



(RESEARCH ARTICLE)



GENERATING FUNCTION FOR FOREIGN DIRECT INVESTMENT AND ECONOMIC GROWTH IN NIGERIA FROM 2005 TO 2024

Elias Ikechukwu Chukwuma *, Nwosu Augustine Ikechukwu and Precious Chikaedum Agina

Department of Mathematics, Faculty of Physical Sciences, Chukwuemeka Odumegwu Ojukwu University, Uli, Anambra State, Nigeria.

* Corresponding Author

Global Journal of Engineering and Technology Advances, 2026, 29(01), 270–283

Publication history: Received on 10 September 2026; revised on 18 October 2026; accepted on 20 October 2026

Article DOI: <https://doi.org/10.30574/gjeta.2026.29.1.0301>

Copyright © 2026 Author(s) retain the copyright of this article. This article is published under the terms of the Creative Commons Attribution License 4.0

ABSTRACT

Foreign Direct Investment (FDI) is widely recognized as catalyst for economic growth, technological advancement and institutional development especially in developing country. The relationship between foreign direct investment and economic growth in Nigeria has attracted considerable attention over the years. The role played by foreign direct investment in economic growth in Nigeria cannot be overemphasized. Foreign direct investment is a key contributor to the economic growth in Nigeria. The aim of this study is to develop the generating function for foreign direct investment and economic growth in Nigeria from 2005 to 2024 using Newton's Backward Difference Method. Furthermore, we shall examine the impact of foreign direct investment on economic growth in Nigeria. The result of the study reveals that the generating function for foreign direct investment and economic growth in Nigeria from 2005 to 2024 is

$$y = -1.051 \times 10^{-177}x^{19} + 3.7775 \times 10^{-166}x^{18} - 6.4307 \times 10^{-155}x^{17} + 6.8921 \times 10^{-144}x^{16} - 5.2136 \times 10^{-133}x^{15} \\ + 2.9576 \times 10^{-122}x^{14} - 1.3048 \times 10^{-111}x^{13} + 4.5813 \times 10^{-101}x^{12} - 1.2990 \times 10^{-90}x^{11} \\ + 3.0008 \times 10^{-80}x^{10} - 5.6709 \times 10^{-70}x^9 + 8.7669 \times 10^{-60}x^8 - 1.1043 \times 10^{-49}x^7 \\ + 1.1240 \times 10^{-39}x^6 - 9.1283 \times 10^{-30}x^5 + 5.8084 \times 10^{-20}x^4 - 2.8245 \times 10^{-10}x^3 + 1.0098x^2 \\ - 2.4492 \times 10^9x + 3.1381 \times 10^{18}$$

Keywords: Foreign direct investments, Economic growth, Economic development, Gross domestic product and spillover

1 INTRODUCTION

Globalization has led to a greater opening of the world economies to foreign trade and investments. A foreign direct investment has a big feature of this phenomenon. Countries around the world have opened their economies and created conditions to attract foreign investments in the hope of fostering economic growth. Foreign direct investment is regarded as a significant variable in economic growth in developing nations. The major problem of most of these nations is the nonexistence of capital, which has a direct impact on investment because it is needed along with other components of production. Over years, human priorities change, requiring the introduction of new technologies made possible by foreign direct investments. Foreign direct investments are normally made through multinational corporations. With this, the local market becomes more competitive and national companies can produce at their maximum capacity, which

reduces costs and favours exports. With the exception of a few, most fast-growing nations did so through foreign direct investments. Foreign direct investment plays an important role in the development of any developing nations (Ujumadu, Okeke, Chukwuma and Nwosu, 2026a, 2026b; Asiedu, 2002).

Nigeria as a developing country faces deficiency of capital in the domestic market to fulfill investment requirements. Nigeria as a country has been working very hard to solve some fundamental issues to promote human development and lower poverty rates. There are various prerequisites that must be met to achieve these goals, with capital being the most important one. People's standard of living rise when their own discretionary income rises, making it possible for them to acquire high-quality health care and education. In most cases, foreign direct investment inflows are taken for granted as a kind of capital investment. Nigeria strives to create an atmosphere that is beneficial from an economic standpoint to draw in as much foreign direct investment as possible since it speeds up the development process (Karimi and Yusop, 2009). Greater opening of world economies to investments and foreign trade was as a result of globalization. One of the noticeable features of this phenomenon is foreign direct investments (FDI). Nations around the world have opened up their economies and created rules to attract foreign investments with the hope to foster economic growth. The economy of Nigeria is known with many macro-economic problems such as slow economic growth, high inflation, unemployment, exchange rate instability and others. The most continuous challenge in the economy of Nigeria has been high unemployment rate among the youths which has resulted to insecurity all over the country. This situation is miserable and dangerous. With regard to unemployment trend in Nigerian economy, the government of Nigeria has introduced measures to stimulate economic growth in order to create more job opportunities for the people. The main postulation of the policy authorities in Nigeria is that there is a direct link between economic growth and job creation. Thus, economic growth turns to be the primary objective of national policy (Ujumadu, Okeke, Chukwuma and Nwosu, 2026a, 2026b; Asiedu, 2006).

In Nigeria, successive governments have made a reasonable effort to push economic growth to greater heights using FDI inflows as a key strategy. Despite decades of substantial FDI inflows, Nigeria continues to grapple with weak institutional structures, pervasive corruption, low regulatory quality and modest economic performance. This paradox raises critical questions about the actual impact of FDI on Nigeria's institutional quality and broader economic growth. Foreign direct investment (FDI) is an essential factor in Nigeria's economic growth and development. The role it plays cannot be overemphasized. Foreign direct investment (FDI) and economic growth relationship has raised an important institutional issues on the recipient economy. The level of institutional quality for recipient economies is regarded as an important factor that can be used to derive foreign direct investment in every nation. It is evident to say that institutions are part of a nation's productive capability frontier. In fact, there is need for solid institutional quality so as to guarantee sustainable development and growth. Nigeria has experienced worst institutional quality over the years (Ujumadu, Okeke, Chukwuma and Nwosu, 2026a, 2026b; Jude and Levieuge, 2017). The indices for control of corruption, rule of law, government effectiveness and political stability have been trending negative throughout the 21st century (World Bank, 2021). Because of Nigeria's deteriorating institutional quality, the economic growth of Nigeria has become very precarious or unjustified.

In this work, we developed the generating function for foreign direct investment and economic growth in Nigeria from 2005 to 2024 using Newton's Backward Difference Method. Furthermore, we examined the impact of foreign direct investment on economic growth in Nigeria.

