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ECONOMIC RECESSION AND INDUSTRIAL GROWTH IN NIGERIA

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ABSTRACT

This paper studied economic recession and industrial growth in Nigeria between the periods Jan 2016 to Dec 2017. The major objective of this research is to assess the industrial sector's growth for the period with a view to determining the extent to which the economic recession indices have affected its growth. The data used for the study were sourced from the CBN statistical bulletin 2017 quarterly edition and we adopted the Chow-Test analysis in order to determine if there exists a structural break in industrial growth for the period. Analysis of the chow-test revealed the existence of a structural break in industrial output starting from June 2016 marking a negative effect of GDP growth rate and inflation rate on industrial sector's output during the one-year period of recession. Furthermore, industrial sector's output increased after the exit from recession in July 2017 with GDP and inflation rates exerting positive relationships with industrial output. The implication of this finding is that the industrial sector has been significantly affected by the recession and that the structural break led to inflation rate and GDP affecting industrial output negatively. It is recommended that the industrial sector be further strengthened towards a steady recovery by way of favourable foreign exchange controls to make

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the sector accessible to needed raw materials and machineries needed to stimulate industrial production, consumption and economic growth in Nigeria.

Keywords: (Economic Recession, Industrial Growth, Structural Break, Chow test, Inflation rate)

1. Introduction

The National Bureau of Statistics cites a significant decline in economic activities spread across the economy, lasting more than a few months as the hallmark of a recession. Recession is a business cycle contraction, and it refers to a general slowdown in economic activity for two consecutive quarters. During recession, there is usually a decline in certain macroeconomic indicators such as GDP, employment, investment spending, capacity utilization, household income, business income, and inflation, with the attendant increase in the rate of unemployment. Technically, when an economy recorded two consecutive quarters of negative growth in real GDP, it can be said to be in recession. GDP is the market value of all legitimately recognized final goods and services produced in the country in a given period of time, usually one year.

Generally, the year 2016 was not the best of moments for the Nigerian economy. The negative growth rate of the GDP for two consecutive quarters (first and second quarter of 2016) confirmed the worst fears of economic units; slipping into a period of economic recession with its attendant high inflation etc.

However, this is not the first of its kind in Nigeria, the country recorded recessions in 1987, 1991 and 1995. In 1987, according to World Bank data, Nigeria had a full year decline in gross domestic product (GDP) declining by 10.8%. During this period, the industrial sector's contribution to GDP declined from N6.234 billion to N6.135 billion (CBN, 2016). Inflation rate was 38% and it reached 40% in 1989.

In 1990, when the economy was slowly recovering from the harsh effects of the 1987 recession, the real GDP recorded yet another slip by declining by 0.55% in 1991. This was followed by a

corresponding increase in the rate of inflation from 7% in 1990 to 44% in 1992 and it passed the 50% mark in 1995 which was termed the worst period of the Nigerian economy by economists. Jalilan and Weiss (2000) noted that the industrial sector is the sector that is badly hit by economic recession. In 2009, the global financial meltdown affected economic activities worldwide and this resulted to a massive decline in stocks of big firms. The industrial firms were not left out of this. The Nigerian economy experienced a steady recovery from this global melt-down and in 2016, the industrial sector growth index dropped to 41.9% in mid year 2016, compared to 45.8% in the beginning of same year 2016. The resultant scaling down of production and reduced staff strength and remuneration had a significant negative impact on the industrial sector coupled with the decline in other sectors which also affected the industries.

This research paper, therefore, focuses on how the 2016 full year recession affected the industrial sector's growth by determining the nature of relationship that exists between inflation and GDP growth rates as key recession indices and industrial sector's growth for the period covering January 2016 to December 2017. Key questions raised to guide this study are: did the monthly rate of inflation and rate of growth in GDP significantly affect the industrial sector during the period the economy slipped into recession? Was there a significant structural break in industrial growth as a result of the economic recession in the second quarter of 2016?

