

## **An Empirical Analysis Of The Impact Of Selected Macroeconomic Aggregates Of Capital Formation: An Implication For Social Studies.**

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### ARTICLE INFO

### ABSTRACT

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This study is carried out to provide an insight into the analysis of the impact of selected macro-economic aggregates on capital formation in Nigeria. The study takes a systematic approach to the subject matter by first devoting separate section to state objectives as well as the methodology. Also, a review of the various literatures was carried in section two where various macroeconomic aggregates policy option were critically appraised. In section three, an empirical assessment of selected macroeconomic aggregates was carried out where the ordinary least square regression method was applied. In the empirical analysis, the dependent variable is gross domestic product, domestic credit to the economy and lending rate of interest. In the analysis, it was observed that the most significant variable determining changes in Gross Capital Formation is Gross domestic product (GDP). The study also found that domestic credit to the economy was significantly related to Gross Capital formation but having negative impact on capital formation. Also, certain recommendations were put forward which, include, well managed exchange rate regime, so that import is not subsidized relative to domestic production. Government should provide an enabling environment by ensuring that the political economy is stable.

**Key Words:** macroeconomic aggregates, human development index, Capital Formation

### Introduction

Macro-economic entails the study of broad based economic aggregates such as national income, employment, the price level, exchange rate and balance of payment position. It also deals with inter temporal economic aggregates such as the determination of investment, savings, consumption income and employment. Human development index

(HDI) and private development index (P01). As Stated by Anyanwu and Oaikhcnan (1995), to study the overall performance of the economy, macroeconomics focuses on policies and policy variables that affect the performance of the economy including monetary and fiscal policies, the stock of money and interest rates, the federal government budget, Federal or Public debt etc. This is so because in the past years, it has been highly difficult to predict the trends in which key macroeconomic aggregates follow in Nigeria.

One key goal of economic policymaking is to have a stable macroeconomic policy. One key element to growth and development is macroeconomic stability. Here, a stable macroeconomic environment is defined as one which keeps inflation low and under control, manages internal and external debt profiles and quickly resolves macroeconomic shocks or crises. Also, there was a remarkable decline in the nation's total external debt stock which witnessed a marginal decline of U.S. \$0.97 billion or 3.5 per cent during the year as it aggregated U.S \$27.08 7 billion of the end of December, 1997, compared to U.S. \$27.0 billion in 1996, this improvement followed the instance of the strategies introduced in 1966 which achieved the landmark reduction of the stock from U.S. \$32.58 billion to U.S. \$28.06 billion that year.

Finally, all these portray a stable macroeconomic policy. It is in the light of this improvement in macroeconomic aggregates that there is need for policy makers to keep interest rate positive and also check the domestic price level and exchange rate so as to encourage private savings, investments, exports and economic growth. The macroeconomic stability witnessed In Nigeria in 1997, where by the real interest rate was made positive for

the first time in about 7 years should be sustained and strengthened to foster economic growth and development.

## **Review of Literature and Theoretical Framework**

### **Capital Formation and Economic Development**

According to Kuznets “Domestic Capital formation would include not only additions to constructions, equipment and inventories within the country, but also other expenditure, except those necessary to sustain output at existing levels. It would include outlays on education, recreation and material luxuries that contribute to the greater health and productivity of individuals and all expenditures by society that serve to raise the morale of employed population”. It covers both the material as well as human capital.

According to Nukse’s definition “The meaning of ‘Capital formation’ is a major determinant of economic growth. Society does not apply the whole of its current productive activity to the needs and desires of immediate consumption, but directs a part of it to the making o capital goods, tools and instruments, machines and transport facilities, plant and equipment to the purpose of increasing the stock of capital goods so as to make possible an expansion of consumable output in the future”.

Capital formation is one of the importance and principal factors in economic development. The main purpose of economic development is to build capital equipment on a sufficient scale to increase productivity in agriculture, mining, plantations and industry. Economic development is the creation of economic and social overhead capital only if there is a rapid rate of capital information in the country, that is, if smaller proportion of the community’s current income or output is devoted to consumption and the rest is saved and

invested in capital domestic saving and investment from 4.5 percent to 12-15 of national income. Capital formation is the fuller utilization of available resources thereby leading increase in the size of national output, income and employment, solving the problem of inflation and balance of payments and making the economy free from the burden of foreign debts.