2 BASIC DEFINITIONS

2.1 INSTITUTIONAL QUALITY

Institutional quality refers to the effectiveness and reliability of a country's institutions in governing and regulating its society and economy. It encompasses the strength and efficiency of legal systems, political processes, and public administration, as well as the protection of property rights and the rule of law. High institutional quality is crucial for economic development, social stability and good governance. It is one of the most important factors that boost the economic growth of any country. It is also an indicator for quality governance and institutions in a country. The institutional quality impedes the positive effects of foreign direct investments (FDIs) and trade openness on economic growth. It plays an important role in achieving the Sustainable Development Goals in any country (Ujumadu, Okeke, Chukwuma and Nwosu, 2026a, 2026b; Jude and Levieuge, 2017; Asiedu, 2009).

2.2 FOREIGN DIRECT INVESTMENT (FDI)

It is an investment made by an organisation or an individual in one country into a business located in another country. Also, it can be defined as an ownership stake in a company, made by foreign investor, company, or government from another country. More specifically, it describes a controlling ownership of an asset in one country by an entity based in another country (Ujumadu, Okeke, Chukwuma and Nwosu, 2026a, 2026b; Abala, 2014).

2.3 ECONOMIC GROWTH

Economic growth can be defined as the improvement or increase in the inflation-adjusted market value of the goods and services produced by an economy in a financial year. It is an increase in the capacity of an economy to produce goods and services, compared from one period of time to another (Ujumadu, Okeke, Chukwuma and Nwosu, 2026a, 2026b; Jude and Levieuge, 2017)

2.4 GROSS DOMESTIC PRODUCT (GDP)

It is an overall market or monetary value of all the finished goods and services produced by a country in a specific period of time. Gross domestic product (GDP) provides an economic portrait of a country, used to estimate the size of an economy and its growth rate (Ujumadu, Okeke, Chukwuma and Nwosu, 2026a, 2026b; Adeyeye et al., 2017).

2.5 ECONOMIC DEVELOPMENT

It is a policy or a program that seeks to improve the entire well-being of people living in a country. Economic development is the process whereby people living in a country become healthier, wealthier and has quality access to education, hospital and housing. In fact, economic development can better be explained by Wikipedia as “the process by which a country improves the social, political and economic well-being of its people (Ujumadu, Okeke, Chukwuma and Nwosu, 2026a, 2026b; Adeyeye et al., 2017).

2.6 SPILLOVER

It refers to the effect on the economy of a country from unrelated events happening in another country. For example political crisis or earthquakes in another nation can have negative or positive effects on the economy of a nation (Ujumadu, Okeke, Chukwuma and Nwosu, 2026a, 2026b; Moga and Xu, 2017).

2.7 POLYNOMIAL FUNCTION

A polynomial function in x is a function which contains only a finite number of positive integer powers of x , usually arranged in the order of ascending or descending powers. The degree of a Polynomial is the highest power of the variable occurring in the function; for instance

$$f(x) = 5x^4 + 7x^3 + 2x^2 + 3x + 1$$

is a 4th degree polynomial. Thus, the general form of a polynomial function can be seen in the form of power series like

$$f(x) = \sum_{m=0}^{\infty} f_m x^m$$

provided that there exist $n_0 \in \mathbb{N}$ such that $f_m = 0$ for all $m > n_0$ (Moore, Okeke and Chukwuma, 2024a, 2024b)

2.8 GENERATING FUNCTION

It is a formal power series of form

$$B(x) = \sum_{n=0}^{\infty} f_n x^n = f_0 + f_1 x + f_2 x^2 + \dots$$

Where f_n is the coefficient of the series (Moore, Okeke and Chukwuma, 2024b; Skoch, 2015 and Stroud and Dexter, 2007).

3 METHODOLOGY

3.1 CREATING DATABASE FOR FOREIGN DIRECT INVESTMENT, AND ECONOMIC GROWTH IN NIGERIA FROM 2005 TO 2024

- Dependent Variable = Economic growth or Gross Domestic Product (GDP) = y variable
- Independent Variable = Foreign direct investment (FDI) and Institutional Quality = x variable

Table 1: Database for Foreign Direct Investment, and Economic Growth in Nigeria from 2005 to 2024

Year	Dependent Variable (Y-variable)	Independent Variable (X-Variable)
	Gross Domestic Product (GDP) in US Dollar (\$ or USD)	Foreign Direct Investment (FDI) in US Dollar (\$ or USD)
2005	1.7567×10^{11}	4.98×10^9
2006	2.3845×10^{11}	4.85×10^9
2007	2.7826×10^{11}	6.04×10^9
2008	3.3948×10^{11}	8.19×10^9
2009	2.9501×10^{11}	8.56×10^9
2010	3.6699×10^{11}	6.03×10^9
2011	4.1447×10^{11}	8.84×10^9
2012	4.6397×10^{11}	7.07×10^9
2013	5.2012×10^{11}	5.56×10^9
2014	5.7418×10^{11}	4.69×10^9
2015	4.9303×10^{11}	3.06×10^9
2016	4.0465×10^{11}	3.45×10^9
2017	3.7575×10^{11}	2.41×10^9
2018	4.2174×10^{11}	7.7525×10^8
2019	4.7452×10^{11}	2.31×10^9
2020	4.322×10^{11}	2.39×10^9
2021	4.4084×10^{11}	3.31×10^9
2022	472.62×10^{11}	-1.868×10^8
2023	3.6281×10^{11}	1.87×10^9
2024	4.8727×10^{11}	1.904×10^{10}

- Sources of Data for Gross Domestic Product (GPD) are; National Bureau of Statistics (NBS) Annual Report 2024, Central Bank of Nigeria (CBN), World Bank Statistical Bulletin, 2024 and <https://www.macrotrends.net/global-metrics/countries/nga/nigeria/gdp-gross-domestic-product>
- Sources of Data for Foreign Direct Investment (FDI) are; National Bureau of Statistics (NBS), Foreign Direct Investment (FDI) Statistical Bulletin 2024, Central Bank of Nigeria (CBN) and <https://www.macrotrends.net/global-metrics/countries/nga/nigeria/foreign-direct-investment>

3.2 MODELING TECHNIQUES

Newton's Backward Difference Method was used to develop the generating function for foreign direct investment and economic growth in Nigeria from 2005 to 2024. Newton's Backward Difference Method is a numerical method used for interpolating or approximating a function when the values of the function are known at certain points. Thus, it is particularly useful when the data points are not uniformly spaced or when the function values are known at the end points of the interval. The Newton's Backward Difference Method for solving interpolation problem was modeled in the theorem below (Theorem 3.1.3) and the general formula is thus;

$$\begin{aligned}
 p_n(x) &= p_n(x_n + vh) \\
 &= y_n + \frac{v}{1} \nabla y_n + \frac{v(v+1)}{2!} \nabla^2 y_n + \frac{v(v+1)(v+2)}{3!} \nabla^3 y_n + \dots + \frac{v(v+1)(v+2) \dots (v+n-1)}{n!} \nabla^n y_n
 \end{aligned}$$