2. LITERATURE REVIEW

2.1 Conceptual Framework:

A global recession is the recession that affects many countries around the world, that is, a period of global economic-slow down or declining economic output (Wikipedia, 2017). However, an economic recession is typically defined as a significant decline in economic activity, real GDP, real income, employment industrial production and sales following a decline in the aggregate demand for at least two consecutive quarters (myaccountrycourse.com, 2017). On the other hand, the National Bureau of Economic Research (NBER) defined recession as a "significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in a real gross domestic product (GDP), real income, employment, industrial production and wholesale-retail sales" (Noko, 2016);

The setup of economic recession gradually induced its effect in ripples: when the government imposes higher interest rates, the cost of money rises, thus lowering consumer and government borrowing. The consumer confidence also declines hence lowering the demand for goods and services; if business operations are difficult to be financed by means of borrowing, the firms start retrenching their staff thereby increasing unemployment. Eventually when recession follows the downward phase of an economy (with stagnation or decline in the investment, reduction of income and increase of unemployment), the economy either enters a recession or it resumes to the expansion phase.

According to Tejvan (2011) therefore, there are several problems induced by economic recession such as:

- ✓ Falling Output: This means that less will be produced resulting to lower real GDP and lower average incomes. Wages tend to rise much more slowly or not at all.
- ✓ Unemployment: a rise in cyclical unemployment is the biggest problem of recession.
- ✓ Higher Government Borrowing: As levels of government borrowing increases, it leads to higher interest rates costs.
- ✓ Devaluation in Exchange rate and others such as falling asset prices, falling share prices, social problems associated with rising unemployment; increased inequality, etc.

2.1.1 History of Economic Recession

In the history of economic recession there was a recession called Wall Street Crash that took place in 1929. The international Monetary Fund defines a global recession as "a decline in annual per-capita real world GDP (purchasing power parity weighted), backed up by a decline or worsening for one or more of the seven other global macro-economic indicators. Industrial production, trade, capital flows, oil consumption, unemployment rate, per-capita investment, and per-capita consumption (Wall Street Journal, 2009; Economic Outlook, 2009). By this definition, since World War II, only four global recessions existed (in 1975, 1982, 1991 and 2009). Each of them lasted for a year but the 1991 recession would have lasted until 1993 if the IMF had used normal exchange rate weighted per capita real world GDP rather than the purchasing power parity weighted per capita real world GDP (Wall Street Journal 2009; World Economic Outlook 2009).

The 2009 global recession called the Great Recession, was by far the worst of the four war recessions, both in terms of the number of countries affected and the decline in real world GDP per capita (Wall street Journal; 2009; World Economic Outlook, 2009).

Prior to April 2009, the IMF argued that a global annual real GDP growth rate of 3.0 percent or less was "equivalent to a global recession (Economist.com; 2008; Lall, Subir, 2008) Based on this measure, there have been seven global recessions since 1970: 1974-75, 1980 – 83, 1990 – 93, 1998, 2001-02, 2008-2009. By distinction, therefore, a national recession is identified by two quarters of decline. Furthermore, a developing country is expected to have a higher GDP growth than a developed country (IMF World Economic Outlook, 2008).

According to IMF, the real GDP growth of the emerging and developing countries is on an uptrend and that of the advanced economies is on a downtrend since 1980s (Wikipedia, the free encyclopedia). Nigeria's first full year recession began in the year 1987 with output contracted to 0.4 percent in the first quarter from a year earlier, and 0.7 percent point in the fourth quarter (Bohlund, 2016). In 2006, there occurred a recession called the bursting of the real estate bubble on the summer which originally led to the bankruptcy of a large number of floating rate mortgages and then moved to the market of corporate subordinated bonds issued to finance securitized mortgages. The outcome was a wave of collapse, mergers, and nationalizations after September 2008.

The 2008 recession is said to be one of the major economic recessions called subprime mortgage crisis. The consequence of the subprime crisis gave birth to instant movement to the financial markets of other countries causing a surprise decline of 40 to 70% (my accounting course, 2017).

