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# IMPACT OF PRICE INSTABILITY ON UNEMPLOYMENT AND ECONOMIC GROWTH IN NIGERIA: AN EMPIRICAL ANALYSIS

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**ABSTRACT:** *This study is an empirical examination of the impact of price instability on unemployment and economic growth in Nigeria between 1986 to 2015. Main variables used in this study are unemployment, inflation rate (proxy for consumer price index), GDP growth rates, Foreign Direct Investment, Investment (proxied by Gross Fix Capital Formation) Interest Rate, Imports, Exports, Exchange Rate and Per Capita Income. The sources of data are statistical bulletins published by World Bank Development Indicators (WBDI) and Central Bank of Nigeria Statistical Bulletin 2015 respectively. There are three regression equations in which the relationship between dependent and independent variables have been tested. The first model is explaining the effect of inflation or price instability and other macroeconomic variables on GDP in Nigeria. The second model explains the effects of unemployment and other economic variables on real GDP while the third model is formulated to describe the effect of macroeconomic variables on unemployment in Nigeria. To achieve these objectives, stationarity tests were conducted with simple Ordinary Least Square using E-views version 8 software. Results from Augmented Dickey Fuller and Philips-Perron unit root test reveals that all the series in the models were stationary, with evidence of a unique long run relationship among the variables in the model. Findings from the OLS regression output reveals the coefficients of imports, exports, exchange rate and manufacturing growth rate as having negative effect on the key dependent variables of gdp-growth rate, price instability and unemployment rate. On the contrary, the coefficients of investment, per capita income and foreign direct investment show positive relationship with the dependent variables in the model. Major policy recommendations of this study are as follows: Government should embark on policies that will reduce the number of imported goods drastically and encourage local production and consumption to encourage domestic industries. This will help reduce unemployment and inflation in Nigeria and improve the gross domestic product figures greatly. Furthermore, over the years, foreign partners in Nigeria has had cause to repatriate their investible funds back to their shores as Nigeria increasingly became unsafe destinations for businesses owing to streams of violence and kidnappings across the country. Government should therefore engage the various agitators and stakeholders across the nation such as the Niger-Delta militants, IPOD/MASSOB and Fulani herdsmen with a view to finding lasting solutions to their demand for genuine peace to be entrenched in the polity. This is one sure way to encourage more foreign inflow of capital for economic growth.*

**KEYWORDS:** Price Instability, Unemployment, Economic Growth, OLS



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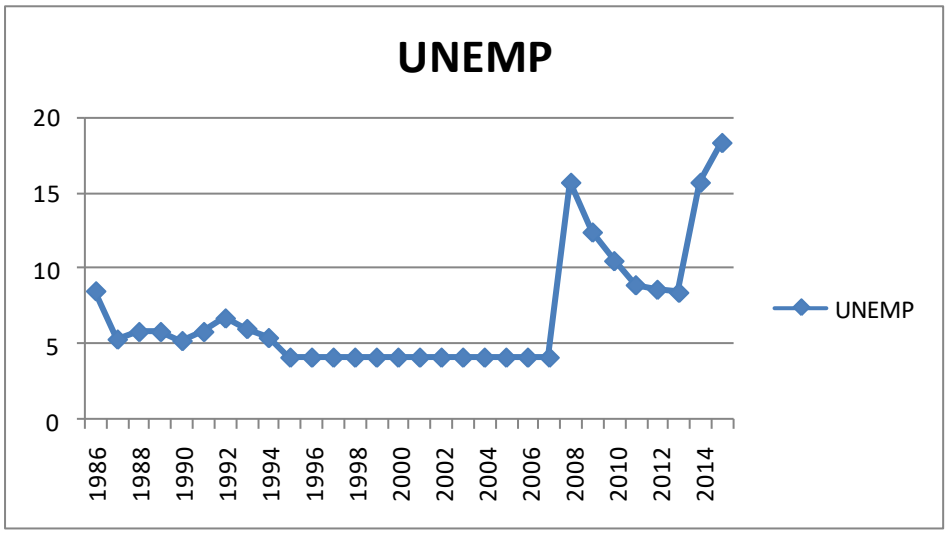
## INTRODUCTION

The Nigerian economy since her political independence in 1960 has undergone different fundamental and structural changes in various sectors of the economy. The subject of inflation, unemployment and economic growth which is measured by gross domestic product are the three most significant variables in any macroeconomic decision making and they are subject of social and economic life of every country. In the case of Nigeria, unemployment was 8.5 percent in 1986 and it remained on a downward trend until 2008 when it skyrocketed to double-digit rate of 15.7 percent. Thereafter it started decreasing from 2009-2013 before rising to 16 per cent in 2015. (World Bank, 2015).




Trend of Unemployment rate 1986 - 2015

*Source: World Bank Development Indicators (2015)*

Besides unemployment, inflation which is measured by gross domestic product deflator (GDP deflator) is another macroeconomic problem that hurts both economic and social indicators in the country. To attain sustainable economic growth, price stability continues to be the central objective of macroeconomic policies for most countries in the world today. Among others the emphasis given to price stability in the conduct of monetary policy is with a view to promoting sustainable economic growth as well as strengthening the purchasing power of the domestic currency (Umaru and Zubairu, 2012 cited in Kasidi and Mwakanemela, 2013). The question on whether or not inflation is harmful to economic growth has recently been subject of intense debate to policy makers and macroeconomists. The Nigerian economy has also come across this macroeconomic problem and the inflation rate was 5.7 percent in 1986. Thereafter, it increased continuously and got to 50 in percent 1989. It stabilized at a single-digit rate of 7.3 percent in 1990 before continuing on a spiral from 1991 – 1996. These periods were moments of uncertainty in the economy of the nation owing to almost complete detachment of the Nigerian economy from other world economies due to the tyrannical, despotic and totalitarian rule of the late General Sani Abacha who ran an autarchic kind of economy. The inflation rate was mild for about four years of 1997 to 2000 when it stabilized at a single digit for these periods. Generally, inflation rates had remained on a double digit rate except in 2006 and 2007 when it dropped to 8 and 5 percent respectively. From 2008 to 2012 it moved back to double digits and remained so except for



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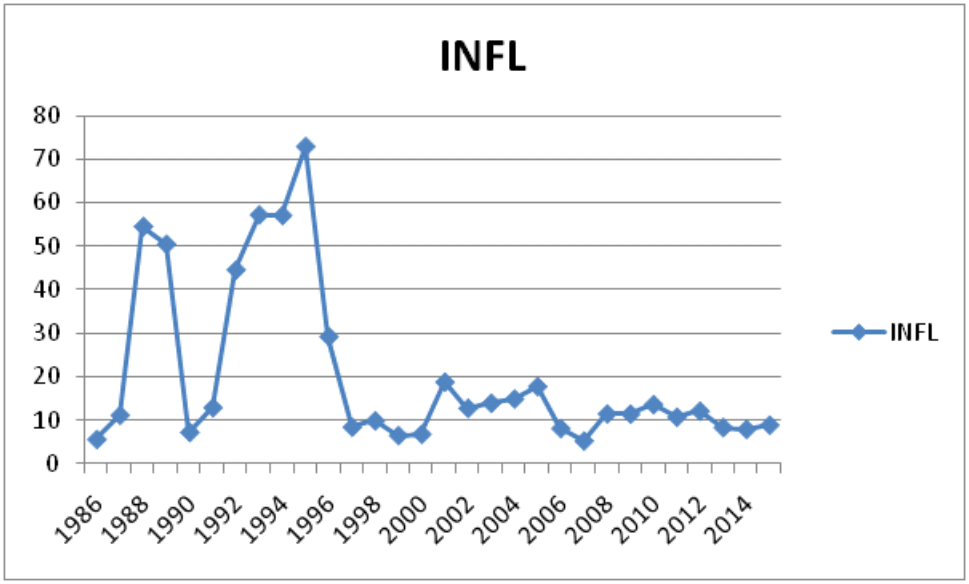
2011-2013. The arbitrary rise in inflation figures are major due to wrong government fiscal policies and inconsistent shifts in monetary policy decisions by the Central Bank of Nigeria. The persistent upward trends in inflation have become a serious and contentious problem in Nigeria since independence. In reaction to this, several measures have been taken to tackle this contentious problem through fiscal and monetary policies. This includes cut back of public spending and the use of bank financing (World Bank Indicators 2015).




**Trend of Inflation Rate 1986 - 2015**

*Source: World Bank Development Indicators (2015)*

Gross domestic product growth rate is used as proxy for economic growth in this study and it is generally perceived that when economic growth takes place in the country, it increases the pace of economic activity in the country hence jobs are created leading to decrease in unemployment figures. The increase in employment opportunities will enhance the purchasing power of the people in the country and as a result, consumption increases which leads to a rise in aggregate demand and hence inflation in the country. In case of Nigeria, gross domestic product growth rate recorded negative growth of -8.7 and -10.7, -0.67 and -0.30 percent between 1986, 1987, 1991 and 1995 respectively. This was the period the country was in dire strait occasioned by bad and unsustainable economic policies from the previous military government. Subsequent years recorded positive growth (World Development Indicators, 2015),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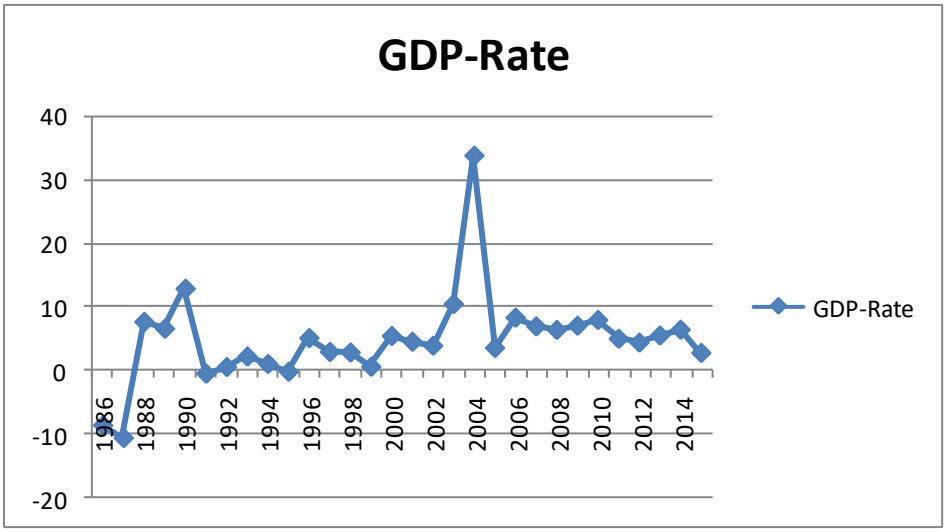


**Trend of gross domestic product growth rate, 1986 - 2015**

***Source**: World Bank Development Indicators (2015)*

The situation in Nigeria is disturbing. The various macroeconomic policies by government have been unable to achieve desired goals of price stability, reduction in unemployment and sustained economic growth. The fluctuations in the economy have confirmed the need to manage the economy effectively. The essence of macroeconomic management underlines the rationale of the government as a vital economic agent. However, it appears that government intervention has not been able to cure the ills in the economy. For several decades, economic performance has not been impressive. The continued economic crisis, with the associated problems of high inflationary pressure, high exchange rate, debt overhang, adverse balance of payment and high inflation rates is difficult to explain. Against a high rate of unemployment and underemployment, a large public sector, low wages and poor working conditions has been persistent high inflation rate in Nigeria. Also, underemployment and unemployment are prominent features of the informal labour market in Nigeria as well. Consequently, the full potentials of labour-surplus economy have not been fully exploited (Aminu and Donga 2014 cited in Ademola and Badiru, 2014).

Unemployment and Inflation are issues that are central to the social and economic life of every country. The existing literature refers to inflation and unemployment as constituting twin problems that explains the endemic nature of poverty in developing countries. It has been argued that continuous improvement in productivity is the surest way to reduce inflation. Growth in productivity provides a significant basis for adequate supply of goods and services thereby improving the welfare of the people and enhancing social progress.

In Nigeria overdependence of the economy on oil brought a boom in the 1970s while economic recession set in 1981.The recession had a very significant implication for the utilization of the country's human resources leading to very high level of unemployment. The problem had aggravated to the extent that many university graduates could not secure jobs, let alone secondary and primary school leavers. Despite various government policies and programmes aimed at reducing unemployment among the youths and adults, the problem remained unabated. The phenomenon of stagflation in the 1970s and 1980s had gone further to complicate the conduct of monetary and fiscal policies aimed at remedying unemployment.



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Stagflation was a situation of simultaneous occurrence of rising inflation and unemployment. The Structural Adjustment Programme (SAP) adopted in 1986 had in no small measure ended up in aggravating the problems of unemployment due to retrenchment of workers in the private and public sectors of the economy. It is in line with the foregoing that this study restricts its scope from 1986, the year the Structural Adjustment Programme was launched to properly determine the effect of SAP on the twin economic problems of rising prices vis-a-vis unemployment in Nigeria.

Most of the works done in this subject area such as Adeyeye and Fakiyesi (1980), Egwaikhide (1994), Englama (2001), Lawanson (2007), Akinbobola (2012), Umaru and Zubairu (2012) had been strictly on either inflation or unemployment alone. None had attempted in analyzing their relative impacts on the economy, either in the short run or in the long run, hence, this study intends to empirically examine the impact of price instability on unemployment and economic growth to determine what type of relationship exists between price instability, unemployment and economic growth in Nigeria. The specific objectives include (i) to analyse the relationship between price instability and economic growth in Nigeria (ii) to analyse the relationship between price instability and unemployment in Nigeria (iii) to analyse the impact of price instability on unemployment and economic growth in Nigeria. To achieve this task, the study was divided into four sections. The next section presents conceptual and empirical framework followed by methodology and data analysis. The last section concludes the study.

## LITERATURE REVIEW

### The Concept of Inflation

Inflation is commonly seen to be a situation in the economy when the money supply is growing faster than the production of new goods and services in the same economy (Hamilton, 2001). Inflation is further defined to be the general price increase in goods and services over a particular time period mainly for a long period (Balami, 2006). However, the definition of inflation, the cause of inflation and its effects on the economy depends on the school of taught the economist belongs, hence the differences in definition and approach. According to Fatukasi (2012) it is the persistent increase in the general price level within the economy which affects the value of the domestic currency. It is not once and for all upward price movement but has to be sustained over time and affect all goods and services within the economy. There are several factors that are responsible for inflation in Nigeria. The inflation which results from excess aggregate demand is called the demand pull inflation, the cost push inflation results from upward movement in the cost of production while structural inflation arises from some constraints such as inefficient production, marketing and distribution systems in the productive sectors of the economy (Fatukasi, 2012). Other forms of inflation in developing country could be imported, open and seasonal inflation. The imported inflation comes as a result of transmission of inflation through internationally traded goods and services. This is when the economy imports goods from countries already, experiencing inflation. The open inflation comes as a result of uninterrupted market mechanisms and seasonal inflation is associated off season in production, when supply constraints permeates the economy as a result of fall in production especially farming produce. In Nigeria other factors can be attributed to inflation such as the nature of the economy, its history and fiscal and monetary policy direction (Jelilov, Obasa and Isik, 2016).



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## The Concept of Unemployment

Unemployment is often defined by the classical economists as the excess supply of labour over the demand for labour which is caused by adjustment in real wage. The Classical or real-wage unemployment occurs when real wages for job are set above the market-clearing level, causing number of job-seekers to exceed the number of vacancies. Unemployment as defined by the International Labour Organization (2009) is a state of joblessness which occurs when people are without jobs and they have actively sought work within the past four weeks. The unemployment rate is a measure of the prevalence of unemployment and it is calculated as a percentage by dividing the number of unemployed individuals by individuals currently in the labour force. In a 2011 news story, Business Week reported that, "more than two hundred million people globally are out of work"; a high record, as almost two-third of advanced economies and half of developing economies are experiencing a slowdown in employment growth.