Capital' formation depends upon savings, on the institutions mobilizing' these savings and on the investment of these savings. The failure of these three stages of capital formation to operation properly responsible for the low rate of capital formation is such countries. The rate of capital formation in LDC's is about 5percent and in West Germany and Australia about 25percent. Low rate of capital formation in LDS's less developed countries like Nigeria are due to low income, low productivity, demographic reason, lack of , lack of capital equipment, inequalities income distribution, small size of market, lack of financial institution, economic backwardness, deficit financing, increase in taxes demonstration effect.

Capital formation is achieved through increase in National income establishment of financial institutions, rural savings, perpetuation of income inequalities, increasing profits. Inflation, profits of public corporation, utilization of the disguised unemployment and others. Through external sources capital formation is achieved through foreign aid, restriction of exports, favourable terms of trade. Investment in capital equipment not only increases production but also employment opportunity. As capital formation is thus an important determinant of economic development, investment will be used to present the capital formation in Nigeria.

## **Performance Appraisal of Nigeria's Macro Economic Policies**

Macro-economic policy refers to the action taken by government agencies responsible for the conduct of economic policy to achieve some desirable objectives of policy, through the manipulation of a set of instrumental variable (Anyanwu and Oaikhcnan (.1995). The two principal instruments of macroeconomic policies are fiscal and monetary policy, income policy, exchange rate policy and Debt management policy.

Generally, Monetary policy and fiscal policy constitute the two principal instruments of macroeconomic management and planning, while monetary policy entails the use of policies as open market operations (OMO), rediscount policy, minimum reserve requirements, liquidity ratio and sectoral credit guidelines to influence level of income, employment, in the aggregated policy level and balance of payment. Fiscal policy on the other hand, involves the use of changes in government expenditure and tax revenues to influence the level of economic activities. In appraising the performance of Nigeria's macroeconomic policies, we shall review the following policy reform, monetary policy reforms, fiscal policy reforms, public debt management, exchange rate policy reforms, deregulated financial environment, Trade policy reforms and political stability. This is because as noted by Fisher (1991). In empirical studies macroeconomic policy variables includes inflation, budget deficit real exchange rate, debt service ratio and credit to the private sector.

### **Monetary Policy Reform**

Monetary policy involves the use of money supply and market rate of interest to influence key macroeconomic aggregates should be such as to prevent inflation which is a major sources of instability. Money and credit policy should be designed in such a way to bring about a low but positive real interest which will boost savings in the upward direction and encourage capital accumulation. The principal task of monetary authorities has been to ensure an adequate liquidity at an optimum cost by influencing interest rates appropriately and this is compatible with government's objective which is a precondition for investment, growth and development.

Until June 1986, when the structural Adjustment Programme (SAP) was introduced in the Nigerian economy, monetary policy was aimed at including the emergence of a market oriented financial system for effective mobilization of financial system for efficient resource allocation. The major monetary credit control which was used by the monetary authorities was the direct monetary control techniques which involved the use of the administered interest rates special deposited, administered exchange rates, prescription of cash reserve requirement, selective credit controls and imposition of credit ceiling. Market based tools are into feasible to be used because of the narrowness and undeveloped nature of the financial markets, the inadequate supply of the relevant debt instruments and deliberate restraint on interest rates.

The introduction of Structural Adjustment Programme with the aim of eliminating price distortions, reducing public sectors' role and promoting non-oil sector growth for sustainable growth and economic development. Emphasis therefore shifted from direct monetary control techniques to-the adoption of indirect- or market based approach to

monetary policy management. The main instrument of market based framework is the “Open Market Operation complement by reserve requirements; market determined interest rate and discount window operation the adoption of a market based framework such an OMO in an economy that had been under direct monetary control for long, required substantial improvement in the macroeconomics, legal and regulatory environment.