Recession Indicators: The technical indicator of a recession is two consecutive quarters of negative quarters of economic growth as measured by a country's Gross Domestic Product (GDP), although the National Bureau of Economic Research (NBER) does not necessarily need to see this occur to call it a recession (Investopedia, 2017). Besides the two consecutive quarters of GDP decline, economists have two categories of recession indicators:

(i) Leading indicators that materialize prior to official declaration of recession. This is the most common leading indicator being the contraction in the stock market. Declines in bread stock indices such as Dow Jones Industrial Average (DJIA) and standard of poor's (S & P) 500 index, often appear several months prior to a recession taking place. This exemplifies 2007 case where the market began declining in August, four months ahead of the official recession in December 2007 (Investopedia, 2017).

(ii) Lagging Indicators: These of a recession include unemployment rate. Though the Great Recession began in December 2007, the unemployment rate still indicated full employment - a rate of 5% or lower – four months later. The unemployment rate began declining in May 2008, and did not recover until several months after the recession ended in June, 2009 (Investopedia, 2017).

2.2 Theoretical Review

There exist some theories proposed by earlier researchers on the areas of economic recession and the impact of the induced problems on economic growth and basic physiological needs.
These are:

2.2.1 Keynesian Economic Theory in Recession

Keynes (1936), first presented his theories forming the basis of the Keynesian economics during the Great Depression. These are the different theories of how in the short run, and especially during recession economic output is strongly influenced by aggregate demand (total spending in the economy). Keynes opined that in recession, that the way to break the cycle is for the government to push in spending heavily into the economy by building roads and bridges and other public works. He argued that level of economic activity is dependent on aggregate demand and that if demand comes low, it results to recession and high unemployment.

2.2.2 Hangover Theory

Krugmen (1998) in his theory gives an idea that slumps are the price we pay for booms; meaning that the suffering an economy experiences during a recession is a necessary punishment for the excesses of the previous expansion. After a long argument on this theory by comparing it

with Keynesianism and Austrian theorists for and against the above theory, this theory was said to have turned out to be intellectually incoherent since nobody has managed to explain why bad investments in the past require the unemployment of good workers in the present.

2.3 Empirical Review

Massavrat and Sha (2015) carried out a research to assess the impact of recession on Consumer's behavior being an empirical study in Dubai. Their aim was to understand the impact of global recession on consumer shopping behavior and how consumer consumption and saving pattern changed across different product categories during and after recession. A total of 235 respondents were issued structured questionnaire. Paired sample t-test and ANOVA were employed to analyze the data. The research finding revealed empirical evidence that the priorities of the consumers significantly changed after recession.

Gautan, et al (2014) carried out a research on global recession and its impact on telecommunications industry as an empirical dissection. The study's objective included analyzing the flows of foreign Direct Investments in telecom sector in India and also examining the reasons behind consistency in FDIs during global financial crisis period. Findings revealed that even with recession, India has witnessed a steady growth in the economy with the FDI's inflows and the telecom sector and its various projects were not hindered by global crisis.

3 Methodology

The methodology used in this research will confirm if economic recession had caused any difference in the growth of the industrial sector in Nigeria. Chow test is used to identify the structural break in the time series data. By structural change, we mean the parameters of the model do not remain the same through the entire period under study. The period covered by this study is from January 2016 to December 2017 (24 months). The choice of this period is because of the figures released by the National Bureau of Statistics (NBS) in 2016 which put the second quarter GDP growth rate at -2.06% following the first quarter GDP growth rate which was -0.25% and annual inflation rate of 17.1%. This confirmation took Nigeria out of a "technical recession" in first quarter of 2016 into a full Economic recession starting from June 2016. However, in the second quarter of 2017, the NBS released another report which put Nigeria's

Gross Domestic Product growth rate at 0.55% (year-on-year) in real terms indicating the emergence of the economy from recession after five consecutive quarters of contraction since first quarter of 2016.

This study, therefore, examines how the 12months of full economic recession (i.e. negative contraction of GDP) affected Nigeria's monthly industrial sector growth from June 2016 to June 2017 using the Chow breakpoint test.

