An Empirical Investigation into the Effect of Financial Sector Development on Investment and Industrial Capacity Utilization in Nigeria, 1986-2012

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Abstract

Investment and capacity utilization has been a subject of concern to Economists all over the world because of the crucial role they play in terms of economic growth of a nation. They constitute the moving vehicles that transform a traditional subsistence economy to a modern one. However, the performance of these macroeconomic aggregates is hinged on the performance of the financial sector. The low performance of these macroeconomic aggregates in Nigeria therefore calls for an empirical investigation into the effect of financial sector on them. The study is situated within the framework of the supply leading hypothesis. It made use of the 3 stage least square method to estimate the two equations. Simulation experiments were also performed. The paper finds out that MCAP has positive effect on investment and it is significant but ROT has a reducing effect and it is not significant. Also, all the financial variables used had negative effect on CUR and they are statistically significant. The simulation results showed that the shocks in the financial sector have varying effects on GFCF and CUR. The paper therefore recommends that both interest rate and foreign exchange rate should not be left entirely to be determined by the market forces. Government should intervene when necessary. When this is done the growth in GFCF and CUR desired would be achieved.

Keywords:- Financial Sector Development, Investment, Gross Fixed Capital Formation, Industrial Capacity Utilization, Financial Intermediation, Supply Leading Hypothesis, Demand Following Hypothesis, Simulation, Money Market, Capital market, Foreign Exchange Market, Rate of Interest, Market Capitalization and Exchange Rate.

INTRODUCTION

In Nigeria, macroeconomic instability has continued to be a major problem as reality on ground shows that her macroeconomic objectives have been quite elusive despite the reform policies of government thereby making the economy highly susceptible to general domestic and external shocks. This is why according to Nwaogwugwu (2010), the macroeconomic performance in Nigeria over the past three decades has been both unsatisfactory and disappointing because economic growth has been stunted, and there was consistent high fiscal deficits and high rate of inflation accompanied by sharp declines in rates of investment. Domestic saving rates have fallen dramatically, thereby contributing to unsustainable external payment positions. In attempting to correct external imbalances through reduction in aggregate demand, government has further compressed investment expenditures, completing the vicious circle of sluggish growth ,high unemployment rate, declining investment and savings rates, and unpredictable manufactured capacity utilization,.

The Nigerian economy has been characterized by low productivity of factor inputs, reliance on mono-product base, low and falling capacity utilization of the manufacturing sector, high volatility in foreign exchange earnings, sharp decline in stock prices, high interest rates, and high inflation. Other features of the Nigerian economy include weak infrastructural base, high unemployment rate, phenomenal growth in money supply and high fiscal deficits and balance of payment deficits. These have been the case in spite of the various reforms in the financial sector since 1986.

For several years, low capacity utilization of the manufacturing sector has hovered around an average of between 30 and 40 percent, indicating gross under-utilization of resources and uneconomic levels of operation. This has been blamed largely on frequent power outages, lack of funds to procure the necessary inputs, falling demand for manufactures, and frequent strikes and lockouts by workers and their employers respectively (Nwaogwugwu 2010).

Nwaogwugwu (2010) also identified inadequacies of long term funds as one of the issues that has made it difficult for Nigerian firms to make appropriate investments in modern machines, information technology and human resources development, all of which are required to reduce production costs, to raise productivity, and to improve competitiveness. Low investments have been traced largely to banks unwillingness to make credit available to producers owing, largely to the mismatch between the short-term nature of banks' funds and the medium to long-term nature of the funds needed by industries. In addition, banks have tended to regard primary production such as agriculture as a high-risk venture in the Nigerian environment and generally prefer to lend to low-risk ventures, such as commerce.

Since the inception of the Structural Adjustment Programme (SAP) in 1986, high and increasing costs of production have been cited by most business organizations in Nigeria as one of the major constraints on their operations. These increased costs, traced largely to poor infrastructural facilities, high interest and exchange rates, and diseconomies of scale, have resulted in increased unit prices of manufactures, a low effective demand for goods and falling capacity utilization rates (Wadinga 2011).