Despite the array of monetary policy instruments especially under the market based regime, monetary policy management has witnessed limited success in Nigeria, due mainly to lack of appropriate policy mix between monetary policy and fiscal policy. During the oil boom era of the mid 1970s monetary management was rather difficult due mainly to the monetization of huge oil receipts the over-ambitions of public sector programme that continue incubates in spite of the depressed oil market, in the 1980s’ and the fiscal deficits accommodation by the CBN as the low interest rates on treasury instruments failed to attract private saves.

Thus, both inflation and exchange deteriorated sharply as the Naira exchange rate which was #2.0206 to US \$100 in 1986 maintained a downward movement to #85.00 to US \$100 1987 (see Table 1) inflation on the other hand, continued to rise in the upward direction rising from 5.4 percent in 1986 an all-time height of 72.8 per cent in 1995 before moderating at 29.3 and 8.5 cent in 1996 and 1997 respectively, from 1978, it deteriorated from 10.0 to 6.6% in 1999, In 2000, it was 6.9 per cent, then in 2002, it moved from 9.3 cent to 9.0 percent in 2003. Prior to SAP, the economy witnessed higher level gross investment averaging 10.6 per cent per year between 1981-1986, which was the period interest rate was

fixed at low levels. Then, between 1994 – 2000, there was an average of 28.2% and 5 per cent in 202—2003, then the interest rate increase during this period.

With the guided deregulation policy of 1994 to 1996, the savings rate declined from 12.3 and 10.1 per cent in 1994 and 1996. The real interest rate was negative due to high rate of inflation with, negative effect on savings and investment, though the interest rate was highly nominal in 1999—2002, the savings rate reduced from 21.6% to 19.5 the interest rate, was increasing, the real interest rate was increasing and positive, this however- raised savings from 1999 to 2000 and then decreased to 1.9.5 per cent in 2002, investment was also affected as the total investment reduced from ₦94760.90 in 1999 to ₦70 1059.4 in 2000. The importance of his development is that with interest rate and inflation rates should be kept low and investment thrives better under a situation of relatively low cost.

### **Fiscal Policy Reform**

Fiscal policy refers to that part of government policy concerning the raising of revenue through taxation and other means and deciding on the level and pattern of expenditure for the purpose of influencing economic activities or attaining some desirable macro-economic goals (Anyanwn and Oiakhenan 1995). A primary objectives of fiscal policy, is to balance the use of resources of public of payment pressure and income inequality.

In Nigeria the major fiscal policy instruments include changes in taxation, rates (on personal income, company income, petroleum profits, capitals gains, import duties, export duties, and excise duties as well as mining rents, royalties and NNPC earnings) and government expenditure (recurrent and capital). These taxes constitute the main source of government revenue in Nigeria.



The rationale for fiscal policy as pointed out by Harper Collins 1991, is to effect a counter cyclical policy so that booms and depressions during the course of business cycles are offset. Thus, fiscal policy is essentially used in fine tuning the economy, this is why Keynes advocated deficit financing, the stimulation of aggregates demand via the multiplier effect to effect a transmission from mass unemployment to a situation of near full employment level.

**Theoretical Framework/Model Specification**

In this study, the factors that determine private investment and hence economic development will be empirically reviewed. The specification of the empirical relationship between investment and key macro-economic variables will be drawn mainly from the accelerator model of investment behaviour as put forward by dark (1971), for the purpose of this study, we shall make use of the flexible accelerator model.

The accelerator model posits that current net investment is a function of changes in income. The fixed accelerator model posits that current designed capitals stocks is fixed in relation to current output.

$$K^*=K_t+Y_t \dots\dots\dots(3.1)$$

Where  $K^*$  = desired Capital Stock.

$K_t$ = Factors of Proportionality which ranges

$Y_t$  Current level of output, (GDP).

Rewriting equation 3.1 we have.

$$K_t = K_y Y_t \dots\dots\dots (3.2)$$

(3.2) expresses desirable capital stock as a proportion of actual output in the current period.

