Impact of Inflation on Corporate Investment in the Sub-Saharan African Countries: An Empirical Analysis of the West-African Monetary Zone

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Abstract

This paper focuses on study of the adverse effects of inflationary pressures on corporate investment, with special emphasis on the West-African monetary zone (WAMZ). We recognised the role of corporate investment in economic development, with a proposition that a major problem with corporate investment in the West-African sub-region is frequent increases in inflation rates and their negative impacts on capital accumulation. The study aimed at unfolding the short-and long-run effects of inflation on corporate investment. We were guided by the research question: "Can the sub-Saharan African countries sustain investment-oriented growth policies in the face of rising inflationary policies?" Our methodology involved the use of error correction mechanism (ECM) in the analysis of factors affecting the rate of corporate investments in selected countries within impacts on corporate investment; and finally, the short-run impact of financial development on corporate investment is not clear in the WAMZ. Based on these, the study concludes that the short-run dynamics of inflation and interest the West-African monetary zone. The analytical model followed the Cobb-Douglas production principles, and the analytical results can be summarized as follows: first, a long-run positive relationship exists between inflation and corporate investment and a short-run negative relationship between inflation and corporate investment; secondly, the short-run dynamics of the economic environment in the WAMZ indicated that real rates of interest, government spending, and relative prices of capital goods are statistically insignificant in determining the level and rate of corporate investment in the selected countries within the West-African monetary zone; third, economic growth does not have significant rates in the West-African monetary zone appear to be associated with economic impacts that are contrary to theoretical expectations. There is a need therefore, to re-examine the theoretical relationships between corporate investment and such explanatory variables as real rates of interest, government spending, and relative prices of capital goods.Our analytical results and conclusions suggest the following recommendations: (i) a need for alternative theories explaining economic behaviours in respect of corporate investment in the West-African sub-region; (ii) a need for emphasis on both appropriate inflationary policies and economic actors that can influence the success of such policies; and, (iii) the need for researchers to re-examine the theoretical relationships between government spending, real interest rates, and relative price of capital and corporate investment in developing countries in general and specifically, the West-African sub-region.

1. Introduction

The role of corporate investment in the development of the economy of the West-African sub-region cannot be overemphasized. Without corporate investment, there would be low rate of economic growth, high rates of unemployment, and general increases in the poverty level resulting in a depressed social and political system. Corporate investment enhances capital accumulation, employment, income growth, and reduction in the poverty level. In any developing economy, inflation is viewed as highly undesirable, regardless of its inverse relationship with unemployment according to the Philips curve analysis. Inflation has adverse effects on monetary purchasing power, corporate investment, and economic growth.

In a nutshell, our problem focus in this study is the adverse effects of inflation on corporate investment, in particular, in relation to economic development of the West African sub-region in general and, in particular, the West-African monetary zone.

The West African monetary zone referred to here is made up of four countries used in the formation the proposed currency union among West-African countries including, Gambia, Ghana, Nigeria, and Sierra Leone. Our aim is to propose effective policy instruments that would ensure non-inflationary growth that can enhance corporate investments and capital accumulation in the West-African sub-region. The rest of the paper is organised as follows: section two presents the literature review, accompanied by the theoretical framework; in section three, we discuss the analytical model; section four is the analysis of data, results, and discussions; and, in section five, we present the findings, conclusion and recommendations.

2. The Literature Review and Theoretical Framework

The destabilising effect of inflation on economic development in general and specifically, on corporate investment has been a major source of debate in economic and business literature. While some authors claim positive effects of inflation on investment, others hold that inflation and investment move in opposite directions so that, rapid increases in the rate of inflation bring about low investment levels. Choi et al, 1995; Luis, 1980; Byrne and Davis, 2004; and, Li, 2006, for example, argued that higher rates of inflation tend to reduce the real rate of return on investments, leading to lower rates of investment. On the same token, Irwin (1987) was of the opinion that the main channels through which inflation affects real rate of inflation would include: changes in real output, changes in the ratio of the price of capital goods to output prices, changes in the cost of capital, and changes in capital gains. He argued that inflated national income is likely to lower the investment-income ratio, thus discouraging corporate investments.

