IMPACT OF MONETARY POLICY INSTRUMENTS ON UNEMPLOYMENT IN NIGERIA

BY

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CERTIFICATION PAGE

I, Chambers Samuel, an undergraduate of the department of Economics, Godfrey Okoye University with the registration number U14/MSS/ECO/091 do hereby affirm the work embodied in this research: The Impact of Selected Monetary Policy Instruments on Unemployment in Nigeria is original and has not been submitted in part or full in any other diploma or degree of this or any other university.

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APPROVAL PAGE

This project has been approved to have satisfied the requirements for the award of Bachelor of Science Degree in the department of Economics, Godfrey Okoye University, Ugwuomu-Nike, Enugu State.

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External Examiner Date

DEDICATION

This research work is dedicated to Rev. Songo Chambers for her support in achieving this stage of my academic pursuit.

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***ABSTRACT***

*This study was undertaken to ascertain the impact of monetary policy on unemployment in Nigeria. This research is being carried out to determine the overall impact of monetary policy on unemployment. In this study, we empirically determined the impact of selected monetary policies on unemployment in Nigeria from 1980 – 2015. The specific objectives of this study are to determine the impact of selected monetary policy on unemployment in Nigeria, to determine if there is a long run relationship between monetary policy and unemployment. From our findings, there exist a positive but insignificant relationship between monetary policy rate and unemployment rate. It will educate the public on various Government policies as related to Monetary and Unemployment.*

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Monetary policy rests on the relationship between the price at which money can be borrowed and the total supply of money in the economy. It is generally referred to as being expansionary or contractionary, where an expansionary policy increases the total supply of money in the economy rapidly, and contractionary policy decreases the total money supply, or increases it slowly. When a central bank embarks on an expansionary monetary policy, it does so to stimulate domestic economy and reduce unemployment, while contractionary policy involves raising interest rates to combat inflation.

According to Adekanye (1986**),** monetary policy can be described as the various ways by which the Federal Government and the Central Bank of Nigeria (CBN) seek to influence the supply of money and credit as well as their price asindicated by interest rate in order to achieve stated or desired economic goals.

Chukwudire (1993) refers to monetary policy as measures to control the availability, cost and use of money and credit in the economy for the purpose of achieving stated objective. He went further to say that monetary policy covers a broad range of policies and measures which include not only such monetary measures that influence the availability, cost and use of money, but also those non-monetary measures which influence monetary situations. He argued that in so far as these non-monetary measures such as price control, income policies, physical control, budgetary measures that deal with inflation aimed at influencing monetary are involved in monetary policy.

Today, unemployment may be viewed as one of the most intractable problems facing Nigeria since 1960 and climaxing in these millennium years. It has become a cankerworm that is now eating deep into the fabric of the Nigerian economy. The existence of high unemployment in any economy is a source of concern to policy makers as well as the general citizenry. According to Englama (2001), the issue of persistent unemployment is now frightening in Nigeria considering the fact that it is widening poverty, misery, and social unrest, ethnic cum religious crisis, robbery, kidnappings, terrorism and other social vices. These have posed a great challenge to policy makers/planners, human resource experts and persons dealing with unemployment programmes, planning and implementations.

Monetary policy has a dual mandate of guaranteeing high employment rate and price stability. At one time or another, economic agents around the globe have also tried to use monetary policy to achieve almost every conceivable economic objective with economic growth and low level unemployment often high in the list. As a case in point, Sellon (2004) posited that when the Federal Reserve of the United States raises its target for the federal funds rate, other rates rise, reducing interest-sensitive spending and slowing the economy, and when it is lowered, other rates tend to fall - stimulating spending and spurring economic activity.

The official unemployment rate steadily increased from 12.3 per cent in 2006 to 23.9 per cent in 2011 (ILO) while the revised rate records shows an increase from 12.3 per cent in 2006 to 19.7 per cent in 2009, but declined to 6.0 per cent in 2011. Between 2013 to first quarter 2014, the unemployment rate rose from 24.7 per cent to 25.1 per cent (ILO), while the revised rate shows a decrease from 10.0 per cent to 7.8 per cent.

The government through the monetary authority promote monetary stability and evolve an efficient and reliable financial system through the application appropriate monetary policy instrument and systemic surveillance. Despite these efforts of government in boosting the performance of financial sector, the sector is still not witnessing significant development in relations to solving the problem of unemployment.

In an effort to encourage employment generation using monetary policy, interest rates were liberalized (deregulated) and were also controlled on several occasions. The failure of these polices and the onward escalation of unemployment problem necessitated the reason for determining the impact of selected monetary policy on unemployment in Nigeria.

* 1. Statement Of The Problem

One of the major objectives of monetary policy in Nigeria is price stability. But despite the various monetary policy instruments that have been adopted by the Central Bank of Nigeria over the years, inflation still remains a major threat to Nigeria’s economic growth.

Disappointedly, the average growth of the aggregate economy was accompanied by increased in the average growth of unemployment and poverty rates from 3.93% and 42.07% respectively between 1981 to 1990 to an alarming rate of 14.7% and 63.99% respectively between 2001 and 2010. Also, within this period the disparity in income distribution (measured by Gini Index) rose from 34.18 in 1980 to 42.9 in 2004 and further to 48.8 in 2013 (World Bank Indicators, 2013).

However, unemployment in Nigeria is primarily youth unemployment, especially secondary school leaver for instance in 1986, they constituted 65.3 percent of all the employed in Nigeria. The figure for 1987 for this group was 70.7 percent when figures are desegregated by location figures for urban unemployment were higher for all the years under survey with the exception of 1986. The national figures for unemployment were 6.1 percent in 1986. It tell slightly to 5.3 percent in 1986 for all the year data indicate that unemployment was higher in the urban than within the rural area.

This study is therefore concerned with finding out the impact of selected monetary policy on unemployment in Nigeria. Also, intend to investigate clearly the extent to which these policies have contributed to worsening the problem of unemployment or alleviating it completely through these question;

Does monetary policy have any impact on unemployment in Nigeria?

What is the relationship between monetary policy and unemployment?

* 1. **Objectives of the Study**

The general objective is to determine the impact of selected monetary policy on unemployment in Nigeria for the period of 1980-2015. Under this general objective, the specific objectives this study covers are;

1. To determine the impact of selected monetary policy on unemployment in Nigeria.
2. To determine if there is a long run relationship between monetary policy and unemployment.