Where

$$v = \frac{x - x_n}{h} \quad (x_n \text{ is the end point and } h \text{ is the step size})$$

3.3 THEOREM (NEWTON'S BACKWARD INTERPOLATION POLYNOMIAL)

Let the function $y=f(x)$ take the values $y_0, y_1, y_2, \dots, y_n$ at the points $x_0, x_1, x_2, \dots, x_n$ where $x_i = x_0 + ih$. Then, Newton's backward interpolation polynomial is given by

$$y = p_n(x) = p_n(x_n + vh) \\ = y_n + \frac{v}{1} \nabla y_n + \frac{v(v+1)}{2!} \nabla^2 y_n + \frac{v(v+1)(v+2)}{3!} \nabla^3 y_n + \dots + \frac{v(v+1)(v+2) \dots (v+n-1)}{n!} \nabla^n y_n$$

Where

$$v = \frac{x - x_n}{h}$$

Proof

Let $y = f(x)$ takes the values $y_0, y_1, y_2, \dots, y_n$ corresponding to the values $x_0, x_1, x_2, \dots, x_n$ of x . Let $x_i - x_{i-1} = h$ for $i = 1, 2, 3, \dots, n$ (Equal intervals)

$$\therefore x_i = x_0 + ih \text{ for } i = 0, 1, 2, 3, \dots, n$$

Now, we want to find a collocation polynomial $p_n(x)$ of degree n in x such that

$$p_n(x_i) = y_i \text{ for } i = 0, 1, 2, \dots$$

Let

$$p_n(x) = a_0 + a_1(x - x_n) + a_2(x - x_n)(x - x_{n-1}) + \dots + a_r(x - x_n)(x - x_{n-1}) \dots (x - x_{n-r+1}) + \dots \\ + a_n(x - x_n)(x - x_{n-1}) \dots (x - x_n) \quad (3.1)$$

Since $x_{n-1} = x_n - h, x_{n-2} = x_n - 2h, x_{n-3} = x_n - 3h, \dots, x_{n-r+1} = x_n - (r-1)h$ and $x_1 = x_n - (n-1)h$, we have

$$p_n(x) = a_0 + a_1(x - x_n) + a_2(x - x_n)(x - x_n + h) + a_3(x - x_n)(x - x_n + h)(x - x_n + 2h) + \dots \\ + a_n(x - x_n)(x - x_n + h) \dots (x - x_n + n - 1h)$$

$$p_n(x) = a_0 + a_1(x - x_n)^{(1)} + a_2(x - x_n + h)^{(2)} + a_3(x - x_n + 2h)^{(3)} + \dots + a_r(x - x_n + \overline{r-1}h)^{(r)} + \dots \\ + a_n(x - x_n + n - 1h)^{(n)} \quad (3.2)$$

We shall find $a_0, a_1, \dots, a_n$ such that $p_n(x_i) = y_i$. Since $\nabla = E^{-1}\nabla$,

$$\nabla^r(x - a)^{(m)} = E^{-r}\nabla^r(x - a)^{(m)} \\ = E^{-r}[m(m-1)(m-2) \dots (m-r+1)h^r(x - a)^{(m-r)}] \\ = m(m-1)(m-2) \dots (m-r+1)h^r(x - rh - a)^{(m-r)} \text{ if } r \leq m \quad (3.3)$$

Since $(x - x_n)$ is a factor in all terms of right hand side (RHS) of (3.2) except a_0 . Putting $x = x_n$ in (3.2), we have $p_n(x) = y_n = a_0$. Now operating (3.2) by ∇^r using (3.3), we have

$$\nabla^r p_n(x) = 0 + 0 + \dots + 0 + a_r r! h^r + (r+1).r.(r-1) - 2h^r a_{r+1}(x - x_n)^1 + \text{terms involving } (x - x_n) \text{ as a factor.}$$

Setting $x = x_n$ in this, we have

$$\nabla^r p_n(x) = \nabla^r y_n = a_r r! h^r$$

Since other terms vanish.

$$\therefore a_r = \frac{1}{r! h^r} \nabla^r y_n \text{ where } r = 1, 2, \dots, n \quad (3.4)$$

Putting values of $a_0, a_1, \dots, a_n$ in (3.2), we have

$$p_n(x) = y_n + \frac{(x - x_n)^{(1)}}{1! h} \nabla y_n + \frac{(x - x_n + h)^{(2)}}{2! h^2} \nabla^2 y_n + \dots + \frac{(x - x_n + h)^{(r)}}{r! h^2} \nabla^r y_n + \dots + \frac{(x - x_n - 1h)^{(n)}}{n! h^n} \nabla^n y_n \quad (3.5)$$

Let

$$\frac{x - x_n}{h} = v; \text{ hence } x = x_n + vh$$

Also,

$$\frac{(x - x_n + \overline{r-1}h)^{(r)}}{h^r} = \frac{(vh + \overline{r-1}h)^{(r)}}{h^r} = (v + \overline{r-1})^{(r)}$$

Therefore, equation (3.5) becomes

$$\begin{aligned} p_n(x) &= p_n(x_n + vh) = y_n + \frac{v^{(1)}}{1!} \nabla y_n + \frac{(v+1)^{(2)}}{2!} \nabla^2 y_n + \dots + \frac{(v+r-1)^{(r)}}{r!} \nabla^r y_n + \dots + \frac{(v+n-1)^{(n)}}{n!} \nabla^n y_n \\ p_n(x) &= p_n(x_n + vh) \\ &= y_n + \frac{v}{1} \nabla y_n + \frac{v(v+1)}{2!} \nabla^2 y_n + \frac{v(v+1)(v+2)}{3!} \nabla^3 y_n + \dots \\ &\quad + \frac{v(v+1)(v+2) \dots (v+n-1)}{n!} \nabla^n y_n \quad (3.6) \end{aligned}$$

Where

$$v = \frac{x - x_n}{h}$$

Table 2: The finite difference table

These differences are presented in a tabular format as shown below;

x_i	y_i	∇y_i	$\nabla^2 y_i$	$\nabla^3 y_i$	$\dots$	$\nabla^n y_i$
x_0	y_0					
x_1	y_1	∇y_1				
x_2	y_2	∇y_2	$\nabla^2 y_2$			
x_3	y_3	∇y_3	$\nabla^2 y_3$	$\nabla^3 y_3$		
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$		
x_{n-1}	y_{n-1}	∇y_{n-1}	$\nabla^2 y_{n-1}$	$\nabla^3 y_{n-1}$		
x_n	y_n	∇y_n	$\nabla^2 y_n$	$\nabla^3 y_n$	$\dots$	$\nabla^n y_n$

Note: ∇y_i is the first difference, $\nabla^2 y_i$ is the second difference, $\nabla^3 y_i$ is the third difference, and so on.