On the contrary, McClain and Nicholes (1994) found a positive relationship between inflation and corporate investment. Other contributors (Mark and Glenn, 2005; Atesoglu, 2005; Ericsson et al, 2001). The literature also presents authors that were concerned with the indirect effects of inflation on investment levels. These authors believe that inflationary uncertainties do have serious consequences on an economy's corporate investments. Dasilva-Filho (2007) for instance, pointed out that inflationary uncertainty was found harmful to capital accumulation in Brazil. This contributor also noted that inflationary uncertainty affected corporate investments in Brazil by raising the cost of capital and making investible credits relatively scarce. Decrease in inflationary pressure is likely to stimulate investment by reducing risk premiums, as low factor prices makes it easy for firms to be able to finance investment projects.

Some empirical arguments on the relationship between inflation and corporate investment have been based on the indirect effects of inflation on capital accumulation as well as on economic growth. Using a panel vector autoregressive approach, Kofi-Ahortor and Adenutsi (2009) found a negative effect of inflation on capital accumulation and economic growth. They noted that in the long run, inflation and economic growth had dampening effects on capital accumulation. Following the same reasoning, Ozgur (2007) observed that inflationary pressures lead to sluggish growth in capital accumulation thereby depressing corporate investments. In addition, Fischer (2013) observed that periods of high inflationary pressures are associated with substantial reduction in corporate investments.

In a study involving the asymmetric effect of inflation on real corporate investment in Iran, Valadkhani et al (2009) found that real gross domestic product (GDP), openness, and inflation can influence corporate investments asymmetrically. The study noted a threshold endogenous estimate of inflation rate to be 11.9 percent. It warns that an annual inflation rate exceeding this threshold would have negative effect on corporate investment. An inflation rate below this threshold would raise aggregate prices, which in the long run, is likely to boost corporate investments.

The issue of crowding out effect has also been introduced in the relationship between inflation and corporate investment. In a study of the relationship between foreign private investment, capital formation, and economic growth in Nigeria, Orji et al (2011) noted that foreign private investment affected economic growth positively but crowded out domestic investment, perhaps as a result of inflated costs of capital. On the same token, Olanipekun and Akeju (2013) in their attempts to evaluate the relationship between money supply, inflation, and capital accumulation in Nigeria, using Johasen cointegration test, noted a stable long-run relationships among money supply, inflation and capital accumulation. In addition, they revealed an observation that broad and narrow money supply has positive relationships with capital accumulation. The researchers observed however, that inflation rates and capital accumulation were negatively related, implying negative relationship between inflation and corporate investment.

In the following section, we present the theoretical framework for our study. The focus is on the theoretical relationship between inflation and corporate investment.

The Theoretical Framework

Our theoretical framework is based on the neo-classical investment theory, propounded by Jorgensen (1963). The framework seeks to establish the relationship between input and output prices, and corporate investment. The neo-classical theory begins with corporate optimization problem, with the assumption that maximizing periodic profits will yield an optimal capital stock.

The logical production function in this argument is of the form:

$$Y = f(L,K) \qquad (1)$$

where Y represents corporate output; L, labour input; and, K represents capital input.

At a given time period, t, the net corporate income is defined by:

$$R_t = P_t Y_t - S_t K_t - W_t L_t \qquad (2)$$

where R_t defines the net income at period t; P_t, the product price at period t; Y_t, output at period t, S_t, price of capital at period t; K_t, the accumulated capital at period t; W_t, the unit price of labour; and, L_t, the quantity of labour.

In the neo-classical theory, the value function of the firm can be defined by:

$$V = \int_t^{d_r} R_t{}^{er} f(L,K) dt$$
$$= \int [P_t Y_t - S_t K_t - W_t L_t] dt \qquad (3)$$

where V represents the net worth; e represents an exponent for continuous discounting; and r, the constant rate of interest.

The corporate gross investment is defined by:

$$I = \frac{dK}{dt} + \Theta K \qquad (4)$$

where Θ represents the rate of depreciation.

Rearranging equation (4), we get:

$$\frac{dK}{dt} = I - \Theta K \qquad (5)$$

where dk/dt represents the rate of change of capital flow.

The real user cost of capital is defined by:

$$C = S(\Theta + r - \alpha/s) \qquad (6)$$

where C is the real user cost of capital; α is the rate of capital appreciation; and, s represents the price of capital assets.

At equilibrium or the optimal point, $Pf_k = C$, implying that the marginal product of capital equals the user cost of capital.