The performance of the industrial sector has also remained unsatisfactory. Available data show that between 1990 and 1992, average growth in the sector stood at 2.1% while between 1993 and 1995, growth was 1.3%. The slow growth in industrial production was mirrored in the sluggish growth of the key sub-sectors of the economy. For the period 1993 to 1995, the average growth of manufacturing sector stood at 8.4%, mining at 3.2% and electricity at 3.1%. The mining sub-sector grew by 7.4% during the period 1999 and 2001, perhaps as a result of increased activity in the solid minerals sub-sector (CBN 2009).

In 1987, the Federal government of Nigeria commenced an extensive reform of the financial system as part of a Structural Adjustment Programme (SAP). The reforms in the capital, money and foreign exchange markets involved liberalizing interest and exchange rates, promoting a market-based system of credit allocation, flexible exchange rate system for naira, enhancing competition and efficiency in the financial system as well as strengthening the regulatory and supervisory framework of the financial system. However recent and current development in the economy has made it not clear if the reforms have achieved the desired results.

It is in view of the foregoing discussion that it becomes necessary to assess the effect of the development in the financial sector on private domestic investment and industrial capacity utilization in Nigeria. The paper is divided into five sections. The preceding section discussed the general introduction while section two discusses the literature review and the theoretical nexus. Section three contains methodology while section discusses empirical results. Section five summarizes, concludes and gives recommendations.

LITERATURE REVIEW AND THEORETICAL NEXUS
Theory of Financial Intermediation
Economic growth needs more investment. Investment depends among other things, upon cost of borrowing or interest rates. To the extent that the growth of the financial intermediaries (FIs) reduces risks and diminishes the rate of interest (or prevents its substantial rise), investment is expected to rise. The role of financial intermediaries has been particularly emphasized in the Gurley-Shaw thesis (1960) and advanced by McKinnon-Shaw (1973). The roles of financial institutions are critical in economic development as they engage in facilitating reliable payment systems, mobilizing savings, allocating credit and diversifying risks.

Gurley and Shaw (1960) argued that the savings deposit of the different types of financial intermediaries are more or less the same as the demand deposit of the commercial banks since the saving deposits held by the financial intermediaries are liquid and can be converted into cash. So it can be classified as near monies but are out of the control of the central bank.

It follows from the above that such savings deposit may frustrate a successful operation of monetary policy. If the Central Bank follows a tight money policy and reduces money supply, it will not automatically reduce liquidity since near monies can be converted into cash to replenish the depleted stock of liquidity. This will aggravate during an inflationary situation.

According to Ghatak (1981) developments in America and United Kingdom in 1960s and 1970s respectively showed that instead of a growth in financial intermediation, the public withdrew funds from their deposit accounts and began to lend directly to investors by buying primary securities. He argued that the financial intermediaries deposit rates were no longer competitive enough to attract funds and could not raise the deposit rates as well as lending rate.

Consequently, the Federal Reserve imposed ceilings on deposit rates (Regulation Q). The rationale was to enforce a tight monetary policy in order to reduce individual's ability to withdraw their funds from the FIs and invest directly in primary securities. Banks, after being starved of fund would be required to reduce their credit expansion hence rendering monetary policy effective.

He stated that the above development suggests that the Gurley-Shaw thesis may have more interesting implication for analyzing the process of economic development rather than the formulation of stabilization policies. This made Mckinon and Shaw (9173) to come up with the financial repression model.

The Mckinnon –Shaw (1973) model assumes that (a) all economic agents are restricted to self finance; and (b) there are indivisibilities in investment activities. Before undertaking actual investment, the potential investors must accumulate money balances. The higher the real interest rate, the greater would be the accumulation of money balances and the larger will be the inducement to invest. The indivisibility in investment implied that the aggregate demand for money would be larger, the greater the ratio of investment to total expenditures. Hence, McKinnon puts forward a hypothesis related to the basic complementarity between money and the physical capital in contrast to the traditional theory where a substitution relation is assumed (McKinnon 1973, p59). Complementarity is given in the demand for money function below;

$(M/P)^d = f (I/Y, Y/P, d-g$……………………………………………………….(1)

Where ;   M/P = the real money stock,

I/Y = investment output ratio,

d-g = the real deposit rate of interest,

d= the nominal interest rate on deposit,

P = the price level and

g = expected future rate of inflation.