3.1 Model Specification

Three periods were observed: The pre-recession period, recession period and the post-recession period. Thus, we have FOUR possible regression specifications as follows:

Jan(2016) – May(2016): $IndOpt_t = \alpha_0 + \alpha_1 GDP_{It} + \alpha_2 INF_t + \ldots + \varepsilon_{1t}$ (1)

June(2016) – June(2017): $IndOpt_t = \alpha_3 + \alpha_4 GDP_{It} + \alpha_5 INF_t + \ldots + \varepsilon_{2t}$ (2)

July(2017) – Dec(2017): $IndOpt_t = \alpha_6 + \alpha_7 GDP_{It} + \alpha_8 INF_t + \ldots + \varepsilon_{3t}$ (3)

Jan(2016) – Dec(2017): $IndOpt_t = \alpha_9 + \alpha_{10} GDP_{It} + \alpha_{11} INF_t + \ldots + \varepsilon_t$ (4)

Equation (4) assumes there is no difference in economic growth between the three time periods; that is, no structural parameter break in Industrial Output over the entire period (Jan 2016 to Dec 2017) given the changes in GDP growth rate and inflation rate. Hence, the null hypothesis:

H_0: equations (1), (2) and (3) are statistically the same (i.e. no structural parameter break)

The test statistic for this hypothesis is computed using the F-statistic thus

$F = \frac{(RSS_R - RSS_{UR})/k}{(RSS_{UR})/n_1 + n_2 - 2k}$ and F-table = $F_{k(n1+n2-2k)}$

Where: ε = residual term

IndOpt = Industrial Output

RGDP = Real Gross Domestic Product growth rate

INF = Inflation Rate

$\alpha_0 - \alpha_{11}$ = Parameters of the model to be estimated

RSS_{UR} = Unrestricted Residual Sum of Squares = $RSS_1 + RSS_2 + RSS_3$

RSS_R = Restricted Residual Sum of Squares = RSS_4

k = number of parameters estimated

n = number of observations

3.2 Chow Test Estimation

In order to ascertain whether there exists a structural break at any of the months, we estimate the Chow test thus:

Table1: Chow test Estimation

Chow Breakpoint Test: 2016M05 2017M06

Null Hypothesis: No breaks at specified breakpoints

Varying regressors: All equation variables

Equation Sample: 2016M01 2017M12

F-statistic	12.53531	Prob. F(6,15)	0.0000
Log likelihood ratio	43.05866	Prob. Chi-Square(6)	0.0000
Wald Statistic	75.21187	Prob. Chi-Square(6)	0.0000

Source: Extracted from Eviews Output

The test above indicates that the F-statistic value of 12.53532 is greater than the F-table value ($F_{3,21}$) at 5% level 3.07, therefore, we reject the null hypothesis of no breaks at specified breakpoints and conclude that there exists a structural break at the specified breakpoints (May 2016 and June 2017). This affirmation supports the National Bureau of statistics (NBS) report of an insignificant GDP growth rate which led to the economic recession in mid year 2016 hence plunging the economy into a structural change over the 24month period under study. This leads us to the estimation of the model parameters before, during and after the economic recession periods.

3.3 Model Estimation:

We estimate the regression equations for the models in order to know the nature of relationship that exist between Industrial Output, GDP and Inflation rate taking into cognizance the breakpoint periods:

1. Pre-recession: Between Jan(2016) – May(2016):

INDOPT = 33.356159 + 8.167774*GDP + 3.380908*INF

t = (-4.411289) (3.109394) (3.873427)

Adj. R^2 = 0.8227, dw = 1.7898, F-statistic = 10.280, df = (N_1-k) = 3

2. Recession Period: Between June(2016) – June(2017):

INDOPT = -23.622822 - 0.190677*GDP - 1.336117*INF

t = (4.029227) (-0.890179) (-3.950913)

Adj. R^2 = 0.5565, dw = 1.3627, F-statistic = 8.5283, df = (N_2-k) = 11

3. Post-Recession: Between July(2017) – Dec(2017):

INDOPT = 1087.833626 + 342.205483*GDP + 0.793522*INF

t = (-0.832195) (0.832732) (0.861933)