The output level, labour, and capital inputs are constrained by the Cobb-Douglas production function:

$$Y = K^\alpha L^{1-\alpha} \qquad (7)$$

Assuming constant returns to scale in production, $f_k = \alpha(Y/K)$, and the optimal capital stock becomes:

$$P\alpha(Y/C) = f(Y, P, C) \qquad (8)$$

It follows that in principle, we can redefine investment as:

$$I = I(dY, dP, dC) + \Theta K \qquad (9)$$

By equation (9), we infer that corporate investment is a function of output changes, changes in output prices, and changes in real user cost of capital, which is positively related to changes in interest rate.

3. The Model

The theoretical literature suggests that the relationship between inflation and corporate investment can lead to economic growth through capital accumulation. In effect, we can comfortably specify our model to be in the form:

$$I = I(IR, C_i) \qquad\qquad (10)$$

Where I = level of investment

IR = rate of inflation

C_i = the vector of control variables

In its specific form, the model can be defined as follows:

$$I = ß_o + ß_1 IR + \lambda C_i + e \qquad\qquad (11)$$

where, e = the stochastic variable

The control variables, C_i, include real exchange rate (x), real rate of interest (r), financial development (fd), government expenditures (gov), the growth rate (y), and relative prices of capital goods (Pc).

4. Estimation of the Model, Results, and Discussion

Our regression estimates employed the error correction mechanism (ECM), identified in the literature as the appropriate model for analyzing the long- and short-run relationships between inflation and corporate investment. The error correction mechanism was introduced by Sargan (1964) in an effort to correct for long-run disequilibrium. With the error correction mechanism, our estimated model, using logarithms and the control variables, becomes:

$$Ln (I_t) = ß_o + ß_1 \ln(IR_t) + \lambda_1 \ln(r_t) + \lambda_2 \ln(Y_t) + \lambda_3 \ln(Pc_t) + \lambda_4 \ln(gov_t) + \lambda_5 \ln(fd_t)$$

$$+ \lambda_6 \ln(x_t) + \lambda_7 E + e_t \qquad\qquad (12)$$

where I_t = periodic corporate investments in the West-African Monetary zone,

E represents the error correction parameter,

IR represents the periodic inflation rate,

λ_i (i = 1, 2, 3, …, 6) represent the coefficients of the control variables of interest.

The Variables and Data Sources

The relevant variables and associated sources of data are as follows:

I_t = periodic corporate investments, was captured as gross fixed capital formation, defined as addition to stock of capital assets;

IR_t = rate of inflation, as defined using the consumer price index (CPI);

r_t = real interest rate, obtained by subtracting the current rate of inflation from the nominal rate of interest;

Y_t = the gross domestic product (GDP), used as a proxy for economic growth at current market prices;

Pc_t = the relative price of capital goods, defined as the ratio of the investment deflator in the private sector to the GDP deflator, and shows how prices of capital goods vary with respect to changes in the prices of other goods and services;

Gov_t = the ratio of government expenditure to the GDP;

fd_t = financial development, defined as the ratio of broad money supply to the GDP;

x_t = the nominal exchange rate viewed as the centrepiece of the investment environment.

The relevant data were from the World Development Indicators of the World Bank.

To account for stationarity of the time-series information on the relevant variables, obtain for the chosen four countries in the West African Monetary Zone (WAMZ) including Gambia, Ghana, Nigeria, and Sierra Leone, we applied the commonly-used Augmented Dickey-Fuller (ADF) unit root test.

As highlighted earlier, our specified model (equation (12)) was estimated using the error correction approach. This helped in the recognition of the direction and magnitude of the effect of inflation on corporate investment in the chosen countries in West African Monetary Zone. The coverage of data for the estimation is 1980 to 2011, the period for which data were readily available.

Prior to the estimation of our short-run error correction model (ECM), we considered it necessary to look at the long-run behaviour of corporate investment with respect to the specified independent variables. Results of the long-run estimates are as presented in table 1 below.