McKinnon argued that conditions that make real money stock attractive to hold enhance rather than inhibit private incentives to accumulate physical capital. In turn, large real money holdings are normally the result of the monetary systems maintaining a high and stable real return to the holders of money. This complementarity hypothesis leads to policy conclusions about inflationary finance and about deposit rate of interest for accelerating development which are quite different from the corpus of accepted monetary theory (McKinnon 1973, p40). McKinnon's complementarity hypothesis has been stated in terms of investment function as follows;

$I/Y = f (r, d-g)$ ……………………………………………………….(1.2)

Where ;   r = average rate of return on physical capital.

Showing complementarity, we have

$$\frac{\partial(M/P)}{\partial(I/Y)} > 0 \text{ and } \frac{\partial(I/Y)}{\partial(d-g)} > 0$$ …………………..…..(1.3)

If domestic savings = investment we have

$(M/P)^d = f (Y/P, sd/Y, d-g)$……………………………………………….(2.4).

It has been pointed out by Shaw (1973) that the removal of financial repression via an increase in the real interest rate will provide the greater incentives to save and invest and lead to a more efficient allocation of resources. Thus in the analysis by Shaw, the demand for money function which is similar to McKinnon was presented as follows:

$(M/P)^d = f (Y/P, C, d-g)$……………   ………………………………….(2.5)

Where; C=the opportunity cost of money holding and is estimated by the difference between real yield on government bonds "d" and "g".

Note carefully that Shaw did not assume complementarity between money and physical capital since investors do not simply depend upon own finance.

Both Mckinnon's thesis of *complimentarity* (1973) and Shaw's thesis of *debt intermediation (1973)*, agreed that policies leading to repression of financial markets reduce the incentive to save, thus stressing the importance of free entry into and competition within the financial markets as pre-requisite for successful financial intermediation and its consequent trickle down effects on economic growth. To them, high reserve requirements on deposits, legal ceilings on bank lending and deposit rates, directed credit, restriction on foreign currency capital transactions and restriction on entry into banking activities are elements of repression that impede financial development cum economic growth. Thus the McKinnon-Shaw framework informed the design of financial sector reforms in many developing countries including Nigeria.

Unfortunately, not all experiences with liberalization have been favourable and in several instances the change-over was followed by a financial crisis that led to restoration of various restrictions. As a result, a new strand of arguments emerged for discussion. The underlying framework for the discussion is the supply leading and the demand following approach of Patrick, (1966), and Nwani (1973).

Supply-leading Hypothesis

The supply-leading concept notes that the development of financial sector induces growth in the real sector through savings collection, project valuation, risk management, management control and financial institutions. Thus this can contribute to technological innovations and lead to improvement in the real sector. Moreover, according to the supply leading hypothesis, financial sector development leads to transfer of resources from the traditional sector to the modern sector and promotes and stimulates an entrepreneurial response in these modern sectors (Roger et al 2005). This approach represents the initial stage of economic development as it supplies the major channel through which economic activities take place.

Mohammed (2004) summarized Nwani (1973) argument that a fully analyzed supply-leading approach in the development of financial institutions and their services may emphasize the following; Monetization of the economy may be hastened and the money civilization processcould be deepened; Economic planning and development may be aided by the channeling of investible funds to established priorities; Economic development is not always a slow evolving process but can be stimulated by more financial institutions; Enables a nation to break the chains of total external control; and Fair and greater competition may be promoted.

Demand-following Hypothesis

The demand-following concept shows that the real sector can stimulate the development of financial intermediation. According to this school of thought, it is believed that real sector growth and stability lead to

increase in the demand for financial services which in turn encourages the creation of financial intermediaries and financial stability (Nwani 1973, Gurley and Shaw 1976;Rogers et al 2005). Other scholars such as Demiriguc-Kunt and Detriagiache (1998), underscored the importance of attaining macroeconomic stability prior to financial deregulation. This according to them is because high and unstable inflation often increases the demand for financial deregulation, but this might trigger further increases in inflation especially if fiscal deficits are large and the exchange rate is depreciating rapidly. As the government finances its deficits through money creation the higher interest rates resulting from the financial liberalization would reduce government revenue from money creation: with a given budget, this would further increase inflation.