3.4 ANALYTIC METHODS

Foreign direct investment is regarded as a significant variable in economic growth of any developing nation. As we said earlier, Foreign Direct Investment (FDI) is widely recognized as catalyst for economic growth, technological advancement and institutional development especially in developing country. Therefore, in this study, foreign direct investment and economic growth (gross domestic product) were carefully considered and data collected on their behalf for the period of study (from 2005 to 2024) were from National Bureau of Statistics (NBS), Foreign Direct Investment (FDI) Statistical Bulletin 2024, Central Bank of Nigeria (CBN), World Bank Statistical Bulletin 2024 <https://www.macrotrends.net/global-metrics/countries/nga/nigeria/gdp-gross-domestic-product>, and <https://www.macrotrends.net/global-metrics/countries/nga/nigeria/foreign-direct-investment>.

4 RESEARCH RESULT

Find the generating function for foreign direct investment and economic growth in Nigeria from 2005 to 2024 in the table 1 below using Newton's Backward Difference Method

Table 3: Database for Foreign Direct Investment, and Economic Growth in Nigeria from 2005 to 2024

Year	Foreign Direct Investment (FDI) in US Dollar (X-variable)	Gross Domestic Product (GDP) in US Dollar (Y-variable)
2005	4.98×10^9	1.7567×10^{11}
2006	4.85×10^9	2.3845×10^{11}
2007	6.04×10^9	2.7826×10^{11}
2008	8.19×10^9	3.3948×10^{11}
2009	8.56×10^9	2.9501×10^{11}
2010	6.03×10^9	3.6699×10^{11}
2011	8.84×10^9	4.1447×10^{11}
2012	7.07×10^9	4.6397×10^{11}
2013	5.56×10^9	5.2012×10^{11}
2014	4.69×10^9	5.7418×10^{11}
2015	3.06×10^9	4.9303×10^{11}
2016	3.45×10^9	4.0465×10^{11}
2017	2.41×10^9	3.7575×10^{11}
2018	7.7525×10^8	4.2174×10^{11}
2019	2.31×10^9	4.7452×10^{11}
2020	2.39×10^9	4.322×10^{11}
2021	3.31×10^9	4.4084×10^{11}
2022	-1.868×10^8	472.62×10^{11}
2023	1.87×10^9	3.6281×10^{11}
2024	1.904×10^{10}	4.8727×10^{11}

Solution

From finite difference table as demonstrate in Table 2, we have

Y r	x_i	y_i	∇y_i	$\nabla^2 y_i$	$\nabla^3 y_i$	$\nabla^4 y_i$	$\nabla^5 y_i$	$\nabla^6 y_i$	$\nabla^7 y_i$	$\nabla^8 y_i$	$\nabla^9 y_i$	$\nabla^{10} y_i$	$\nabla^{11} y_i$	$\nabla^{12} y_i$	$\nabla^{13} y_i$	$\nabla^{14} y_i$	$\nabla^{15} y_i$	$\nabla^{16} y_i$	$\nabla^{17} y_i$	$\nabla^{218} y_i$	$\nabla^{19} y_i$
2005	4.98x 10 ⁹	1.756 7x10 ¹ ₁																			
2006	4.85x 10 ⁹	2.384 5x10 ¹ ₁	- 482. 923 1																		
2007	6.04x 10 ⁹	2.782 6x10 ¹ ₁	33.4 538	4.87 15x1 0 ⁻⁷																	
2008	8.19x 10 ⁹	3.394 8x10 ¹ ₁	28.4 744	- 1.49 08x1 0 ⁻⁹	- 1.52 22x1 0 ⁻¹⁶																
2009	8.56x 10 ⁹	2.950 1x10 ¹ ₁	- 120. 189 2	- 5.89 93x1 0 ⁻⁸	- 1.54 99x1 0 ⁻¹⁷	3.81 90x1 0 ⁻²⁶															
2010	6.03x 10 ⁹	3.669 9x10 ¹ ₁	- 28.4 506	- 4.24 72x1 0 ⁻⁸	- 1.65 21x1 0 ⁻¹⁵	- 1.38 69x1 0 ⁻²⁴	- 1.35 72x1 0 ⁻³³														
2011	8.84x 10 ⁹	4.144 7x10 ¹ ₁	16.8 968	1.61 96x1 0 ⁻⁷	3.14 51x1 0 ⁻¹⁶	7.02 36x1 0 ⁻²⁵	5.23 63x1 0 ⁻³⁴	4.87 25x1 0 ⁻⁴³													
2012	7.07x 10 ⁹	4.639 7x10 ¹ ₁	- 27.9 661	- 4.31 37x1 0 ⁻⁸	1.37 65x1 0 ⁻¹⁶	1.57 91x1 0 ⁻²⁵	- 5.28 59x1 0 ⁻³⁴	- 4.73 96x1 0 ⁻⁴³	- 4.59 91x1 0 ⁻⁵²												