Table1: The Estimated Long-Run Corporate Investment Behaviour in WAMZ

The Gambia	Ghana	Nigeria	Sierra Leone
C 18.2(3.86)*	C 2.04(2.9)*	C 6.12(2.8)*	C 20.9(3.2)*
Ln(IR) 0.34(2.65)*	Ln(IR) 0.07(1.3)***	Ln(IR) -0.01(-0.08)	Ln(IR) 0.10(0.21)
Ln(r) 0.34(2.65)*	No data on r	Ln(r) -0.11(-0.88)	Ln(r) -0.36(-1.92)**
Ln(Y) 0.01(0.38)	Ln(Y) -0.00(-0.34)	Ln(Y) 0.03(1.15)	Ln(Y) 0.15(2.67)*
Ln(Pc) -1.09(-2.16)**	Ln(Pc) 0.08(2.1)**	Ln(Pc) -0.3(-3.36)*	No data on Pc
Ln(gov) 0.24(0.44)	Ln(gov) 0.38(1.8)**	Ln(gov) 1.02(2.12)**	Ln(gov) -5.08(-3.49)*
Ln(fd) 0.11(0.71)	Ln(fd) 0.13(0.63)	Ln(fd) -0.26(-1.40)***	Ln(fd) -1.16(-2.25)**
Ln(x) -2.34(-4.77)*	Ln(x) -0.37(-5.3)*	Ln(x) -0.85(-1.93)**	Ln(x) -0.83(-1.07)
D.W = 2.3	D.W = 1.7	D.W = 0.59	D.W = 1.8
R^2 = 0.74	R^2 = 0.94	R^2 = 0.73	R^2 = 0.69

Source: Authors' Long-run Estimates, 2014

Note: (*)(**)(***) indicate 1%, 5%, and 5% significance level, respectively.

Discussion

The results presented in table 1 indicate as follows:

First, in Gambia, the long run dynamics of investment indicate that economic growth (Y), government expenditures (gov), and financial development(fd) are statistically insignificant in explaining variations in corporate investment. By implication, long-run variations in these variables do not have significant economic impacts on corporate investment in Gambia. The negative signs observed for relative price of capital goods (Pc) and exchange rate (x) suggest that periodic increases in these variables are likely to depress corporate investments in Gambia. Nevertheless, the coefficient of determination, R^2, and the Durbin Watson (DW) statistics appear encouraging for the regression results in Gambia.

Second, according to column 2, table 1, almost all of the variables of interest had long-run significant impacts on corporate investment in Ghana, except for economic growth (Y) and financial development (fd). The negative signs observed for economic growth and exchange rate (x) suggest that, though not statistically significant, economic growth may depress corporate investment in the short run, and, that rises in exchange rate in favour of the Ghanaian currency are likely to discourage corporate investments in Ghana. A relatively high value of the coefficient of determination, R^2 , is encouraging for the model's application in Ghana.

Third, in column 3, we observed that in the long run, all our explanatory variables had negative effects on corporate investment, except for economic growth (Y) and government expenditures (gov). Observe also from table 1, column 3 that the impact of economic growth on corporate investment is insignificant in Nigeria.

Finally, our observations for Sierra Leone indicate negative impacts of real interest rate (r), government expenditures (gov), financial development (fd), and exchange rate (x) on corporate investment.

The results also indicated that inflation rate (IR), and exchange rates are not significant in the determination of corporate investments in Sierra Leone.

We can now concentrate on the short-run dynamics of corporate investment at the selected countries in West African Monetary Zone. Using the error correction mechanism or model, and specifying the independent variables in their first difference log form, except in situations needing second difference, we arrived at the results presented in table 2 below.

Table 2: The Short-run, Error Correction Estimates

The Gambia	Ghana	Nigeria	Sierra Leone
C -0.14(-0.61)	C -0.06(-0.7)	C -0.04(-0.96)	C -0.11(-0.51)
dLn(IR), (-1) -0.12(-1.3)***	dLn(IR), (-2) -0.11(-2.12)**	dLn(IR) -0.10(-1.70)**	dLn(IR) -0.62(-1.61)***
dLn(r), (-1) -0.07(-0.43)	No data on r	dLn(r), (-1) -0.003(-1.42)***	dLn(r) -0.62(-2.34)**
dLn(Y), (-1) -0.03(-1.3)***	dLn(Y), (-1) 0.03(1.8)**	dLn(Y) 0.003(0.32)	dLn(Y) 0.23(0.33)
dLn(Pc) -0.19(-0.11)	dLn(Pc) 0.47(0.16)	dLn(Pc), (-1) -0.07(-0.55)	No data on Pc
dLn(gov) 0.38(1.13)	dLn(gov), (-1) 0.48(1.6)***	dLn(gov) 0.29(1.53)***	dLn(gov) -0.13(-0.44)
dLn(fd) 0.12(1.50)***	dLn(fd) 0.44(1.5)***	dLn(fd) -0.09(-1.39)***	dLn(fd) -0.92(-1.30)***
dln(x), (-1) -4.5(-4.2)*	dLn(x), (-2) 0.14(1.4)***	dLn(x) -0.32(-1.38)***	dLn(x) -5.81(-1.37)***
Ecm(-1) 0.02(2.73)*	Ecm(-1) -0.55(-2.27)*	Ecm(-1) -0.25(-0.72)	Ecm(-1) -0.23(-0.43)
$R^2 = 0.78$	$R^2 = 0.49$	$R^2 = 0.36$	$R^2 = 0.85$)
D.W = 2.8	D.W = 2.3	D.W = 1.6	D.W = 1.8

