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Rivers State, Nigeria.**Abstract**

*Countries use investment to address economic issues such as poverty and unemployment. In recent years, researchers have been interested in the relationship between investment and interest rate. Nonetheless, the problem of interest rate fluctuation, which is argued to arise from its relationship with inflation, exchange rate, and investment expectation, has been seen as a threat to interest rates positive effect on investment. Using secondary data from the CBN and the World Bank, this study examines the impact of interest rates on investment in Nigeria from 1980 to 2019. Specifically, the study is set to look into the effects of exchange rates and inflation on interest rates, as well as to evaluate the influence of exchange rates, inflation, and interest rates on investment in Nigeria and to look into the long-term relationship between interest rates and investment. The study's statistical approach was multiple regressions, which revealed that high interest rates have a negative impact on investment. And a 1% change in the explanatory variables results in a 69 percent change in expenditure. As a result, the study's policy recommendations are as follows: policymakers should develop policies that promote saving and lower prime lending rates for legitimate investors. It also suggests that, since income and savings are linked, relevant authorities should consider economic policies that will increase people's income levels in order to mobilize investment.*

**Key Words:** Interest rate, Investment, Economy, Nigeria.

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**Introduction**

In any economy, the interest rate is a key monetary policy tool for promoting economic growth and development, especially through the investment process. Interest rate volatility, both short and long term, is a popular aspect of any economy. Interest rates fluctuate in response to a number of economic factors, including changes in federal policy, domestic and foreign financial market crises, and changes in long-term economic growth, inflation, business climate, and investment prospects. These macroeconomic trends, on the other hand, are unpredictable (Acha and Acha, 2011).

The economic cycle, or the expansion and contraction of the economy over time, is correlated with a more frequent variability of interest rates. Short-term interest rates for example, increases during market growth and fall during economic downturns. The level of economic activities, especially investment, which is the key driver of economic growth, does not appear to correlate well with long-term interest rates. The phrase cyclical interest rate volatility refers to interest rate variability over time periods that relate to the duration of a normal business cycle.

The interest rate is the cost of borrowing money. That is the cost of borrowing money from an investor that is referred to as the opportunity cost. It can also be thought of as a payment made to the individual who provided the financial services. It is a major monetary cost. This is because, whether calculated in terms of cost of capital or opportunity cost of funds, interest rates have major economic effects, either by affecting the cost of capital or by influencing the availability of credit by - savings (Acha and Acha 2011). Investment has been known as both the engine of economic growth and the primary cause of economic malaise since the time of Adam Smith and Karl Marx. The shift of capital stock over time is referred to as investment. It is the

aggregation of newly created physical entities such as factories, equipment, residences, and inventory of products.

As a result, investment, unlike finance, is a flow term rather than a stock term. This implies that the value of an investment is calculated over time. Investment plays a critical role in a country's economic development. Investment is used by countries to fix economic concerns such as poverty, unemployment, and so on (Davis and Emerenini, 2015; Tordee, Alobari, Zukbee and Abuba, 2020). As a result, the determinants of investment level become crucial in an economy. Understanding the essence of interest rate behavior is important for developing policies that foster economic growth. Its significance stems from its ability to balance supply and demand in the financial sector.

This can be seen in its ability to raise investment levels, making it a big determinant of investment. However, Nigeria's interest rate strategy is probably the most divisive of all financial policies. The explanation for this is that interest rate policy has a direct relationship with many other macroeconomic variables, especially investment decisions. According to a study of interest rate structure from 1960 to 1987, the minimum rediscount was between 4% and 5% between 1970 and 1974. It was reduced to 3.5 percent in 1975, then increased to 4 percent in 1977. Furthermore, between 1978 and 1983, it fluctuated between 5% and 8%. However, it was increased to 10% in 1984 and remained there until 1987, when it was increased to 12.75 percent (Central Bank Statistical Bulletin, 2011). Commercial bank weighted average deposit and lending rates between 1970 and 1974, on the other hand, were 3% and 7%, respectively. The deposit rate was raised to 4% in 1974, while the lending rate was reduced from 7% to 6%. This period lasted from 1975 to 1978, when the deposit and lending rates were raised to 5% and 7%, respectively. Between 1980 and 1986, deposit rates ranged from 6% to 9.5 percent, while commercial bank lending rates ranged from 7.5

percent to 10.5 percent. In 1987 however, the deposit rate was raised to 14% while the prime and maximum lending rates stood at 17.5% and 19.20% respectively (Osuji, 2020).