To derive flexible accelerator model, we assume that the current net model, we assume that the current net investment equally the value of discrepancy.. between the capital stock in the previous period and actual/capital stock in the previous period.

Under this assumption we have

$$I_t = K_t - K_{t-1} \dots\dots\dots(3.3)$$

A net investment rate that generates the optimality of capital stock would yield.

$$I_t = K_y (Y_t - Y_{t-1}) \dots\dots\dots (34)$$

Substituting equation (3.4) into equation (3.2) will yield.

$$I_t = K_y (Y_t - Y_{t-1}) \dots\dots\dots 3.5$$

Equation 3.5 expresses net investments as being proportional discrepancy between a actual level of income in the immediate past period.

The factor of proportionality (K) is assumed as the fixed capital output ratio. In the long-run we can represent private investment using the accelerator investment model as:

$G_t$  -Gross investment  $V$

$KG^*$  = Desired capital stock

$KP$  =Actual capital stock

$a$  = Co-efficient of adjustment

$u_t$  =Stochastic disturbance term

The acceleration investment model as noted by Anyanwun and Oaikhcnan (1995) has some draw backs which makes it difficult to estimate empirically. Also in line with the problems associated with the accelerator model, Blejer and Ihan (1994) of asserted that the concept and measurement of the capital stock equation is difficult to use for empirical

analysis. In order to develop a model to capture the impact of macro-economic activities on investment, we shall introduce the following-variables namely: inflation (INF), domestic credit government to the Nigeria economy (DC), the level of income (GDP) and lending interest rate (LRINT). The rationale for including domestic credit a key determinant of private investment through the multiplier effect would encourage growth in the private investment.

However, public investment as noted by Blejer and Khan (1984) call cause financial crowding out effect on private sector by lowering the resources available to, the private sector and then depress private investment activities. On the basis of these arguments, we specify the investment model as

$$G_{it} = F(GDP_t, INF_t, DC_t, LRINT_t) \dots\dots\dots$$

(3.7) V A priori signs + ± + -

Expressed in a linear representation. Equation (3.7) is re-specified as follows;

$$G_{it} = \alpha_0 + \alpha_1 GDP_t + \alpha_2 INF_t +$$

$$\alpha_3 DC_t + \alpha_4 LRINT_t - 1 \text{ ut...}, (V3.8):$$

A priori signs  $\alpha_1, \alpha_3 > 0$   $\alpha_2 < 0$

Where

$G_{it}$  = Gross Investment

$GDP_t$  = Gross domestic product a proxy for growth in come

$INF_t$  – Inflation

$DC$  = domestic credit to the economy

$LRINT$  = lending interest rate

Ut= stochastic disturbance term

$\alpha_0$  =constant term

$\alpha_1 \alpha_4$ = regression co-efficient

## Method of Data Analysis

The method used here is highly deductive and is based on secondary data collected From Various statistical publications of the l'ederal office statistic (FOS) and the Central Bank of Nigeria. The ordinary least square regression technique was supplied and the empirical analysis is used to analysis the relationship between key macroeconomic variables and investment behaviour in Nigeria.

## Presentation and Discussion of Results

No	Year	Inv.#	GDP#	INF.#	DC#	LRINT%
1	1975.00	5019.80	21558.60	33.90.	488.60	9.00
2	1976.00	8107.30	27297.50	21.20	2627.30	10.00
3	1977.00	9420.60	32747.30	15.40	5537.40	6.00
4	1978.00	9386.30	36083.60	16.60	8068.10	11.00
5	1979.00	9095.50	43150.60	11.80	8863.80	11.00
6	1980.00	10841.20	50848.60	9.90	10878.50	9.50
7	1981.00	12215.00	50749.10	20.90	1268.50	10.00
8	1982.00	10922.00	51709.10	7.70	28182.10	11.75
9	1983.00	8135.00	57142.10	23.20	28182.10	11.50
10	1984.00	8417.00	63608.10	49.60	31141.60	13.60
11	1985.00	5573.00	72355.40	5.50	326800.3	11.75
12	1986.00	7332.00	76061.90	5.40	36820.30	17.60
13	1987.00	10661.00	108885.1	10.20	46926.40	19.20
14	1988.00	12383.70	145243.3	38.30	57326.30	17.60
15	1989.00	18414.10	224796.9	40.90	4.9249.10	24.60
16	1990.00	30626.80	2606367	7.50	66976.41	27.70
17	1991.00	35423.90	324010.0	13.00	83823.70	20.80
18	1992.00	58640.30	54980.80	44.50	141735.7	31.20
19	1993.00	80984.10	697090.5	57.20	274134.3	18.32
20	1994.00	85021.80	91494.30	75.00	3506023	21.00
21	1995.00	114390.0	19777.40	72.80	394 196.8	20.82
22	1996.00	172100.0	28239.00	29.30	371079.1.	20.12

