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Louis N. Chete

*Nigerian Institute for Social and Economic Research (NISER), Ibadan*

Godwin Akpokodje

*Nigerian Institute for Social and Economic Research (NISER), Ibadan*

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## Macroeconomic Determinants of Domestic Private Investment in Nigeria: An Empirical Exploration

Louis N. Chete and Godwin Akpokodje\*



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*Despite a decade of profound macroeconomic adjustments, the record of private investment recovery has been disappointing. This paper empirically investigates the determinants of private investment in Nigeria. The results reveal that a combination of internal disequilibria and external shocks account for the slow pace of private investment resurgence. Conclusively, the paper advocates the synchronization of monetary, fiscal, trade and exchange rate policies of government in a mutually reinforcing manner to facilitate the attainment of the objectives of price stability, higher rates of investment and growth.*

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### I. INTRODUCTION

The conjunction of the debt crisis and global commodity shocks that marked the decade of the 1980s triggered a protracted period of macroeconomic instability and a drop in external financing which precipitated a drastic decline in investment. Both public and private investments in developing countries declined precipitously and remained depressed throughout the decade. Indeed, in 1989, the average ratio of private investment to GDP stood at three points below its level in the 1970s.

Some conjectures have been advanced for the plummeting of investment in less developed countries (LDCs). First, the cutback in foreign savings was not offset by a corresponding expansion in domestic savings. Second, the worsening of the fiscal position following cuts in foreign lending induced a rise in domestic interest rates and an acceleration in inflation, forcing public investment to contract. Third, the pervasive macroeconomic disequilibria associated with the external shock, coupled with the inability of governments to manage the crisis pragmatically, hurt

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\* Chete and Akpokodje are Research Fellows at the Nigerian Institute of Social and Economic Research, Ibadan. The views expressed in the paper are those of the authors.

## II. TRENDS IN PRIVATE INVESTMENT IN NIGERIA

Table 1 presents trends in private investment in Nigeria for the period 1973 to 1994. The analysis is bifurcated into sub-periods: pre-debt, pre-SAP and SAP. The Table reveals a drop in the growth rate of Gross Domestic Fixed Investment (GDFI) from an annual average of 4.1 per cent in the pre-debt period (1973 - 81) to 3 per cent in the debt period (1982 - 94). GDFI however grew significantly (7.4 per cent) during the Structural Adjustment Programme (SAP) period in comparison to the period pre-SAP. As a proportion of GDP, GDFI declined considerably in both the debt and the SAP periods. GDFI as a percentage of GDP declined from an annual average of 24.4 per cent in the pre-debt period to 13.9 per cent in the debt period. Similarly, GDFI declined from about 21 per cent of GDP in the pre-SAP period to 14.2 per cent in the SAP period. The average annual ratio of GDFI, both in the pre-debt and SAP periods shows that Nigeria has barely been replacing its depreciating capital.

The larger chunk of investment in Nigeria is public. Table 1 shows that only about 30 per cent of GDFI is private during the period of study. However, while there was a slight decline in the share of private investment in GDFI during the SAP period, the decline during the debt period was very steep.

Although there has been some marginal improvements in the growth of private investment in recent year. Table 1 shows that as a percentage of GDP, private investment has been significantly low in both the debt and the SAP periods. For instance, private investment declined from an annual average of 8.6 per cent of GDP in the pre-debt period to 4.2 per cent during the debt period. Similarly, private investment fell from an annual average of 7.1 per cent in the pre-SAP period to 4.7 per cent in the SAP period. In general, the marginal rise in private investment in the 1980s pales in comparison with the 1970s. Quantitatively, the average annual rate of private investment was 9.2 per cent in the 1970s and 4.6 per cent in the 1980s. This is in spite of the array of measures put in place to stimulate private investment.

## III. REVIEW OF RELATED STUDIES

The failure of the standard neoclassical flexible accelerator model, especially its heroic assumption of perfect capital markets and little or no public investment to effectively replicate the conditions in developing countries, has provided the fillip for the jettisoning of the strict version of the model and the development of more plausible variants. Consequently, there is considerable eclecticism in the modelling of private investment behaviour as different authors bring to bear on their analysis the peculiarities of their economies. There are, however, common threads and these are briefly elucidated here.