1.4 The statement of hypothesis

The study is guided with both null and alternative hypothesis which is denoted using Ho for null hypothesis and Hi for alternative hypothesis.

**Ho**- Monetary policy has no significant effect on unemployment rate.

**Hi-** . Monetary policy has significant effect on unemployment rate.

**1.5 Significance of the Study**

This research work is being carried out to determine the overall impact of monetary policy on unemployment. The findings of this work will be of immense use and benefit to government Ministries, National Directorate for Employment and Monetary Authorities (Central Bank of Nigeria), Department and Agencies at federal level in solving some macro-economic problems, state and local, policy makers and intellectual researchers who may be willing to improve the work subsequently. Lastly, it will educate the public on various government policies as related to monetary and unemployment.

**1.6 Scope of the Study**

The research work deals with the impact of selected monetary policy on unemployment. This research work covers the period of years (1980-2015) which is sufficient and suitable for conducting a research, making new findings and relevant recommendations.

**CHAPTER TWO**

**2.0 LITERATURE REVIEW**

The primary goal of monetary policy in Nigeria has been the maintenance of domestic price and exchange rate stability since it is critical for the attainment of sustainable economic growth and external sector viability. Essentially the consequences of macroeconomic policy depend on the effective use of monetary policy on inevitable macroeconomic aggregates. It cannot be denied that the ability to achieve the staffed economic policy objectives such as non-inflationary growth, exchange rate stability, promoting financial sector soundness, mobilization and product use of resources, employment and output growth depend on the choice of appropriate mix of policy instruments.

According to Layard, Nickell&Jackman (1994) unemployment generally reduces output and aggregate income. It increases inequality since the unemployed lose more than the employed. It erodes human capital and involves psychic costs. Though unemployment increases leisure, the pain of rejection largely offsets the value of this. Those who are unemployed sometimes feel as if the society does not need them.

**2.1 CONCEPTUAL LITERATURE**

Kogar (1995) argues that monetary policy is an effective instrument in relation to influencing demand. He noted that it is crucial to generating an environment for sustainability of lower inflation. Gordan (1981) believe that the effective use of the monetary policy instruments depend on a number of factors, including the level of development of the money markets. The situation is worse in developing economies.

Milton Friedman is of the view that monetary policy cannot be used to achieve a level of unemployment attempting to do this would have effect of destabilizing the economy. If the authorities increase the money supply in the face of an undesired rate of unemployment, this may lower the unemployment rate below its natural level and bring it closer to the target rate while the Keynesian view is that monetary policy should be directed at interest rate rather than money supply and the monetary policy should at all times be subsidiary to fiscal policy.

According to Chris Enyinnaya (1989), monetary policy is usually formulated by the Central Bank of Nigeria on behalf of the Federal Government. He highlighted that it is a design to regulate the economy through the regulation of money supply and the terms and availability of credits. According to Radchiffs report (1983), he saw monetary policy as having several objectives such as a high and stable level of employment, price stability etc. he further says that the role of monetary policy is of limited importance by today it is of primary importance in helping to achieve the government macroeconomic objective. J. C. Anyanwu (1988), pointed out that the monetary policy throughout the world is a major economic stabilization weapon. He further says that it involves measures, designed to regulate and control the volume, cost and availability and direction of money and credit in an economic to achieve some specified macro economy policy objectives. It is noticeable that the monetary policy enforced within the economy over the past years has been detrimental to and inconsistent with the departmental need of the economy as observed by (Apata, 2007). This concern has exerted pressures on the national monetary authorities in Nigeria to re-examine and re-evaluate their domestic monetary policies with the view of finding possible solutions. As a result of this, the Structural adjustment programme was introduced in Nigeria in 1986 so as to correct structural imbalances within the economy and to liberalize the national economy. In guaranteeing optimum growth in liquidity for meeting desired growth and balance of payment objectives and at a similar time come through economic stability. However despite all effort place in situation to boost and increase the amount of each national output (i.e. Gross Domestic Product) and employment in Nigeria, very little may be shown for the efforts that have been put in place by the government towards economic growth and development in African nations at large especially in Nigeria. Government through the monetary authority has been controlling the money supply in circulation to stop inflation and deflation within the economy, and maintain a balanced growth and development in Nigeria. Yet the distortion still exists.

Bernanke and Kuttner (2005) also reported that tightening of money supply increases risk premium that will be needed to compensate investors for holding risky assets as it signifies a deceleration of economic activity, and may influence unemployment dynamics. Ken Chinemelu (1988), looked at monetary policy as a deliberate effort by the government through the Central Bank to control the monetary supply and credit conditions for the purpose of achieving certain broad economic objectives. Among the objectives of the price monetary policies are full employment, price stability, economic growth and balance of payment position.

**2.2 THEORETICAL LITERATURE**

**MONETARY POLICY AND UNEMPLOYMENT IN NIGERIA**

In Nigeria, the Central Bank conducts monetary policy primarily to achieve price stability using monetary policy rate (MPR) that signals the direction of interest rates as nominal anchor (CBN, 2013). Prior to the 1986 structural adjustment programme (SAP) introduced by the Federal Government and the financial sector reforms of 1987, the conduct of monetary policy was by direct control of the Bank. Consequently, nominal interest rates was lowest during this period, but with high inflation, while real interest rates were generally negative leading to low savings, low investment and low growth as a result of the repressed regime (Soludo, 2008). According to NBS (1988), the desired policy objective of enhancing investment and growth in the real sector was not achieved as the composite consumer price index for all items increased from 204.8 per cent in 1980 to 516.6 per cent in 1987, while food price index raised from 199.7 per cent in 1980 to 541.9 per cent in 1987.

In addition, inappropriate and ineffective policies of the past such as the Economic Stabilization (1982) and Economic Emergency (1985) measures aggravated the economic quagmire. In effect, these austerity measures dramatically reduced supply of new materials and spare parts to the import dependent industrial sector, resulting in extensive plant closure, substantial drop in capacity utilization and retrenchment of many workers (Anyanwu, Oyefusi ,Oaikhenah, Dimowo, 1997).