Unemployment has been categorized as one of the serious impediments to social welfare. Apart from representing a colossal waste of a country's manpower resources, it generates welfare loss in terms of lower output, thereby leading to lower income and wellbeing. The need to avert the negative effects of unemployment has made the tackling of unemployment problem to feature very prominently in the development objectives of many developing countries. One of the steps taken by the Nigerian government to reduce the problem of youth unemployment in Nigeria was the establishment of National Directorate of Employment (NDE), YOU-Win programme etc. Even though these agencies have been performing below expectations, their modest contribution has not gone unnoticed.

## The Concept of Economic Growth

Economic growth according to Jhingan (2003), is the process whereby the real per capital income of a country increases over a long period of time, and is measured by the increase in the amount of goods and services produced in a country. A growing economy produces more goods and services in each successive time period. Thus in a wider perspective, it implies raising the standard of living of the people and reducing inequality of income distribution. In the words of Zhattau (2013) economic growth is the basis of increase prosperity and it comes from accumulation of more capital and innovations which lead to technical progress, the idea similar to Solow (2002) Growth Model who sees economic growth in terms of growth in total GDP due to increase in population, technical progress and investment. Growth according to Classical Economists signifies increase in the rate of investment. In other words, growth is a function of share of profit in the national income. There exists a positive relationship between higher rate of profit and higher rate of growth in the long run.

## Theoretical Framework

Theoretical viewpoint supports the existence of positive relationship between real GDP growth and employment level. William Phillips proposed higher price level following increasing employment level. Increasing employment level tends to increase the GDP growth rate, thus, employment and GDP growth rates are positively related with each other and as such, unemployment and GDP growth rates will be negatively related to each other. Arthur Okun defined this negative relationship between GDP growth and unemployment rate and this is the only empirical hypothesis explaining the relationship between unemployment rate and GDP growth.



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**Empirical Review from other Countries**

This section of the study presents the empirical literature on the impact of price instability on unemployment and economic growth. As mentioned above many scholars have researched on the relationship between unemployment and economic growth and between unemployment and inflation using Phillips Curve model. For example, Stock and Watson (1999) used the conventional Phillips curve (unemployment rate) to investigate forecasts of U.S. inflation at the 12-month horizon. These authors focused on three questions. First, has the U.S. Phillips curve been stable? If not, what are the implications of the instability for forecasting future inflation? Second, would an alternative Phillips curve provide better forecasts of inflation than unemployment rate Phillips curve? Third, how do inflation forecasts different from Phillips curve stack up against time series forecasts made using interest rate, money, and other series? They found that inflation forecasts produced by Phillips curve generally had been more accurate than forecasts based on other macroeconomic variables, including interest rates, money and commodity prices but relying on it to the exclusion of other forecasts was a mistake. Forecasting relations based on other measures of aggregate activity could perform as well or better than those based on unemployment, and combining these forecasts would produce optimal forecasts.

On the other hand, Faria and Carneiro (2001) investigated the relationship between inflation and economic growth for Brazil for the period between 1980 and 1995 with the result establishing a negative relationship in the short run but that inflation does not affect economic growth in the long run. This could be a situation where the scope of production can change to absorb the lag of excess demand. Omoke (2010) viewed the findings of Faira and Carneiro to support the neutrality concept of money and that inflation affects economic growth in the long run as established by some other researchers. Sweidan (2004) examined the possibility of the relationship between inflation and economic growth having a structural breakpoint effects for Jordanian economy covering the period of 1970 and 2003. He found out a positive and significant relation of economic growth with the inflation rate of below 2 percent and he established structural breakpoint at 2 percent level of inflation and as such inflation which is higher than 2 percent affect economic growth negatively. This poses a serious policy question for Nigeria which has not recorded the rate of inflation less than 5 percent since 1986, the study scope for this research. The lowest in 2007 was 5.4 percent and the highest being 72.72 percent in 1995. Khan and Senhadji (2001) in Vaona (2012) established the threshold of annual inflation increase to be around 1 percent for developed countries while that of developing country which Nigeria belongs at 11%.

Ahmed and Mortaza (2005) empirically established a statistically significant negative relationship between inflation and economic growth using CPI and real GDP as proxy variables for Bangladesh for the period between 1980 and 2005. This reconciles with the work of Saeed (2007) for Kuwait between 1985 and 2005 which indicates long run and strong inverse relationship between CPI and real GDP. Erbaykal and Okuyan (2008) established relationship between inflation and economic growth for Turkey within the period of 1987 to 2006 and found out that there exists a negative and significant relationship in the short run but no significant relationship was found between the two variables in the long run. They further carried out causal relationship between the two variables with the results establishing a causality relationship from economic growth to inflation.

Tan (2008) integrated the Philips curve within the framework of Okuns law for some members of ASEAN, specifically, Malaysia, Singapore Thailand, the Philippines, Indonesia,



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Japan and South Korea, using quarterly data for the countries from 1991 to 2007. They empirically established a small trade-off between economic growth and inflation in Singapore, South Korea, and Thailand after 1997/98 ASEAN financial crises years while no trade-off relationship was established for Malaysia, Philippines, Indonesia and Japan. Popovic (2009) conducted a research on inflation and unemployment in the EU: comparative analysis of Phillips regularity through correlation analysis of unemployment and inflation in EU for the 1998-2007 period and found that the simple linear correlation coefficient between them is negative. They concluded that the relation between unemployment and inflation is moderate and inverse (negative). Muhammad (2014), studied the effect of inflation and unemployment on economic growth in Pakistan and found that there is an inverse relationship between economic growth and unemployment.

**Empirical Review**

Aminu and Manu (2014) carried out research on analysis of unemployed resources and inflation in Nigeria from 1986 to 2010 using OLS technique and found that both unemployed human resources, rate of natural resource production (i.e rate of tapped resources), total inflation have positive impact on rate of economic growth in Nigeria.

Omoke and Oruta (2010) used the data covering the period of 1970 to 2005 to establish possible relationship between inflation and economic growth in Nigeria. He employed Johansen-Juselius Co-integration technique which is considered superior to Engle and Granger (1987) in assessing co-integration properties of variables in a multivariate context. The results showed a no co-integrating relationship between inflation and economic growth for Nigeria. They further employed VAR-Granger causality at two lag periods and established unidirectional causality running from inflation to economic growth and he therefore concluded that inflation indeed has an impact on growth. In Nigeria, the pursuits of higher economic growth in most cases have spiral effects on upward price movement.

According to Oladipo and Akinbobola (2011), Nigeria's government has greater influence on the nation's economic activities through the use of fiscal instruments such as budget deficit operation. He added that this fiscal policy in most cases has some effect on macroeconomic variables such as interest rate, exchange rate, inflation, consumption, investment etc. which in turn affect economic development. He reasoned further that the major impact of the increase in budget deficit was felt in 1993 with high rate of inflation which shows an evidence of a positive relationship between budget deficit and inflation in Nigeria. He further gave a view that the source of financing the deficit has varying impact of a budget deficit on inflation. This thinking makes Nigeria's fight against high inflationary level difficult in the sense that the economy being almost entirely monotype in nature finances its deficit from the petroleum sector. This hinders the country from generating more investment which could ordinarily bring about more employment and hence economic growth. This negates the postulation of the Philips curve that there is a stable and negative relationship between the level of unemployment and the rate of change of wage which indicate that unemployment being accompanied by falling wages, reduced levels of unemployment by rising wages. The relationship of Philips connotes that as the wage rates are increased, more demands will be stimulated giving rise to more investment to offset the gap in demand and supply and that the more demand persist, inflation will increase until equilibrium is further achieved.

In addition, Ogwu (2010) maintained that inflation hurt the poorest the most as they have least ability to protect themselves from the rising commodity prices. He added that the cost



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push inflation comes as a result of depreciation of naira which raises the prices of essential commodity as well as other imported commodities. With the passage of time more wage increases will be demanded to offset the price hike and the real wages will continue to depreciate as the price will keep on rising after wages might have been increased to meet workers demand. This phenomenon is seen to impact negatively on the non-working population as well as the low and medium income workers' who may have not benefited from the compensatory income increase or have little income increase that may not match up with the wage increase within the economy.

This is why Nembee and Madume (2011) after empirically investigating the impact of monetary policy on Nigeria's macroeconomic stability between 1970 and 2009 concluded that Nigeria should adopt the macroeconomic policy mix of monetary, fiscal and exchange rate in managing inflation with the aim of achieving price stability required for achieving sustainable growth and development. The over-dependence on petroleum economy is a major factor responsible for the bottlenecks of the supply side in Nigeria. According to Fatukasi (2012), factors such as agricultural bottlenecks, industrial production, imports and exports, militancy, wage bill, government deficit financing and money supply are responsible for inflation in Nigeria. According to Kogid et al. (2012), inflation is a major macroeconomic problem which needs to be curbed in the sense that low level of inflation indicates a positive effect on the economy whereas high inflation gives negative signals to the economy. This explains why Emeka (2009) reasoned that the pursuit of price stability invariably implies an indirect pursuance of other economic objectives such as economic growth. He added that economic growth can only be achieved under the condition of price stability and allocative efficiency of financial markets. From the reviewed literature above, the relationship and impact of price instability on unemployment and economic growth in Nigeria is still ambiguous which calls for further research, hence this study.

## METHODOLOGY

This section focuses on methodology used to determine the effect of price instability on unemployment and economic growth. Prices become unstable if they are increasing from a certain range which is around 3% to 5%. This section also discusses study design, procedure and choice of variables. The relationships among variables have been analyzed with the help of constructing three econometric models.

### Choice of Variables

Main variables, used in this study, are unemployment, inflation rate (proxy for consumer price index), GDP growth rates, Foreign Direct Investment, Gross Fix Capital Formation (proxy for domestic investment), Interest Rate, Imports, Exports, Exchange Rate and Per Capita Income. The sources of data are statistical bulletins published by World Bank Development Indicators (WBDI) and Central Bank of Nigeria Statistical Bulletin 2015.

### Method of Data Analysis

To analyze the impact of price instability on unemployment and economic growth in Nigeria, an econometric model has been developed. Simple OLS (Ordinary Least Square), E-views version 8 software method is used to test the relationships. There are three regression equations in which the relationship between dependent and independent variables have been



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analyzed. The first model or equation is explaining the effect of inflation or price instability and other macroeconomic variables on GDP in Nigeria. The second model explains the effects of unemployment and other economic variables on real GDP. The third model is formulated to describe the effect of macroeconomic variables on unemployment in Nigeria

**Model Specification**

This paper adopted the Okun's (1962) type model and modified it to incorporate inflation, unemployment and economic growth as the dependent variables while Foreign Direct Investment, Gross Fix Capital Formation (proxy for domestic investment), Interest Rate, Imports, Exports, Exchange Rate and Per Capita GDP serve as exogenous / independent variables for the three models. The Okun's law is the reduced version of the Phillips postulate. The study assumes a linear relationship between the rate of growth of GDP, unemployment rate, inflation rate and other variables. The three equations / models are specified as follows:.

**Regression Analysis on Effect of Price Instability and other Macro-Variables on Economic Growth Rate**

To analyze the effect of price instability and other variables on economic growth rate the following econometric model has been developed.

The model is specified as:

$$Log(GDP\text{-}rate) + \lambda_0 - \lambda_1 Log(CPI) + \lambda_2 Log(PCI) + \lambda_3 Log(MANG\text{-}rate) + \lambda_4 Log(INVT) - \lambda_6 IMPT + U_t \quad \ldots\ldots (eqtn\ 1)$$

Where

| | | |
|---|---|---|
| GDP-rate | = | Gross Domestic Product Rate |
| CPI | = | Consumer Price Index |
| PCI | = | Per Capita Income |
| MANG-rate | = | Manufacturing Growth Rate |
| INVT | = | Investment |
| IMPT | = | Imports |
| $U_t$ | = | Stochastic Error Term |

The apriori expectations from the above parameters are as follows:

- The relationship between Consumer Price index (CPI) and Gross Domestic Product growth rate (GDP-rate) is expected to be negative because an increase in one of them must decrease the value of other.
- Per Capita Income is expected to have a positive effect on GDP. It is used as indicator for standard of living in an economy. This is on the rationale that all the citizens would benefit from increased economic production. Per capita income indicates standard of living frequently, widely and consistently, hence it is positively


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related to economic growth of any nation.

- Manufacturing sector, being a very important sector in any economy, is expected to also have a positive relationship with GDP in the Nigerian economy. Manufacturing industry increases employment opportunities in the country and improves purchasing power of the work force. With an increase in income, consumption level increase and this activity has positive effect on Gross Domestic Product.

- Investment plays significant role on economic growth. It contributes to current demand of capital goods and enlarges the production base that increases production capacity. It modernizes production processes, improves cost effectiveness and reduces the labor needs per unit of output thus leading to high productivity with low cost.

- On the contrary, imports have negative effect on economic growth because it acts as a leakage in an economy as there is outflow of money. If a country prefers to import finished goods then there are two main losses for the economy; one it is outflow of money and the other is that it results to damages to local industry.

**Regression Analysis for Effect of Macroeconomic Variables on Economic Growth (RGDP)**

The effect of macro-variables on economic growth is captured by the following econometric model:

$$Log(RGDP)\ \alpha_0 - \alpha_1 Log(UNEMP) + \alpha_2 Log(FDI) + \alpha_3 Log(INVT) - \alpha_4 Log(EXCR) + \alpha_5 Log(INTR) + \alpha_6 Log(EXP) + U_t \quad \ldots (eqtn\ 2)$$

| | | |
|---|---|---|
| RGDP | = | Real Gross Domestic Product |
| UNEMP | = | Unemployment |
| FDI | = | Foreign Direct Investment |
| INVT | = | Investment |
| EXCR | = | Exchange Rate |
| INTR | = | Interest Rate |
| EXP | = | Exports |
| $U_t$ | = | Stochastic Error Term |

The expected relationship of the explanatory variables on RGDP is as follows:

- The relationship between real GDP and unemployment is very important for economists in order to obtain a sustainable rise in living standards. If GDP growth rate is below its natural rate, it is expected to promote employment because this rise in total income will not generate inflationary pressures. If the GDP growth is above



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its natural level, economists will decide not to intensively promote the creation of new jobs in order to obtain a sustainable growth rate which will be indifferent to inflation.

- FDI has grown rapidly and considered to be the major source of capital moving towards emerging economies. The flow of capital in Nigeria supports the domestic industry.
- Investment has significant effect on Real GDP. Investment benefits are in terms of increased value addition, reduced cost, larger production and higher competitiveness. The ultimate effect of investment is improvement in gross domestic product.
- Exchange rate is a better indicator of any country's international purchasing power and relative economic growth. Exchange rate determines the GDP growth rate and the position of currency in the international market.
- Interest payments are the value addition to financial sector. Many investors invest in that economy whose interest rate payments are evidencing healthy position and it creates positive effect on the economic growth.