### Statement of Problem

The issue of fluctuations in interest rate as highlighted above makes it a variable of interest for development economists. This is so, considering the importance of interest rate as a monetary policy instrument and its expected relationship with investment which is one of the major determinants of a country's economic development. There is yet no detailed conclusion on the actual link between interest rate and investment whether negative or positive, since most of the study has been inconclusive. Therefore, this study is to examine and establish the claims of past researches and therefore add to existing knowledge.

### Objectives

- i. Examine the effects of exchange rate and inflation on interest rate
- ii. Assess the impact of exchange rate, inflation and interest rate on investment in Nigeria
- iii. Investigate the causal relationship between interest rate and investment in Nigeria

### Research Hypotheses

**H<sub>01</sub>:** There is no significant relationship between investment and interest rate.

**H<sub>02</sub>:** There is no long run relationship between investment and interest rate.

**H<sub>03</sub>:** There is no significant relationship between exchange rate, inflation and investment in Nigeria.

### Literature Review

#### Conceptual Review

Interest rates are one of the most significant factors in macroeconomics and financial market functioning. It is critical in determining the value of financial instruments and has a broad impact on economic agents' decisions about whether to consume, save, or invest. It also

has an effect on how wealth is distributed between lenders and borrowers. The prices of main financial assets such as stocks, bonds, and foreign currencies are influenced by interest rates. Individuals are concerned about interest rates because they dictate monthly payments on car loans and home mortgages. Also, it determines the income earned on savings account, term deposits as well as other forms of market.

According to Black (2002), interest rate is the cost a borrower must pay in order to have access to cash that he or she does not own, as well as the return that a lender receives in exchange for foregoing consumption or liquidity in the current era. Interest rate is both an expense and a benefit in this definition. The cost of money, or interest rate, affects the demand for loan-able funds by borrowers in need of such funds. Interest rates are viewed as lending rates on various types of loans and advances in the financial system when viewed in this light.

Ajilore (2014) distinguished nominal and actual interest rates at the outset of his research, as well as the variants of interest rates in deposit and lending rates forms:

#### *Nominal Interest Rate*

It is known as the rate charged for the use of money or credit before the rate of inflation over the rental period is taken into account. In other words, it incorporates both inflation and instability. That is, interest rates were not changed to account for increases in buying power caused by market changes. In reality, inflation will lower the buying power of any investment's returns. Furthermore, inflation reduces the buying power of the principal. Inflation of 5% per year, for example, reduces the buying power of a N1,000 principal by N50 per year.

#### *Real Interest Rate*

This is the nominal interest rate after inflation is factored in. The real interest rate is supposed to be optimistic to promote saving. Since both lenders and borrowers are aware that inflation decreases the buying power of interest

income, they base their investment decisions on interest rates adjusted for inflation. Real interest rates are interest rates that have been adjusted for inflation. Since the lending and borrowing parties do not know what the real interest rate will be over the life of the loan, they must base their savings and investment decisions on their perceptions of the real interest rate.

### ***Savings Deposit Rate***

The savings deposit rate is the rate of interest charged by banks and other deposit-taking institutions on money deposited in savings deposit accounts. The account's interest is subject to the condition that funds can only be withdrawn after seven days' notice. Banks, on the other hand, seldom use this limitation nowadays, most likely to achieve a competitive edge in deposit mobilization.