According to Alade (2013), the SAP and financial sector reforms led to the deregulation of the banking industry and liberalization of interest rates. Since then, interest rate have risen relative to the repressed regime era with significant moderation in inflation rate, particularly during 1998-2006, except for the aberration between 1993-1998, the period of “guided deregulation”. Some of the structural factors that encompass interest rates dynamics under the liberalized regime include the structure of the banking industry. Chatterjee (1995) argued that the expansion of productivity of input that revolutionizes technology is the main supply of employment and unemployment. The author expressed that if the expansion of output will increase over the expansion of inputs, then total issue productivity or the residual, has inflated. If total issue productivity is not growing, then corporations and also the economy become inefficient. It follows that reallocation of labour and capital cannot be achieved and labour and capital are employed in less profitable opportunities. There are varied causes for the lag in total issue productivity. Lastly, Technology is not up within the production of products and services and employees skills are not being increased. New merchandise is not fictional once the price of foreign materials is increasing. Once total issue productivity is stagnating, the co-movements in different vital variables can lag. For instance, consumption expenditures will not increase on top of the trend, nor can investment disbursement. Value and total hours worked will not be on top of the trend either. Once consumption, investment, GDP, and hours of labour decline, the Solow’s residual, that represents the expansion burning productivity and is measured by the distinction between actual and foreseen productivity growth (or shocks), can decline. That is, there is no improvement in technology and productivity underneath this condition. Therefore, unemployment will increase. Technology stocks caused by scientific and engineering development, by R&D, management techniques, and by industrial organizations that build inputs a lot of productive.

**THE KEYNESIAN MONETARY POLICY**

The essential element of Keynesian economics is the idea that the macro economy can be in disequilibrium (recession) for a considerable time. Keynesian economics advocates government intervention to help overcome the lack of aggregate demand to reduce unemployment and increase growth. Keynes does not agree with the older quantity theorists that there is a direct and proportional relationship between quantity of money and prices. According to him, the effect of a change in the quantity of money on prices is indirect and non-proportional. Keynes complains that economics has been divided into two compartments with no doors or windows between the theory of value and the theory of money and prices. This dichotomy between the relative price level (as determined by demand and supply of goods) and the absolute price level (as determined by demand and supply of money) arises from the failure of the classical monetary economists to integrate value theory with monetary theory According to him, the problems of the real world are related to the theory of shifting equilibrium whereas money enters as a “link between the present and future”. Keynes’s Reformulated Quantity Theory of Money:

The Keynesian reformulated quantity theory of money is based on the following:

Assumptions:

· All factors of production are in perfectly elastic supply so long as there is any unemployment’s.

· All unemployed factors are homogeneous, perfectly divisible and interchangeable.

· There are constant returns to scale so that prices do not rise or fall as output increases.

· Effective demand and quantity of money change in the same proportion so long as there are any unemployed resources.

Given these assumptions, the Keynesian chain of causation between changes within the amount of cash associated in costs is an indirect one through the speed of interest. Therefore once the amount of cash is exaggerated, its 1st impact is on the speed of interest that tends to fall. Given the marginal potency of capital, a fall within the rate of interest can increase the amount of investment. The exaggerated investment can raise resultant demand through the multiplier factor effect thereby increasing financial gain, output and employment. Since the provision curve of things of production is absolutely elastic in an exceedingly scenario of state, wage and non-wage factors are obtainable at constant rate of remuneration. There being constant returns to scale, costs does not rise with the rise in output as long as there is any unemployment. Below the circumstances, output and employment can increase within the same proportion as effective demand, and therefore the effective demand can increase within the same proportion with the quantity of money. But once full employment is reached, output ceases to retort the least bit to changes within the supply of money and then in effective demand. The elasticity of supply of output in response to changes within the supply that was infinite as long as there was unemployment falls to zero. The whole result of changes within the supply of money is exerted on costs that rise in precise proportion with the rise in effective demand. So long as there is unemployment, output can change within the same proportion because the quantity of money, and there will be no change in prices; and once there is full employment, costs can change within the same proportion because of the quantity of money. Therefore, the reformulated amount theory of money stresses the purpose that with increase within the quantity of money costs rise only if the amount of full employment is reached, and not before this. Keynesian himself discovered that the important world is thus difficult that the simplifying assumptions, upon that the reformulated quantity theory of money relies, will not hold. In line with him, the subsequent potential complications would qualify the statement that as long as there is unemployment, employment can change within the same proportion because of the quantity of money, and once there is full employment, price can change within the same proportion because of the quantity of money according to Tily (1993).

**THE MONETARIST VIEW**

The monetarist view argues that solely financial matters in associate degree economic which economic recessions and expansions are caused by decrease and increase in funds severally. They emphasize that the expansion rate of money is that the principal determinant of the behavior of national income. This view relies on variety of historical studies allotted by Friedman and Schwarz, Friedman and Meiselman, Anderson and Jordan of the FRS Bank of Saint Price fighter. These studies reveal that there is an awfully shut relationship between funds than between value and any of the economic expert variables like combination expenditure. Although the monetarists have tried to enforce their position on the idea of empirical studies nevertheless they are skeptical concerning the success of monetary policy in distinction of economic policy. They agree that as associate degree economic stabilizer, monetary policy could do a lot of damage than sensible attributable to the operational lag. The operational lag refers to the time elapsing between taking of associate degree action and also the effective impact of that action on the economic state of affairs. On the common it takes long term for an amendment within the cash in hand to affects value thus additionally the operation lag. Milton Friedman himself admits that the intermission concerned is thus giant that contrary diurnal monetary policy may even have destabilizing result on the economy. The economist thus, hold that the economy is essentially stable and once disturbed by some changes in basic conditional can quickly revert to its end of the day growth path. It is on this basis that the monetarists advocate associate degree mounted proportion growth within the cash in hand and a finish to discretionary monetary policy. Milton Friedman thus, believes that economic policy might not have any potent influence on the economy except that it affects the behavior of money.

**2.3 Empirical Review**

Kogar (1995) examined the relationship between financial innovations and monetary control and concludes that in a changing financial structure, Central Banks cannot realize efficient monetary policy without setting new procedures and instruments in the long-run, because profit seeking financial institutions change or create new instruments in order to evade regulations or respond to the economic conditions in the economy.