The impact of public investment on private investment is conceptually ambiguous. On one hand, public investment that engenders higher fiscal deficits may crowd-out private investment through high interest rates, credit rationing and so on. On the other, public investment in infrastructure may complement private investment. Thus, at bottom, the impact of public investment on private investment remains an empirical question. While some authors have found a complementary relationship (e.g. Servén and Solimano (1991), Greene and Villanueva (1991) and Blejer and Khan (1984), others indicate a negative association (e.g. Balassa (1988) and Laumas (1990).

Since the ground-breaking articles by McKinnon (1973) and Shaw (1973), it has become widely accepted that a significant number of firms in developing countries face severe credit constraints. The rudimentary nature of capital markets in these countries has tended to restrain access by firms to equity capital. Several constructs have been used to gauge the impact of credit constraints on private investment. In Blejer and Khan (1984), credit availability was captured by the change in real bank credit to the private sector plus real net private capital flows. This was found to have a significant positive effect on private investment for the 24 developing countries studied. Similarly, de Melo and Tybout (1986), in a study of Uruguay, proxied credit availability by real money growth. Real money growth in the current period was found to exert a positively insignificant influence on private investment. However, when real money growth was lagged one period, it was found to be positively significant.

Foreign exchange shortage is also widely acknowledged as a potent constraint to private investment. Rama (1990) notes that since the bulk of capital goods and raw materials used in the industrial sectors of most developing countries are imported, then, foreign exchange shortages will impinge adversely on private investment. Bilsborrow (1977), in his study on Colombia, introduced a foreign exchange variable defined as the sum of international reserves in the previous period and export earnings in the current year. His results show a significant direct correspondence between foreign exchange availability and private investment. Similarly, Fry (1980), in a study of a group of 61 developing countries, used two variables to mirror foreign exchange availability: foreign exchange receipts and import capacity. For both, he found a significant positive relationship with private investment.

In recent times, the foreign exchange issue has been examined from a slightly different perspective. A key component of economic reform programmes is the real devaluation of the domestic currency. In the short-run, a real devaluation will depress private investment through its contractional impact on domestic absorption. The main demand side effects are a contraction in private sector wealth and expenditure due to the induced rise in the general price level. The slump in general



economic activity will compel private investors to roll back investment activity. On the supply side, the effect of real devaluation is, however, ambiguous. A real devaluation will induce a rise in foreign prices measured in domestic currency, thereby boosting investment in the tradeable sector while shrinking same in the non-tradeable sector. On balance, a real devaluation is expected to have a negative impact on private investment as a substantial proportion of capital and intermediate goods are obtained offshore.

De Melo and Tybout (1986) found a positive but insignificant relationship between the real exchange rate and private investment for Uruguay, while Oshikoya (1994), on the strength of a study of selected African countries, reported a positive and significant effect for middle-income countries and a negative but significant impact for low-income ones.

The irreversible nature of long-term private investment expenditure has been stressed in recent literature on private investment (see Pindyck, 1991). The argument is that installed capacity can seldom be put to productive use in different sector, at least not without incurring substantial cost. By corollary, private investors will be unwilling to commit large expenditure on fixed investments when there is pervasive economic instability.

The effect of economic instability on private investment has been captured through several channels. Blejer and Khan (1984) introduced cyclical factors, defined as the difference between actual and trend output, and found a significant negative relationship. Dialami and Walton (1989) used the spread between domestic and international interest rates and also found a significant negative association.

Dornbusch and Reynoso (1989) have argued that accelerating domestic inflation constitute a strong disincentive to private investment in developing countries by, *ipso facto*, increasing the riskiness of longer-term investment projects and reducing the average maturity of commercial lending. This is corroborated by Green and Villanueva (1991) who found a negative relationship between private investment and higher inflation in a study of 23 developing countries.

Monumental external debt burden has the capacity to undermine or dampen private investment. Borenstein (1989) and Froot and Krugman (1990) posit that high ratio of external debt to GDP can reduce the incentives for investment because much of forthcoming returns from such investment would be used to repay existing debt, thereby serving as a tax on domestic investment.

The presence or persistence of external shocks has profound implication for investment decisions. External shocks can be mirrored by the terms of trade statistics. Adverse movement in the terms of trade will increase the cost of imports relative to income and also reduce the purchasing power of exports. Therefore, a deterioration in the terms of trade is expected to have a negative impact on private investment. This is supported by Cardoso (1993) who found a negative relationship between private investment in Latin America and terms of trade deterioration.