23	1997.00	294660.0	2.9396.50	8.50	365870.6	19.63
24	1998.00	282880.0	28813.10	10.00	417068.9	21.37
25	1999.00	947690.0	33526.50	6.60	525648.9	21.656
26	2000.00	701059.4	49809.43	6.90	519712.2	21.65
27	2001.00	140211.8	56398.65	18.19	765746.4	23.78
28	2002.00	787600.0	59019.70	12.90	874530.0	24.15

In the empirical analysis of the impact of selected macroeconomic aggregate on capital Formation in Nigeria, the method used is the Ordinary Least Regression Techniques.

This method was adopted because the (OLS) has desirable properties, which makes it a unique estimating technique when compared with other unbiased estimates.

To carry out the study, the data used were compiled from the various issues of the Central Bank of Nigeria statistical Bulletin. These data includes Gross Domestic Product (GDP) Gross Fixed Capital Formation (GFCF), Inflation Rate (INFR), Lending Interest Rate (LRINT) and Domestic Credit to the economy (DC). The data for different variables were compiled for period (1975-2002), spacing over 28 years.

### Presentation of Model

Model 1

GCF= F (GDP, INF, DC, LRINT)

GCF= 19122.0751 + 0.09805 GDP—  
(6.205) (4.6 17)  
2262.0060INF + 0.1500 DC +  
(-1.196) (0.283)

+2858.318 LRINT  
(0.492)

R<sup>2</sup>= 0.650

R<sup>2</sup>= 0.589 VI = 4 5% level significant

F= 10.672 V2=23

DW= 2.208

## **Interpretation /Analysis of Regression Results**

The above results show that GDP, DC and LRINT all have a positive linear relationship with GCF while INF has a negative linear relationship with GC.

The above results show that;

- A unite change in GDP result in a 0.09805 unit exchange in GCF.
- Unit change in INF result in a 2262.006 unit exchange in GCG.
- A unit change in DC result in a 0.015 unit in GCF.
- A unit change in LRINT results in a 2858.818 unit change in GCF.

The result obtained was 0.650 and it shows that 65% of variation in GCI is explained by the explanatory variable.

The  $R^2$  is given as 0.589. It means that 58.9% of variation in GCF is captured by the explanatory variables.

## **SUMMARY**

These studies investigate the impact of selected macroeconomic aggregates on Gross Capital Formation in Nigeria. The essence of the investigation is to determine the contribution of some of these macroeconomic aggregates on Gross Capitals formation and hence on the development and growth of the Nigeria economy. The Nigeria investigation showed that most significant variable determining changes and growth in Gross capital formation is the growth in the level of income GDP.

The Nigeria economy has grown from a mere subsistence and agricultural economy in the 1960's up to the 1990's as a result of the continuous growth in oil export revenue. This

trend has resulted in an increase in economic activities and there by leading to expansion in Gross capital formation. The study also found that domestic credit to the economy was not significant related to Gross Capital Formation thereby having a negative impact on capital formation in Nigeria. One reason that can be domestic credit to the Nigeria economy is the fact that since the 1970's government has continuously engaged in "Fiscal irresponsibility" manifesting in huge and wasteful expenditure on donations, corruption, poor performance of public and private project and many abandoned projects.