2013	5.56x 10 ⁹	5.201 2x10 ¹¹	- 37.1 854	2.81 08x1 0 ⁻⁹	- 9.77 61x1 0 ⁻¹⁷	7.84 70x1 0 ⁻²⁶	3.02 05x1 0 ⁻³⁵	- 1.16 42x1 0 ⁻⁴²	- 9.72 17x1 0 ⁻⁵²	- 8.83 21x1 0 ⁻⁶¹										
2014	4.69x 10 ⁹	5.741 8x10 ⁻¹¹	- 62.1 379	2.86 81x1 0 ⁻⁸	- 6.23 38x1 0 ⁻¹⁸	- 6.83 04x1 0 ⁻²⁶	3.79 25x1 0 ⁻³⁵	- 2.20 57x1 0 ⁻⁴⁵	- 8.60 74x1 0 ⁻⁵²	- 6.96 44x1 0 ⁻⁶¹	- 6.44 03x1 0 ⁻⁷⁰									
2015	3.06x 10 ⁻⁹	4.930 3x10 ⁻¹¹	49.7 853	- 4.47 69x1 0 ⁻⁸	1.83 17x1 0 ⁻¹⁷	- 4.24 76x1 0 ⁻²⁷	- 2.15 68x1 0 ⁻³⁵	1.08 17x1 0 ⁻⁴⁴	- 2.54 31x1 0 ⁻⁵⁴	- 2.89 90x1 0 ⁻⁶¹	- 2.27 12x1 0 ⁻⁷⁰	- 2.17 14x1 0 ⁻⁷⁹								
2016	3.45x 10 ⁹	4.046 5x10 ¹¹	226. 615 4	- 1.42 60x1 0 ⁻⁷	4.63 65x1 0 ⁻¹⁷	- 7.74 81x1 0 ⁻²⁷	6.49 44x1 0 ⁻³⁷	- 8.61 12x1 0 ⁻⁴⁵	3.80 20x1 0 ⁻⁵⁴	- 1338 6x10 ⁻⁶³	- 1.11 41x1 0 ⁻⁷⁰	- 8.26 50x1 0 ⁻⁸⁰	- 8.79 02x1 0 ⁻⁸⁹							
2017	2.41x 10 ⁹	3.757 5x10 ¹¹	27.7 885	3.05 89x1 0 ⁻⁷	- 1.96 71x1 0 ⁻¹⁶	7.71 68x1 0 ⁻²⁶	- 1.82 22x1 0 ⁻³⁵	2.93 48x1 0 ⁻⁴⁵	- 3.18 95x1 0 ⁻⁵⁴	1.13 68x1 0 ⁻⁶³	- 4.28 27x1 0 ⁻⁷³	- 3.04 05x1 0 ⁻⁸⁰	- 2.14 12x1 0 ⁻⁸⁹	- 2.58 72x1 0 ⁻⁹⁸						
2018	7.752 5x10 ⁸	4.217 4x10 ¹¹	- 28.1 327	2.09 07x1 0 ⁻⁸	1.24 73x1 0 ⁻¹⁶	- 8.21 10x1 0 ⁻²⁶	3.32 89x1 0 ⁻³⁵	7.54 74x1 0 ⁻⁴⁴	- 8.99 46x1 0 ⁻⁵⁴	1.10 47x1 0 ⁻⁶³	3.97 52x1 0 ⁻⁷⁴	- 1069 8x10 ⁻⁸¹	- 5.57 20x1 0 ⁻⁹⁰	9.29 68x1 0 ⁻⁹⁹	1.26 85x1 0 ⁻¹⁰⁷					
2019	2.31x 10 ⁹	4.745 2x10 ¹¹	34.3 900	- 6.25 23x1 0 ⁻⁷	5.66 79x1 0 ⁻¹⁶	- 5.89 41x1 0 ⁻²⁵	- 2.13 15x1 0 ⁻³⁴	7.58 28x1 0 ⁻⁴⁴	- 7.43 70x1 0 ⁻⁵⁶	- 1.36 60x1 0 ⁻⁶³	6.64 33x1 0 ⁻⁷³	- 9.99 33x1 0 ⁻⁸³	- 1.64 94x1 0 ⁻⁹¹	- 1.44 96x1 0 ⁻⁹⁹	3.03 6x10 ⁻¹⁰⁸	3.61 3x10 ⁻¹¹⁷				
2020	2.39x 10 ⁹	4.322 x10 ¹¹	-529	- 3.48 90x1 0 ⁻⁷	- 1.38 17x1 0 ⁻¹⁴	1.35 70x1 0 ⁻²³	- 2.11 33x1 0 ⁻³²	9.09 57x1 0 ⁻⁴²	- 2.84 54x1 0 ⁻⁵¹	6.07 97x1 0 ⁻⁶¹	- 9.44 71x1 0 ⁻⁷¹	2.61 36x1 0 ⁻⁸⁰	- 4.25 22x1 0 ⁻⁹⁰	6.95 5x10 ⁻¹⁰⁰	- 5.87 7x10 ⁻¹⁰⁹	1.47 3x10 ⁻¹¹⁷	8.26 x10 ⁻¹²⁷			
2021	3.31x 10 ⁹	4.408 4x10 ¹¹	9.39 13	5.38 39x1 0 ⁻⁷	3.50 05x1 0 ⁻¹⁶	1.57 41x1 0 ⁻²³	- 1.55 07x1 0 ⁻³²	2.25 04x1 0 ⁻⁴¹	4.96 04x1 0 ⁻⁵⁰	- 2.33 11x1 0 ⁻⁵⁹	- 7.22 63x1 0 ⁻⁶⁹	- 3.09 64x1 0 ⁻⁷⁹	1.23 45x1 0 ⁻⁸⁸	- 2.43 24x1 0 ⁻⁹⁸	5.12 7x10 ⁻¹⁰⁸	- 2.09 33x1 0 ⁻¹¹⁷	2.31 5x1 0 ⁻¹²⁶	- 8.92 x10 ⁻¹³⁶		

2022	- 1.868 $\times 10^8$	4.726 2×10^1 1	- 9.08 83	7.17 15×10^{-9}	2.12 76×10^{-16}	1.42 71×10^{-25}	6.00 66×10^{-33}	- 5.91 56×10^{-42}	8.75 32×10^{-51}	8.37 66×10^{-60}	- 5.51 40×10^{-69}	- 2.35 96×10^{-79}	- 8.16 24×10^{-90}	2.11 70×10^{-98}	- 5.20 1×10^{-108}	- 1.23 3×10^{-118}	- 3.56 $\times 10^{-127}$	5.30 3×10^{-136}	- 2.75 $\times 10^{-145}$		
2023	- 1.868 $\times 10^8$	3.628 1×10^1 1	- 53.3 888	3.07 64×10^{-8}	- 4.53 70×10^{-17}	5.86 66×10^{-25}	4.05 53×10^{-34}	1.03 72×10^{-41}	- 1.03 09×10^{-50}	1.60 18×10^{-59}	- 2.70 97×10^{-69}	- 7.59 97×10^{-79}	1.00 77×10^{-88}	- 1.56 28×10^{-98}	8.85x 10^{-108}	- 2.10 00×10^{-117}	3.52 $\times 10^{-127}$	- 1.69 8×10^{-136}	2.35 $\times 10^{-145}$	1.64x 10^{-154}	
2024	1.904 $\times 10^{10}$	4.872 7×10^1 1	7.24 87	3.15 38×10^{-9}	- 1.75 53×10^{-18}	2.61 95×10^{-27}	- 3.49 06×10^{-35}	- 2.41 14×10^{-44}	- 6.25 14×10^{-52}	6.21 16×10^{-61}	- 9.63 52×10^{-70}	1.21 69×10^{-79}	6.54 05×10^{-89}	- 2.95 45×10^{-99}	1.24 3×10^{-108}	- 5.84 7×10^{-118}	1.44 6×10^{-127}	- 1.91 1×10^{-137}	1.15 9×10^{-146}	- 1.15 74×10^{-155}	- 1.27 8×10^{-164}