 Mohammed (2004) summarized this view that, the demand-following approach could result in the following;-

i.   Increasing advantages to the colonial powers and will solidify the competitive advantage of foreign entrepreneurs. We may also add here that, this approach may result in the creation of oligopolistic structure of the banking industry in which only very few banks control a large proportion of the activities of the industry.

ii.   A conservation form of financial development, which may slow down the pace of economic development, and

iii.   Discrimination against borrowers whether in the agricultural, commercial or manufacturing sectors and leads to the development of monopoly trade.

Thus the issue of financial deregulation has remained controversial for the developing countries. Schmidt-Hebbel and Serven (2002) contend that financial liberalization is not risk free and should be carefully implemented to attain its benefit. According to them, an excessive rapid financial reform often leads to financial crises. This risks they maintained increase significantly in the absence of prudential guidelines and strong supervision of banks and other liberalized capital market segments.

This is work is situated within the framework of the supply leading hypothesis as the deregulation and liberalization of the financial sector in Nigeria since 1986 is in tandem with its tenets. This has been supported by many authors (Ndedibo, 2000; Ahmed, 2002; Olofin & Udoma, 2006; Iganiga, 2010; Umejiaku, 2011;Omankhalen, 2012 ; and Ajayi and Kolapo, 2013;).

METHODOLOGY AND MODEL SPECIFICATION.

This research made use of 3 stage least square (3 SLS) method to estimate the two equations specified for gross fixed capital formation (GFCF) and capacity utilization (CUR). The use of this method is hinged on the fact the 3SLS make use of information of all pre-determined variables in the model and estimates the structural equations simultaneously. The method of incorporating the predetermined-variable information into each structural equation is to multiply the predetermined variables throughout each structural equation. However this transformation will lead to a possible non-constant-error variance for each structural equation. In order to correct this situation, when we estimate the model by the 2SLS, we use the residuals from it as weighting factor and perform the weighted regression to correct for possible heteroscedasticity (Christ, 1968; Iyoha, 2004). Simulation experiment would also be performed to see how the shocks in the money, capital and foreign exchange markets affect GFCF and CUR.

The theoretical underpinning of the model specification is found in Jorgerson and Siebert (1968) neoclassical theory of investment. Their theory of investment was based on the determination of the optimal stock. Their investment theory was a derivation from the profit maximization theory. In their expected profit theory of investment, the desired stock of capital investment is assumed to be proportional to the market value of the firm. The present value is maximized according to subject to two constraints. First the rate of change of the flow of capital services which is proportional to the flow of net investment where proportionality is the time rate of utilization of capital stock and net investment is the total investment less replacement investment that is equally proportional to capital stock. Second, the levels of output and the levels of labor and capital services are constrained by a production function. They argued that holding the price of investment goods constant, the rate of change of the price of investment goods must vary as the interest rate varies so as to leave the user cost of capital unchanged. They assumed that all changes in the interest rate are exactly compensated by the changes in the price of investment goods so as to leave the own-interest rate on investment goods unchanged and that changes in the time path of interest rate leave the time path of forward or discounted prices of capital goods unchanged. They concluded that the demand for investment goods depends on the interest rate by comparing two alternative and continuous paths of optimal capital accumulation depending on a time path of the interest rate.

At the capital market, it has been argued that the market size influences economic performance of a nation. A common index of stock market is the market capitalization. Market capitalization equals the total value of all listed shares. In terms of economic significance, the assumption is that market size and the ability to mobilize capital and diversify risk are positively correlated. Thus liquidity becomes the watchword with which investors can reduce the riskiness of their investment in projects that are more profitable though with a long gestation period. Dermirguc-Kunt and Detriagiache (1998) identified two main reasons why liquidity is important. The first is that liquidity relates to the riskiness of the investment. An investment is deemed to be less risky where investors are

able to alter their portfolios quickly and cheaply. The second reason is that, theoretically, allocation of capital is more efficient and as such liquid market enhances long term economic growth.

Following from these explanations, we have the following behavioral equation:

$GFCF=C_1+C_2ROT+C_3EXR+C_4MCAP+C_5GDP+C_6GFCF_{t-1}+C_7CUR_{t1}$
$+C_8FDI+U_t$…………………………………………………………………….....3.0

> Where
> ROT= Rate of Interest;
> EXR=foreign exchange rate;
> MCAP=Market Capitalization
> GDP = Gross Domestic Product
> GFCF=Gross fixed capital formation,
> CUR=capacity utilization rate;
> FDI = foreign capital inflow proxied by foreign direct investment. .

