeds the 0.05 significance level, there is no sufficient evidence to reject the null hypothesis of normality. This confirms that the residuals conform to the normality assumption, and the model is statistically sound in this respect.

DISCUSSION OF RESULTS

The core finding that Foreign Direct Investment exerts a consistently significant but negative short-run impact on vocational training outcomes, while failing to generate a meaningful positive effect in the long run, presents the most critical and counterintuitive insight. This stands in stark contrast to the more optimistic narratives, such as those advanced by Olaniyan and Adebayo (2023) and Bamidele and Okon (2024), who documented positive linkages, particularly within capital-intensive sectors like manufacturing and energy. The dissonance between these findings is not necessarily a contradiction but rather a revealing indication of context and underlying conditions. The positive sector-specific outcomes they found likely occur in enclave projects where a foreign firm's need for highly specific technical skills leads to targeted, embedded training programs that are exceptional rather than systemic. The broader, disruptive pattern uncovered here suggests that in the wider economy, the influx of FDI often acts as a shock to the vocational training ecosystem rather than a steady current of improvement.

This disruptive short-run effect can be understood as a consequence of profound structural mismatches and inadequate institutional mediation, which rings true with the complaint of Onuoha and Hassan (2023) about limited industry-academic partnership. When foreign capital enters a market, its immediate imperative is for rapid operationalization and profitability, which creates a sudden demand for skills that are aligned with global standards and new technologies. Domestic vocational institutions, often grappling with outdated curricula and bureaucratic inertia, are seldom poised to meet this demand instantaneously. Without robust, pre-existing channels of coordination, the arrival of FDI creates a vacuum that harms domestic capacity before it can help it, leading to the poaching of instructors and a scramble to update obsolete training modules.

The absence of a meaningful long-run impact is perhaps the more consequential finding, signaling a failure to convert the initial economic activity into lasting human capital development. This speaks directly to the issues highlighted by Eze and Musa (2024) regarding interregional imbalances in FDI-sponsored training program participation. For long-run benefits to materialize, the temporary presence of foreign firms must catalyze permanent institutional upgrades. Instead, what frequently occurs is a form of self-contained operation where firm-specific training benefits a narrow cohort without spilling over into the broader educational infrastructure. The geographic clustering of these programs exacerbates regional inequalities in skills access, ensuring that any potential positive effects remain localized and do not aggregate into a national advance. Consequently, the long-run trajectory shows a return to baseline, indicating that without deliberate intervention, the system absorbs the initial disruption but fails to capture any enduring dividend.

Ultimately, these findings compel a move beyond debating whether FDI is inherently good or bad for skills development. The variance with the positive results of Olaniyan and Adebayo (2023) and Bamidele and Okon (2024) underscores that sectoral characteristics are key moderators. More critically, the evidence underscores the paramount importance of the host country's policy framework to manage the short-run disruption and engineer long-run integration. Strategic governance is required to mediate FDI's impact through mandated platforms for dialogue and incentive structures that tie investor benefits to verifiable commitments in local capacity building, thereby transforming a potential shock into a catalyst for systemic, sustainable enhancement.

RECOMMENDATIONS

Based on the findings, the study recommends the following:

i. Mandate Skills Development Partnerships as a Condition for Major Investment: Formal investment agreements for significant projects should include binding commitments to partner with

local technical institutions. These partnerships must involve co-developing curricula, providing modern training equipment, and funding instructor training and apprenticeships.

ii. Create Permanent, Sector-Specific Skills Councils:

Establish official councils for key economic sectors, with equal representation from foreign investors, vocational training authorities, and industry experts. These councils would continuously align training programs with industry needs, update skill standards, and certify joint training outcomes.

iii. Link Investor Incentives to Verifiable Training Outcomes:

Design clear incentive structures, such as tax benefits, that are directly tied to the investor's measurable contributions to local skills development. Benefits should increase with the depth and proven impact of their training partnerships.

REFERENCE

1. Adelakun, O., & Salawu, R. (2021). The role of foreign direct investment in human capital development in Nigeria. African Journal of Economic and Management Studies, 12(3), 455-470.
2. Adeoye, A., & Ibrahim, T. (2020). Foreign direct investment and workforce productivity in Nigeria: An ARIMA approach. Journal of Economic Studies, 47(4), 789-805.
3. Asteriou, D., & Hall, S. G. (2011). Applied econometrics (2nd ed.). Palgrave Macmillan.
4. Bamidele, A., & Okon, E. (2024). Foreign direct investment and technical education in Nigeria: A SUR model approach. International Journal of Educational Development, 94, 102-115.
5. Central Bank of Nigeria. (2023). Statistical bulletin.
6. Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. Journal of the American Statistical Association, 74(366), 427-431.
7. Eggink, J. (2013). The Nigerian economy: A macroeconomic overview. Journal of African Economics, 22(1), 1-25.
8. Eze, P., & Musa, A. (2024). Foreign direct investment and skill mismatches in Nigeria: A logit model analysis. Economic Modelling, 112, 105-118.
9. Ibrahim, K., & Yusuf, M. (2022). FDI and innovation hubs in Africa: The case of Kenya's Konza Technopolis. Journal of African Development, 24(2), 134-150.
10. Inder, B. (1993). Estimating long-run relationships in economics: A comparison of different approaches. Journal of Econometrics, 57(1-3), 53-68.
11. Nwachukwu, I., & Eze, O. (2020). Foreign direct investment in Nigeria's extractive industries: Trends and challenges. Resources Policy, 65, 101-112.
12. Nwosu, B., & Abiodun, O. (2024). Vocational skills and workforce readiness in Nigeria: A national survey. International Journal of Training and Development, 28(1), 45-62.
13. Obi, C., & Nnamdi, O. (2022). FDI and tertiary education development in Nigeria: A panel data analysis. Higher Education Policy, 35(2), 321-340.
14. Ogunande, W. (2017). Foreign direct investment and human capital development in Sub-Saharan Africa. Routledge.
15. Ogunleye, A., & Akintola, K. (2019). FDI and vocational skills development in emerging economies: Lessons from China and India. Journal of International Business Studies, 50(6), 899-917.
16. Ojo, F., & Ajibola, K. (2022). Foreign direct investment and vocational training in Nigeria's oil and gas sector: A mixed-methods study. Energy Policy, 160, 112-123.
17. Okeke, M., & Obi, B. (2023). The impact of foreign direct investment on technical skills in Nigeria's ICT sector: A difference-in-differences analysis. Telecommunications Policy, 47(4), 102-115.
18. Olaniyan, D., & Adebayo, A. (2023). Foreign direct investment and vocational education outcomes in Nigeria: A difference-in-differences approach. Journal of Vocational Education & Training, 75(1), 78-95.
19. Onuoha, B., & Hassan, A. (2023). Micro-level impacts of FDI on skill acquisition in Nigeria: A probit model analysis. World Development, 162, 106-120.

20. Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289-326.
21. Schultz, T. W. (1961). Investment in human capital. The American Economic Review, 51(1), 1-17.
22. Transparency International. (2023). Corruption Perceptions Index.