From Newton's Backward Difference Method, we have

$$p_n(x) = p_n(x_n + vh) \\ = y_n + \frac{v}{1} \nabla y_n + \frac{v(v+1)}{2!} \nabla^2 y_n + \frac{v(v+1)(v+2)}{3!} \nabla^3 y_n + \dots \\ + \frac{v(v+1)(v+2) \dots (v+n-1)}{n!} \nabla^n y_n \quad (3.6)$$

Where

$$v = \frac{x - x_n}{h}$$

This formular can be written as

$$y = y_n + \frac{v}{1} \nabla y_{n-1} + \frac{v(v+1)}{2!} \nabla^2 y_{n-2} + \frac{v(v+1)(v+2)}{3!} \nabla^3 y_{n-3} + \dots + \frac{v(v+1)(v+2) \dots (v+n-1)}{n!} \nabla^n y_{n-n} \quad (3.7)$$

Where

$$v = \frac{x - x_n}{h} \text{ and } h \text{ has already been used inside the difference table above.}$$

Thus, $x_n = 1.904 \times 10^{10}$, $v = x - x_n = x - 1.904 \times 10^{10}$, $y_n = 4.8727 \times 10^{11}$, $\nabla y_{n-1} = 7.2487$, $\nabla^2 y_{n-2} = 3.1538 \times 10^{-9}$, $\nabla^3 y_{n-3} = -1.7553 \times 10^{-18}$, $\nabla^4 y_{n-4} = 2.6195 \times 10^{-27}$, $\nabla^5 y_{n-5} = -3.4906 \times 10^{-35}$, $\nabla^6 y_{n-6} = -2.4114 \times 10^{-44}$, $\nabla^7 y_{n-7} = -6.2514 \times 10^{-52}$, $\nabla^8 y_{n-8} = 6.2116 \times 10^{-61}$, $\nabla^9 y_{n-9} = -9.6352 \times 10^{-70}$, $\nabla^{10} y_{n-10} = 1.2169 \times 10^{-79}$, $\nabla^{11} y_{n-11} = 6.5405 \times 10^{-89}$, $\nabla^{12} y_{n-12} = -2.9545 \times 10^{-99}$, $\nabla^{13} y_{n-13} = 1.2430 \times 10^{-108}$, $\nabla^{14} y_{n-14} = -5.847 \times 10^{-118}$, $\nabla^{15} y_{n-15} = 1.446 \times 10^{-127}$, $\nabla^{16} y_{n-16} = -1.911 \times 10^{-137}$, $\nabla^{17} y_{n-17} = 1.159 \times 10^{-146}$, $\nabla^{18} y_{n-18} = -1.574 \times 10^{-155}$ and $\nabla^{19} y_{n-19} = -1.278 \times 10^{-164}$

Now $y = 4.8727 \times 10^{11} + [(x - 1.904 \times 10^{10})](7.2487) + 1/2![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)](3.1538 \times 10^{-9}) + 1/3![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)](-1.7553 \times 10^{-18}) + 1/4![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)](2.6195 \times 10^{-27}) + 1/5![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)](-3.4906 \times 10^{-35}) + 1/6![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)](-2.4114 \times 10^{-44}) + 1/7![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)(x - 1.904 \times 10^{10}+6)](6.2116 \times 10^{-61}) + 1/8![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)(x - 1.904 \times 10^{10}+6)(x - 1.904 \times 10^{10}+7)](-9.6352 \times 10^{-70}) + 1/9![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)(x - 1.904 \times 10^{10}+6)(x - 1.904 \times 10^{10}+7)(x - 1.904 \times 10^{10}+8)](1.2169 \times 10^{-79}) + 1/10![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)(x - 1.904 \times 10^{10}+6)(x - 1.904 \times 10^{10}+7)(x - 1.904 \times 10^{10}+8)(x - 1.904 \times 10^{10}+9)](6.5405 \times 10^{-89}) + 1/11![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)(x - 1.904 \times 10^{10}+6)(x - 1.904 \times 10^{10}+7)(x - 1.904 \times 10^{10}+8)(x - 1.904 \times 10^{10}+9)(x - 1.904 \times 10^{10}+10)](-2.9545 \times 10^{-99}) + 1/12![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)(x - 1.904 \times 10^{10}+6)(x - 1.904 \times 10^{10}+7)(x - 1.904 \times 10^{10}+8)(x - 1.904 \times 10^{10}+9)(x - 1.904 \times 10^{10}+10)(x - 1.904 \times 10^{10}+11)](1.2430 \times 10^{-108}) + 1/13![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)(x - 1.904 \times 10^{10}+6)(x - 1.904 \times 10^{10}+7)(x - 1.904 \times 10^{10}+8)(x - 1.904 \times 10^{10}+9)(x - 1.904 \times 10^{10}+10)(x - 1.904 \times 10^{10}+11)(x - 1.904 \times 10^{10}+12)](-5.847 \times 10^{-118}) + 1/14![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)(x - 1.904 \times 10^{10}+6)(x - 1.904 \times 10^{10}+7)(x - 1.904 \times 10^{10}+8)(x - 1.904 \times 10^{10}+9)(x - 1.904 \times 10^{10}+10)(x - 1.904 \times 10^{10}+11)(x - 1.904 \times 10^{10}+12)(x - 1.904 \times 10^{10}+13)](1.446 \times 10^{-127}) + 1/15![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)(x - 1.904 \times 10^{10}+6)(x - 1.904 \times 10^{10}+7)(x - 1.904 \times 10^{10}+8)(x - 1.904 \times 10^{10}+9)(x - 1.904 \times 10^{10}+10)(x - 1.904 \times 10^{10}+11)(x - 1.904 \times 10^{10}+12)(x - 1.904 \times 10^{10}+13)(x - 1.904 \times 10^{10}+14)](-1.911 \times 10^{-137}) + 1/16![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)(x - 1.904 \times 10^{10}+6)(x - 1.904 \times 10^{10}+7)(x - 1.904 \times 10^{10}+8)(x - 1.904 \times 10^{10}+9)(x - 1.904 \times 10^{10}+10)(x - 1.904 \times 10^{10}+11)(x - 1.904 \times 10^{10}+12)(x - 1.904 \times 10^{10}+13)(x - 1.904 \times 10^{10}+14)(x - 1.904 \times 10^{10}+15)](1.159 \times 10^{-146}) + 1/17![(x - 1.904 \times 10^{10})(x - 1.904 \times 10^{10}+1)(x - 1.904 \times 10^{10}+2)(x - 1.904 \times 10^{10}+3)(x - 1.904 \times 10^{10}+4)(x - 1.904 \times 10^{10}+5)(x - 1.904 \times 10^{10}+6)(x - 1.904 \times 10^{10}+7)(x - 1.904 \times 10^{10}+8)(x - 1.904 \times 10^{10}+9)(x - 1.904 \times 10^{10}+10)(x - 1.904 \times 10^{10}+11)(x - 1.904 \times 10^{10}+12)(x - 1.904 \times 10^{10}+13)(x - 1.904 \times 10^{10}+14)(x - 1.904 \times 10^{10}+15)(x - 1.904 \times 10^{10}+16)](-1.278 \times 10^{-164})$