### ***Fixed Deposit Rate***

A fixed deposit account is an investment account in which a predetermined sum is invested at a predetermined interest rate and maturity date. Fixed deposits in Nigeria have a tenor of 30, 90, or 180 days. Fixed deposit rates are the interest rates charged on this type of account. They usually have higher interest rates than savings accounts.

### **Investment**

Investment can be described as the purchase of an asset with the intention of earning a profit (Odoko, 2002). It may also refer to the creation of capital goods, which are goods that are not used but are instead used in the production of future goods. Building a railroad or a warehouse, clearing property, or putting oneself through college are all examples. Investing is motivated by a variety of factors. Profit/return is the primary motivation. This motive, according to Keynes' theory, is based on capital underutilization. Furthermore, Soludo (2001) described investment as the creation of "physical" capital. The explanation is based on a neoclassical production function with separable input factors – primarily

capital and labor – and investment that adds to the capital stock.

### ***Determinants of Investment***

Jobs, according to Keynes, is dependent on investment. Investment fluctuations cause fluctuations in jobs. As a result, he claims that two factors influence investment: potential profitability expectations or business trust, and interest rates. Firms either lend from their own income or borrow, according to Chete (2006). Households with savings must choose between investing for gains and lending/depositing for interest. The household will invest if the projected benefit is greater than the rate of interest. They will lend or invest their own money for interest if this is not possible. Firms that spend their own profits will make the same decision. If the companies borrow money to invest, they would have to pay interest. As a result, companies can only borrow money if the projected profit is sufficient to cover the interest and the cost of initial capital.

As a result, the decision to invest would be focused on the rate of interest and business trust in all of the above. Business trust or assumptions about future profitability are more important than interest rates among these two. This is due to the fact that the short-term interest rate is constant. The assumption of profitability entails a number of potential factors, none of which can be guaranteed. Poor prospects will lead to a decrease in investment, which will have an effect on jobs, and vice versa (Chete, 2006).

### ***Savings and Investment***

Savings and investment are inextricably linked. The basic economic activities of an economy are saving and investment, according to Sleka (2004). Capital formation and economic growth are inextricably linked. Savings by themselves have no impact on economic growth unless they are properly mobilized, channeled, and invested to increase capital stock and thereby increase demand and wealth in the economy. As a result, total savings and expenditure are equal.

However, they might not always be in balance. Savings were immediately invested, according to classical economists. They assumed that the person who made the decision to save and the person who made the decision to invest were the same person. However, Keynes argued that different people save and save for different reasons and are affected by different factors. As a result, savings can sometimes surpass expenditure. There would be a lack of aggregate demand and general unemployment if this happened.

The difference between savings and investment, according to Keynes, can be bridged by government interference, either directly by government spending or indirectly by controlling the money supply. This implies:

$$S=I \quad [1]$$

$$\therefore Y=C+I \quad [2]$$

$$\text{Or } Y=C+S \quad [3]$$

Where S = savings; I = Investment; Y = Income; and C = Consumption (Adenuga, 2020).

### **Government Spending**

State spending is money spent by the government. It is designed to create public goods for the common well-being of society, such as literacy, public health, defense, child nutrition, social welfare, infrastructure, and many others. State, according to classical economists, is inefficient. Keynes disagreed with them, claiming that government actions (taxation and spending) have a significant impact on the economy's level. Taxation and public spending, according to Keynes, should be used to achieve macroeconomic targets such as development and economic stability. Fiscal policy is being portrayed in this way.

Keynes demonstrated that monetary policy is more successful in reviving depressed economies. During a downturn, government

spending can be used to boost successful demand. Increased demand would result from the influx of capital into the economy, resulting in increased investment and jobs. As a result, government spending will re-establish the economy's growth trajectory. Many countries have followed his advice and recovered from the 1930s Great Depression. Government and monetary policy have played an increasingly important role in macroeconomic management since then.