Source: Authors' Short-run Estimate, 2014

Note: (*)(**)(***) indicate 1%, 5%, and 5% significance level, respectively.

Discussion

Our short-run, error correction estimates indicate as follows:

First, the short-run dynamics of corporate investment show that, with respect to Gambia, real interest rate, government expenditures, and relative prices of capital goods are statistically insignificant in the explanation of variations in corporate investment. By implication, short-run variations in these variables do not have significant economic impact on corporate investment in the Gambian economy. In addition, we observed that in the short run inverse relationship exists between corporate investment and inflation at Gambia. As can be inferred from column 1, table 2, a one percent rise in inflation would reduce corporate investment by about twelve percent in a given period of time.

Second, according to the results, all the variables of interest have significant economic impacts on corporate investment in Ghana, except for the relative prices of capital goods (Pc). We also observed a negative relationship between inflation and corporate investment, and that government expenditures crowds in corporate investment at the rate of about 48 percent (see column 2, table 2). Also we observed, in the case of Ghana, that growth rate (Y) and financial development (fd) do stimulate corporate investments.

Third, in the case of Nigeria, we observed that in the short run, government spending has positive effects on corporate investment. According to table 2, a one percent rise in government spending in Nigeria would crowd in corporate investments by about 29 percent. One surprising observation in the case of Nigeria is the economic growth (Y) appears not to have significant effects on corporate investment, just as in the Gambia. Additionally, it appears relative prices of capital goods do not have significant effects on corporate investment in Nigeria. These observations are contrary to the propositions of economic theory.

The results also indicate that financial development weakens the level of corporate investments in Nigeria. In addition, changes in real rate of exchange discourage corporate investment in Nigeria.

Finally, in the case of Sierra Leone, our results indicate that economic growth and government spending do not have significant effects on corporate investment, though these variables are positively-related to corporate investment. We also observed that in Sierra Leone, all the explanatory variables, including the rate of inflation, real rate of interest, government expenditures, financial development, and foreign exchange rate are inversely-related to corporate investment.

Note that some important descriptive analysis on inflationary trends and corporate investments are presented in appendices 1 and 2 at end of the paper.

5. *Summary of Findings, Conclusions, and Recommendations*

Our analytical results reveal the following:

1. The long run impacts of inflation on corporate investment in the West African Monetary zone appear positive, except for Nigeria. The long-run dynamics of corporate investment also indicate some negative relationships with the rate of interest in the selected countries, except for the Gambia. Another important observation on the long-run dynamics of corporate investment in the West African Monetary zone is the crowding in effects of government expenditures and positive effects of economic growth on corporate investment in more than 90 percent of the countries in the monetary zone.

2. The short-run dynamics of corporate investment in the West African Monetary zone have some interesting implications on the effects of inflation and other relevant variables on corporate investments:

(i) in the short run, Sub-Saharan African countries in the monetary zone mostly experience significant negative relationships between inflation and corporate investment so that, inflationary pressures depress growth in corporate investment at these countries and, as far as economic growth is concerned, inflationary pressures are bad;
(ii) in the short run, real rates of interest, government spending, and relative prices of capital goods are statistically insignificant in the variations in corporate investment. This is especially the case in Gambia and Sierra Leone;
(iii) in the short run, it appears economic growth does not have significant impact on corporate investment, especially in Nigeria and Sierra Leone – contrary to postulations of economic theories;
(iv) relative prices of capital goods do not have significant effects on corporate investment in the short run.
(v) the short-run impact of financial development on corporate investment is not clear in the West African Monetary Zone.

Based on these findings, the following conclusions are in place:
First, the short-run dynamics of inflation and interest rates in the West African Monetary zone appear to be associated with economic impacts contrary to economic theories and expectations; secondly, it is an established fact that inflationary pressures can discourage corporate investment and inflow of foreign capital in the West African Monetary zone.