Damachi (2001) in his study of past policy measures for solving unemployment problems in Nigeria suggests that there is a strong need for institutional collaboration and improved coordination of policy measures for dealing with unemployment. He stated that while there are some discernable lapses, the overall policy direction for employment appears to be adequate. According to him, what is required is the political will to pursue the policy measures backed by adequate steps to make the policies work as well as transparency in programme implementation.

Danjuma, Jbrin&Onyeiwu (2004) examined the impact of monetary policy on the Nigerian economy from 1981 to 2008 using the Ordinary Least Squares (OLS) Method. The result of the analysis shows that monetary policy presented by money supply exerts a positive impact on GDP growth and Balance of Payment but negative impact on rate of inflation.

Aliero*et al.* (2013) examined the relationship between financial sector development and unemployment with a time series data from 1980 to 2011 in an auto regressive distributed lag framework. The study reported a persistent unemployment in Nigeria and concluded that formal credit allocation in rural areas has both short run and long run effect in reducing unemployment the study recommends that monetary authority be strengthened and financial services be deepened, particularly deposit money banks, to provide necessary credit facilities to the teeming unemployed youth in the country.

Muhammad (2011) researched into the role of unemployment on the making of the Nigerian Gross Domestic Product (GDP) for a period of nine years (2000-2008). His data was analysed using regression analysis, findings showed that unemployment has enormous effects on crime (over 65 percent) on the making of the Nigerian GDP and there exist an inverse relationship between the model (unemployment) and the GDP—increase in the model leads to decrease on the GDP and vice versa.

Borishade (2001) in his study of restructuring the educational system as a long term solution to the unemployment problem in Nigeria concluded that education is the key with which to unlock the economic potential of the people as it empowers the individual to improve himself as well as equip him to participate in, contribute to, and drive benefits from the national economy. To him, the reinvigoration of the technical and vocational education is a worthy step in this direction. He however, concluded that the pluralistic nature of Nigerian society makes it imperative that all sectors of the country have to be carried along in the developmental process.

According to Innocent (2014), “with global unemployment projected to reach over 215 million by 2018, experts fear that Africa, particularly Nigeria’s share of the global scourge might increase disproportionately, with attendant unsavory consequences unless the country immediately adopts pro-active and holistic approach to halt the rising youth unemployment”.

Nnanna, (2001) observed that though, the Monetary management in Nigeria has been relatively more successful during the period of financial sector reform which is characterized by the use of indirect rather than direct monetary policy tools yet, the effectiveness of monetary policy has been undermined by the effects of fiscal dominance, political interference and the legal environment in which the Central Bank operates.

Sanusi (1997) in his study titled stimulating investment through interest rate management reported that interest rate has positive relationship with unemployment that is; a lower interest rate encourages private investment spending which will increase the demand for labour and reduce unemployment. According to him, high interest rate (Prime Lending Rate) has characterized the Nigerian economy over the years and this has adversely affected the manufacturing sector which ought to significantly reduce unemployment. He concluded by urging the authorities to reduce the prime lending rate as this could reduce unemployment problem in the economy.

Hammer &Sturn (2012) inspected the impact of monetary policy on unemployment covering the year (1980-2007). The result shows that the extent to which hysteresis occurs in the aftermath of recessions depend on monetary policy reactions.

**Summary and Limitation of Previous Studies**

The reviewed literatures have attempted to show evidence of the impact of selected monetary policy on unemployment in Nigeria. Monetary policy has been shown to be one of the core variables in regulating the strength of economy of a nation given the increasing role of government especially in developing countries as well as regulating the rate of unemployment through adequate policies. However, studies which have been carried out in Nigeria are very few. It is therefore the aim of this study to contribute to the existing literature in Nigeria, using time series data.

**CHAPTER THREE**

**3.0 RESEARCH METHODOLOGY**

This section presents the research method adopted for the study. This research provides us with the frame work for model specification, parameter estimation, evaluation technique, data collection and transformation for the study.

**3.1 Model Specification**

An econometric model stipulates some aspect of the real economy. It concentrates on the point it is studying and leaves out the thing not essential. The study will adopt the model of Damachi (2001), to empirically determine the impact of monetary policy on unemployment in Nigeria. The specification of the model is related to the information relevant to the study.

Thus to study any relationship between variables, it is essential to express it in mathematical form.

The research techniques postulate a functional model to capture the objective as follows

UNEMPt = F [INTRt, CRRt,MPRt]……………………………………………..[3.1]

The econometric form of the model is represented as

In UNEMPt = β1 + β 2INTRt + β 3InCRRt + β 4InMPRt + µt …………… [3.12]

Where

In UNEMPt = Log of unemployment

INTRt = Interest Rate

In CRRt = Log of Cash Reserve Ratio

In DMBAt= Log of monetary policy rate

β1 = intercept

β 2, β 3 ,β 4  are partial slopes or parameters

µ t = the stochastic term.

**3**.**2 Estimation Procedure**

Conceptually, in building models, ordinary least square [OLS] will be used as the estimation technique based on E views 3.1 regression software packages.

However, the OLS possess some limitation that may render it unrealistic, such as multi- co-linearity, heteroskedasticity, and autocorrelation and specification basis.

**3.3 Evaluation Techniques**

The techniques for evaluating the result of the regression imply the use of statistical criteria and econometric test.

**Statistical Criteria [First Order Test]**

These test include

**T – test** –This is used to verify individual significant parametric estimates of the regression.

**F- Test**- this measures the overall level of significance of the model. It tests the simultaneous null hypothesis to be equal to zero in the regression model.

**R2**- this is the coefficient of determination and it is used to measure the goodness of fit of a regression line.

**Econometric Test (Second Order Test)**

The test include

**Test of stationary**

This is used to test whether a variable’s mean value and variance varies over time. It is necessary in time series variables in order to avoid the problem of spurious regression. The Augmented Dickey Fuller Test would be used for the analysis.

**Co integration Test**

Economically two variables or more are said to be co integrated if they have a long run equilibrium relationship between them.

**Test for Normality**

This is used to verify whether the error term is normally distributed. The JarqueBera test for normality will be applied.

**Test for Multicollinearity**

This is used for testing the linear collinearity or dependence among the explanatory variable. The correlation matrix will be used.