**Regression Analysis for Effect of Macroeconomic variables on Unemployment in Nigeria**

The effect of macroeconomic variables on unemployment is modeled as follows:

$$Log(UNEMP) = \beta_0 - \beta_1 Log(RGDP) + \beta_2 Log(FDI) + \beta_3 Log(INVT) - \beta_4 Log(IMPT) + \beta_5 Log(EXP) + \beta_3 Log(EXCR) + U_t \quad \ldots. \text{(eqtn 3)}$$

| | | |
|---|---|---|
| UNEMP | = | Unemployment |
| RGDP | = | Real Gross Domestic Product |
| FDI | = | Foreign Direct Investment |
| INVT | = | Investment |
| IMPT | = | Imports |
| EXP | = | Exports |
| $U_t$ | = | Stochastic Error Term |

The apriori expectations from the above parameters are as follows:

- Unemployment has adverse effect on GDP because when unemployment increases Real Gross Domestic Product decreases and vice versa.
- In Nigeria, foreign direct investment has an adverse effect on unemployment level. Nigeria is seeking to enhance the inflows of FDI to supplement domestic saving and


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investment and to benefit the economy. This strategy sustains high rate of economic growth thus increasing employment opportunities living standards.

- Investment has indirect relation with unemployment. Real Investment supports industrialization which amplifies job opportunities in the country thus leading to a reduction in the unemployment rate.

- Imports have positive relationship with unemployment. When imports of a country increase, it means that people have changed their consumption patterns from local market to foreign goods. There are certain reasons behind this change. For instance quality and durability of local products are not up to the mark. Secondly, the people could be status conscious. Thirdly, the price of local product is higher than foreign products like Chinese goods. Irrespective of the reasons above, if import of a country increase, local industries become stagnant and ultimately reduce its production. When the production capacity of a nation is adversely affected, it leads to reduction in labour force hence a rise in unemployment rate.

- Exports have negative effect on unemployment due to industrial sector production that would require manpower for production thus raising the employment level.

- Exchange rate measures the purchasing power of a country. It has positive effect on unemployment. When the exchange rate changes it affect goods market in the country and the value of money depreciates which causes a reduction in consumption and industrial production and ultimately decrease employment opportunities for the citizens.

## RESULTS AND DISCUSSION

This section presents the results and their subsequent interpretations.

### Estimation Procedure: Testing for Stationarity and Longrun Relationship

As this study involves time series data, the ordinary least square (OLS) method cannot be applied unless it is established that the variables concerned are stationary. Before estimating the equations, the stability properties of the variables employed were first investigated. Two-unit root tests were used in the study, i.e. the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) and Johansen Cointegration test. The choice of two unit roots was informed by the imperatives of comparison and consistency. According to Hamilton (1994), the PP unit root test is generally considered to have a greater reliability than the ADF because it is robust in the midst of serial correlation and heteroscedasticity, though it has its own shortcomings. Johansen cointegration test were also employed to test the long run relationship between the variables used in the model. Below are the tabulated results for unit root and cointegration test.



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**Table 1: Augmented Dickey Fuller and Philip-Perron Unit Root Test with Intercept**

| Variable | | Level t-statistic value | 1st Difference t-statistic value | 5% Critical Value | Order of Integration |
|---|---|---|---|---|---|
| **Log(RGDP)** | *ADF* | ---- | -5.677279 | -2.971853 | I(1) |
| | *P-P* | ---- | -5.708038 | -2.971853 | I(1) |
| **Log(GDP-rate)** | *ADF* | -3.691641 | ---- | -2.967767 | I(0) |
| | *P-P* | -3.665499 | ---- | -2.967767 | I(0) |
| **Log(UNEMP)** | *ADF* | ---- | -5.769425 | -2.971853 | I(1) |
| | *P-P* | ---- | -6.078330 | -2.971853 | I(1) |
| **Log(CPI)** | *ADF* | ---- | -3.351178 | -2.991878 | I(1) |
| | *P-P* | -3.004662 | --- | -2.967767 | I(0) |
| **Log(INTR)** | *ADF* | ---- | -5.031670 | -2.967767 | I(1) |
| | *P-P* | -5.026009 | ---- | -2.967767 | I(0) |
| **Log(EXCR)** | *ADF* | ---- | -5.568183 | -2.971853 | I(1) |
| | *P-P* | -3.423399 | ---- | -2.967767 | I(0) |
| **Log(INVT)** | *ADF* | ---- | -5.825755 | -2.976263 | I(1) |
| | *P-P* | ---- | -5.038318 | 2.971853 | I(1) |
| **Log(EXPT)** | *ADF* | ---- | -7.799366 | -2.971853 | I(1) |
| | *P-P* | ---- | -7.799366 | -2.971853 | I(1) |
| **Log(IMPT)** | *ADF* | ---- | -7.702074 | -2.971853 | I(1) |
| | *P-P* | ---- | -7.797039 | -2.971853 | I(1) |
| **Log(Pcp_GDP)** | *ADF* | ---- | -5.682839 | -2.971853 | I(1) |
| | *P-P* | ---- | -5.715096 | -2.971853 | I(1) |
| **Log(FDI)** | *ADF* | ---- | -9.292745 | -2.971853 | I(1) |
| | *P-P* | ---- | -9.283480 | 2.971853 | I(1) |
| **Log(MANG-rate)** | *ADF* | ---- | -5.213597 | -2.971853 | I(1) |
| | *P-P* | ---- | -5.217852 | -2.971853 | I(1) |

Source: Author's computation from E-views 8.0

Table 1 above shows the results of unit root test using both Augmented Dickey-Fuller (ADF) and Phillips-Perron (P-P) at level and first difference. The unit root test indicates that all the variables are either I(0) or first difference stationary. To find out whether the variables has long run relationship, cointegration test was carried out and evidence indicates the presence of a unique long-run relationship among the variables in the models.

**Regression Analysis for Economic Growth rate and Price Instability and other variables**

The model is specified as:

$$Log(GDP\text{-}rate) + \lambda_0 - \lambda_1 \text{Log}(CPI) + \lambda_2 \text{Log}(PCI) + \lambda_3 \text{Log}(MANG\text{-}rate) + \lambda_4 \text{Log}(INVT) - \lambda_6 IMPT + U_t$$



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Table 2: OLS Estimate: Dependent Variable = GDP-rate

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 2.775867 | 1.213241 | 2.287976 | 0.0312 |
| CPI | -0.003430 | 0.010206 | -0.336043 | 0.7398 |
| PCI | 0.000469 | 0.000237 | 1.981582 | 0.0591 |
| MANG_RATE | -0.275633 | 0.130500 | -2.112135 | 0.0453 |
| INVT | 0.012470 | 0.077300 | 0.161324 | 0.8732 |
| IMPT | -0.022255 | 0.029921 | -0.743772 | 0.4642 |

**Durbin-Watson Statistic:** 1.816794

Source: Author's computation using Eviews 8.0 software

Table 2 presents regression results between gross domestic product growth rate and price instability in Nigeria. The results indicate that the coefficient of consumer price index (a proxy for inflation rate) is statistically insignificant as indicated by its p-value (0.7398). The coefficient of consumer price index (inflation) shows that, with a percentage increase in the explanatory variable CPI, the country's growth rate will decrease by 0.003430, all things being equal. This is in consonance with economic a priori expectation that the relationship between Consumer Price index (CPI) and Gross Domestic Product growth rate (GDP-rate) is expected to be negative since an increase in one of them must decrease the value of the other.

Per capita income on the other hand is positively related with GDP growth rate, implying that a percentage increase in per capita GDP will potentially increase prices by 0.000469 percentage points. This means that if we strengthen per capita income by allowing an even and equitable distribution of our common wealth, more money will be in the hands of a greater majority of the population which will translate to purchase of more goods (both consumption and durable goods) thereby fuelling a rise in prices as more money will begin to chase few goods thus leading to inflationary pressure on the economy.

The coefficient of manufacturing rate is negatively signed but statistically significant at 5% significant level. The result reveals that a percentage increase in manufacturing output will translate to about 27 percentage decrease in GDP growth rate in Nigeria, all things being equal. The negative relationship between this variable and GDP growth only confirms how weak, ineffective and stagnant our manufacturing sector has become over the years. It should be noted that this sector performed wonderfully in the 80s but due to endemic corruption, indiscipline and government neglect, the fortunes of the sector has been dwindling. If the government considers this critical situation and takes some constructive steps to help, then, manufacturing sector can grow with greater potential and contribute more to growth in the economy.

The relationship between investment and GDP growth rate is positive but insignificant. Empirical evidence shows that a percentage increase in investment translates to less than two percentage increase in growth rate of the country. This result is a confirmation of low government investment in the critical sectors of the economy such as education, health, agriculture, tourism, sports, building of industries etc that could boost the growth rate of the



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economy.

Imports have negative and significant relationship with GDP growth rate .The value of t-statistic is 2.06. The result reveals that a percentage increase in import translate to about 2 percent decrease in growth rate. Of course, a nation that is import-dependent is bound to suffer stagnation in growth as more of their consumables are imported from other countries, leaving their home industries barren and unproductive.

**Equation two explains the relationship between real GDP with different macro-variables. It is represented in the table below.**

Table 3: OLS Estimate: Dependent Variable = RGDP

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 23.29717 | 0.507516 | 45.90432 | 0.0000 |
| UNEMP | 0.019094 | 0.026363 | 0.724262 | 0.4762 |
| FDI | 1.26E-10 | 3.97E-11 | 3.180332 | 0.0042 |
| EXCR | 0.011469 | 0.001642 | 6.986858 | 0.0000 |
| EXPT | -0.008748 | 0.009155 | -0.955602 | 0.3492 |
| INVT | 0.047012 | 0.026008 | 1.807614 | 0.0838 |
| INTR | 0.000135 | 0.008882 | 0.015211 | 0.9880 |

**R-squared:** 0.923080

**Adjusted R-squared:** 0.903013

**Source:** Author's computation from Eviews 8.0 software

There is a positive but insignificant relationship between real GDP and unemployment within the period under reference. Theoretically, unemployment and economic growth has inverse relationship, meaning that a percentage rise in the former will translate to 0.019094 percentage decreases in economic growth. Certainly, as more able-bodied men and women are allowed to remain idle, it will lead to a fall in the various productive sectors of the economy hence reduction in growth.

The relationship between FDI and real GDP is positive and statistically significant judging from the t- value of 3.180332. This result shows that as foreign direct investment rise, economic growth also rises due to growth in different sectors of the economy. When foreign direct investment rises by a percentage point, economic growth (real GDP) will rise equally by 126 percent. The inflow of capital from abroad is a potent tool for growing the economy as investment by foreigners in different sectors of the economy are bound to positively impact on growth prospects in the country.

Exchange rate has a positive and significant relationship with economic growth with a p-value of 0.0000%, indicating that a 1% increase in exchange rate will increase economic growth by 0.011469%. This implies that exchange rate appreciation serve as a robust effect on a country's exports and real gross domestic product. This finding is in line with theory as a



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nation stands to gain a lot from appreciation in its currency, especially if such an economy has much to export to reap the gains of an appreciating currency.

Unexpectedly, the coefficient of export came in with a negative sign but is statistically insignificant. This is in contrast with established economic theories as a country need to export reasonably to be able to earn foreign exchange; build its external reserves and be able to use same to grow its economy and provide jobs for its citizenry. The result reveals the import-dependent nature of the Nigerian economy where virtually all consumables are bought from abroad with little or nothing to export in return, thus placing the country's balance of payment in perpetual deficit.

The coefficient for investment has a positive sign which conforms to a priori expectation. The coefficient is equally statistically significant at 10%. From the result presented above, it can be deduced that a one percentage increase in investment will make the real gross domestic product of Nigeria rise by 5%. This reveals the modest investment the government has made over the years in the various sectors of the economy.

Finally, the coefficient of interest rate is positive but not significant in the model. Many investors invest in that economy whose interest rate payments are evidencing healthy position and it creates positive effect on economic growth. A rise in lending rate is a proof that less funds will be available to the productive sectors of the economy as borrowers become discouraged from assessing such funds from the commercial banks because of the associated cost of borrowing.

**Model 3 shows the effect of macroeconomic variables on unemployment in Nigeria**

$$Log(UNEMP) = \beta_0 - \beta_1 Log(RGDP) + \beta_2 Log(FDI) + \beta_3 Log(INVT) - \beta_4 Log(IMPT) + \beta_5 Log(EXP) + \beta_3 Log(EXCR) + U_t$$

Table 4:
OLS output: Dependent Variable (unemployment)

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -3.641259 | 2.913807 | -1.249657 | 0.2240 |
| LOG(RGDP) | 0.113061 | 0.146879 | 0.769757 | 0.4493 |
| LOG(FDI) | 0.132865 | 0.126149 | 1.053240 | 0.3032 |
| LOG(INVT) | 0.557206 | 0.237453 | 2.346595 | 0.0279 |
| LOG(IMPT) | -0.039197 | 0.237563 | -0.164995 | 0.8704 |
| LOG(EXPT) | -0.355413 | 0.234428 | -1.516085 | 0.1431 |
| LOG(EXCR) | -0.051478 | 0.100340 | -0.513037 | 0.6128 |

**R-squared:** 0.693637

**Adjusted R-squared:** 0.613717

Durbin-Watson Statistic: 1.683888

**Source:** Author's computation from Eviews 8.0 software



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Increase in RGDP over the years did not reduce unemployment in Nigeria; this is due to its insignificant effect as revealed in its t-statistic value of 0.769757. This is inconsistent with our theoretical a priori expectations as real gross domestic product is expected to contribute significantly to a reduction in unemployment rate in any economy where there is real growth. The issue of diversification of the economy should be given serious attention. The country has depended too much on a single commodity (crude oil) at the expense of so many other untapped minerals and agricultural products that has great potential of significantly contributing to growth hence reduction in the alarming unemployment figures.

The result also revealed that a percentage rise in foreign inflows brings in only 13% to the economy in terms of growth. This contribution is infinitesimal and thus can do little in solving our unemployment problems. Over the years, foreign partners in Nigeria has had cause to repatriate their investible funds back to their shores as Nigeria increasingly became unsafe destinations for businesses owing to streams of violence and kidnapping across the country.

Empirical evidence from our OLS output reveals that investment contributes about 55 percent in reducing unemployment in Nigeria. This is however not realistic as evidence on ground reveal otherwise. It is regrettable that most often than not, funds are appropriated for building roads, agriculture, irrigation / dams, power stations, industries etc but end up in private bank accounts with little or nothing to show for on ground. It is therefore not surprising that inspite of huge investible funds from both government and the Central Bank of Nigeria for investment in the different sectors of the economy, the country remains in the grip of unemployment as evident from the legion of graduates from our universities, polytechnics and colleges of education roaming the streets in search of non-existent jobs.

As expected, the coefficient of import is negatively signed and insignificant as well. The result indicates that a percentage rise in import will increase the unemployment level by 4 percent. This is consistent with happenings in Nigeria where virtually every product is imported, thus leading to closure of local industries. This is one of the reasons for the astronomical rise in unemployment levels Nigeria is faced with. Concerted efforts should be made in building refineries and revamping local industries such that most of our consumables are produced on our shore and refining of petroleum products carried out in Nigeria to reduce our import-dependency on other economies. These innovations will go a long way in reducing the alarming incident of joblessness to a manageable level.

Contrary to a priori expectations, the coefficient of export appeared with a negative sign. This result furthermore reveals how helpless the country has become hence the rise in unemployment rate. Nigeria has little or nothing apart from crude oil and very few primary products to export. Worthy of note is the fact that the upstream sector of the Nigerian oil industry employs just a fraction of our workforce and so no matter the crude oil exported, unemployment still persists. Diversification of the economy and value addition to our primary products will give the country a competitive edge in international trade.

The coefficient of exchange rate shows that a percentage rise in exchange rate will reduce employment by 5 percent. When a country's currency depreciates against other major international currencies, it only shows how weak and ineffective such currency has become. More of such local currencies will be required to purchase less stock of machineries and inputs for productive purpose, thereby contributing to rise in the unemployment rate as


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companies and industries which cannot assess this essential inputs, in the short run, resort to sacking their workers.