$CUR=C_{29}+C_{30}ROT+C_{31}EXR_t+C_{32}GPL+C_{33}GDP+C_{34}PCE + U_t$……………………3.1

> Where
> ROT = Rate of Interest
> EXR = Exchange Rate
> GPL = General Price level
> GDP = Gross Domestic Product
> PCE= Personal Consumption Expenditures

Equation 3.1 is included because for additional investment to be made, it is believed that the optimum utilization of capacities of the firms is nearly reached. This presupposes that it is only then can the efficiency of labour and capital be realized, hence an increase in the capacity of the economy to produce.

EMPIRICAL RESULTS ANALYSIS
Table 1 Empirical Results for Gross fixed Capital formation and Capacity Utilization

$GFCF = -980671.3 – 23570.96ROT – 2811.8EXR + 71.97MCAP + 5.02GDP + 0.33GFCF_{t-1}$
pr (0.014)   (0.03)   (0.12)   (0.0003)   (0.0000)   (0.001)
$+ 0.35CUR – 3.5FDI$ …………………………………………….………………3.2.
  (0.01)   (0.0000)
$R^2 = 0.96$
$\check{R}^2 = 0.94$
$CUR=-3172252–23535.78ROT–2187.47EXR-7404.35GPL+12.21GDP – 0.01PCE$…….3.3
  pr (0.0000)   (0.03)   (0.17)   (0.001)   (0.0000)   (0.34)
$R^2 = 0.97$
$\check{R}^2 = 0.96$

This consists of two equations (equations 3.2 and 3.3) representing gross fixed capital formation (GFCF) and capacity utilization rate (CUR) respectively. Besides the functional determinants of the variables, financial sector development variables such as interest rate (ROT), exchange rate (EXR) and market capitalization (MCAP) were used in the regression analysis. The results are presented in table 1 above. For GFCF, all the variables are correctly signed. The coefficients of exchange rate (EXR), rate of interest (ROT), and, MCAP were high and significant. Only EXR was not statistically significant. This is because exchange rate appreciation would make domestic goods become competitive with other goods in the international market thus encouraging domestic production and capital formation hence improving the GFCF condition. The coefficients of national output (GDP) and GFCF lagged are low but they are significant. This show that the increase in the level of national income would normally increase the GFCF as it formed the base to expand the frontier of the national economy. This has been made possible by the removal of credit ceilings to commercial banks, the deregulation of interest rates and the ensued competition in the financial sector brought about by its liberalization which enhanced efficiency and reduction of costs of borrowing. People could borrow to buy vehicles, build houses, machineries and equipments and assets in both money and capital market. The overall fit is high showing 96% and 94% for R^2 and $\check{R}^2$ respectively indicating that about 96% of the variation in d dependent variable is explained by the development in the financial sector.

The CUR equation parameter estimates were equally correctly signed with the exception of personal consumption expenditure (PCE) and general price level (GPL). All the parameter estimates are high with the exception of (PCE). However only exchange rate (ROT), GPL and GDP that is of significant impacts. The wrong sign of PCE is explained by the fact that a large portion of the GDP is geared towards export as the relative contribution of the Mining and oil as well as agriculture took the lead. There are recent exportations of log woods, cassava to other countries. The overall fit is quite high with 97% of the variation in dependent variables been explained by the independent variables.

TABLE :2.   Simulation Experiments and Results

A	MONEY MARKET	
S/NO	EXPERIMENTS	RESULTS
1	Decrease in Rate of Interest (ROT) by 10%	GCFC will decrease by 0.31% CUR will decrease by 4.97%
2	An increase in Rate of Interest (ROT) by 10%	GCFC will increase by 0.31% CUR will increase by 4.97%

B	CAPITAL MARKET	
S/NO	EXPERIMENTS	RESULTS
4	A Decrease in Market Capitalization (MCAP) by 10%	GFCF will increase by 1.14% CUR will increase by 1.42%
5	An increase in Market Capitalization (MCAP) by 10%	GFCF will decrease by 1.12% CUR will decrease by 1.42%

C	FOREIGN EXCHANGE MARKET	
S/NO	EXPERIMENTS	RESULTS
6	Decrease in Exchange Rate (EXR) by 10%	GFCF will increase by 1.02% CUR will decrease by 4.57%
7	An increase in Exchange rate (EXR) by 10%	GFCF will increase by 0.31% CUR will increase by 4.97%