We present the following recommendations:

First, we foresee a need for alternative theories explaining economic behaviours in respect of corporate investments in the West African sub-region in general and, specifically, the West African Monetary zone. We would need a theory that would be supported with appropriate analytical models. This proposition invariably is a challenge to African economists and scholars in similar fields.

Second, countries in the West African Monetary zone need to lay emphasis on not only appropriate inflationary policies but on the economic actors that can influence the success of such policies.

Finally, researchers need to re-examine the theoretical relationship between government expenditure and corporate investment especially, with reference to developing countries in general. We observed from the current study that in the specific case of the West African sub-region, government spending may crowd in rather than crowd out private investment.

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Appendix 1:

Inflation and Investment Trends in the West African Monetary Zone (WAMZ) Gambia

Trend in Inflation and Investment   **Correlation Matrix**

Range of years	Inflation	Investment
1981-1985	13.6	20.0
1986-1990	22.5	18.6
1991-1995	6.64	12.6
1996-2000	2.03	5.3
2001-2005	9.4	32.9
2006-2010	5.3	19.9
1981-2011	9.6	18.2

	inflation	savings	Investment	Savings-investment gap
Inflation	1	0.6	0.21	-0.18
Savings	0.06	1	0.28	0.31
Investment	0.21	0.28	1	-0.83
Saving-investment gap	-0.18	0.31	-0.83	1

Ghana

Trend in Inflation and Investment

Range of years	Average Inflation	Average investment
1981-1985	62.0	5.7
1986-1990	31.7	11.7
1991-1995	27.5	11.2
1996-2000	25.3	22.0
2001-2005	20.4	25.2
2006-2010	13.6	21.5
1981-2011	29.4	17.8

Correlation Matrix

	inflation	savings	Investment	Savings-investment gap
Inflation	1	-0.37	-0.51	0.38
Savings	-0.37	1	0.82	-0.05
Investment	-0.51	0.82	1	-0.61
Saving-investment gap	0.38	-0.05	-0.61	1

Nigeria

Correlation Matrix

Trend in Inflation and Investment

Range of years	Average Inflation	Average Investment
1981-1985	15.3	23.2
1986-1990	25.9	13.3
1991-1995	48.9	11.7
1996-2000	12.2	7.6
2001-2005	18.3	7.5
2006-2010	10.1	9.9
1981-2011	21.0	12.14

	inflation	savings	Investment	Savings-investment gap
Inflation	1	-0.00	-0.04	0.02
Savings	-0.00	1	0.19	0.78
Investment	-0.04	0.19	1	-0.47
Saving-investment gap	0.02	0.78	-0.47	1

Sierra Leone

Trend in Inflation and Investment

Range of years	Average Inflation	Average Investment
1981-1985	30.9	13.1
1986-1990	88.2	9.3
1991-1995	59.2	8.3
1996-2000	15.2	4.2
2001-2005	22.5	11.2
2006-2010	10.8	12.6
1981-2011	37	10.73

Correlation Matrix

	inflation	savings	Investment	Savings-investment gap
Inflation	1	0.42	-0.06	0.41
Savings	0.42	1	0.43	0.38
Investment	-0.06	0.43	1	-0.67
Saving-investment gap	0.41	0.83	-0.67	1