#### IV. THE MODEL

The various hypotheses specified above were subjected to econometric analysis. The general form of the equation estimated is as follows:

$$P1_t = f \left( \overset{(-+)}{G1_{t-1}}, \overset{(+ -)}{GR_{t-1}}, \overset{(-)}{INFL_t}, \overset{(-)}{RER_t}, \overset{(-)}{DSR_t}, \overset{(-)}{\Delta TOT_t}, \overset{(-)}{DevY_t}, \overset{(+)}{\Delta C_t}, v \right)$$

where

- P1 = private investment as ratio of GDP
- G1 = public investment as ratio of GDP
- GR = growth rate of real GDP
- INFL = inflation rate
- RER = Real exchange rate, defined as the nominal exchange rate with respect to the US dollar multiplied by the ratio of the US CPI to domestic CPI (see Doroodian, 1993).
- DSR = debt service as a ratio of exports of goods and services
- $\Delta TOT$  = change in terms of trade
- DevY = economic instability proxied by the deviation of actual GDP from its trend level (see Blejer Khan, 1984).
- $\Delta C$  = change in domestic credit to private sector plus net foreign private capital inflow.
- V = stochastic error term.

The sources and comments on data utilized in the study which spans the period 1973 – 94 are contained in the appendix. All estimations are OLS while the double log functional form was adopted.

#### V. ESTIMATION RESULTS AND DISCUSSION

Table 2 presents results obtained from our estimation experiments.

In equation 1, only external shocks significantly influence private investment. The association was found to be negative. The other determinants were not significant. To gain further insights into the determinants of private investment, variants of equation 1 were explored.

In equations 2 - 5, credit availability was mirrored by the growth rate of money supply, while economic instability was captured by the spread between domestic interest rate and international interest rate in equations 2 – 4 and by deviation of



actual income from its trend level in equation 5. Both variables were found to be insignificant and were therefore dropped and replaced by alternative surrogates in equations 6 – 7. In equations 2 – 4, foreign exchange availability was measured using various approximations. These are foreign exchange earnings, international reserves plus exports, and import capacity, in equations 2, 3 and 4, respectively.

These were found to have positive but insignificant effects on private investment. Consequently, in equations 5 – 7, the effect of foreign exchange constraint on private investment was captured through the real exchange rate.

External shocks mirrored by the debt service ratio and movements in the terms of trade had their hypothesized signs and were significant in all equations.

Overall, equations 6 and 7 provided the best fit. In equation 6, public investment was found to be a significant explanation of private investment. The sign was positive, suggesting that public investment crowds in private investment. This is consistent with the findings of Ariyo and Raheem (1991). Conceptually, the infrastructure component of public investment is expected to crowd in private investment. But as evident from equation 7, when public investment was decomposed into its infrastructure and non-infrastructure components, both significantly crowd in private investment. This finding is not entirely new as Oshikoya (1994) found a similar association for sample of middle-income countries. It is striking, however, from equation 7 that the magnitude of the coefficient on infrastructure investment is less than that of non-infrastructure. This is expected as a large chunk of public investment in Nigeria has been on non-infrastructure.

From equations 6 and 7, private investment is significant and negatively affected by external shocks. The negative values obtained for the debt service ratio and adverse movements in terms of trade cohere with results from studies of other developing countries. It is noteworthy though, that in both equations, the magnitude of the coefficient on adverse movements in terms of trade is higher than that of the debt service ratio.

The corpus of research on private investments has indicated a negative association between economic instability and private investment. Our results authenticate this position. From equations 6 and 7, inflation and the deviation of income from its trend level (surrogates for economic instability) have a negative impact on private investment. In both equations, the magnitude of the impact of deviations of income on private investment is quite high, while that of inflation is very low.

Clearly, the real exchange rate exhibits a negative and significant relationship with private investment. This conforms with expectation since the economy is heavily dependent on non-competitive imported capital and intermediate goods. The effect of a devaluation of the domestic currency is to raise the real cost of imported inputs with corresponding dampening effect on private investment.