Source: Computed as Baseline Simulation Experiments

Implications of Findings of the Baseline Simulation Results

This study examined how the instability in the money, capital and foreign exchange markets affect some selected macroeconomic variables and found the following:

Money Market

With the reduction in interest rate, both capacity utilization rate and gross fixed capital formation reduced but when interest rate was increased by 10%, both capacity utilization rate and gross fixed capital formation also increased. These implied that financial shocks from the money market had effects on selected both gross fixed capital formation and capacity utilization.

Capital Market

A reduction in market capitalization by 10% showed that both gross fixed capital formation and capacity utilization increased but when market capitalization was increased by 10%, both gross fixed capital formation and capacity utilization also reduced. These implied that financial shocks from the capital market had effects on the two independent variables in Nigeria.

Foreign Exchange Market

When the foreign exchange was reduced by 10% only the GFCF increased while the CUR reduced but when foreign exchange rate was increased by 10%, both capacity utilization rate gross fixed capital formation increased. These implied that financial shocks from the foreign exchange market had effects on the independent variables variables.

With the outcome of the policy simulation exercise, it is imperative that some measures of controlled be pursued interest rate and exchange rate. These imply that the Federal government should intervene in the determination of interest rate and exchange rates when necessary and they should not be left completely to the forces of the market.

SUMMARY, RECCOMENDATIONS AND CONCLUSION

This work examined the impact of financial sector development on gross fixed capital formation and capacity utilization in Nigeria. The study finds out that Market capitalization (MCAP), national output (GDP and capacity utilization (CUR)) had positive and significant impact on gross fixed capital formation (GFCF) from 1986-2012. Only interest rate had a reducing effect and it was not statistically significant.

No financial sector variable had positive relationship on capacity utilization rate (CUR). Gross domestic product (GDP) was the only factor that had positive impact on capacity utilization and it has significant impact. Other variables of statistically significant impacts are ROT, EXR and GPL even though they are negatively signed.

Simulations results showed that the shocks in the financial sector have serious implications for GFCF and CUR.

From the foregoing, the paper concludes that the stability in the financial sector is required for both the

growth and stability of GFCF and CUR.

The paper gives the following recommendations, that; the rate of interest should be lowered for borrowers to remove the prohibiting factors affecting access to availability of domestic credit to both consumers and investors. Credit would enhance households' personal consumption and investment. When interest rate is low and it is followed by availability of domestic credit, investment is encouraged, activities in the money market would improve, capacity utilization rate in the private sector would improve, and the national frontiers of the economy would also expand. However the complete deregulation of the interest rate is not appropriate. The guided deregulation of interest rate by the Central Bank should be continued through the manipulation of the minimum discount rate.

Furthermore the foreign exchange conditions that would make naira appreciate should be put in place. The total subjection of the foreign exchange determination of naira to the dictates of the market should be looked into. Government should intervene when necessary and abstain when the market improves thus there should be guided deregulation of the foreign exchange market. This will help in improving the gross fixed capital formation of the economy.

Also activities in the capital market should be encouraged. The three tiers of government should make use of the bond market to raise revenue of the government and the private offers should be encouraged. This could be done by reducing the cost of going public and the sharp practices by some companies especially banks which eroded the confidence of the public in the market should be addressed. When these are done activities in the capital market would rise and gross fixed capital formation would improve.