Source: Authors' Computations based on available data

Appendix 2

Savings and Investment Gaps in the West African Monetary Zone

	Ghana				**Gambia**		
Year	GDS	GFCF	GAPS	Year	GDS	GFCF	GAPS
1981	5.7	4.7	1	1981	24.3	25.3	-1
1982	5.6	3.5	2.1	1982	19.9	22.5	-2.6
1983	4.3	3.8	0.5	1983	10	18.9	-8.9
1984	6.7	6.9	-0.2	1984	12.1	18.3	-6.2
1985	8	9.5	-1.5	1985	8.2	15.1	-6.9
1986	6.9	9.3	-2.4	1986	-1.4	16.6	-18
1987	7.6	10.4	-2.8	1987	31.5	17.1	14.4
1988	9.9	11.2	-1.3	1988	30.1	16.4	13.7
1989	11.4	13.2	-1.8	1989	17.5	20.4	-2.9
1990	10.5	14.4	-3.9	1990	21.9	22.3	-0.4
1991	11.9	15.8	-3.9	1991	19.4	20.3	-0.9
1992	6.9	12.7	-5.8	1992	24.1	24.9	-0.8
1993	12.8	23.8	-11	1993	0.5	5.3	-4.8
1994	19	22.6	-3.6	1994	0.4	4.7	-4.3
1995	17.6	21.1	-3.5	1995	-0.2	6.9	-7.1
1996	18.1	20.3	-2.2	1996	1	6.8	-5.8
1997	10.4	23.8	-13.4	1997	4.2	5.2	-1
1998	18	22.4	-4.4	1998	0	4.9	-4.9
1999	9.4	20.5	-11.1	1999	0	4.8	-4.8
2000	15.3	23.1	-7.8	2000	0	4.6	-4.6
2001	21.1	27.1	-6	2001	0	11.2	-11.2
2002	18.8	18.8	0	2002	0	7.3	-7.3
2003	21.2	22.9	-1.7	2003	7.8	100	-92.2
2004	22.9	28.4	-5.5	2004	17.5	24.2	-6.7
2005	19.2	29	-9.8	2005	13.1	21.9	-8.8
2006	16.5	21.6	-5.1	2006	20.5	24.3	-3.8
2007	11.5	20.1	-8.6	2007	14	19.1	-5.1
2008	9.3	21.5	-12.2	2008	4.5	15	-10.5
2009	15.3	19.7	-4.4	2009	15.2	19.6	-4.4
2010	14.8	24.7	-9.9	2010	11.5	21.4	-9.9
2011	27.4	25.6	1.8	2011	17.9	19.2	-1.3
Average	**13.35**	**17.82**	**-4.46**	**Average**	**11.15**	**18.21**	**-7.06**

Savings and Investment Gap

Nigeria				**Sierra Leone**			
Year	GDS	GFCF	GAPS	Year	GDS	GFCF	GAPS
1981	24.7	35.2	-10.5	1981	3.8	18.3	-14.5
1982	20.9	31.9	-11	1982	5.2	12.8	-7.6
1983	16.3	23	-6.7	1983	3.8	12.5	-8.7
1984	15.8	14.2	1.6	1984	11.2	12.2	-1
1985	11.1	11.9	-0.8	1985	8	9.7	-1.7
1986	14.9	15.1	-0.2	1986	0.7	9.3	-8.6
1987	18	13.6	4.4	1987	15.4	10.1	5.3
1988	31.2	11.9	19.3	1988	15.6	5.4	10.2
1989	23	11.7	11.3	1989	10.2	8.5	1.7
1990	26.1	14.3	11.8	1990	4	13	-9
1991	19.3	13.7	5.6	1991	6.7	10.9	-4.2
1992	13.4	12.7	0.7	1992	-2.8	8.4	-11.2
1993	7.2	13.6	-6.4	1993	0	7.7	-7.7
1994	13.9	11.2	2.7	1994	5.2	8.7	-3.5
1995	10.4	7.1	3.3	1995	-3.3	5.6	-8.9
1996	14.2	7.3	6.9	1996	2	11	-9
1997	-2.1	8.4	-10.5	1997	-3.4	2.4	-5.8
1998	0	8.6	-8.6	1998	2.5	5.3	-2.8
1999	29.4	6.9	22.5	1999	0.7	0.3	0.4
2000	10.5	7	3.5	2000	-9.5	1.1	-10.6
2001	7.6	7.6	0	2001	-1.5	11	-12.5
2002	4.5	7	-2.5	2002	1.3	11.8	-10.5
2003	10.8	9.9	0.9	2003	2.8	11.3	-8.5
2004	20.1	7.4	12.7	2004	3.7	10.5	-6.8
2005	38.3	5.5	32.8	2005	5.7	11.5	-5.8
2006	16.3	8.2	8.1	2006	4.2	10.4	-6.2
2007	27	9.2	17.8	2007	0.3	9.5	-9.2
2008	14.6	8.3	6.3	2008	-1.6	9.1	-10.7
2009	22.2	12.1	10.1	2009	-2.4	9.9	-12.3
2010	26.3	11.6	14.7	2010	11.4	24.1	-12.7
2011	0	10.3	-10.3	2011	10.2	40.3	-30.1
Average	**16.32**	**12.14**	**4.18**	**Average**	**3.55**	**10.73**	**-7.18**

Source: Authors' Computations based on available data