**Robustness Checks**

| | |
|---|---|
| Jarue-Bera (Normality Tests) | (0.863059) |
| Heteroskedasticity Test: Breusch-Pagan-Godfrey | (0.2908) |
| Breusch-Godfrey Serial Correlation LM Test | (0.5753) |

Source: Author's computation from E-views 8.0

Diagnostic tests for Heteroskedasticity Test: Breusch-Pagan-Godfrey, Breusch-Godfrey Serial Correlation LM Test: and stability test (CUSUM/CUSUM squares) were performed to ascertain model fitness to ensure that our models yield robust estimates. These results are presented in the table below. The above figures reveals that the modelling and results of all our models, including the OLS are robust and as such, we can make inference with greater certainty.

## CONCLUDING REMARKS

The Nigerian economy is in a crucial phase of its turmoil. A lot of social and economic problems, like low literacy rate occasioned by falling standard in education at all levels, poor health facilities, hyper inflation, high unemployment, rising trade deficit and continuous low economic growth have been faced by successive administrations in the country. The government has been indulging in unnecessary political bickering and debates which have no direct link with the revival of the economy and welfare of the general public. In this study, the effects of price instability on unemployment and economic growth in Nigeria are discussed. To achieve this objective a set of regression equations have been developed. The variables which have been selected for analysis are Inflation (CPI), volume of imports, exchange rate, exports, GDP growth, manufacturing growth rate, real gross domestic product, gross fixed capital formation (investment) by public and private sector, foreign direct investment and interest rate in the country. Annual time series data from 1986 to 2015 were sourced from World Bank Development Indicators and Central Bank of Nigeria statistical bulletin 2015 and subjected to unit root and cointegration tests. There was evidence of longrun equilibrium relationship among variables in the models.

The coefficient of imports, exports, exchange rate and manufacturing growth rate has negative effects on the key dependent variables of gdp-growth rate, price instability and unemployment rate. On the contrary, the coefficients of investment, per capita income and foreign direct investment show positive relationship with the dependent variables in the model. One of the main results of this research is in favor of negative relationship between consumer price index (inflation) and economic growth rate. These results are also supported by Ahmed and Mortaza (2005) results in which they established a statistically significant negative relationship between inflation and economic growth. The prime reason behind this inverse relationship between inflation and economic growth rate is that as inflation increases, purchasing power of consumers decreases and the consumption level automatically falls because real value of money will reduce according to the proportion of change in prices. It is important to note that consumption has direct relation to GDP, which



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means that when consumption decreases GDP also decreases.

Another major finding from this study is the fact that increases in RGDP over the years did not reduce unemployment in Nigeria; this is due to its insignificant effect as revealed in its t-statistic value of 0.769757. This result is inconsistent with our theoretical a priori expectations as real gross domestic product is expected to contribute significantly to a reduction in unemployment rate in any economy where there is real growth. The issue of diversification of the economy should be given serious attention. The country has depended too much on a single commodity (crude oil) at the expense of so many other untapped minerals and agricultural products that has great potential of significantly contributing to growth hence reduction in the alarming unemployment figures. Some major policy recommendations of this study are as follows:

(a) Concerted effort should be made by policy makers to diversify the Nigerian economy away from oil in order to increase the level of output in the other sectors of the economy by improving on productivity. This will reduce unemployment and the prices of goods and services (inflation) so that the Nigerian economy can have inclusive economic growth.

(b) The government should discourage excessive importation by revamping its ailing industries for more robust and efficient productive base.

(c) Government should embark on policies that will reduce the number of imported goods drastically and encourage local production and consumption to encourage domestic industries; these will reduce unemployment and inflation in Nigeria and increase output..

(d) Inspite of huge investible funds from both government and the apex bank for investment in the different sectors of the economy, the country remains in the grip of unemployment as evident from the legion of graduates from our universities, polytechnics and colleges of education roaming the streets in search of non-existent jobs. It is therefore recommended that agencies of government established for fighting corrupt practices should be strengthened and allowed to freely fight corrupt officers in all segments of the economy.

(e) Evidence revealed that over the years, foreign partners in Nigeria has had cause to repatriate their investible funds back to their shores as Nigeria increasingly became unsafe destinations for businesses owing to streams of violence and kidnappings across the country. Government should engage the various agitators across the nation such as the Niger-Delta militants, IPOD/MASSOB and Fulani herdsmen with a view to finding lasting solutions to their demand for genuine peace to be entrenched in the country. This is one sure way to encourage more foreign inflow of capital for economic growth.

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## APENDIX

Null Hypothesis: D(LOG(RGDP)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -5.677279 | 0.0001 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(RGDP),2)
Method: Least Squares
Date: 03/06/17 Time: 19:07
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(RGDP(-1))) | -1.131773 | 0.199351 | -5.677279 | 0.0000 |
| C | 0.122517 | 0.052027 | 2.354900 | 0.0264 |

| | | | |
|---|---|---|---|
| R-squared | 0.553506 | Mean dependent var | -0.011348 |
| Adjusted R-squared | 0.536333 | S.D. dependent var | 0.360391 |
| S.E. of regression | 0.245402 | Akaike info criterion | 0.096907 |
| Sum squared resid | 1.565769 | Schwarz criterion | 0.192065 |
| Log likelihood | 0.643301 | Hannan-Quinn criter. | 0.125998 |
| F-statistic | 32.23150 | Durbin-Watson stat | 1.938783 |
| Prob(F-statistic) | 0.000006 | | |


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At level

Null Hypothesis: LOG(GDP_RATE) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -3.691641 | 0.0097 |
| Test critical values: | 1% level | -3.679322 | |
| | 5% level | -2.967767 | |
| | 10% level | -2.622989 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GDP_RATE))
Method: Least Squares
Date: 03/06/17 Time: 19:08
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| LOG(GDP_RATE(-1)) | -0.642872 | 0.174142 | -3.691641 | 0.0010 |
| C | 0.856916 | 0.283752 | 3.019950 | 0.0055 |

| | | | |
|---|---|---|---|
| R-squared | 0.335437 | Mean dependent var | 0.033641 |
| Adjusted R-squared | 0.310824 | S.D. dependent var | 1.138091 |
| S.E. of regression | 0.944805 | Akaike info criterion | 2.790795 |
| Sum squared resid | 24.10172 | Schwarz criterion | 2.885092 |
| Log likelihood | -38.46653 | Hannan-Quinn criter. | 2.820328 |
| F-statistic | 13.62822 | Durbin-Watson stat | 2.049104 |
| Prob(F-statistic) | 0.000995 | | |


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Null Hypothesis: D(LOG(PCP_GDP)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -5.682839 | 0.0001 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(PCP_GDP),2)
Method: Least Squares
Date: 03/06/17 Time: 19:09
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(PCP_GDP(-1))) | -1.132860 | 0.199348 | -5.682839 | 0.0000 |
| C | 0.093390 | 0.049880 | 1.872299 | 0.0725 |

| | | | |
|---|---|---|---|
| R-squared | 0.553990 | Mean dependent var | -0.011348 |
| Adjusted R-squared | 0.536836 | S.D. dependent var | 0.360379 |
| S.E. of regression | 0.245260 | Akaike info criterion | 0.095754 |
| Sum squared resid | 1.563966 | Schwarz criterion | 0.190912 |
| Log likelihood | 0.659438 | Hannan-Quinn criter. | 0.124845 |
| F-statistic | 32.29466 | Durbin-Watson stat | 1.938814 |
| Prob(F-statistic) | 0.000006 | | |


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Null Hypothesis: D(LOG(MANG_RATE)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -5.213597 | 0.0002 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(MANG_RATE),2)
Method: Least Squares
Date: 03/06/17 Time: 19:10
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(MANG_RATE(-1))) | -0.992453 | 0.190359 | -5.213597 | 0.0000 |
| C | 0.010525 | 0.044769 | 0.235085 | 0.8160 |

| | | | |
|---|---|---|---|
| R-squared | 0.511109 | Mean dependent var | 0.009708 |
| Adjusted R-squared | 0.492306 | S.D. dependent var | 0.332474 |
| S.E. of regression | 0.236896 | Akaike info criterion | 0.026361 |
| Sum squared resid | 1.459117 | Schwarz criterion | 0.121519 |
| Log likelihood | 1.630941 | Hannan-Quinn criter. | 0.055452 |
| F-statistic | 27.18160 | Durbin-Watson stat | 1.950567 |
| Prob(F-statistic) | 0.000019 | | |


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Null Hypothesis: D(LOG(FDI)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -9.292745 | 0.0000 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(FDI),2)
Method: Least Squares
Date: 03/06/17 Time: 19:10
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(FDI(-1))) | -1.478089 | 0.159058 | -9.292745 | 0.0000 |
| C | 0.112689 | 0.086478 | 1.303100 | 0.2040 |

| | | | |
|---|---|---|---|
| R-squared | 0.768591 | Mean dependent var | -0.055289 |
| Adjusted R-squared | 0.759691 | S.D. dependent var | 0.912842 |
| S.E. of regression | 0.447488 | Akaike info criterion | 1.298415 |
| Sum squared resid | 5.206381 | Schwarz criterion | 1.393572 |
| Log likelihood | -16.17781 | Hannan-Quinn criter. | 1.327505 |
| F-statistic | 86.35512 | Durbin-Watson stat | 1.815491 |
| Prob(F-statistic) | 0.000000 | | |


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Null Hypothesis: D(LOG(EXPT)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -7.799366 | 0.0000 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(EXPT),2)
Method: Least Squares
Date: 03/06/17 Time: 19:11
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(EXPT(-1))) | -1.354976 | 0.173729 | -7.799366 | 0.0000 |
| C | -0.029001 | 0.051953 | -0.558217 | 0.5815 |

| | | | |
|---|---|---|---|
| R-squared | 0.700565 | Mean dependent var | -0.044742 |
| Adjusted R-squared | 0.689048 | S.D. dependent var | 0.492619 |
| S.E. of regression | 0.274700 | Akaike info criterion | 0.322471 |
| Sum squared resid | 1.961955 | Schwarz criterion | 0.417629 |
| Log likelihood | -2.514599 | Hannan-Quinn criter. | 0.351562 |
| F-statistic | 60.83011 | Durbin-Watson stat | 1.795914 |
| Prob(F-statistic) | 0.000000 | | |


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Null Hypothesis: D(LOG(IMPT)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -7.702074 | 0.0000 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(IMPT),2)
Method: Least Squares
Date: 03/06/17 Time: 19:11
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(IMPT(-1))) | -1.371314 | 0.178045 | -7.702074 | 0.0000 |
| C | -0.008670 | 0.055114 | -0.157306 | 0.8762 |

| | | | |
|---|---|---|---|
| R-squared | 0.695272 | Mean dependent var | -0.017478 |
| Adjusted R-squared | 0.683552 | S.D. dependent var | 0.518314 |
| S.E. of regression | 0.291571 | Akaike info criterion | 0.441681 |
| Sum squared resid | 2.210352 | Schwarz criterion | 0.536839 |
| Log likelihood | -4.183540 | Hannan-Quinn criter. | 0.470772 |
| F-statistic | 59.32195 | Durbin-Watson stat | 1.895239 |
| Prob(F-statistic) | 0.000000 | | |


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Null Hypothesis: D(LOG(INFL)) has a unit root
Exogenous: Constant
Lag Length: 4 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -3.351178 | 0.0235 |
| Test critical values: | 1% level | -3.737853 | |
| | 5% level | -2.991878 | |
| | 10% level | -2.635542 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(INFL),2)
Method: Least Squares
Date: 03/06/17 Time: 19:12
Sample (adjusted): 1992 2015
Included observations: 24 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(INFL(-1))) | -1.752864 | 0.523059 | -3.351178 | 0.0036 |
| D(LOG(INFL(-1)),2) | 0.879365 | 0.435919 | 2.017267 | 0.0588 |
| D(LOG(INFL(-2)),2) | 0.489170 | 0.354005 | 1.381816 | 0.1839 |
| D(LOG(INFL(-3)),2) | 0.397668 | 0.228405 | 1.741064 | 0.0987 |
| D(LOG(INFL(-4)),2) | 0.206719 | 0.171017 | 1.208764 | 0.2424 |
| C | -0.043228 | 0.110436 | -0.391427 | 0.7001 |

| | | | |
|---|---|---|---|
| R-squared | 0.579410 | Mean dependent var | -0.019010 |
| Adjusted R-squared | 0.462579 | S.D. dependent var | 0.728700 |
| S.E. of regression | 0.534203 | Akaike info criterion | 1.796236 |
| Sum squared resid | 5.136709 | Schwarz criterion | 2.090749 |
| Log likelihood | -15.55483 | Hannan-Quinn criter. | 1.874370 |
| F-statistic | 4.959401 | Durbin-Watson stat | 2.199137 |
| Prob(F-statistic) | 0.004984 | | |


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At level

Null Hypothesis: LOG(INTR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -5.031670 | 0.0003 |
| Test critical values: | 1% level | -3.679322 | |
| | 5% level | -2.967767 | |
| | 10% level | -2.622989 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(INTR))
Method: Least Squares
Date: 03/06/17 Time: 19:13
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| LOG(INTR(-1)) | -0.969408 | 0.192661 | -5.031670 | 0.0000 |
| C | 1.285172 | 0.337632 | 3.806426 | 0.0007 |

| | | | |
|---|---|---|---|
| R-squared | 0.483922 | Mean dependent var | 0.089992 |
| Adjusted R-squared | 0.464808 | S.D. dependent var | 1.766276 |
| S.E. of regression | 1.292151 | Akaike info criterion | 3.416966 |
| Sum squared resid | 45.08066 | Schwarz criterion | 3.511262 |
| Log likelihood | -47.54600 | Hannan-Quinn criter. | 3.446498 |
| F-statistic | 25.31770 | Durbin-Watson stat | 1.999497 |
| Prob(F-statistic) | 0.000028 | | |


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Null Hypothesis: D(LOG(INVT)) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -5.825755 | 0.0001 |
| Test critical values: | 1% level | -3.699871 | |
| | 5% level | -2.976263 | |
| | 10% level | -2.627420 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(INVT),2)
Method: Least Squares
Date: 03/06/17 Time: 19:13
Sample (adjusted): 1989 2015
Included observations: 27 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(INVT(-1))) | -1.426891 | 0.244928 | -5.825755 | 0.0000 |
| D(LOG(INVT(-1)),2) | 0.426390 | 0.174525 | 2.443138 | 0.0223 |
| C | 0.015954 | 0.038109 | 0.418637 | 0.6792 |

| | | | |
|---|---|---|---|
| R-squared | 0.616817 | Mean dependent var | 0.008573 |
| Adjusted R-squared | 0.584885 | S.D. dependent var | 0.307106 |
| S.E. of regression | 0.197866 | Akaike info criterion | -0.298010 |
| Sum squared resid | 0.939627 | Schwarz criterion | -0.154028 |
| Log likelihood | 7.023129 | Hannan-Quinn criter. | -0.255196 |
| F-statistic | 19.31660 | Durbin-Watson stat | 1.669511 |
| Prob(F-statistic) | 0.000010 | | |


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Null Hypothesis: D(LOG(UNEMP)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -5.769425 | 0.0001 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(UNEMP),2)
Method: Least Squares
Date: 03/06/17 Time: 19:14
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(UNEMP(-1))) | -1.075845 | 0.186473 | -5.769425 | 0.0000 |
| C | 0.045997 | 0.057705 | 0.797100 | 0.4326 |

| | | | |
|---|---|---|---|
| R-squared | 0.561450 | Mean dependent var | 0.022421 |
| Adjusted R-squared | 0.544583 | S.D. dependent var | 0.451335 |
| S.E. of regression | 0.304582 | Akaike info criterion | 0.528996 |
| Sum squared resid | 2.412024 | Schwarz criterion | 0.624153 |
| Log likelihood | -5.405943 | Hannan-Quinn criter. | 0.558087 |
| F-statistic | 33.28626 | Durbin-Watson stat | 2.001433 |
| Prob(F-statistic) | 0.000004 | | |