**Test for Autocorrelation**

This is used to verify the randomness of the error term between members of the same series of observations. The Durbin Watson d statistics test will be used.

**Test for Heteroskasdasticity**

This is necessary in order to determine the uniformity of the error variances. The white’s heteroscadasticity test will be applied in the model.

**3.4 Evaluation of the A Prior Expectation**

**Variable sign**

INTR -

CRR -

MPR -

**3.5 Data Transformation and Collection Techniques**

The annual time series data used in this study is secondary in nature ranging from 1980 to 2015 which give a total of 36 observations. The data were gotten from CBN statistical bulletin (2015).

**CHAPTER FOUR**

**4.0 PRESENTATION AND ANALYSIS OF RESULT**

The result of the ordinary least square (OLS) regression model was presented in this chapter. The analysis of the result was subjected to economic criteria, statistical first order test and econometric second order tests. An OLS model was estimated to determine the impact of selected monetary policy on unemployment rate in Nigeria.

**4.1 Analysis of Unit Root and Co-Integration Results**

We employ Augmented Dickey-Fuller (ADF) test. The results are shown in the table below.

**Table 4.1**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Variable at level form** | | | **Variable at difference form** | | | **Order of integration** |
| **Variable** | **ADF Stat.** | **Lag** | **5%** | **ADF Stat.** | **Lag** | **5%** |  |
| UNEMP | **-2.078795** | **1** | **-2.9499** | **-2.772143** | **1** | **-2.4499** | 1 (1) |
| In(CRR) | **-0.568639** | **1** | **-2.9499** | **-3.580889** | **1** | **-2.9499** | 1 (1) |
| INTR | **-1.611799** | **1** | **-2.9499** | **-5.866815** | **1** | **-2.9527** | 1 (1) |
| MPR | **-0.854516** | **1** | **-2.9499** | **-5.092396** | **1** | **-2.9527** | 1 (1) |
| (RESIDUAL) | **-3.320444** | **1** | **-1.9510** | NA | NA | NA | 1(0) |

The results show that all the variables are integrated of order one 1(1) (differenced once to attain stationarity).In other words, all the variables have unit roots, but stationary after being differenced. This is because the ADF statistics for each of the variables are less than the critical levels at 5%. In other words, the null hypothesis for unit root is accepted for all the variables at the level form. On the other hand, the ADF statistics for each of the variables when differenced are higher than their critical values at 5% which implies that the null hypothesis of unit root is rejected.

However, though the variables are not stationary, there is tendency of long-run relationship between the dependent variable and the independent variables. Thus, we proceeded to examine their long-run equilibrium relationship using co-integration ADF (CADF) test after which we examined the adjustment to short-run discrepancies when co-integration was established. As already shown in table 4.1 above, the error term (residual) is stationary at its level form. This implies that there exists a long-run relationship between dependent and independent variables.

**4.2 DETERMINANT OF SAVING IN NIGERIA.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Coefficient** | | **Std. Error** | | **t-stat.** |
| Constant | 6.105399 | | 2.577081 | | 2.369114 |
| In(CRR) | 1.459865 | | 0.636958 | | 2.291934 |
| INTR | -0.435052 | | 0.119846 | | -3.630084 |
| MPR | | 0.243181 | | 0.439874 | 0.552842 |

R2 =0.636971 **F-stat. =**18.71570 **D.W =**1.406085

|  |
| --- |
|  |

**4.3 Evaluation Based On Economic Criteria**

The OLS regression applied the Log Linear Model in order to determine the relative change in the dependent variable from a relative change in each of the explanatory variables.

The result has established a positive and significant relationship between cash reserve ratio and unemployment rate. This has been found to be inconsistent with the theory.

The result also revealed a negative but significant relationship between interest rate and unemployment rate. This has been found to be consistent with the theory.

Lastly, the result revealed a positive but insignificant relationship between monetary policy rate and unemployment rate. This has been found to be inconsistent with the theory.

**4.3.1 Summary of the Signs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Expected Sign** | **Realized Sign** | **Remark** |
| In(CRR) | Negative | Positive | Does not conform |
| INTR | Negative | Negative | Conforms |
| MPR | Negative | Positive | Does not conform |

**4.4 Evaluation Based On Statistical Criteria**

**Coefficient of Determination (R2)**

This measures the goodness of fit of the regression model. It shows how the variation in the dependent is explained by explanatory variables, from the table, R2 = 0.636971.This implies that about 63% variation on unemployment rate is explained by the explanatoryvariables.

**Student t-Test**

This tests the explanatory power of the Independent variables; the result shows that the variable cash reserve ratio (CRR) has a significant impact on unemployment rate. This is because its absolute t-statistic of 2.291934 is greater than the critical t-statistics of 2.042 at 5% level of significance. Its coefficient of 1.459865 implies that a percentage increase in reserve ratio (CRR) will increase unemployment rate (UNEMP) by 1.459865 percent.

Again, the variable interest rate (INTR) has a significant impact on unemployment rate. This is because its absolute t-statistic of -3.630084 is greater than the critical t-statistics of 2.042 at 5% level of significance. Its coefficient of -0.435052 implies that a unit increase in interest rate (INTR) decreases unemployment rate by -0.435052 units.

Lastly, the variable monetary policy rate (MPR) has an insignificant impact on unemployment rate. This is because its absolute t-statistic of 0.552842is less than the critical t-statistics of 2.042 at 5% level of significance. Its coefficient of 0.243181 implies that a unit increase in monetary policy rate (MPR) increases unemployment rate by 0.243181 units.

**F-Statistic**

The F-statistic is used to determine the overall significance of the entire variable in the model. The calculated f-statistic of18.71570 is greater than the critical f-value of 8.59. This implies that the entire variables joined together are significantly different from zero.

**4.5 Evaluation Based On Econometric Criteria**

**Autocorrelation Test**

This test whether the error are correlated with one another. To do that, we apply the Durbin Watson‘d’ test with the hypothesis as below.

From the Durbin Watson table, the estimated d\* is 1.406085while the dl is 1.043, du is 1.513 at 0.01 level of significance (dl < d < du => 1.043 <1.40608< 1.513) which falls under no decision region. However, we conclude that there is no positive autocorrelation problem.