$$\begin{aligned} & (x - 1.904 \times 10^{10+11}) (x - 1.904 \times 10^{10+12}) (x - 1.904 \times 10^{10+13}) (x - 1.904 \times 10^{10+14}) (x - 1.904 \times 10^{10+15}) (x - 1.904 \\ & \times 10^{10+16}) (x - 1.904 \times 10^{10+17})] [-1.574 \times 10^{-155}] + 1/19! [(x - 1.904 \times 10^{10}) (x - 1.904 \times 10^{10+1}) (x - 1.904 \times 10^{10+2}) (x \\ & - 1.904 \times 10^{10+3}) (x - 1.904 \times 10^{10+4}) (x - 1.904 \times 10^{10+5}) (x - 1.904 \times 10^{10+6}) (x - 1.904 \times 10^{10+7}) (x - 1.904 \times 10^{10+8}) \\ & (x - 1.904 \times 10^{10+9}) (x - 1.904 \times 10^{10+10}) (x - 1.904 \times 10^{10+11}) (x - 1.904 \times 10^{10+12}) (x - 1.904 \times 10^{10+13}) (x - 1.904 \times \\ & 10^{10+14}) (x - 1.904 \times 10^{10+15}) (x - 1.904 \times 10^{10+16}) (x - 1.904 \times 10^{10+17}) (x - 1.904 \times 10^{10+18})] [-1.278 \times 10^{-164}] \end{aligned}$$

[illegible]

This can be written as follows to avoid error;

$$y = 4.8727 \times 10^{11} + [(x - 1.904 \times 10^{10})(7.2487)] + [(x - 1.904 \times 10^{10})^2(1.5769 \times 10^{-9})] \\ + [(x - 1.904 \times 10^{10})^3(2.9255 \times 10^{-19})] + [(x - 1.904 \times 10^{10})^4(1.0915 \times 10^{-28})] \\ + [(x - 1.904 \times 10^{10})^5(-2.9088 \times 10^{-37})] + [(x - 1.904 \times 10^{10})^6(-3.3492 \times 10^{-47})] \\ + [(x - 1.904 \times 10^{10})^7(-1.2404 \times 10^{-55})] + [(x - 1.904 \times 10^{10})^8(1.54058 \times 10^{-65})] \\ + [(x - 1.904 \times 10^{10})^9(-2.6552 \times 10^{-75})] + [(x - 1.904 \times 10^{10})^{10}(3.3535 \times 10^{-86})] \\ + [(x - 1.904 \times 10^{10})^{11}(1.6385 \times 10^{-96})] + [(x - 1.904 \times 10^{10})^{12}(-6.168 \times 10^{-109})] \\ + [(x - 1.904 \times 10^{10})^{13}(1.996 \times 10^{-119})] + [(x - 1.904 \times 10^{10})^{14}(-6.707 \times 10^{-130})] \\ + [(x - 1.904 \times 10^{10})^{15}(1.106 \times 10^{-139})] + [(x - 1.904 \times 10^{10})^{16}(-9.136 \times 10^{-150})] \\ + [(x - 1.904 \times 10^{10})^{17}(3.258 \times 10^{-159})] + [(x - 1.904 \times 10^{10})^{18}(-2.458 \times 10^{-168})] \\ + [(x - 1.904 \times 10^{10})^{19}(-1.051 \times 10^{-177})]$$

Expand them completely using python, we have

$$y = -1.051 \times 10^{-177}x^{19} + 3.7775 \times 10^{-166}x^{18} - 6.4307 \times 10^{-155}x^{17} + 6.8921 \times 10^{-144}x^{16} - 5.2136 \times 10^{-133}x^{15} \\ + 2.9576 \times 10^{-122}x^{14} - 1.3048 \times 10^{-111}x^{13} + 4.5813 \times 10^{-101}x^{12} - 1.2990 \times 10^{-90}x^{11} \\ + 3.0008 \times 10^{-80}x^{10} - 5.6709 \times 10^{-70}x^9 + 8.7669 \times 10^{-60}x^8 - 1.1043 \times 10^{-49}x^7 \\ + 1.1240 \times 10^{-39}x^6 - 9.1283 \times 10^{-30}x^5 + 5.8084 \times 10^{-20}x^4 - 2.8245 \times 10^{-10}x^3 + 1.0098x^2 \\ - 2.4492 \times 10^9x + 3.1381 \times 10^{18}$$

Thus, the generating function for foreign direct investment and economic growth in Nigeria from 2005 to 2024 is given as follows;

$$y = -1.051 \times 10^{-177}x^{19} + 3.7775 \times 10^{-166}x^{18} - 6.4307 \times 10^{-155}x^{17} + 6.8921 \times 10^{-144}x^{16} - 5.2136 \times 10^{-133}x^{15} \\ + 2.9576 \times 10^{-122}x^{14} - 1.3048 \times 10^{-111}x^{13} + 4.5813 \times 10^{-101}x^{12} - 1.2990 \times 10^{-90}x^{11} \\ + 3.0008 \times 10^{-80}x^{10} - 5.6709 \times 10^{-70}x^9 + 8.7669 \times 10^{-60}x^8 - 1.1043 \times 10^{-49}x^7 \\ + 1.1240 \times 10^{-39}x^6 - 9.1283 \times 10^{-30}x^5 + 5.8084 \times 10^{-20}x^4 - 2.8245 \times 10^{-10}x^3 + 1.0098x^2 \\ - 2.4492 \times 10^9x + 3.1381 \times 10^{18}$$

5 DISCUSSION OF RESEARCH RESULT

The research results of this study revealed that the generating function for foreign direct investment and economic growth in Nigeria from 2005 to 2024 is

$$y = -1.051 \times 10^{-177}x^{19} + 3.7775 \times 10^{-166}x^{18} - 6.4307 \times 10^{-155}x^{17} + 6.8921 \times 10^{-144}x^{16} - 5.2136 \times 10^{-133}x^{15} \\ + 2.9576 \times 10^{-122}x^{14} - 1.3048 \times 10^{-111}x^{13} + 4.5813 \times 10^{-101}x^{12} - 1.2990 \times 10^{-90}x^{11} \\ + 3.0008 \times 10^{-80}x^{10} - 5.6709 \times 10^{-70}x^9 + 8.7669 \times 10^{-60}x^8 - 1.1043 \times 10^{-49}x^7 \\ + 1.1240 \times 10^{-39}x^6 - 9.1283 \times 10^{-30}x^5 + 5.8084 \times 10^{-20}x^4 - 2.8245 \times 10^{-10}x^3 + 1.0098x^2 \\ - 2.4492 \times 10^9x + 3.1381 \times 10^{18}$$

Furthermore, the result also revealed that foreign direct investment is significant to the economic growth in Nigeria and has impacted positively by providing much-needed capital for investment, enhancing competition, and facilitating technology transfer.