### **Theoretical Framework**

There exist many well-known theories explaining the relationship between interest rates and investment. They include the Classical Theory; Loan-able Funds Theory; neoclassical theory, Keynesian theory, acceleration theory and others. But this study shall anchor on the neoclassical theory as they have given deeper insight into the study's variables of interest and their relationships.

The neoclassical or loanable funds theory states that interest rates are determined by the demand and availability of loanable funds. They claim that interest is the cost of credit, and that it is dictated by the demand and availability of loanable funds. They went on to say that the government, businessmen, and consumers are the three key sources of demand for loanable funds, and that businessmen and consumers' borrowings are interest elastic, meaning that their willingness to borrow increases at lower interest rates and decreases at higher interest rates (Olubanjo, 2015).

The neoclassical theory of investment, on the other hand, states that investment is a function of interest rate. They base their case on the principle of optimal capital accumulation. According to the theory, demand and the price of capital services relative to the price of output decide the desired capital stock. The cost of capital services is determined by the cost of capital goods, i.e. the interest rate, as well as the taxation of business profits. As a result, changes in demand or the price of capital resources relative to output change the desired capital stock,

and thus investment (Olubanjo, 2015; Collins, Johnny, M-epbari and Barikui, 2017). As a result, according to neoclassical theory, interest rate is the most important determinant of the desired capital stock. As a result, monetary policy will change the desired capital stock and investment by affecting the interest rate.

### Empirical Literatures

The areas of monetary policy, finance, and economic development have all been studied. This segment examines the findings of those studies objectively, with a focus on Nigeria and other developing countries.

Tran *et al.* (2019) research the effect of expansionary monetary policy on corporate investment using data from 250 Vietnamese firms. They discover that an expansionary monetary policy boosts corporate borrowing and investment. Relatedly, Ndikumana (2016) finds that adopting a contractionary monetary policy to combat inflation has negative effects on investment and national income in 37 Sub-Saharan African countries using data from 1980 to 2012.

In 101 developing countries, Mehrara and Karsalari (2011) investigate the non-linear relationship between the real interest rate and private investment. The real interest rate has a declining marginal impact on investment, according to the researchers. Specifically, the real interest rate has a positive impact on private investment up a threshold of about 6 %; and then the real interest rate lowers the level of private investment.

However, some findings suggest that both monetary policy tools may be useful. Bhat, Kamaiah, and Acharya (2019), for example, look at how various monetary policy tools, including the money supply and the interest rate, affect the price level, aggregate demand, and supply. The findings show that the money supply and interest rates are critical monetary policy tools because they affect the price level, aggregate demand, and supply.

Also, Kutu and Ngalawa (2016) used a structural vector autoregression model to investigate how monetary shocks influence industrial production in BRICS countries. The findings show that an exchange rate shock (depreciation) has a significant positive effect on industrial production over time. Furthermore, differences in the money supply justify exchange rate fluctuations better than changes in the interest rate. As a result, the money supply has a greater impact on economic production than interest rates.

In addition, Afrin (2017) investigates the monetary policy transmission process in Bangladesh. The findings show that money supply targeting has a significant impact on price levels, while the impact of bank credit is negligible. In agreement, Anwar and Nguyen (2018) used systemic vector autoregression to examine monetary policy transmission in Vietnam, and found that interest rate and money supply shocks in the monetary aggregates have a strong influence on production levels.

Karim (2012) also looks at how monetary policy's interest rate and diverse money sources influence firms' investment spending. Both instruments appear to be useful in assessing investment expenditure in Malaysia, according to the findings.

Cyrus and Elias (2014), on the other hand, argue that monetary policy is unsuccessful in Kenya due to weak institutional and systemic frameworks, while fiscal policy has a strong impact on real national income. In Tanzania, Montiel *et al.* (2012) demonstrate that monetary policy does not have a significant impact on real production.

Eregha (2010) examines the relationship between interest rate and investment in Nigeria using data from 1970 to 2002. The interest rate is negatively associated with investment, according to the findings. Similarly, Musa *et al.* (2013) use annual time series data from 1970 to 2010 to examine the effect of monetary and fiscal policies on Nigeria's inflation rate and economic development. They discover that the money

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supply has a significant positive impact on development.