. Finally, the paper suggests that exchange rate depreciation must be done with caution for an import dependent economy like Nigeria. Depreciation would lead to an imported inflation as it raises the cost of imported inputs needed for the domestic economy. Thus foreign exchange management should therefore not be absolutely left to the whims and caprices of the forces of the market but requires intervention when it is necessary.
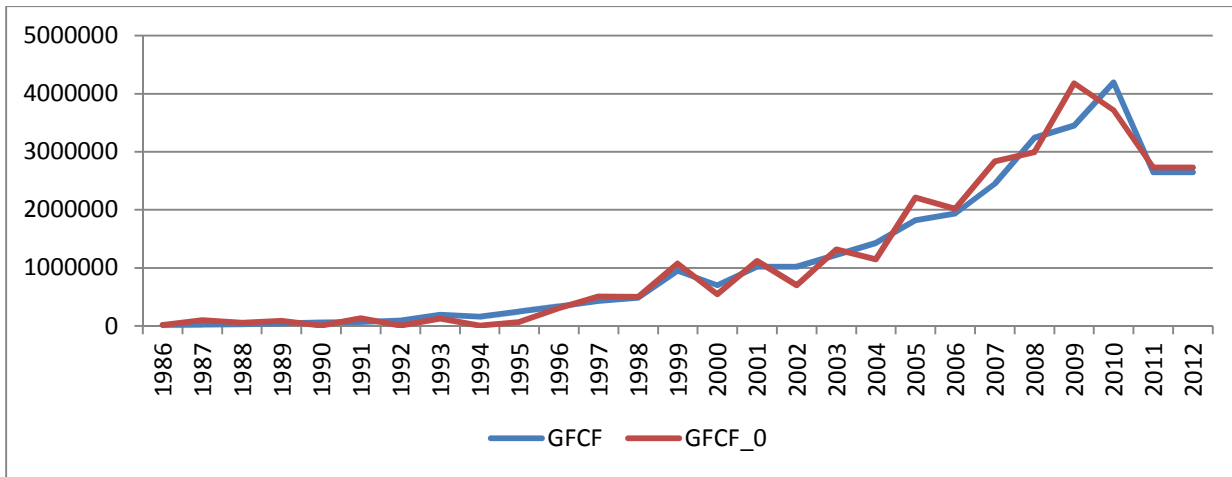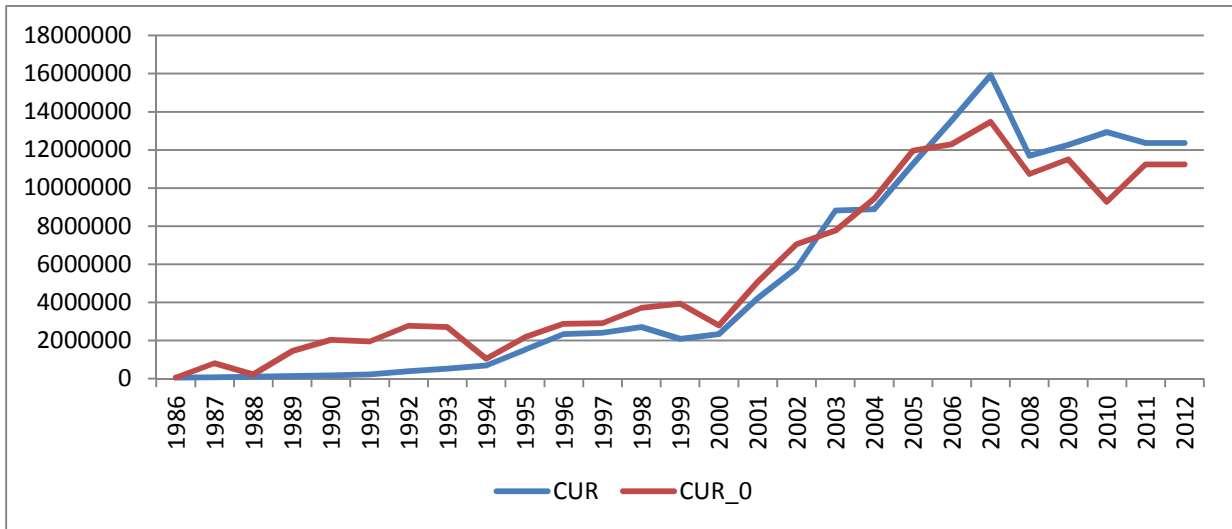
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APPENDIX
TRACKING OF ACTUAL AND SIMULATED VALUES
Tracking of Simulated Value of ROT
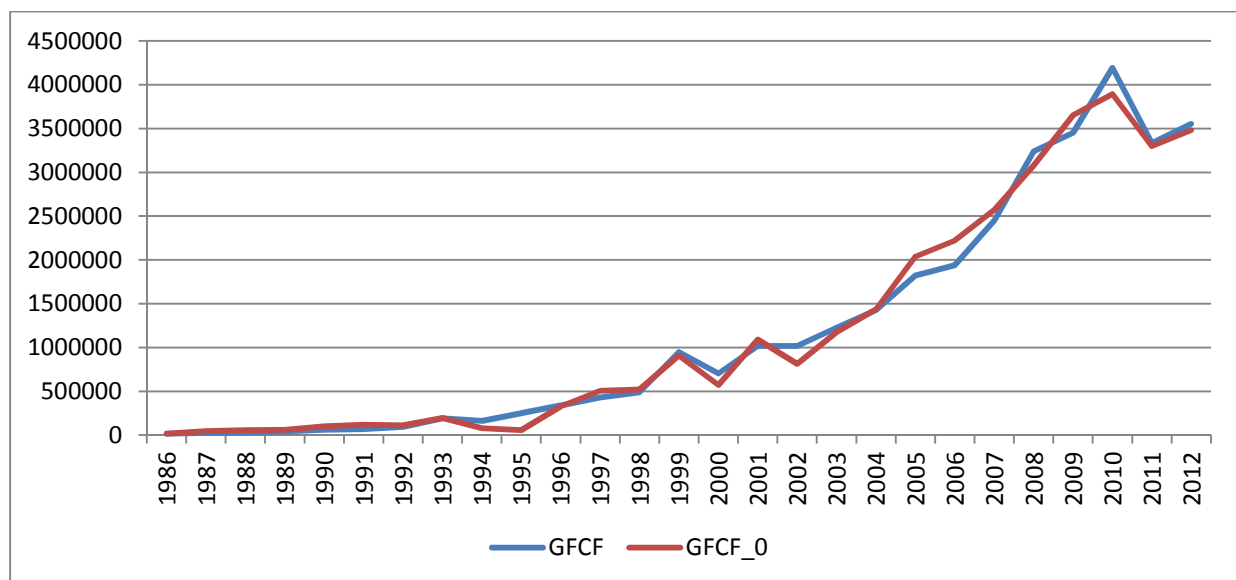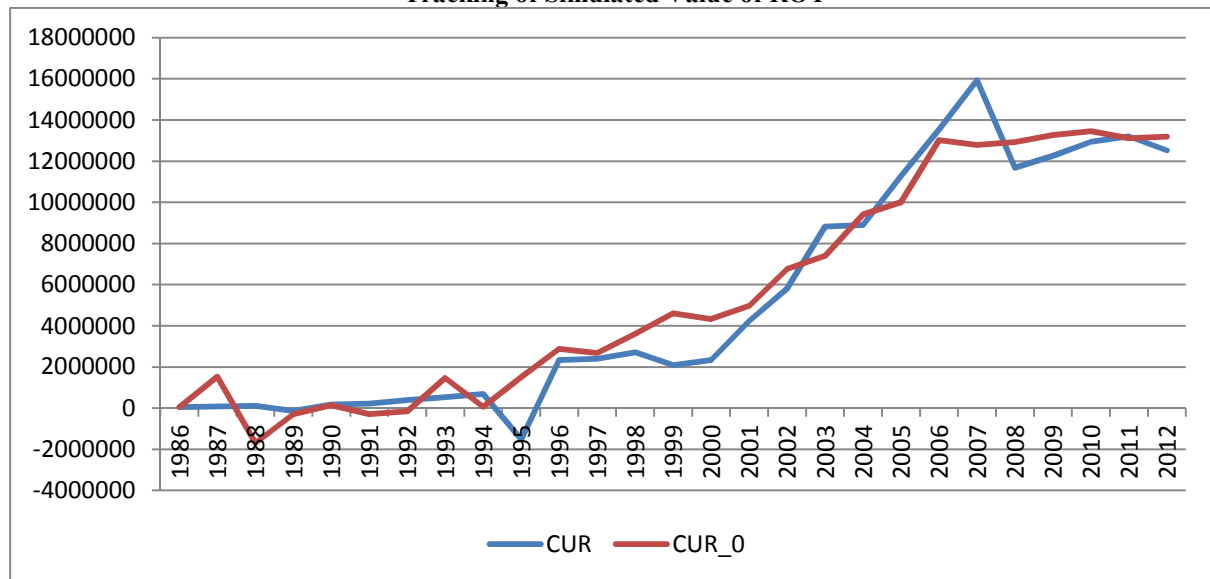
Tracking of Simulated Value of EXR

Tracking of Simulated Value of MCAP