6 CONCLUSION

Foreign Direct Investment (FDI) is widely recognized as catalyst for economic growth, technological advancement and institutional development especially in developing country. It is an essential factor in Nigeria's economic growth and development. The role it plays cannot be overemphasized. In this study, the generating function for foreign direct investment and economic growth in Nigeria from 2005 to 2024 was obtained as

$$y = -1.051 \times 10^{-177}x^{19} + 3.7775 \times 10^{-166}x^{18} - 6.4307 \times 10^{-155}x^{17} + 6.8921 \times 10^{-144}x^{16} - 5.2136 \times 10^{-133}x^{15} \\ + 2.9576 \times 10^{-122}x^{14} - 1.3048 \times 10^{-111}x^{13} + 4.5813 \times 10^{-101}x^{12} - 1.2990 \times 10^{-90}x^{11} \\ + 3.0008 \times 10^{-80}x^{10} - 5.6709 \times 10^{-70}x^9 + 8.7669 \times 10^{-60}x^8 - 1.1043 \times 10^{-49}x^7 \\ + 1.1240 \times 10^{-39}x^6 - 9.1283 \times 10^{-30}x^5 + 5.8084 \times 10^{-20}x^4 - 2.8245 \times 10^{-10}x^3 + 1.0098x^2 \\ - 2.4492 \times 10^9x + 3.1381 \times 10^{18}$$

Furthermore, this study confirms that foreign direct investment has a significant positive impact on economic growth in Nigeria, highlighting the importance of creating a favourable investment climate to attract more FDI.

6.1 RECOMMENDATIONS

Nigeria's government should stabilize foreign direct investment (FDI) inflows by creating a favourable investment climate to streamline regulatory processes, reducing bureaucracy and ensuring policy consistency to attract more FDI. Also, Nigeria's government should identify and promote key sectors that can drive economic growth such as agriculture, manufacturing and services, and provide targeted incentives for FDI in these areas. Lastly, Nigeria's government should implement policies that encourage technological transfer and knowledge sharing between foreign investors and local businesses.

The findings of this study suggest that FDI's impact on economic growth in Nigeria is conditional on factors such as public sector investment, infrastructure development and exchange rate stability. Policy makers should focus on these areas to maximize FDI's benefits.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Funding Source

Economic situation of Nigeria.

Disclosure of conflict of interest

The authors declare no conflicts of interest regarding this manuscript.

REFERENCES

- [1] Abala, D. (2014), "Foreign Direct Investment and Economic Growth: An Empirical Analysis of Kenyan Data", *DBA Africa Management Review*, Vol. 4 No. 1, pp. 622-83.
- [2] Adeyeye, P.O., Theuns, P. and Pelser, T.G. (2017) 'Foreign direct investment and economic growth in Africa: a comparative analysis', *Int. J. Sustainable Economy*, 9(3),183–198
- [3] Asiedu, E. (2002). On the determinants of foreign direct investment to developing countries: Is Africa different? *World Dev.* 2002, 30, 107–119.
- [4] Asiedu E (2006). Foreign direct investment in Africa: role of government policy, institutions and political instability. *World Econ* 29(1):63–77
- [5] Asiedu, E. (2009).Foreign direct investment in Africa: The role of natural resources, market size, government policy, institutions and political instability. *The World Economy*, 2009 29(1), 63-77.
- [6] Chika Moore, Justina Ebele Okeke and Elias Ikechukwu Chukwuma, (2024). Generalized techniques for constructing the generating functions of some algebraic and rational functions. Published by *World Journal of Advanced Research and Reviews*, 2024, 23(01), 202–212. Article DOI: <https://doi.org/10.30574/wjarr.2024.23.1.1929>
- [7] Chika Moore, Justina Ebele Okeke and Elias Ikechukwu Chukwuma, (2024). Generalized Technique for constructing the closed form of the generating functions of certain classes of sequences. Published by *World Journal of Advanced Research and Reviews*, 2024, 23(01), 1046–1064. Article DOI: <https://doi.org/10.30574/wjarr.2024.23.1.2077>
- [8] Jude, C. and Leveuge, G. (2017). Growth effect of foreign direct investment in developing economies: The role of institutional quality. *World Econ.* 2017, 40, 715–742
- [9] Karimi, M.S and Yusop, Z (2009). FDI and Economic Growth in Malaysia. 2009. Available online: https://mpra.ub.uni-muenchen.de/14999/1/fdi_on_economic_growth.pdf (accessed on 28 March 2023).
- [10] Moga, T. J. and Xu, H. (2017). Foreign direct investment and economic growth in sub-saharan Africa: the role of institutions. *www.kspjournals.org*. Volume 4. Issue 4. Pp. 378 – 387.
- [11] World Bank (2021) World development indicators, World Bank database, Washington DC
- [12] Rosary Ngozi Ujumadu, Justina Ebele Okeke, Elias Ikechukwu Chukwuma and Nwosu Augustine Ikechukwu, (2026). Modeling of the Effects of Foreign Direct Investment and Institutional Quality on Economic Growth in Nigeria from 2005 to 2024. *World Journal of Advanced Research and Reviews*, 2026, 32(01), 152–161. Article DOI: <https://doi.org/10.30574/wjarr.2026.32.1.2531>
- [13] Rosary Ngozi Ujumadu, Justina Ebele Okeke, Elias Ikechukwu Chukwuma and Nwosu Augustine Ikechukwu, (2026). The Impact of Foreign Direct Investment and Institutional Quality on Economic Growth in Nigeria from 2005 to 2024. *World Journal of Advanced Research and Reviews*, 2026, 32(01), 600–609. Article DOI: <https://doi.org/10.30574/wjarr.2026.32.1.2591>