Using OLS techniques, Owumere *et al.* (2012) examined the effect of interest rate liberalization on savings and investment in Nigeria. Interest rate liberalization has a negative major effect on investment in Nigeria, according to the report. As a result, the study concluded that, while liberalization is a positive idea, it is counterproductive in Nigeria.

From 1970 to 2012, Orji *et al.* (2013) investigated the relationship between financial liberalization and private investment in Nigeria. Financial liberalization, as measured by the real interest rate, had a statistically significant positive effect on private investment in Nigeria, according to the regression results. During the time under consideration, the chows test revealed a systemic split between financial liberalization and private investment in Nigeria. Furthermore, the granger test showed that there is no causal association in Nigeria between financial liberalization and private investment.

Owusu and Odhiambo (2014) used the ARDL bounds testing method to examine the relationship between financial liberalization and economic growth in Nigeria. Financial liberalization policies had a positive and important impact on Nigerian economic growth both in the short and long run, according to the report.

Contrastingly, Nwadiubu *et al.* (2014) use the Johansen co-integration test and error correction model to investigate the relationship between financial liberalization and economic development in Nigeria from 1987 to 2012. The research discovered that financial liberalization, as measured by the lending rate, had a negligible effect on Nigeria's economic growth during the study period.

Orji *et al.* (2015) used OLS methodology and co-integration analysis to investigate the correlation between financial liberalization and economic growth in Nigeria. Financial

liberalization and private investment had a substantial positive effect on economic development, according to the findings of their report. The findings also revealed that the lending rate had a negative but minor effect on Nigeria's economic development.

Previous research has mainly focused on the relationship between monetary policy and investment, or economic development, and the majority of evidence suggests that interest rates and inflation are negatively correlated with investment in developed countries, whereas national income and money supply are positively associated. Other research suggests that systemic and institutional flaws are to blame for the slower or less successful transmission of monetary policy in developing countries.

However, a thorough review of the literature reveals no signs of an empirical analysis attempting to determine how changes in the inflation rate influence the effect of monetary policy on investment in Nigeria. This is the chasm that this research aims to close. This paper also builds on previous work by using more robust econometric estimation models, which are better suited to parameterizing dynamic interrelationships among macroeconomic variables. In addition, this research uses more recent data for Nigeria, expanding the review span from 1980 to 2019.

### **Method of Study**

The quasi-survey method is employed in the study as it investigates the economic relationship between variables without manipulation. The study used secondary data sourced from CBN Statistical Bulletins, and World Bank National account data for Nigeria. The variables of interest are Gross Capital Formation (proxy for investment); and interest rate, exchange rate, and inflation rate as monetary policy variables to influence investments.

### **Model Specification**

To understand the impact of interest rate on investment in the Nigerian economic context,

this study specifies a model stating that investment depends on interest rate. And because Nigeria has its fair share of globalization, the study also takes a look at what Obadan (2006) said that the naira exchange rate evaluation or depreciation will encourage export and consequently encourage investment in order to produce exportable goods. Therefore, this study will employ econometric techniques using the OLS method to estimate the relationship between the selected variables as follows:

$$GCF=f (INT, INF, EXR) \quad [1]$$

Econometrically, the statement follows thus;

$$GCF= \beta_0+ \beta_1 INT + \beta_2 INF + \beta_3 EXR + \mu \quad [2]$$

Where

GCF = Gross capital formation

INT = Interest rate

INF = Inflation rate

EXR = Exchange rate

$\mu$  = stochastic or error term

Apriori theoretical expectation

$\beta_1 > 0$ ;  $\beta_2 > 0$ ;  $\beta_3 > 0$ .