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Null Hypothesis: D(LOG(EXCR)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -5.568183 | 0.0001 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(EXCR),2)
Method: Least Squares
Date: 03/06/17 Time: 19:14
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(EXCR(-1))) | -0.998312 | 0.179289 | -5.568183 | 0.0000 |
| C | 0.137925 | 0.063534 | 2.170872 | 0.0393 |

| | | | |
|---|---|---|---|
| R-squared | 0.543897 | Mean dependent var | -0.022657 |
| Adjusted R-squared | 0.526355 | S.D. dependent var | 0.435271 |
| S.E. of regression | 0.299562 | Akaike info criterion | 0.495756 |
| Sum squared resid | 2.333165 | Schwarz criterion | 0.590913 |
| Log likelihood | -4.940577 | Hannan-Quinn criter. | 0.524846 |
| F-statistic | 31.00466 | Durbin-Watson stat | 1.988462 |
| Prob(F-statistic) | 0.000008 | | |


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Philip-Perron Unit Root Test

Null Hypothesis: D(LOG(RGDP)) has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -5.708038 | 0.0001 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 0.055920 |
| HAC corrected variance (Bartlett kernel) | 0.049200 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(RGDP),2)
Method: Least Squares
Date: 03/06/17 Time: 19:15
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(RGDP(-1))) | -1.131773 | 0.199351 | -5.677279 | 0.0000 |
| C | 0.122517 | 0.052027 | 2.354900 | 0.0264 |

| | | | |
|---|---|---|---|
| R-squared | 0.553506 | Mean dependent var | -0.011348 |
| Adjusted R-squared | 0.536333 | S.D. dependent var | 0.360391 |
| S.E. of regression | 0.245402 | Akaike info criterion | 0.096907 |
| Sum squared resid | 1.565769 | Schwarz criterion | 0.192065 |
| Log likelihood | 0.643301 | Hannan-Quinn criter. | 0.125998 |
| F-statistic | 32.23150 | Durbin-Watson stat | 1.938783 |
| Prob(F-statistic) | 0.000006 | | |


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At Level

Null Hypothesis: LOG(GDP_RATE) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -3.665499 | 0.0103 |
| Test critical values: | 1% level | -3.679322 | |
| | 5% level | -2.967767 | |
| | 10% level | -2.622989 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 0.831094 |
| HAC corrected variance (Bartlett kernel) | 0.793805 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(GDP_RATE))
Method: Least Squares
Date: 03/06/17 Time: 19:16
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| LOG(GDP_RATE(-1)) | -0.642872 | 0.174142 | -3.691641 | 0.0010 |
| C | 0.856916 | 0.283752 | 3.019950 | 0.0055 |

| | | | |
|---|---|---|---|
| R-squared | 0.335437 | Mean dependent var | 0.033641 |
| Adjusted R-squared | 0.310824 | S.D. dependent var | 1.138091 |
| S.E. of regression | 0.944805 | Akaike info criterion | 2.790795 |
| Sum squared resid | 24.10172 | Schwarz criterion | 2.885092 |
| Log likelihood | -38.46653 | Hannan-Quinn criter. | 2.820328 |
| F-statistic | 13.62822 | Durbin-Watson stat | 2.049104 |
| Prob(F-statistic) | 0.000995 | | |


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Null Hypothesis: D(LOG(PCP_GDP)) has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -5.715096 | 0.0001 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 0.055856 |
| HAC corrected variance (Bartlett kernel) | 0.048980 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(PCP_GDP),2)
Method: Least Squares
Date: 03/06/17 Time: 19:17
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(PCP_GDP(-1))) | -1.132860 | 0.199348 | -5.682839 | 0.0000 |
| C | 0.093390 | 0.049880 | 1.872299 | 0.0725 |

| | | | |
|---|---|---|---|
| R-squared | 0.553990 | Mean dependent var | -0.011348 |
| Adjusted R-squared | 0.536836 | S.D. dependent var | 0.360379 |
| S.E. of regression | 0.245260 | Akaike info criterion | 0.095754 |
| Sum squared resid | 1.563966 | Schwarz criterion | 0.190912 |
| Log likelihood | 0.659438 | Hannan-Quinn criter. | 0.124845 |
| F-statistic | 32.29466 | Durbin-Watson stat | 1.938814 |
| Prob(F-statistic) | 0.000006 | | |


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Null Hypothesis: D(LOG(MANG_RATE)) has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -5.217852 | 0.0002 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 0.052111 |
| HAC corrected variance (Bartlett kernel) | 0.058509 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(MANG_RATE),2)
Method: Least Squares
Date: 03/06/17 Time: 19:18
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(MANG_RATE(-1))) | -0.992453 | 0.190359 | -5.213597 | 0.0000 |
| C | 0.010525 | 0.044769 | 0.235085 | 0.8160 |

| | | | |
|---|---|---|---|
| R-squared | 0.511109 | Mean dependent var | 0.009708 |
| Adjusted R-squared | 0.492306 | S.D. dependent var | 0.332474 |
| S.E. of regression | 0.236896 | Akaike info criterion | 0.026361 |
| Sum squared resid | 1.459117 | Schwarz criterion | 0.121519 |
| Log likelihood | 1.630941 | Hannan-Quinn criter. | 0.055452 |
| F-statistic | 27.18160 | Durbin-Watson stat | 1.950567 |
| Prob(F-statistic) | 0.000019 | | |


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Null Hypothesis: D(LOG(FDI)) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -9.283480 | 0.0000 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 0.185942 |
| HAC corrected variance (Bartlett kernel) | 0.186634 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(FDI),2)
Method: Least Squares
Date: 03/06/17 Time: 19:18
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(FDI(-1))) | -1.478089 | 0.159058 | -9.292745 | 0.0000 |
| C | 0.112689 | 0.086478 | 1.303100 | 0.2040 |

| | | | |
|---|---|---|---|
| R-squared | 0.768591 | Mean dependent var | -0.055289 |
| Adjusted R-squared | 0.759691 | S.D. dependent var | 0.912842 |
| S.E. of regression | 0.447488 | Akaike info criterion | 1.298415 |
| Sum squared resid | 5.206381 | Schwarz criterion | 1.393572 |
| Log likelihood | -16.17781 | Hannan-Quinn criter. | 1.327505 |
| F-statistic | 86.35512 | Durbin-Watson stat | 1.815491 |
| Prob(F-statistic) | 0.000000 | | |


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Null Hypothesis: D(LOG(EXPT)) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -7.799366 | 0.0000 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 0.070070 |
| HAC corrected variance (Bartlett kernel) | 0.070070 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(EXPT),2)
Method: Least Squares
Date: 03/06/17 Time: 19:19
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(EXPT(-1))) | -1.354976 | 0.173729 | -7.799366 | 0.0000 |
| C | -0.029001 | 0.051953 | -0.558217 | 0.5815 |

| | | | |
|---|---|---|---|
| R-squared | 0.700565 | Mean dependent var | -0.044742 |
| Adjusted R-squared | 0.689048 | S.D. dependent var | 0.492619 |
| S.E. of regression | 0.274700 | Akaike info criterion | 0.322471 |
| Sum squared resid | 1.961955 | Schwarz criterion | 0.417629 |
| Log likelihood | -2.514599 | Hannan-Quinn criter. | 0.351562 |
| F-statistic | 60.83011 | Durbin-Watson stat | 1.795914 |
| Prob(F-statistic) | 0.000000 | | |


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Null Hypothesis: D(LOG(IMPT)) has a unit root
Exogenous: Constant
Bandwidth: 14 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -7.797039 | 0.0000 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 0.078941 |
| HAC corrected variance (Bartlett kernel) | 0.074129 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(IMPT),2)
Method: Least Squares
Date: 03/06/17 Time: 19:19
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(IMPT(-1))) | -1.371314 | 0.178045 | -7.702074 | 0.0000 |
| C | -0.008670 | 0.055114 | -0.157306 | 0.8762 |

| | | | |
|---|---|---|---|
| R-squared | 0.695272 | Mean dependent var | -0.017478 |
| Adjusted R-squared | 0.683552 | S.D. dependent var | 0.518314 |
| S.E. of regression | 0.291571 | Akaike info criterion | 0.441681 |
| Sum squared resid | 2.210352 | Schwarz criterion | 0.536839 |
| Log likelihood | -4.183540 | Hannan-Quinn criter. | 0.470772 |
| F-statistic | 59.32195 | Durbin-Watson stat | 1.895239 |
| Prob(F-statistic) | 0.000000 | | |


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At Level

Null Hypothesis: LOG(INFL) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -3.004662 | 0.0462 |
| Test critical values: | 1% level | -3.679322 | |
| | 5% level | -2.967767 | |
| | 10% level | -2.622989 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 0.370469 |
| HAC corrected variance (Bartlett kernel) | 0.451132 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(INFL))
Method: Least Squares
Date: 03/06/17 Time: 19:20
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| LOG(INFL(-1)) | -0.439763 | 0.154587 | -2.844751 | 0.0084 |
| C | 1.207832 | 0.435122 | 2.775846 | 0.0099 |

| | | | |
|---|---|---|---|
| R-squared | 0.230607 | Mean dependent var | 0.015714 |
| Adjusted R-squared | 0.202111 | S.D. dependent var | 0.706191 |
| S.E. of regression | 0.630802 | Akaike info criterion | 1.982823 |
| Sum squared resid | 10.74361 | Schwarz criterion | 2.077120 |
| Log likelihood | -26.75094 | Hannan-Quinn criter. | 2.012356 |
| F-statistic | 8.092609 | Durbin-Watson stat | 1.556267 |
| Prob(F-statistic) | 0.008376 | | |


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At Level

Null Hypothesis: LOG(INTR) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -5.026009 | 0.0003 |
| Test critical values: | 1% level | -3.679322 | |
| | 5% level | -2.967767 | |
| | 10% level | -2.622989 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 1.554505 |
| HAC corrected variance (Bartlett kernel) | 1.499469 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(INTR))
Method: Least Squares
Date: 03/06/17 Time: 19:20
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| LOG(INTR(-1)) | -0.969408 | 0.192661 | -5.031670 | 0.0000 |
| C | 1.285172 | 0.337632 | 3.806426 | 0.0007 |

| | | | |
|---|---|---|---|
| R-squared | 0.483922 | Mean dependent var | 0.089992 |
| Adjusted R-squared | 0.464808 | S.D. dependent var | 1.766276 |
| S.E. of regression | 1.292151 | Akaike info criterion | 3.416966 |
| Sum squared resid | 45.08066 | Schwarz criterion | 3.511262 |
| Log likelihood | -47.54600 | Hannan-Quinn criter. | 3.446498 |
| F-statistic | 25.31770 | Durbin-Watson stat | 1.999497 |
| Prob(F-statistic) | 0.000028 | | |


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Null Hypothesis: D(LOG(INVT)) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -5.038318 | 0.0003 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 0.044348 |
| HAC corrected variance (Bartlett kernel) | 0.044348 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(INVT),2)
Method: Least Squares
Date: 03/06/17 Time: 19:21
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(INVT(-1))) | -0.969342 | 0.192394 | -5.038318 | 0.0000 |
| C | 0.007187 | 0.041300 | 0.174029 | 0.8632 |

| | | | |
|---|---|---|---|
| R-squared | 0.494012 | Mean dependent var | 0.006967 |
| Adjusted R-squared | 0.474551 | S.D. dependent var | 0.301485 |
| S.E. of regression | 0.218540 | Akaike info criterion | -0.134949 |
| Sum squared resid | 1.241750 | Schwarz criterion | -0.039791 |
| Log likelihood | 3.889283 | Hannan-Quinn criter. | -0.105858 |
| F-statistic | 25.38465 | Durbin-Watson stat | 2.011208 |
| Prob(F-statistic) | 0.000030 | | |


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Null Hypothesis: D(LOG(UNEMP)) has a unit root
Exogenous: Constant
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -6.078330 | 0.0000 |
| Test critical values: | 1% level | -3.689194 | |
| | 5% level | -2.971853 | |
| | 10% level | -2.625121 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 0.086144 |
| HAC corrected variance (Bartlett kernel) | 0.055207 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(UNEMP),2)
Method: Least Squares
Date: 03/06/17 Time: 19:21
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG(UNEMP(-1))) | -1.075845 | 0.186473 | -5.769425 | 0.0000 |
| C | 0.045997 | 0.057705 | 0.797100 | 0.4326 |

| | | | |
|---|---|---|---|
| R-squared | 0.561450 | Mean dependent var | 0.022421 |
| Adjusted R-squared | 0.544583 | S.D. dependent var | 0.451335 |
| S.E. of regression | 0.304582 | Akaike info criterion | 0.528996 |
| Sum squared resid | 2.412024 | Schwarz criterion | 0.624153 |
| Log likelihood | -5.405943 | Hannan-Quinn criter. | 0.558087 |
| F-statistic | 33.28626 | Durbin-Watson stat | 2.001433 |
| Prob(F-statistic) | 0.000004 | | |


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At Level

Null Hypothesis: LOG(EXCR) has a unit root
Exogenous: Constant
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

| | | Adj. t-Stat | Prob.* |
|---|---|---|---|
| Phillips-Perron test statistic | | -3.423399 | 0.0183 |
| Test critical values: | 1% level | -3.679322 | |
| | 5% level | -2.967767 | |
| | 10% level | -2.622989 | |

*MacKinnon (1996) one-sided p-values.

| | |
|---|---|
| Residual variance (no correction) | 0.074376 |
| HAC corrected variance (Bartlett kernel) | 0.042502 |

Phillips-Perron Test Equation
Dependent Variable: D(LOG(EXCR))
Method: Least Squares
Date: 03/06/17 Time: 19:22
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| LOG(EXCR(-1)) | -0.109792 | 0.038917 | -2.821222 | 0.0089 |
| C | 0.575414 | 0.155658 | 3.696665 | 0.0010 |

| | | | |
|---|---|---|---|
| R-squared | 0.227673 | Mean dependent var | 0.161986 |
| Adjusted R-squared | 0.199068 | S.D. dependent var | 0.315817 |
| S.E. of regression | 0.282640 | Akaike info criterion | 0.377183 |
| Sum squared resid | 2.156897 | Schwarz criterion | 0.471479 |
| Log likelihood | -3.469155 | Hannan-Quinn criter. | 0.406715 |
| F-statistic | 7.959292 | Durbin-Watson stat | 2.103860 |
| Prob(F-statistic) | 0.008863 | | |


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Cointegration Test

Date: 03/06/17 Time: 19:23
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments
Trend assumption: Linear deterministic trend
Series: RGDP GDP_RATE PCP_GDP MANG_RATE
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | 0.05 Critical Value | Prob.** |
|---|---|---|---|---|
| None * | 0.582573 | 49.56948 | 47.85613 | 0.0342 |
| At most 1 | 0.449965 | 25.10741 | 29.79707 | 0.1576 |
| At most 2 | 0.255340 | 8.369753 | 15.49471 | 0.4267 |
| At most 3 | 0.004084 | 0.114594 | 3.841466 | 0.7350 |