**Heteroscedasticity Test**

This test is conducted to check if errors have constant variance or not. The null hypothesis is that the errors are homoscedastic (no heteroscedasticity). Note that this test follows chi-square distribution. We compare the estimated chi-square statistics with the critical chi-square statistics. From the result obtained χ2 Cal = is 20.03922 less than χ2 critical of 20.599 which is statistically insignificant and therefore do not reject the null hypothesis of homoscedasticity.

**Multicollinearity Test**

This test was carried out through the use of correlation matrix. It suggests that if the pair wise correlation coefficient between two regressors is high, say in excess of 0.8, then multicollinearity is a serious problem (Gujarati, 2009). The correlation matrix as shown in the appendice; from the result, the existence of collinearity can be found among the explanatory variable. Thus, we can conclude that multicollinearity is a problem in this model. Hence, the highest value is 088.

**Normality Test**

This test is to know if the error term is normally distributed. The null hypothesis is that the error term follows normal distribution. From our result, the JarqueBera Statistic is 49.157. The JarqueBera is greater than critical chi-square values of 5.99. Thus, we reject the null hypothesis which implies that the errors do follow normal distribution.

**CHAPTER FIVE**

**5.0 SUMMARY, POLICY RECOMMENDATIONS AND CONCLUSION**

**5.1 Summary**

In this study, we set out to empirically determine the impact of selected monetary policy on unemployment in Nigeria from 1980- 2015. The study was conducted to ascertain how monetary policy affects the rate of unemployment.

Secondary data were used; the source of data included CBN Statistical Bulletin (2015). In order to achieve the objectives of the study, an econometric model was formulated using the Ordinary Least Square (OLS). In this model, unemployment rate was regressed on cash reserve ratio, interest rate and monetary policy rate to determine the impact of selected monetary policy on unemployment rate.

**The major findings of the study are summarized below:**

1. The result has established a positive and significant relationship between cash reserve ratio and unemployment rate. This has been found to be inconsistent with the theory.
2. The result also revealed a negative but significant relationship between interest rate and unemployment rate. This has been found to be consistent with the theory.
3. Lastly, the result revealed a positive but insignificant relationship between monetary policy rate and unemployment rate. This has been found to be inconsistent with the theory.

**5.2 Policy Recommendations**

Based on the following findings of this study, the following policy recommendations are suggested:

1. The result revealed a negative but significant relationship between interest rate and unemployment rate. We therefore, advocate for a moderate interest rate which needed to be sustained for economic growth and development.
2. The government should through the monetary authority effectively check the cash reserve ratio over time in order to dictate when there is need for adjustment.
3. There is need for the government to seek a proper role for monetary policy in promoting strong and sustainable growth in a stable macroeconomic environment in Nigeria through monetary policy.
4. The CBN should be serious with monitoring the discount rate, cash reserve and liquidity ratios etc. to ensure that budget proposal on them are strictly adhered to, in order to ensure proper control of the money in circulation and hence inflation.
5. There is need for government to adequately strengthen all sectors through the adoption of balance growth strategy which absorb potential workers and reduces unemployment rate.

**5.3 Conclusion**

In this study, we empirically determined the impact of selected monetary policies on unemployment in Nigeria from 1980 - 2015. From our findings, there exist a positive but insignificant relationship between monetary policy rate and unemployment rate.

Also, the result revealed an insignificant relationship between interest rate, cash reserve ratio and unemployment rate. The general conclusion is that interest rate, cash reserve ratio, and monetary policy rate have impact on the rate of unemployment in Nigeria.

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APPENDIX

**REGRESSION RESULT**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Dependent Variable: UNEMP | | | | |
| Method: Least Squares | | | | |
| Date: 03/17/18 Time: 01:18 | | | | |
| Sample: 1980 2015 | | | | |
| Included observations: 36 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 6.105399 | 2.577081 | 2.369114 | 0.0240 |
| LCRR | 1.459865 | 0.636958 | 2.291934 | 0.0286 |
| INTR | -0.435052 | 0.119846 | -3.630084 | 0.0010 |
| MPR | 0.243181 | 0.439874 | 0.552842 | 0.5842 |
| R-squared | 0.636971 | Mean dependent var | | 9.138611 |
| Adjusted R-squared | 0.602936 | S.D. dependent var | | 6.609950 |
| S.E. of regression | 4.165126 | Akaike info criterion | | 5.795809 |
| Sum squared resid | 555.1448 | Schwarz criterion | | 5.971756 |
| Log likelihood | -100.3246 | F-statistic | | 18.71570 |
| Durbin-Watson stat | 1.406085 | Prob(F-statistic) | | 0.000000 |