The rise in each of the variables under examination will occur if the coefficient of the time variable (t) which is  $\beta_1$  is positively significant. The negative but significant value of the coefficient of the squared time variable ( $\beta_1$ ) will imply deceleration of the variables while stagnation in growth rate of the variables will occur if the coefficient of the time variable (t) is not significant.

**Table 2: OLS Result**

Dependent Variable: GCF

Method: Least Squares

Date: 04/12/21 Time: 15:30

Sample (adjusted): 1981 2019

Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	55.32392	3.757260	14.72454	0.0000
INT	-0.570943	0.144076	-3.962780	0.0003
INF	-0.293838	0.121844	-2.411593	0.0213
EXR	-0.144271	0.020812	-6.932008	0.0000
R-squared	0.714637	Mean dependent var		35.94341
Adjusted R-squared	0.690177	S.D. dependent var		19.39048
S.E. of regression	10.79307	Akaike info criterion		7.692601
Sum squared resid	4077.166	Schwarz criterion		7.863223
Log likelihood	-146.0057	Hannan-Quinn criter.		7.753819
F-statistic	29.21692	Durbin-Watson stat		0.691052
Prob(F-statistic)	0.000000			

## Method of Data Analysis

Summarily, the following econometric analytic models are employed: OLS, ADF and Cointegration.

## Result and Findings

The data used for this study is depicted in the table 1 (See appendix 1).

The OLS result reveals a negative but significant relationship (-0.570943) between gross capital formation and interest rate which implies an inverse relationship, meaning that any upward

movement in gross capital formation will result to a downward movement in interest rate. The same trend of movement applies to all the other variables with gross capital formation. This implies that a decrease in inflation, interest rate and exchange rate will lead to increase in investment. Altogether, the variables (interest rate, inflation and exchange rate) are responsible for 69.01% variation in investment (F-statistics = 29.21692; Probability = 0.000000). The result of the Augmented Dickey-Fuller Unit Root Test is presented in table 3 below.

Table 3 Augmented Dickey-Fuller Unit Root Test

Variables	Lag	ADF Statistic	Critical Values		Remarks
			1%	5%	
GCF	0	-3.617051	-3.615588	-2.941145	Stationary
INT	0	-4.569301	-3.610453	-2.938987	Stationary
EXR	0	1.450470	-3.610453	-2.938987	Stationary
INF	0	-3.458215	-3.615588	-2.941145	Stationary

The result of the ADF statistic shows the series less than 5 percent critical value at level difference. This implies that the series are differenced once for them to be stationary, which means they are said to be integrated of order one I(1), and in relation to a linear combination of the variables being integrated of order zero, I(0), are said to be cointegrated. Therefore, the cointegration test is necessary.

The Johansen cointegration test result shows four cointegrating equations, which implies the existence of long run equilibrium between CGF, INT, EXR and INF. If there is a long run equilibrium, it follows therefore that there is a long run relationship between investment and interest rate, which also is impacted by the effects of inflation and exchange rate.

From the foregoing analysis, it is seen that as investment increases, interest rate declines,

which confirms the previous finding by Eregha (2010) and Owumere *et al.* (2012). The implication of these findings is that the more interest rate falls, the more investors will be encouraged to invest more of their money in the economy.

Secondly, as Ndikumana (2016) reports that adopting a contractionary monetary policy to combat inflation has negative effects on investment, this study applies this to Nigeria as no study has studied the link between inflation and investment in Nigeria. This study found that as more money is invested into productive activities in the economy, inflation declines. This is because as more money is invested, the volume of money in circulation goes down as disposable income falls, leading to decline in inflation. This implies that investment can be used to control inflation, just as controlling inflation can help to encourage investment.

**Table 4: Johansen Cointegration Test**

Date: 04/13/21 Time: 14:51

Sample (adjusted): 1987 2019

Series: GCF EXR INF INT

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.931471	131.7741	47.85613	0.0000	
At most 1 *	0.564372	43.31751	29.79707	0.0008	
At most 2 *	0.274822	15.89562	15.49471	0.0435	
At most 3 *	0.148152	5.291474	3.841466	0.0214	

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Also, the study found that as investment increases, exchange rate declines, which imply that a fall in exchange rate encourages investors to invest more money within the economy. This is so because, by investing more in the economy, importation is reduced and exportation is increased, and this leads to a competitive advantage for the Nigerian currency at the international market. This implies that the value of Naira becomes high against foreign currencies.