A number of experimentation was carried out with respect to the credit variable. We tried a change in domestic credit to the private sector plus net foreign capital



inflow but got spurious results. We also experimented with the money supply growth rate but again the results were meaningless. Finally, we regressed domestic credit to the private sector plus foreign private capital inflow on private investment and got interesting results. Both were significant and positively correlated. The implication of this is that total credit inflow from both domestic and foreign sources rather than their sectoral breakdown is what spurs private investment.

Elsewhere, Ariyo and Raheem (1991) found a significantly positive association between domestic credit flows to the private sector and private investment in Nigeria. Earlier, Oyejide and Raheem (1990) had arrived at a similar result.

Following Blejer and Khan (1984) and Oshikoya (1994), the next stage of our analysis was to rank in order of relative importance the factors determining private investment in Nigeria and this was accomplished using the beta coefficients of equation 7 generated through the SPSS/PC package. This results are reported in Table 3. From the Table, economic instability is the most important determinant of private investment in Nigeria. It is followed by the non-infrastructure component of public investment and debt service ratio. The least important determinant is the infrastructure component of public investment.

## VI. POLICY IMPLICATIONS AND CONCLUSIONS

A number of policy lessons can be deduced from the results exposited in the preceding section. One of these is the complementarity between private and public investments. Adjustment policies which typically advocate the reduction of government expenditure would therefore tend to undermine private investment.

The impact of credit availability on private investment was equally highlighted in this article. Our results suggest that private investment level will be reduced in the event of any reduction in both domestic credit and foreign capital inflow to the private sector.

The macroeconomic uncertainty associated with a high debt service ratio in Nigeria was also brought into sharp relief. A policy of debt accumulation through the instrumentality of incessant debt rescheduling and contracting of fresh loans constitute a strong disincentive to the resurgence of private investment.

Finally, there is the need to synchronize monetary, fiscal, trade and exchange rate policies in a way that they would be mutually reinforcing in achieving the common objectives of price stability, higher rates of investment and growth. An albatross of the current attempt at adjustment has been the pursuit of a restrictive monetary policy alongside an expansionary fiscal policy. More worrisome is government's predilection for financing fiscal deficits through borrowing from the banking system. This has engendered wide fluctuations in interest rate with damaging consequences for saving, investment and growth. In addition, deficit



financing has induced a persistent depreciation of the exchange rate with obvious inflationary implications.

With depreciating exchange rate, the quantum of naira required to service the country's external debt will soar, thereby compounding the external debt problem. All these accentuate the need to streamline the macroeconomic policies of government.

In summary, this paper has been preoccupied with the determinants of private investment in Nigeria. Alternative surrogates of the determinants distilled from the literature were employed and the results generally corroborate theoretical and anecdotal priors. On the strength of our findings, a number of policy advice was offered, chief among which is the need to maintain macroeconomic stability.

**Table 1**  
**Stylised Facts on Private Investment in Nigeria (1973 – 94)**

Period	GDP Growth Rate (per cent)	GDFI Growth Rate (per cent)	GDFI as per cent of GDP	Private Investment Rate	Private Investment as per cent of GDFI
<b>Pre Debt: 1973-81</b>	4.4	4.1	24.4	8.6	36.2
<b>Debt: 1982-94</b>	2.6	3.0	13.9	4.2	29.5
<b>Pre-SAP: 1973-85</b>	2.8	-3.5	21.0	7.1	33.2
<b>SAP: 1987-94</b>	4.3	7.4	14.2	4.7	32.6

*Sources:* Computed from: "Trends in Private Investment in Developing Countries," IFC Discussion Papers Nos. 20 and 25, World Bank.