**UNIT ROOT TEST AT LEVEL FORM**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ADF Test Statistic | -2.078795 | 1% Critical Value\* | | -3.6353 |
|  |  | 5% Critical Value | | -2.9499 |
|  |  | 10% Critical Value | | -2.6133 |
| \*MacKinnon critical values for rejection of hypothesis of a unit root. | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | | |
| Dependent Variable: D(UNEMP) | | | | |
| Method: Least Squares | | | | |
| Date: 03/17/18 Time: 01:24 | | | | |
| Sample(adjusted): 1982 2015 | | | | |
| Included observations: 34 after adjusting endpoints | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| UNEMP(-1) | -0.289711 | 0.139365 | -2.078795 | 0.0460 |
| D(UNEMP(-1)) | 0.244154 | 0.496043 | 0.492203 | 0.6260 |
| C | 2.533540 | 1.430038 | 1.771660 | 0.0863 |
| R-squared | 0.131236 | Mean dependent var | | -0.050000 |
| Adjusted R-squared | 0.075187 | S.D. dependent var | | 4.772818 |
| S.E. of regression | 4.589885 | Akaike info criterion | | 5.969684 |
| Sum squared resid | 653.0785 | Schwarz criterion | | 6.104363 |
| Log likelihood | -98.48463 | F-statistic | | 2.341447 |
| Durbin-Watson stat | 1.364253 | Prob(F-statistic) | | 0.112973 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ADF Test Statistic | -0.568639 | 1% Critical Value\* | | -3.6353 |
|  |  | 5% Critical Value | | -2.9499 |
|  |  | 10% Critical Value | | -2.6133 |
| \*MacKinnon critical values for rejection of hypothesis of a unit root. | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | | |
| Dependent Variable: D(LCRR) | | | | |
| Method: Least Squares | | | | |
| Date: 03/17/18 Time: 01:22 | | | | |
| Sample(adjusted): 1982 2015 | | | | |
| Included observations: 34 after adjusting endpoints | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| LCRR(-1) | -0.007277 | 0.012797 | -0.568639 | 0.5737 |
| D(LCRR(-1)) | 0.440456 | 0.161228 | 2.731874 | 0.0103 |
| C | 0.153638 | 0.075574 | 2.032945 | 0.0507 |
| R-squared | 0.195962 | Mean dependent var | | 0.208060 |
| Adjusted R-squared | 0.144089 | S.D. dependent var | | 0.180875 |
| S.E. of regression | 0.167338 | Akaike info criterion | | -0.653510 |
| Sum squared resid | 0.868058 | Schwarz criterion | | -0.518831 |
| Log likelihood | 14.10967 | F-statistic | | 3.777699 |
| Durbin-Watson stat | 2.056766 | Prob(F-statistic) | | 0.034024 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ADF Test Statistic | -1.611799 | 1% Critical Value\* | | -3.6353 |
|  |  | 5% Critical Value | | -2.9499 |
|  |  | 10% Critical Value | | -2.6133 |
| \*MacKinnon critical values for rejection of hypothesis of a unit root. | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | | |
| Dependent Variable: D(INTR) | | | | |
| Method: Least Squares | | | | |
| Date: 03/17/18 Time: 01:23 | | | | |
| Sample(adjusted): 1982 2015 | | | | |
| Included observations: 34 after adjusting endpoints | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| INTR(-1) | -0.181833 | 0.112814 | -1.611799 | 0.1171 |
| D(INTR(-1)) | -0.083473 | 0.178925 | -0.466528 | 0.6441 |
| C | 2.648022 | 1.761608 | 1.503185 | 0.1429 |
| R-squared | 0.105221 | Mean dependent var | | -0.002941 |
| Adjusted R-squared | 0.047494 | S.D. dependent var | | 3.781716 |
| S.E. of regression | 3.690819 | Akaike info criterion | | 5.533671 |
| Sum squared resid | 422.2865 | Schwarz criterion | | 5.668350 |
| Log likelihood | -91.07241 | F-statistic | | 1.822722 |
| Durbin-Watson stat | 2.043140 | Prob(F-statistic) | | 0.178481 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ADF Test Statistic | -0.854516 | 1% Critical Value\* | | -3.6353 |
|  |  | 5% Critical Value | | -2.9499 |
|  |  | 10% Critical Value | | -2.6133 |
| \*MacKinnon critical values for rejection of hypothesis of a unit root. | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | | |
| Dependent Variable: D(MPR) | | | | |
| Method: Least Squares | | | | |
| Date: 03/17/18 Time: 01:23 | | | | |
| Sample(adjusted): 1982 2015 | | | | |
| Included observations: 34 after adjusting endpoints | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| MPR(-1) | -0.067690 | 0.079214 | -0.854516 | 0.3994 |
| D(MPR(-1)) | -0.156695 | 0.171893 | -0.911583 | 0.3690 |
| C | 0.797752 | 0.646694 | 1.233585 | 0.2266 |
| R-squared | 0.059269 | Mean dependent var | | 0.235294 |
| Adjusted R-squared | -0.001424 | S.D. dependent var | | 1.459901 |
| S.E. of regression | 1.460940 | Akaike info criterion | | 3.680134 |
| Sum squared resid | 66.16468 | Schwarz criterion | | 3.814813 |
| Log likelihood | -59.56228 | F-statistic | | 0.976546 |
| Durbin-Watson stat | 1.923899 | Prob(F-statistic) | | 0.387896 |

**UNIT ROOT AT DIFFERENCE FORM**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ADF Test Statistic | -2.772143 | 1% Critical Value\* | | -3.6353 |
|  |  | 5% Critical Value | | -2.4499 |
|  |  | 10% Critical Value | | -2.6133 |
| \*MacKinnon critical values for rejection of hypothesis of a unit root. | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | | |
| Dependent Variable: D(UNEMP,2) | | | | |
| Method: Least Squares | | | | |
| Date: 03/17/18 Time: 01:29 | | | | |
| Sample(adjusted): 1982 2015 | | | | |
| Included observations: 34 after adjusting endpoints | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| D(UNEMP(-1)) | -1.260146 | 0.454575 | -2.772143 | 0.0092 |
| C | 0.145110 | 0.894520 | 0.162221 | 0.8722 |
| R-squared | 0.193645 | Mean dependent var | | -0.800000 |
| Adjusted R-squared | 0.168447 | S.D. dependent var | | 5.288113 |
| S.E. of regression | 4.822206 | Akaike info criterion | | 6.041362 |
| Sum squared resid | 744.1174 | Schwarz criterion | | 6.131148 |
| Log likelihood | -100.7032 | F-statistic | | 7.684775 |
| Durbin-Watson stat | 1.227590 | Prob(F-statistic) | | 0.009205 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ADF Test Statistic | -3.580889 | 1% Critical Value\* | | -3.6353 |
|  |  | 5% Critical Value | | -2.9499 |
|  |  | 10% Critical Value | | -2.6133 |
| \*MacKinnon critical values for rejection of hypothesis of a unit root. | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | | |
| Dependent Variable: D(LCRR,2) | | | | |
| Method: Least Squares | | | | |
| Date: 03/17/18 Time: 01:31 | | | | |
| Sample(adjusted): 1982 2015 | | | | |
| Included observations: 34 after adjusting endpoints | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| D(LCRR(-1)) | -0.568483 | 0.158755 | -3.580889 | 0.0011 |
| C | 0.118664 | 0.043449 | 2.731104 | 0.0102 |
| R-squared | 0.286077 | Mean dependent var | | 0.000894 |
| Adjusted R-squared | 0.263767 | S.D. dependent var | | 0.192950 |
| S.E. of regression | 0.165559 | Akaike info criterion | | -0.701957 |
| Sum squared resid | 0.877112 | Schwarz criterion | | -0.612171 |
| Log likelihood | 13.93327 | F-statistic | | 12.82277 |
| Durbin-Watson stat | 2.031565 | Prob(F-statistic) | | 0.001118 |