### Summary and Conclusion

From 1980 to 2019, the study examined the relationship between investment and interest rates in Nigeria, using investment as a dependent variable and interest rate, exchange rate, and inflation rate as explanatory variables. Data was obtained from the CBN and World Bank, and

estimation was performed using the multiple regression method of econometrics. The study discovered that high interest rates, inflation, and exchange rates stifled investment, with a 1% rise in the explanatory variables resulting in a 69% reduction in investment. As a result, in Nigeria, there is an inverse relationship between investment and interest rates.

The study emphasized the following policy implications in light of the important role investment plays in stimulating economic growth through diversification of the economy, job creation, and economic self-reliance:

Policy makers and Monetary authorities should implement policies that encourage people to save more, such as raising the deposit rate, which will encourage people to deposit their

money in banks, increasing the availability of loanable funds. This would result in a decrease in interest rates and, as a result, an increase in investment.

Let the regulatory authorities encourage a decrease in the prime lending rate for investors in order to allow them to borrow more and invest more.

Since savings promote investment and income leads to savings, the government should implement policies that will allow unemployed citizens to save more, resulting in a high rate of investment, which will ultimately contribute to economic growth and development.

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**APPENDIX**  
**Table 1: Data on GCF, INT, EXR and INF**

DATE	EXR	GCF	INF	INT
1980	0.55	NA	9.9723	-3.547418
1981	0.62	89.38613	20.8128	-65.85715
1982	0.67	85.94140	7.6977	-4.586180
1983	0.72	75.75651	23.2123	-8.022386
1984	0.77	58.95629	17.8205	4.342493
1985	0.89	46.39545	7.4353	2.343231
1986	1.75	54.94827	5.7172	4.310292
1987	4.02	50.04989	11.2903	-4.769645
1988	4.54	43.75477	54.5112	-2.962676
1989	7.36	52.48744	50.4667	-6.612412
1990	8.04	53.12219	7.3644	17.46624
1991	9.91	48.40018	13.0070	0.990847
1992	17.30	43.77439	44.5888	-14.98717
1993	22.07	44.47636	57.1653	-7.052475
1994	22.00	42.06784	57.0317	-15.92023
1995	21.90	37.20593	72.8355	-31.45257
1996	21.88	36.58167	29.2683	-5.260784
1997	21.89	38.42226	8.5299	12.12661
1998	21.89	40.55340	9.9964	11.48467
1999	92.34	38.27800	6.6184	6.047248
2000	101.70	34.04928	6.9333	-1.140889
2001	111.23	30.03794	18.8736	12.13870
2002	120.58	26.76866	12.8766	3.023542
2003	129.22	28.37090	14.0318	9.935713
2004	132.89	26.06325	14.9980	-2.604847
2005	131.27	24.96612	17.8635	-1.593680
2006	128.65	26.16650	8.2252	-5.627968
2007	125.81	20.18004	5.3880	9.187171
2008	118.55	18.85977	11.5811	6.684909
2009	148.90	21.11545	12.5550	18.18000
2010	150.30	16.81501	13.7202	1.067736
2011	153.86	15.67631	10.8400	5.685580
2012	157.50	14.21112	12.2178	6.224809
2013	157.31	14.16873	8.4758	11.20162
2014	158.55	15.08353	8.0625	11.35621
2015	192.44	14.82718	9.0094	13.59615
2016	253.49	14.72496	15.6753	6.686234
2017	305.79	14.71562	16.5235	5.790567
2018	306.08	19.01838	12.0947	6.055977
2019	306.04	25.41589	11.3968	4.522188