**Table 2**  
**Results of Estimated Equations**

Equation	GI	IGI	NIGI	DSR	TOT	INFL	GR	RER	A	RX	M	DevY	SIR	C	TC	MSG	DW	R <sup>2</sup>	SE
1.	-0.07 (0.26)	-	-	-0.39++ (4.13)	-0.8++ (3.18)	-	-0.02+ (1.75)	0.33 (1.34)	-	-	-	-	-0.01 (0.7)	-0.05 (0.77)	-	-	2.19	0.83	0.25
2.	0.24 (1.25)	-	-	-0.32++ (3.62)	-0.32++ (5.67)	-0.01 (2.66)	-0.03++ (2.78)	-	-0.01 (0.13)	-	-	-	0.01 (0.74)	-	-	0.13 (1.69)	2.52	0.90	0.20
3.	0.23 (1.22)	-	-	-0.31++ (3.58)	-0.93++ (5.83)	-0.01++ (2.54)	-0.03++ (2.63)	-	-	0.11 (0.49)	-	-	0.05 (0.39)	-	-	0.12 (1.56)	2.35	0.90	0.20
4.	0.22 (1.12)	-	-	-0.32++ (4.08)	-0.94++ (5.05)	-0.01++ (2.81)	-0.03++ (2.79)	-	-	-	0.03 (0.25)	-	0.01 (0.78)	-	-	0.13+ (1.80)	2.55	0.90	0.20
5.	0.73++ (3.29)	-	-	-0.17+ (1.99)	-0.65++ (3.85)	-0.01++ (2.57)	-	-0.07 (0.94)	-	-	-	-0.47	-	-	-	-0.05 (0.69)	2.20	0.89	0.19
6.	0.87++ (4.07)	-	-	-0.19++ (2.47)	-0.69++ (4.61)	-0.01++ (2.77)	-	-0.18+ (1.99)	-	-	-	-0.85++ (3.09)	-	-	0.61+ (1.9)	-	2.31	0.92	0.18
7.	-	0.13++ (2.32)	0.62++ (2.65)	-0.34++ (4.55)	-1.24++ (4.47)	-0.01+ (1.76)	-	-0.30+ (2.03)	-	-	-	-1.16++ (2.72)	-	-	1.21++ (2.38)	-	2.03	0.89	0.21

where:

GI = Public Investment Rate  
 IGI = Infrastructure Public Investment  
 NIGI = Non-Infrastructure Public Investment  
 DSR = Debt Service Ratio  
 TOT = Terms of Trade  
 INFL = Inflation Rate  
 GR = Growth Rate of Real GDP  
 RER = Real Exchange Rate

A = Foreign Exchange Receipts  
 RX = International Reserves in 0-1 Plus Exports in t  
 M = Import Capacity  
 DevY = Deviations of Actual Y from Trend Y  
 SIR = Spread Between Domestic and Foreign Interest Rate  
 C = Change in Domestic Credit to Private Sector Plus Net Foreign Capital Inflow  
 TC = Domestic Credit to Private Sector plus Foreign Capital Inflow  
 MSG = Growth Rate of Money Supply

**Note:** T values are in parentheses below the estimated coefficients.  
 R<sup>2</sup> is the coefficient of determination.  
 SE is the standard error of estimate for the equation.  
 + and ++ imply significant at 10% and 5% levels, respectively.

**Table 3**  
**Relative Importance of Determinants of Private Investment in Nigeria**

<b>Variables</b>	<b>Beta Coefficients</b>
Economic Instability (Devy)	-0.934
Non-Infrastructure Public Investment (NIGI)	0.8527
Debt Service Ratio (DSR)	-0.8019
Credit Flows to Private Sector (TC)	0.413
Terms of Trade (TOT)	-0.3345
Real Exchange Rate (RER)	0.289
Infrastructure Public Investment (IGI)	0.055



## APPENDIX

### Data Sources

The data utilized in the study which spans the period 1973 – 94 were derived from a combination of national and international sources. Specifically, data on private and public investment were obtained from "Trends in Private Investment in Developing Countries," IFC Discussion Paper Nos 20 and 25, 1994. Public investment in infrastructure was derived by adding government capital expenditures on transport and communication, housing, health and education as contained in the 1994 *Statistical Bulletin* of the Central Bank of Nigeria, and dividing same by the total government capital expenditure. The ratio obtained was then used in splitting public investment into its infrastructure and non-infrastructure components.

Statistics on exports, GDP and its real growth rate, terms of trade index, import capacity, international reserves, domestic and the United States consumer price indices, nominal exchange rate, domestic interest rate and the US lending rate, debt service as a ratio of exports of goods and services, were all sourced from *World Debt Tables*, published by the World Bank.

Data on inflation rate, domestic money supply, credit to the private sector, and foreign private capital inflow were derived from the 1994 *Statistical Bulletin* of the Central Bank of Nigeria.

For economic estimation, variables such as import capacity, international reserves, credit to the private sector and foreign private capital inflow were normalised over the GDP.

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