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

| Hypothesized No. of CE(s) | Eigenvalue | Max-Eigen Statistic | 0.05 Critical Value | Prob.** |
|---|---|---|---|---|
| None | 0.582573 | 24.46208 | 27.58434 | 0.1194 |
| At most 1 | 0.449965 | 16.73765 | 21.13162 | 0.1847 |
| At most 2 | 0.255340 | 8.255159 | 14.26460 | 0.3534 |
| At most 3 | 0.004084 | 0.114594 | 3.841466 | 0.7350 |

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

| RGDP | GDP_RATE | PCP_GDP | MANG_RATE |
|---|---|---|---|
| -1.39E-10 | -0.090507 | 0.026392 | 0.245756 |
| -1.72E-11 | 0.227637 | 0.003294 | 0.289013 |
| -5.62E-12 | 0.009801 | 0.000111 | -0.631537 |
| 1.21E-10 | -0.041932 | -0.018323 | -0.262054 |

Unrestricted Adjustment Coefficients (alpha):



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| | | | | |
|---|---|---|---|---|
| D(RGDP) | 1.96E+10 | 4.36E+09 | 1.56E+10 | 9.21E+08 |
| D(GDP_RATE) | 0.574135 | -4.060425 | -0.194744 | 0.226292 |
| D(PCP_GDP) | 106.1107 | 28.55061 | 97.72766 | 6.368506 |
| D(MANG_RATE) | 0.251176 | -0.104630 | 0.455430 | -0.018889 |

1 Cointegrating Equation(s): Log likelihood -962.6800

Normalized cointegrating coefficients (standard error in parentheses)

| RGDP | GDP_RATE | PCP_GDP | MANG_RATE |
|---|---|---|---|
| 1.000000 | 6.51E+08 | -1.90E+08 | -1.77E+09 |
| | (3.2E+08) | (4783149) | (9.0E+08) |

Adjustment coefficients (standard error in parentheses)

| | |
|---|---|
| D(RGDP) | -2.718480 |
| | (1.14034) |
| D(GDP_RATE) | -7.98E-11 |
| | (2.1E-10) |
| D(PCP_GDP) | -1.48E-08 |
| | (7.1E-09) |
| D(MANG_RATE) | -3.49E-11 |
| | (2.9E-11) |

2 Cointegrating Equation(s): Log likelihood -954.3112

Normalized cointegrating coefficients (standard error in parentheses)

| RGDP | GDP_RATE | PCP_GDP | MANG_RATE |
|---|---|---|---|
| 1.000000 | 0.000000 | -1.90E+08 | -2.47E+09 |
| | | (4920519) | (9.1E+08) |
| 0.000000 | 1.000000 | 9.45E-05 | 1.082456 |
| | | (0.00350) | (0.64983) |

Adjustment coefficients (standard error in parentheses)

| | | |
|---|---|---|
| D(RGDP) | -2.793563 | -7.78E+08 |
| | (1.14168) | (2.0E+09) |
| D(GDP_RATE) | -9.85E-12 | -0.976265 |
| | (1.7E-10) | (0.30037) |
| D(PCP_GDP) | -1.52E-08 | -3.104567 |
| | (7.1E-09) | (12.4032) |



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| | | | |
|---|---|---|---|
| D(MANG_RATE) | -3.31E-11 | -0.046551 | |
| | (2.9E-11) | (0.05113) | |

| | | |
|---|---|---|
| 3 Cointegrating Equation(s): | Log likelihood | -950.1836 |

Normalized cointegrating coefficients (standard error in parentheses)

| RGDP | GDP_RATE | PCP_GDP | MANG_RATE |
|---|---|---|---|
| 1.000000 | 0.000000 | 0.000000 | 1.28E+11 |
| | | | (4.5E+10) |
| 0.000000 | 1.000000 | 0.000000 | 1.017664 |
| | | | (0.61520) |
| 0.000000 | 0.000000 | 1.000000 | 685.5724 |
| | | | (236.455) |

Adjustment coefficients (standard error in parentheses)

| | | | |
|---|---|---|---|
| D(RGDP) | -2.881384 | -6.25E+08 | 5.32E+08 |
| | (1.04277) | (1.8E+09) | (2.0E+08) |
| D(GDP_RATE) | -8.75E-12 | -0.978174 | 0.001756 |
| | (1.7E-10) | (0.30044) | (0.03259) |
| D(PCP_GDP) | -1.58E-08 | -2.146769 | 2.905431 |
| | (6.5E-09) | (11.3133) | (1.22735) |
| D(MANG_RATE) | -3.57E-11 | -0.042087 | 0.006335 |
| | (2.6E-11) | (0.04529) | (0.00491) |


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Date: 03/06/17 Time: 19:24
Sample (adjusted): 1988 2015
Included observations: 28 after adjustments
Trend assumption: Linear deterministic trend
Series: FDI EXPT IMPT INFL INTR INVT
UNEMP EXCR
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | 0.05 Critical Value | Prob.** |
|---|---|---|---|---|
| None * | 0.984312 | 315.2652 | 159.5297 | 0.0000 |
| At most 1 * | 0.905328 | 198.9290 | 125.6154 | 0.0000 |
| At most 2 * | 0.834200 | 132.9236 | 95.75366 | 0.0000 |
| At most 3 * | 0.734509 | 82.60835 | 69.81889 | 0.0034 |
| At most 4 | 0.548681 | 45.47549 | 47.85613 | 0.0823 |
| At most 5 | 0.376151 | 23.19923 | 29.79707 | 0.2364 |
| At most 6 | 0.299354 | 9.987497 | 15.49471 | 0.2817 |
| At most 7 | 0.000943 | 0.026424 | 3.841466 | 0.8708 |

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

| Hypothesized No. of CE(s) | Eigenvalue | Max-Eigen Statistic | 0.05 Critical Value | Prob.** |
|---|---|---|---|---|
| None * | 0.984312 | 116.3362 | 52.36261 | 0.0000 |
| At most 1 * | 0.905328 | 66.00537 | 46.23142 | 0.0001 |
| At most 2 * | 0.834200 | 50.31527 | 40.07757 | 0.0025 |
| At most 3 * | 0.734509 | 37.13286 | 33.87687 | 0.0197 |
| At most 4 | 0.548681 | 22.27627 | 27.58434 | 0.2065 |
| At most 5 | 0.376151 | 13.21173 | 21.13162 | 0.4330 |
| At most 6 | 0.299354 | 9.961073 | 14.26460 | 0.2145 |
| At most 7 | 0.000943 | 0.026424 | 3.841466 | 0.8708 |

Max-eigenvalue 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

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

| FDI | EXPT | IMPT | INFL | INTR | INVT | UNEMP | EXCR |
|---|---|---|---|---|---|---|---|
| 1.43E-10 | -0.000607 | -0.051029 | 0.088060 | 0.143795 | 0.176510 | -0.295221 | 0.013729 |



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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2.02E-10 | 0.081871 | -0.219864 | -0.001733 | 0.188243 | -0.253912 | 0.240969 | -0.013053 |
| -1.04E-10 | 0.143315 | -0.049993 | 0.009492 | -0.082789 | -0.312753 | 0.344672 | 0.000540 |
| 6.69E-11 | -0.021824 | -0.091518 | -0.025211 | -0.213957 | -0.083032 | -0.027064 | -0.002007 |
| 3.90E-10 | -0.137422 | -0.056079 | -0.000655 | 0.052172 | -0.210843 | -0.501849 | -0.013871 |
| -2.13E-10 | -0.071295 | 0.079690 | 0.007760 | -0.061412 | -0.102585 | 0.389884 | -0.009407 |
| -3.29E-10 | 0.059655 | -0.102096 | 0.005868 | 0.083350 | 0.226306 | -0.172568 | 0.001765 |
| -7.96E-10 | -0.069721 | 0.001469 | 0.001245 | -0.018036 | -0.195309 | 0.437597 | 0.025697 |

Unrestricted Adjustment Coefficients (alpha):

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| D(FDI) | -2.45E+08 | -3.13E+08 | 3.33E+08 | -1.28E+08 | 4.58E+08 | -2.50E+08 | 1.77E+08 | -15974804 |
| D(EXPT) | -0.421303 | 0.896373 | -0.174107 | 1.835403 | 3.652918 | 1.352362 | 0.839347 | -0.007770 |
| D(IMPT) | -0.674966 | 1.076473 | 3.690052 | 2.081324 | 0.198251 | -0.161999 | 0.734742 | 0.024511 |
| D(INFL) | -12.22207 | -0.956118 | -4.382847 | 2.759905 | -5.176913 | -0.772753 | 3.132886 | -0.044232 |
| D(INTR) | -0.282230 | -3.557859 | 1.895843 | 3.443318 | -0.369854 | 0.579902 | -1.275079 | 0.066472 |
| D(INVT) | 0.014624 | 1.081193 | 0.808981 | 0.169717 | 0.112422 | 0.003861 | -0.615875 | 0.005736 |
| D(UNEMP) | -0.009281 | -0.170873 | -0.734360 | 0.905006 | 0.602859 | -1.103928 | -0.032422 | 0.011888 |
| D(EXCR) | -2.990076 | 1.187311 | -3.656426 | -7.459146 | 1.604802 | 1.987242 | 0.594491 | 0.202972 |

1 Cointegrating Equation(s): Log likelihood -1162.014

Normalized cointegrating coefficients (standard error in parentheses)

| FDI | EXPT | IMPT | INFL | INTR | INVT | UNEMP | EXCR |
|---|---|---|---|---|---|---|---|
| 1.000000 | -4230754. | -3.56E+08 | 6.14E+08 | 1.00E+09 | 1.23E+09 | -2.06E+09 | 95730293 |
| | (5.1E+07) | (5.8E+07) | (1.9E+07) | (7.1E+07) | (1.2E+08) | (1.5E+08) | (5399551) |

Adjustment coefficients (standard error in parentheses)

| | |
|---|---|
| D(FDI) | -0.035133 |
| | (0.03684) |
| D(EXPT) | -6.04E-11 |
| | (2.1E-10) |
| D(IMPT) | -9.68E-11 |
| | (1.7E-10) |
| D(INFL) | -1.75E-09 |
| | (3.7E-10) |
| D(INTR) | -4.05E-11 |
| | (2.3E-10) |
| D(INVT) | 2.10E-12 |
| | (6.3E-11) |
| D(UNEMP) | -1.33E-12 |
| | (8.2E-11) |
| D(EXCR) | -4.29E-10 |
| | (4.2E-10) |

2 Cointegrating Equation(s): Log likelihood -1129.012

Normalized cointegrating coefficients (standard error in



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parentheses)

| FDI | EXPT | IMPT | INFL | INTR | INVT | UNEMP | EXCR |
|---|---|---|---|---|---|---|---|
| 1.000000 | 0.000000 | -3.63E+08 | 6.08E+08 | 1.00E+09 | 1.21E+09 | -2.02E+09 | 94071451 |
| | | (5.3E+07) | (1.9E+07) | (7.0E+07) | (1.2E+08) | (1.4E+08) | (5343584) |
| 0.000000 | 1.000000 | -1.786776 | -1.523855 | -0.178668 | -6.081685 | 7.951256 | -0.392091 |
| | | (0.26977) | (0.09710) | (0.35662) | (0.61722) | (0.70938) | (0.02737) |

Adjustment coefficients (standard error in parentheses)

| | | |
|---|---|---|
| D(FDI) | -0.098437 | -25447374 |
| | (0.06107) | (2.0E+07) |
| D(EXPT) | 1.21E-10 | 0.073643 |
| | (3.5E-10) | (0.11628) |
| D(IMPT) | 1.21E-10 | 0.088542 |
| | (2.9E-10) | (0.09636) |
| D(INFL) | -1.95E-09 | -0.070863 |
| | (6.4E-10) | (0.21242) |
| D(INTR) | -7.61E-10 | -0.291116 |
| | (3.4E-10) | (0.11092) |
| D(INVT) | 2.21E-10 | 0.088510 |
| | (8.8E-11) | (0.02908) |
| D(UNEMP) | -3.59E-11 | -0.013984 |
| | (1.4E-10) | (0.04656) |
| D(EXCR) | -1.88E-10 | 0.099021 |
| | (7.2E-10) | (0.23801) |

| 3 Cointegrating Equation(s): | Log likelihood | -1103.854 |
|---|---|---|

Normalized cointegrating coefficients (standard error in parentheses)

| FDI | EXPT | IMPT | INFL | INTR | INVT | UNEMP | EXCR |
|---|---|---|---|---|---|---|---|
| 1.000000 | 0.000000 | 0.000000 | 1.24E+09 | 1.10E+09 | 2.68E+09 | -4.19E+09 | 2.38E+08 |
| | | | (5.0E+07) | (1.7E+08) | (3.0E+08) | (3.6E+08) | (1.4E+07) |
| 0.000000 | 1.000000 | 0.000000 | 1.564613 | 0.318765 | 1.178143 | -2.717363 | 0.313757 |
| | | | (0.12058) | (0.41289) | (0.72141) | (0.87549) | (0.03386) |
| 0.000000 | 0.000000 | 1.000000 | 1.728514 | 0.278397 | 4.063087 | -5.970875 | 0.395040 |
| | | | (0.10564) | (0.36173) | (0.63202) | (0.76701) | (0.02967) |

Adjustment coefficients (standard error in parentheses)

| | | | |
|---|---|---|---|
| D(FDI) | -0.132995 | 22243345 | 64602912 |
| | (0.06275) | (3.9E+07) | (5.4E+07) |
| D(EXPT) | 1.39E-10 | 0.048691 | -0.166878 |
| | (3.8E-10) | (0.23432) | (0.32820) |
| D(IMPT) | -2.62E-10 | 0.617383 | -0.386711 |
| | (2.1E-10) | (0.13086) | (0.18328) |
| D(INFL) | -1.49E-09 | -0.698992 | 1.053006 |
| | (6.4E-10) | (0.39283) | (0.55020) |
| D(INTR) | -9.58E-10 | -0.019413 | 0.701870 |
| | (3.4E-10) | (0.21108) | (0.29565) |
| D(INVT) | 1.37E-10 | 0.204449 | -0.278905 |



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| | | | |
|---|---|---|---|
| | (8.1E-11) | (0.04946) | (0.06928) |
| D(UNEMP) | 4.03E-11 | -0.119229 | 0.074755 |
| | (1.5E-10) | (0.08940) | (0.12522) |
| D(EXCR) | 1.91E-10 | -0.425001 | 0.074328 |
| | (7.5E-10) | (0.45824) | (0.64183) |

4 Cointegrating Equation(s): Log likelihood -1085.288

Normalized cointegrating coefficients (standard error in parentheses)

| FDI | EXPT | IMPT | INFL | INTR | INVT | UNEMP | EXCR |
|---|---|---|---|---|---|---|---|
| 1.000000 | 0.000000 | 0.000000 | 0.000000 | 4.84E+09 | 7.05E+08 | 9.59E+08 | -1.30E+08 |
| | | | | (6.1E+08) | (1.2E+09) | (1.5E+09) | (4.8E+07) |
| 0.000000 | 1.000000 | 0.000000 | 0.000000 | 5.052185 | -1.324756 | 3.807870 | -0.151276 |
| | | | | (0.72449) | (1.42142) | (1.74254) | (0.05707) |
| 0.000000 | 0.000000 | 1.000000 | 0.000000 | 5.507666 | 1.297998 | 1.237907 | -0.118708 |
| | | | | (0.80868) | (1.58659) | (1.94502) | (0.06370) |
| 0.000000 | 0.000000 | 0.000000 | 1.000000 | -3.025297 | 1.599692 | -4.170509 | 0.297219 |
| | | | | (0.54272) | (1.06480) | (1.30535) | (0.04275) |