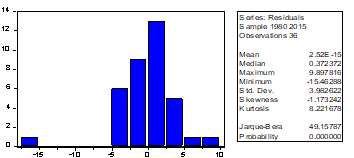
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ADF Test Statistic | -5.866815 | 1% Critical Value\* | | -3.6422 |
|  |  | 5% Critical Value | | -2.9527 |
|  |  | 10% Critical Value | | -2.6148 |
| \*MacKinnon critical values for rejection of hypothesis of a unit root. | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | | |
| Dependent Variable: D(INTR,2) | | | | |
| Method: Least Squares | | | | |
| Date: 03/17/18 Time: 01:32 | | | | |
| Sample(adjusted): 1983 2015 | | | | |
| Included observations: 33 after adjusting endpoints | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| D(INTR(-1)) | -1.554309 | 0.264932 | -5.866815 | 0.0000 |
| D(INTR(-1),2) | 0.324237 | 0.173110 | 1.873014 | 0.0708 |
| C | -0.016384 | 0.643366 | -0.025466 | 0.9799 |
| R-squared | 0.630181 | Mean dependent var | | -0.010303 |
| Adjusted R-squared | 0.605526 | S.D. dependent var | | 5.884201 |
| S.E. of regression | 3.695698 | Akaike info criterion | | 5.538724 |
| Sum squared resid | 409.7455 | Schwarz criterion | | 5.674770 |
| Log likelihood | -88.38894 | F-statistic | | 25.56038 |
| Durbin-Watson stat | 1.851576 | Prob(F-statistic) | | 0.000000 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ADF Test Statistic | -5.092396 | 1% Critical Value\* | | -3.6422 |
|  |  | 5% Critical Value | | -2.9527 |
|  |  | 10% Critical Value | | -2.6148 |
| \*MacKinnon critical values for rejection of hypothesis of a unit root. | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | | |
| Dependent Variable: D(MPR,2) | | | | |
| Method: Least Squares | | | | |
| Date: 03/17/18 Time: 01:32 | | | | |
| Sample(adjusted): 1983 2015 | | | | |
| Included observations: 33 after adjusting endpoints | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| D(MPR(-1)) | -1.365247 | 0.268095 | -5.092396 | 0.0000 |
| D(MPR(-1),2) | 0.185155 | 0.170696 | 1.084710 | 0.2867 |
| C | 0.384916 | 0.262727 | 1.465082 | 0.1533 |
| R-squared | 0.598422 | Mean dependent var | | 0.060606 |
| Adjusted R-squared | 0.571650 | S.D. dependent var | | 2.219500 |
| S.E. of regression | 1.452628 | Akaike info criterion | | 3.671134 |
| Sum squared resid | 63.30387 | Schwarz criterion | | 3.807180 |
| Log likelihood | -57.57371 | F-statistic | | 22.35264 |
| Durbin-Watson stat | 1.979519 | Prob(F-statistic) | | 0.000001 |

**CO INTEGRATION TEST**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ADF Test Statistic | -3.320444 | 1% Critical Value\* | | -2.6321 |
|  |  | 5% Critical Value | | -1.9510 |
|  |  | 10% Critical Value | | -1.6209 |
| \*MacKinnon critical values for rejection of hypothesis of a unit root. | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | | |
| Dependent Variable: D(RESIDUAL) | | | | |
| Method: Least Squares | | | | |
| Date: 03/17/18 Time: 01:34 | | | | |
| Sample(adjusted): 1982 2015 | | | | |
| Included observations: 34 after adjusting endpoints | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| RESIDUAL(-1) | -0.931097 | 0.280413 | -3.320444 | 0.0023 |
| D(RESIDUAL(-1)) | 0.135490 | 0.419193 | 0.323216 | 0.7486 |
| R-squared | 0.303477 | Mean dependent var | | -0.412238 |
| Adjusted R-squared | 0.281711 | S.D. dependent var | | 4.838029 |
| S.E. of regression | 4.100324 | Akaike info criterion | | 5.717031 |
| Sum squared resid | 538.0050 | Schwarz criterion | | 5.806817 |
| Log likelihood | -95.18953 | Durbin-Watson stat | | 1.509954 |

**NORMALITY TEST**



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| White Heteroskedasticity Test: | | | | |
| F-statistic | 6.068387 | Probability | | 0.000331 |
| Obs\*R-squared | 20.03922 | Probability | | 0.002725 |
|  |  |  |  |  |
| Test Equation: | | | | |
| Dependent Variable: RESID^2 | | | | |
| Method: Least Squares | | | | |
| Date: 03/17/18 Time: 01:36 | | | | |
| Sample: 1980 2015 | | | | |
| Included observations: 36 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 44.83753 | 42.46304 | 1.055919 | 0.2997 |
| LCRR | -90.02610 | 23.71141 | -3.796741 | 0.0007 |
| LCRR^2 | 9.852845 | 2.348849 | 4.194754 | 0.0002 |
| INTR | 10.62749 | 5.755071 | 1.846631 | 0.0750 |
| INTR^2 | -0.164349 | 0.150987 | -1.088499 | 0.2853 |
| MPR | -1.938996 | 12.87002 | -0.150660 | 0.8813 |
| MPR^2 | 0.315181 | 0.761751 | 0.413758 | 0.6821 |
| R-squared | 0.556645 | Mean dependent var | | 15.42069 |
| Adjusted R-squared | 0.464916 | S.D. dependent var | | 42.02813 |
| S.E. of regression | 30.74334 | Akaike info criterion | | 9.861889 |
| Sum squared resid | 27409.43 | Schwarz criterion | | 10.16980 |
| Log likelihood | -170.5140 | F-statistic | | 6.068387 |
| Durbin-Watson stat | 1.082541 | Prob(F-statistic) | | 0.000331 |

**MULTICOLLINEARITY TEST**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | UNEMP | LCRR | INTR | MPR |
| UNEMP | 1.000000 | 0.697464 | -0.486987 | 0.631019 |
| LCRR | 0.697464 | 1.000000 | -0.155075 | 0.883268 |
| INTR | -0.486987 | -0.155075 | 1.000000 | -0.104590 |
| MPR | 0.631019 | 0.883268 | -0.104590 | 1.000000 |