In addition to all these, problems, is the liberal licensing of new banks which resulted in many unhealthy competition among the banks and the ultimate distress of most banks in the early, 1990's. the result of all these is that domestic credit to the economy had little impact on Gross capital formation as there were high cases of capital flight in the 1990s and early 2000s.

The study also found that inflation has a positive impact on Gross Capital Formation but no significant, so although inflation is said to have an adverse effect on economy by increasing the cost of production and thereby making it difficult for firms to operate. However, one result seems to have agreed to suggest that to some extent. Mild inflation has a possible impact on growth and capital formation.

Finally, the study shows interest rate has a negative impact on Gross Capital Formation. Before (SAP) Structural Adjustment Programme; there was a rigidly controlled interest rate regime. Interest rate fixed at very low rate, this encouraged monetary expansion without promoting the rapid growth of the money and capital markets. Privates sectors savers were equally not attracted to government debt instruments because of rates. This

development resulted in the development of market based policies which resulted in the deregulation of interest rate, increase competition among banks and deregulation of the exchange rate market. The deregulation of interest rate led to increase in the rate of interest there by pushing it out of control, while the depreciation of the naira vis-à-vis dollar hit an all line low level. The implication of his is that there was a drastic main existing capital stock.

## **Conclusion**

Evidence both in the analysis and economic theory reflect that for capital formation to take place in an economy overtime, government should embark on a sound macroeconomic policy, sound trade and commercial policy and a stable exchange rate policy. To boost investment and increase capital formation, government should be made to avoid high unsustainable fiscal deficit. This will keep interest rate at a relatively low level and this elimination the possibilities of the “Crowding out” of private investment, it is therefore necessary to engineer reduction in unproductive government spending.

Secondly, government should embark on a sound monetary policy which will be aimed at preventing inflation which is the major sources of instability that leads to reduction in investment. Government should design monetary and credit policies in such a way that will bring about low but positive real interest rate.

Government should embark on trade liberalization and a stable exchange rate regime. Exchange rate with the price of foreign exchange play a significant role in the stability of economy to obtain optional productive capacity.

Thirdly, the study suggest that there is need for government to create a conducive, political environment that will eliminate all forms of uncertainty. Uncertainty plays a vital



role in investment decision, the greater the uncertainty, the lower will be the aggregate level of investment. The Nigeria economy has been characterized by uncertainty arising from erratic policy reversal. This has generally had a negative impact on investment and capital accumulation in Nigeria.

Finally, for growth and development to take place in Nigeria, there is need for the government to maintain a stable political economy, the June 12, 1993 annulment created a very big gap in the country's growth and development, thus, a resolution of all the social, ethnic and political problems in Nigeria will go a long way to reducing uncertainty and increasing confidence in the stability of the Nigerian economy.

## **Recommendations**

Bearing in mind the importance of capital formation in nation building and accepting that for capital stock to grow overtime, there must be a corresponding growth in the level of economic activities. This discussion and analysis of the study has revealed certain problems militating against the growth of Gross fixed capital formation in Nigeria, to offer solution to those problems, we therefore make the following recommendations;

- One glaring feature of the Gross Fixed Capital Formation in Nigeria is the growing dependence on imported raw materials to the neglect of the use of local raw materials. In spite of the SAP and its implication for import substitution. As observed by Bankey, Fanik and Olajide (1993), "a conservative estimate of foreign exchange content of housing investment in 1990 was such that price of imported raw material for housing construction was greater than income non-oil export". This is to improve the local sourcing of raw

materials, government should ensure a freely determined exchange rate so that imports are not subsidized relative to domestic production. Government should also provide a less inflationary environment so that long term finance can prosper.

- In the analysis, the level of incomes was found to be highly correlated with Gross Capital Formation for growth to take place in the economy, government among other things should provide an enabling environment. The deregulation of the foreign exchange market and the 1995 guided deregulation coupled with the energy crises and political instability which have been playing Nigeria since 1993 till date have all had a negative impact on Gross Capital foreign and growth of the Nigerian economy. Also, the deterioration in social infrastructure has seriously undermined productive sector activities and capital formation in Nigeria.

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