Adjustment coefficients (standard error in parentheses)

| | | | | |
|---|---|---|---|---|
| D(FDI) | -0.141532 | 25026640 | 76274522 | -14657363 |
| | (0.06412) | (3.9E+07) | (5.8E+07) | (2.1E+07) |
| D(EXPT) | 2.62E-10 | 0.008635 | -0.334850 | -0.086579 |
| | (3.7E-10) | (0.22512) | (0.33619) | (0.12454) |
| D(IMPT) | -1.23E-10 | 0.571960 | -0.577190 | -0.078748 |
| | (1.7E-10) | (0.10369) | (0.15485) | (0.05736) |
| D(INFL) | -1.31E-09 | -0.759224 | 0.800425 | -1.185806 |
| | (6.3E-10) | (0.38116) | (0.56922) | (0.21086) |
| D(INTR) | -7.27E-10 | -0.094560 | 0.386745 | -0.087501 |
| | (2.7E-10) | (0.16455) | (0.24574) | (0.09103) |
| D(INVT) | 1.48E-10 | 0.200745 | -0.294438 | 0.002814 |
| | (8.2E-11) | (0.04945) | (0.07384) | (0.02736) |
| D(UNEMP) | 1.01E-10 | -0.138980 | -0.008069 | -0.030308 |
| | (1.4E-10) | (0.08289) | (0.12379) | (0.04586) |
| D(EXCR) | -3.08E-10 | -0.262212 | 0.756973 | -0.112020 |
| | (6.0E-10) | (0.35774) | (0.53425) | (0.19791) |

5 Cointegrating Equation(s): Log likelihood -1074.150

Normalized cointegrating coefficients (standard error in parentheses)

| FDI | EXPT | IMPT | INFL | INTR | INVT | UNEMP | EXCR |
|---|---|---|---|---|---|---|---|
| 1.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | -2.74E+09 | -6.98E+08 | -74777461 |
| | | | | | (7.3E+08) | (9.2E+08) | (3.0E+07) |
| 0.000000 | 1.000000 | 0.000000 | 0.000000 | 0.000000 | -4.914582 | 2.079171 | -0.094013 |
| | | | | | (1.03718) | (1.29876) | (0.04215) |
| 0.000000 | 0.000000 | 1.000000 | 0.000000 | 0.000000 | -2.615470 | -0.646643 | -0.056282 |



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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | (0.98675) | (1.23561) | (0.04010) |
| 0.000000 | 0.000000 | 0.000000 | 1.000000 | 0.000000 | 3.749314 | -3.135347 | 0.262929 |
| | | | | | (0.56430) | (0.70662) | (0.02293) |
| 0.000000 | 0.000000 | 0.000000 | 0.000000 | 1.000000 | 0.710549 | 0.342168 | -0.011334 |
| | | | | | (0.27113) | (0.33951) | (0.01102) |

Adjustment coefficients (standard error in parentheses)

| | | | | | |
|---|---|---|---|---|---|
| D(FDI) | 0.037384 | -37973392 | 50565358 | -14957428 | -70423559 |
| | (0.09791) | (4.4E+07) | (5.2E+07) | (1.9E+07) | (6.8E+07) |
| D(EXPT) | 1.69E-09 | -0.493355 | -0.539703 | -0.088970 | -0.079548 |
| | (5.0E-10) | (0.22507) | (0.26574) | (0.09603) | (0.34809) |
| D(IMPT) | -4.53E-11 | 0.544716 | -0.588307 | -0.078878 | -0.634884 |
| | (3.0E-10) | (0.13407) | (0.15830) | (0.05720) | (0.20735) |
| D(INFL) | -3.33E-09 | -0.047804 | 1.090743 | -1.182418 | -2.435194 |
| | (9.3E-10) | (0.41817) | (0.49372) | (0.17842) | (0.64672) |
| D(INTR) | -8.72E-10 | -0.043734 | 0.407486 | -0.087259 | -1.623300 |
| | (4.7E-10) | (0.21254) | (0.25093) | (0.09068) | (0.32870) |
| D(INVT) | 1.92E-10 | 0.185296 | -0.300742 | 0.002741 | 0.108209 |
| | (1.4E-10) | (0.06386) | (0.07540) | (0.02725) | (0.09876) |
| D(UNEMP) | 3.36E-10 | -0.221826 | -0.041877 | -0.030703 | -0.134884 |
| | (2.3E-10) | (0.10301) | (0.12162) | (0.04395) | (0.15931) |
| D(EXCR) | 3.18E-10 | -0.482747 | 0.666977 | -0.113070 | 1.775923 |
| | (1.0E-09) | (0.45662) | (0.53912) | (0.19482) | (0.70618) |

| | | |
|---|---|---|
| 6 Cointegrating Equation(s): | Log likelihood | -1067.544 |

Normalized cointegrating coefficients (standard error in parentheses)

| FDI | EXPT | IMPT | INFL | INTR | INVT | UNEMP | EXCR |
|---|---|---|---|---|---|---|---|
| 1.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | -2.33E+09 | 27153002 |
| | | | | | | (4.9E+08) | (2.3E+07) |
| 0.000000 | 1.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | -0.859286 | 0.089128 |
| | | | | | | (0.82850) | (0.03828) |
| 0.000000 | 0.000000 | 1.000000 | 0.000000 | 0.000000 | 0.000000 | -2.210447 | 0.041183 |
| | | | | | | (0.62970) | (0.02910) |
| 0.000000 | 0.000000 | 0.000000 | 1.000000 | 0.000000 | 0.000000 | -0.893610 | 0.123212 |
| | | | | | | (0.69457) | (0.03209) |
| 0.000000 | 0.000000 | 0.000000 | 0.000000 | 1.000000 | 0.000000 | 0.767010 | -0.037813 |
| | | | | | | (0.23916) | (0.01105) |
| 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 1.000000 | -0.597906 | 0.037265 |
| | | | | | | (0.22294) | (0.01030) |

Adjustment coefficients (standard error in parentheses)

| | | | | | | |
|---|---|---|---|---|---|---|
| D(FDI) | 0.090658 | -20159697 | 30654215 | -16896437 | -55079317 | -1.28E+08 |
| | (0.10265) | (4.5E+07) | (5.2E+07) | (1.8E+07) | (6.6E+07) | (9.9E+07) |
| D(EXPT) | 1.40E-09 | -0.589772 | -0.431934 | -0.078475 | -0.162599 | -1.308834 |
| | (5.2E-10) | (0.22568) | (0.26509) | (0.09176) | (0.33698) | (0.50158) |
| D(IMPT) | -1.08E-11 | 0.556266 | -0.601217 | -0.080135 | -0.624936 | -1.744542 |
| | (3.2E-10) | (0.14093) | (0.16554) | (0.05730) | (0.21043) | (0.31322) |



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| | | | | | | |
|---|---|---|---|---|---|---|
| D(INFL) | -3.16E-09 | 0.007290 | 1.029162 | -1.188415 | -2.387738 | 0.397835 |
| | (1.0E-09) | (0.43844) | (0.51500) | (0.17826) | (0.65466) | (0.97444) |
| D(INTR) | -9.95E-10 | -0.085078 | 0.453698 | -0.082759 | -1.658913 | -0.006780 |
| | (5.1E-10) | (0.22166) | (0.26037) | (0.09012) | (0.33097) | (0.49264) |
| D(INVT) | 1.91E-10 | 0.185021 | -0.300434 | 0.002771 | 0.107972 | -0.563150 |
| | (1.6E-10) | (0.06725) | (0.07900) | (0.02734) | (0.10042) | (0.14947) |
| D(UNEMP) | 5.72E-10 | -0.143121 | -0.129849 | -0.039270 | -0.067090 | 0.182415 |
| | (2.1E-10) | (0.09093) | (0.10681) | (0.03697) | (0.13578) | (0.20210) |
| D(EXCR) | -1.05E-10 | -0.624427 | 0.825340 | -0.097648 | 1.653883 | 0.391436 |
| | (1.1E-09) | (0.46894) | (0.55083) | (0.19066) | (0.70020) | (1.04223) |

| 7 Cointegrating Equation(s): | Log likelihood | -1062.563 |
|---|---|---|

Normalized cointegrating coefficients (standard error in parentheses)

| FDI | EXPT | IMPT | INFL | INTR | INVT | UNEMP | EXCR |
|---|---|---|---|---|---|---|---|
| 1.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 19119359 |
| | | | | | | | (1.8E+07) |
| 0.000000 | 1.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.086169 |
| | | | | | | | (0.03300) |
| 0.000000 | 0.000000 | 1.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.033572 |
| | | | | | | | (0.01996) |
| 0.000000 | 0.000000 | 0.000000 | 1.000000 | 0.000000 | 0.000000 | 0.000000 | 0.120135 |
| | | | | | | | (0.03415) |
| 0.000000 | 0.000000 | 0.000000 | 0.000000 | 1.000000 | 0.000000 | 0.000000 | -0.035172 |
| | | | | | | | (0.01130) |
| 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 1.000000 | 0.000000 | 0.035206 |
| | | | | | | | (0.01172) |
| 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 1.000000 | -0.003443 |
| | | | | | | | (0.01023) |

Adjustment coefficients (standard error in parentheses)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| D(FDI) | 0.032506 | -9602691. | 12586419 | -15858054 | -40328965 | -88323318 | -2.43E+08 |
| | (0.11838) | (4.5E+07) | (5.5E+07) | (1.8E+07) | (6.7E+07) | (1.1E+08) | (1.6E+08) |
| D(EXPT) | 1.12E-09 | -0.539701 | -0.517628 | -0.073550 | -0.092640 | -1.118885 | -1.220102 |
| | (6.0E-10) | (0.22864) | (0.27811) | (0.09010) | (0.34003) | (0.53857) | (0.81293) |
| D(IMPT) | -2.52E-10 | 0.600096 | -0.676231 | -0.075824 | -0.563695 | -1.578265 | 1.384742 |
| | (3.7E-10) | (0.13990) | (0.17017) | (0.05513) | (0.20805) | (0.32954) | (0.49741) |
| D(INFL) | -4.19E-09 | 0.194181 | 0.709306 | -1.170032 | -2.126612 | 1.106825 | 3.548591 |
| | (1.1E-09) | (0.41874) | (0.50934) | (0.16500) | (0.62273) | (0.98634) | (1.48882) |
| D(INTR) | -5.76E-10 | -0.161142 | 0.583879 | -0.090241 | -1.765191 | -0.295337 | 0.417984 |
| | (5.7E-10) | (0.21800) | (0.26517) | (0.08591) | (0.32421) | (0.51351) | (0.77511) |
| D(INVT) | 3.94E-10 | 0.148281 | -0.237556 | -0.000843 | 0.056638 | -0.702526 | 0.581823 |
| | (1.6E-10) | (0.06058) | (0.07369) | (0.02387) | (0.09009) | (0.14270) | (0.21540) |
| D(UNEMP) | 5.82E-10 | -0.145055 | -0.126539 | -0.039460 | -0.069792 | 0.175078 | -1.043394 |
| | (2.5E-10) | (0.09400) | (0.11433) | (0.03704) | (0.13979) | (0.22141) | (0.33420) |
| D(EXCR) | -3.01E-10 | -0.588963 | 0.764645 | -0.094160 | 1.703434 | 0.525973 | -0.022717 |
| | (1.3E-09) | (0.48369) | (0.58835) | (0.19060) | (0.71933) | (1.13935) | (1.71978) |



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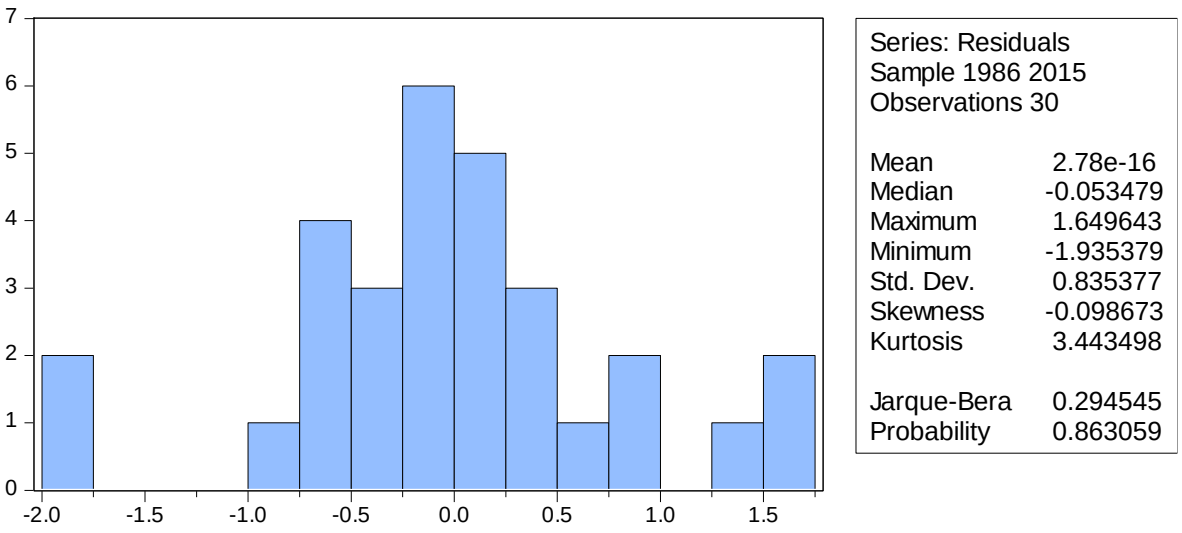
Dependent Variable: LOG(GDP_RATE)
Method: Least Squares
Date: 03/06/17 Time: 19:34
Sample: 1986 2015
Included observations: 30

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 2.775867 | 1.213241 | 2.287976 | 0.0312 |
| CPI | -0.003430 | 0.010206 | -0.336043 | 0.7398 |
| PCP_GDP | 0.000469 | 0.000237 | 1.981582 | 0.0591 |
| MANG_RATE | -0.275633 | 0.130500 | -2.112135 | 0.0453 |
| INVT | 0.012470 | 0.077300 | 0.161324 | 0.8732 |
| IMPT | -0.022255 | 0.029921 | -0.743772 | 0.4642 |

| | | | |
|---|---|---|---|
| R-squared | 0.314570 | Mean dependent var | 1.270454 |
| Adjusted R-squared | 0.171772 | S.D. dependent var | 1.009023 |
| S.E. of regression | 0.918282 | Akaike info criterion | 2.844231 |
| Sum squared resid | 20.23779 | Schwarz criterion | 3.124471 |
| Log likelihood | -36.66347 | Hannan-Quinn criter. | 2.933882 |
| F-statistic | 2.202904 | Durbin-Watson stat | 1.816794 |
| Prob(F-statistic) | 0.087369 | | |





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Breusch-Godfrey Serial Correlation LM Test:

| | | | |
|---|---|---|---|
| F-statistic | 0.566995 | Prob. F(2,22) | 0.5753 |
| Obs*R-squared | 1.470551 | Prob. Chi-Square(2) | 0.4794 |

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 03/06/17 Time: 19:36
Sample: 1986 2015
Included observations: 30
Presample missing value lagged residuals set to zero.

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.378004 | 1.324084 | 0.285484 | 0.7779 |
| CPI | -0.002219 | 0.011316 | -0.196067 | 0.8464 |
| PCP_GDP | -3.66E-05 | 0.000247 | -0.148255 | 0.8835 |
| MANG_RATE | -0.045656 | 0.140581 | -0.324769 | 0.7484 |
| INVT | 0.015687 | 0.080202 | 0.195591 | 0.8467 |
| IMPT | -0.010104 | 0.032676 | -0.309226 | 0.7601 |
| RESID(-1) | 0.095388 | 0.216071 | 0.441465 | 0.6632 |
| RESID(-2) | -0.233205 | 0.240357 | -0.970243 | 0.3425 |

| | | | |
|---|---|---|---|
| R-squared | 0.049018 | Mean dependent var | 2.78E-16 |
| Adjusted R-squared | -0.253567 | S.D. dependent var | 0.835377 |
| S.E. of regression | 0.935311 | Akaike info criterion | 2.927304 |
| Sum squared resid | 19.24576 | Schwarz criterion | 3.300957 |
| Log likelihood | -35.90956 | Hannan-Quinn criter. | 3.046839 |
| F-statistic | 0.161999 | Durbin-Watson stat | 2.034456 |
| Prob(F-statistic) | 0.990292 | | |


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Heteroskedasticity Test: Breusch-Pagan-Godfrey

| | | | |
|---|---|---|---|
| F-statistic | 1.315737 | Prob. F(5,24) | 0.2908 |
| Obs*R-squared | 6.454188 | Prob. Chi-Square(5) | 0.2645 |
| Scaled explained SS | 5.046654 | Prob. Chi-Square(5) | 0.4102 |

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 03/06/17 Time: 19:37
Sample: 1986 2015
Included observations: 30

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 2.825489 | 1.379971 | 2.047498 | 0.0517 |
| CPI | 0.002272 | 0.011609 | 0.195729 | 0.8465 |
| PCP_GDP | -0.000430 | 0.000269 | -1.595043 | 0.1238 |
| MANG_RATE | -0.071563 | 0.148434 | -0.482119 | 0.6341 |
| INVT | -0.015689 | 0.087923 | -0.178443 | 0.8599 |
| IMPT | -0.056231 | 0.034033 | -1.652246 | 0.1115 |

| | | | |
|---|---|---|---|
| R-squared | 0.215140 | Mean dependent var | 0.674593 |
| Adjusted R-squared | 0.051627 | S.D. dependent var | 1.072530 |
| S.E. of regression | 1.044477 | Akaike info criterion | 3.101766 |
| Sum squared resid | 26.18238 | Schwarz criterion | 3.382006 |
| Log likelihood | -40.52649 | Hannan-Quinn criter. | 3.191417 |
| F-statistic | 1.315737 | Durbin-Watson stat | 2.314114 |
| Prob(F-statistic) | 0.290800 | | |


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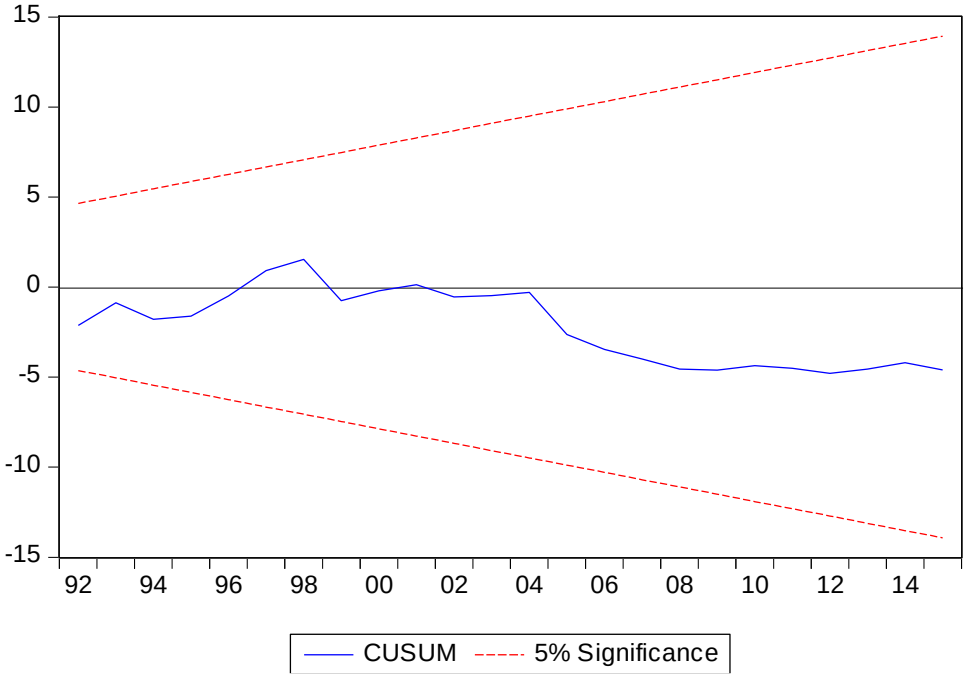



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Model 2

Dependent Variable: LOG(RGDP)
Method: Least Squares
Date: 03/06/17 Time: 19:41
Sample: 1986 2015
Included observations: 30

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 23.29717 | 0.507516 | 45.90432 | 0.0000 |
| UNEMP | 0.019094 | 0.026363 | 0.724262 | 0.4762 |
| FDI | 1.26E-10 | 3.97E-11 | 3.180332 | 0.0042 |
| EXCR | 0.011469 | 0.001642 | 6.986858 | 0.0000 |
| EXPT | -0.008748 | 0.009155 | -0.955602 | 0.3492 |
| INVT | 0.047012 | 0.026008 | 1.807614 | 0.0838 |
| INTR | 0.000135 | 0.008882 | 0.015211 | 0.9880 |

| | | | |
|---|---|---|---|
| R-squared | 0.923080 | Mean dependent var | 25.00176 |
| Adjusted R-squared | 0.903013 | S.D. dependent var | 1.168095 |
| S.E. of regression | 0.363776 | Akaike info criterion | 1.016405 |
| Sum squared resid | 3.043653 | Schwarz criterion | 1.343351 |
| Log likelihood | -8.246071 | Hannan-Quinn criter. | 1.120998 |
| F-statistic | 46.00178 | Durbin-Watson stat | 1.332313 |
| Prob(F-statistic) | 0.000000 | | |

Model 3

Dependent Variable: LOG(UNEMP)
Method: Least Squares
Date: 03/06/17 Time: 19:48
Sample: 1986 2015
Included observations: 30

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -3.641259 | 2.913807 | -1.249657 | 0.2240 |
| LOG(RGDP) | 0.113061 | 0.146879 | 0.769757 | 0.4493 |
| LOG(FDI) | 0.132865 | 0.126149 | 1.053240 | 0.3032 |
| LOG(INVT) | 0.557206 | 0.237453 | 2.346595 | 0.0279 |
| LOG(IMPT) | -0.039197 | 0.237563 | -0.164995 | 0.8704 |
| LOG(EXPT) | -0.355413 | 0.234428 | -1.516085 | 0.1431 |
| LOG(EXCR) | -0.051478 | 0.100340 | -0.513037 | 0.6128 |



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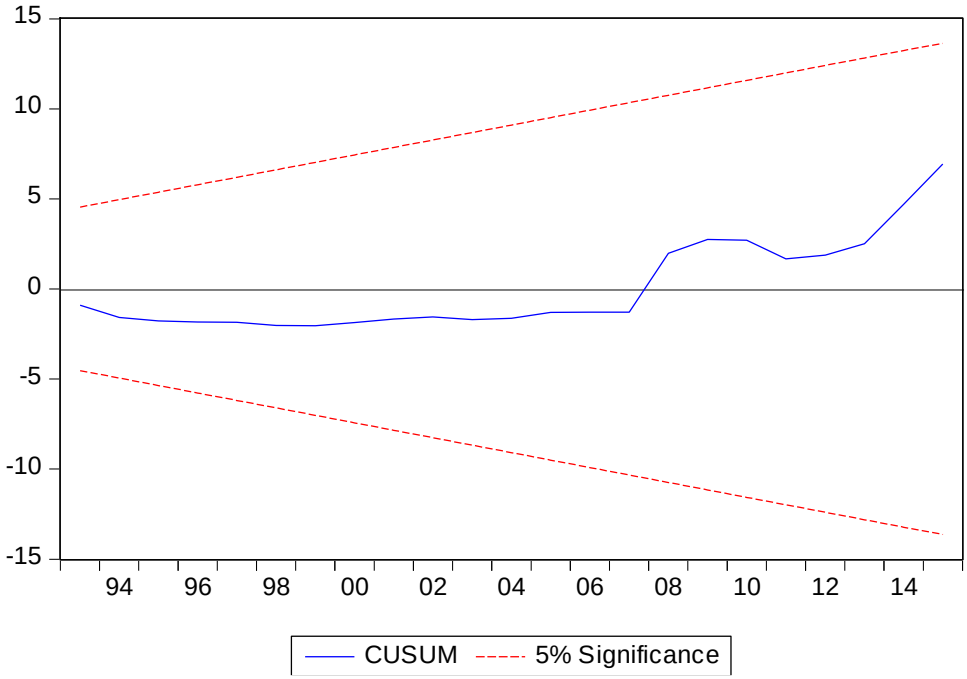
| | | | |
|---|---|---|---|
| R-squared | 0.693637 | Mean dependent var | 1.806821 |
| Adjusted R-squared | 0.613717 | S.D. dependent var | 0.469751 |
| S.E. of regression | 0.291958 | Akaike info criterion | 0.576550 |
| Sum squared resid | 1.960508 | Schwarz criterion | 0.903496 |
| Log likelihood | -1.648252 | Hannan-Quinn criter. | 0.681143 |
| F-statistic | 8.679066 | Durbin-Watson stat | 1.683888 |
| Prob(F-statistic) | 0.000054 | | |

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| | RGDP | UNEMP | CPI | FDI | INVT | IMPT | GDP_ RATE | EXPT | EXCR | INTR | PCP_ GDP | MANG_ RATE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 | 2.07E+10 | 8.50 | 5.717151 | 1.93E+08 | 15.70250 | 10.40073 | 1.000000 | 13.31603 | 1.754523 | 1.000000 | 240.6174 | 9.532040 |
| 1987 | 2.41E+10 | 5.30 | 11.29032 | 6.11E+08 | 12.66393 | 14.70481 | 1.000000 | 26.94186 | 4.016037 | 1.000000 | 272.5077 | 7.097746 |
| 1988 | 2.33E+10 | 5.80 | 54.51122 | 3.79E+08 | 9.848316 | 12.45735 | 7.542522 | 22.85462 | 4.536967 | 1.000000 | 256.3758 | 7.921599 |
| 1989 | 2.42E+10 | 5.80 | 50.46669 | 1.88E+09 | 11.74670 | 16.41044 | 6.467191 | 43.98132 | 7.364735 | 1.000000 | 260.0476 | 5.754452 |
| 1990 | 3.08E+10 | 5.20 | 7.364400 | 5.88E+08 | 14.42773 | 17.68597 | 12.76601 | 35.34425 | 8.038285 | 14.64821 | 321.6684 | 5.495197 |
| 1991 | 2.74E+10 | 5.80 | 13.00697 | 7.12E+08 | 13.79346 | 23.17552 | 1.000000 | 41.70108 | 9.909492 | 2.072104 | 279.2758 | 6.201069 |
| 1992 | 2.93E+10 | 6.70 | 44.58884 | 8.97E+08 | 12.80218 | 23.52160 | 0.433725 | 37.50938 | 17.29843 | 1.000000 | 291.2835 | 5.070092 |
| 1993 | 1.58E+10 | 6.00 | 57.16525 | 1.35E+09 | 13.61295 | 24.27999 | 2.090378 | 33.82986 | 22.06540 | 4.374451 | 153.0757 | 5.700960 |
| 1994 | 1.81E+10 | 5.40 | 57.03171 | 1.96E+09 | 11.19636 | 17.99864 | 0.909763 | 24.31023 | 21.99600 | 1.000000 | 171.0248 | 6.989694 |
| 1995 | 2.85E+10 | 4.10 | 72.83550 | 1.08E+09 | 7.083232 | 24.00634 | 1.000000 | 35.76149 | 21.89526 | 1.000000 | 263.2880 | 5.446356 |
| 1996 | 3.50E+10 | 4.10 | 29.26829 | 1.59E+09 | 7.303718 | 25.45243 | 4.993706 | 32.23857 | 21.88443 | 1.000000 | 314.7399 | 4.917161 |
| 1997 | 3.58E+10 | 4.10 | 8.529874 | 1.54E+09 | 8.372144 | 35.08539 | 2.802256 | 41.77460 | 21.88605 | 16.61355 | 314.2998 | 5.143054 |
| 1998 | 3.20E+10 | 4.10 | 9.996378 | 1.05E+09 | 8.619863 | 36.48173 | 2.715640 | 29.69152 | 21.88600 | 25.28227 | 273.8698 | 5.224296 |
| 1999 | 3.59E+10 | 4.10 | 6.618373 | 1.00E+09 | 7.011568 | 21.97686 | 0.474238 | 33.86953 | 92.33810 | 2.767927 | 299.3568 | 4.725918 |
| 2000 | 4.64E+10 | 4.10 | 6.933292 | 1.14E+09 | 7.031060 | 19.65017 | 5.318093 | 51.73036 | 101.6973 | 1.000000 | 377.5003 | 3.667227 |



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| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2001 | 4.41E+10 | 4.10 | 18.87365 | 1.19E+09 | 7.593798 | 36.36478 | 4.411065 | 45.44807 | 111.2313 | 23.83785 | 350.2602 | 4.213242 |
| 2002 | 5.91E+10 | 4.10 | 12.87658 | 1.87E+09 | 7.020332 | 27.41795 | 3.784648 | 35.96569 | 120.5782 | 1.000000 | 457.3970 | 3.426106 |
| 2003 | 6.77E+10 | 4.10 | 14.03178 | 2.01E+09 | 9.913518 | 35.43100 | 10.35418 | 39.78790 | 129.2224 | 8.613594 | 510.2963 | 3.390342 |
| 2004 | 8.78E+10 | 4.10 | 14.99803 | 1.87E+09 | 7.401317 | 18.28738 | 33.73578 | 30.16075 | 132.8880 | 19.36914 | 645.7639 | 3.061206 |
| 2005 | 1.12E+11 | 4.10 | 17.86349 | 4.98E+09 | 5.467015 | 19.09139 | 3.444667 | 31.65697 | 131.2743 | 1.000000 | 804.0060 | 2.832143 |
| 2006 | 1.45E+11 | 4.10 | 8.239527 | 4.85E+09 | 8.273721 | 21.49798 | 8.210965 | 43.11133 | 128.6517 | 1.000000 | 1014.735 | 2.577617 |
| 2007 | 1.66E+11 | 4.10 | 5.382224 | 6.03E+09 | 9.256423 | 30.73439 | 6.828398 | 33.72852 | 125.8081 | 11.61433 | 1131.148 | 2.521544 |
| 2008 | 2.08E+11 | 15.70 | 11.57798 | 8.20E+09 | 8.329817 | 25.08984 | 6.270264 | 39.88313 | 118.5460 | 4.190484 | 1376.857 | 2.410130 |
| 2009 | 1.69E+11 | 12.40 | 11.53767 | 8.55E+09 | 12.09461 | 31.03424 | 6.934416 | 30.76862 | 148.9017 | 23.70650 | 1091.969 | 2.469561 |
| 2010 | 3.69E+11 | 10.50 | 13.72020 | 6.03E+09 | 17.29074 | 17.38727 | 7.839739 | 25.26412 | 150.2980 | 1.000000 | 2314.964 | 6.552817 |
| 2011 | 4.12E+11 | 8.90 | 10.84079 | 8.84E+09 | 16.21198 | 21.46430 | 4.887387 | 31.32981 | 153.8616 | 5.941526 | 2514.149 | 7.188658 |
| 2012 | 4.61E+11 | 8.60 | 12.21701 | 7.07E+09 | 14.90769 | 12.94139 | 4.279277 | 31.43875 | 157.4994 | 6.883106 | 2739.852 | 7.793216 |


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