Adj. R^2 = 0.999, dw = 1.0964, F-statistic = 3539.091, df = (N_3-k) = 4

4. Entire Period: Between Jan(2016) – Dec(2017):

INDOPT = 6.0751184 + 0.457896*GDP + 0.383459*INF

t = (-2.816666) (2.918494) (2.834564)

Adj. R^2 = 0.3245, dw = 0.9528, F-statistic = 6.525, df_R = (N_1+N_2+N_3-2k) = 20

The regression estimates above suggests that the relationship between Gross Domestic Product (GDP), Inflation rate and Industrial sector's output are NOT the same in the periods before, during and after recession. The coefficients indicates that GDP and inflation rate both have positive and individually significant relationships with Industrial output before the economic recession (Jan2016 to May2016) increasing Industrial output by 8.168 and 3.381 units respectively. However, during the recession period, negative GDP growth rate contributed to about -0.191 units decrease in industrial sector's output while inflation led to negative coefficient of -1.336 units decrease in industrial output. During this recession period, Inflation only significantly affects industrial growth. The following period after economic recession in July 2017 to December 2017, GDP growth rate contributed 342.205 units increase in industrial output while decreasing inflation rate contributed 0.7935 units increase in industrial output. The explanatory variables are jointly significant based on the F-statistics in all three periods with high explanatory power 82%, 56% and 99% for the periods before, during and after the recession.

The fourth regression where we assumed no structural break (pooled regression) showed adjusted R^2 = 32% with a positive autocorrelation and a significant F-statistics. The result

showed that GDP growth rate and inflation rate have positive and significant relationships with industrial sector's output contributing 0.458 and 0.383 units respectively to industrial growth with a positive constant trend.

3.4 Dummy Structural Break Estimate

The dummy Chow test method is used to further affirm and identify the structural break sources in the model. We quantify the effect of the economic recession on industrial growth by constructing a nominal artificial variable (dummy variable: $RECD_1$). Here, the dummy variable (called the differential intercept) assumes 1 in the period before and after the economic recession (Jan2016 to May2016 and July2017 to Dec2017) and the period during the recession is assigned 0 (June2016 to June2017). In a single regression, we capture the effect of the economic recession on Nigeria's industrial sector's growth. The regression estimates are shown below:

Dependent Variable: INDOPT
Method: Least Squares
Date: 11/28/17 Time: 04:28
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.204193	4.215629	-1.471712	0.1567
GDP	0.455584	0.173148	2.631188	0.0160
INFR	0.390428	0.238270	1.638592	0.1169
$RECD_1$	0.043037	0.016949	2.539206	0.0017

R-squared	0.383292	Mean dependent var	0.022500
Adjusted R-squared	0.290786	S.D. dependent var	1.827766
S.E. of regression	1.539251	Akaike info criterion	3.851480
Sum squared resid	47.38585	Schwarz criterion	4.047823
Log likelihood	-42.21776	Hannan-Quinn criter.	3.903570
F-statistic	4.143423	Durbin-Watson stat	0.951759

Prob(F-statistic)	0.019487

Source: Extract from Eviews output

We can see that the dummy variable ($RECD_1$) has a positive and significant impact on industrial growth for the period under study. The economic recession increased Industrial output by 0.043 units with an individual significance based on the t-statistic value. Also, the coefficients of GDP and inflation rate are both positive (0.4556 and 0.3904 respectively). The positive constant signifies an increase in industrial output given the absence of the explanatory variables. This analysis summarizes the fact that the economic recession significantly affected the industrial sector's output but since the inflation rate has a positive coefficient, it means that the economic recession led to an increased industrial sector's output during the period. The overall F-statistics value 4.1434 further strengthened the claim that GDP growth rate and inflation rate for the period both have joint impact on industrial sector's growth.

4. Summary of Basic Findings

1. Prior to the full economic recession between Jan. 2016 and May 2016, the industrial sector recorded a positive growth estimated at about ₦33.35 billion with GDP growth rate increasing the sector's output by 8.168 units and a favourable inflation rate which helped the sector to record 3.381 units increase.
2. The study revealed a structural break starting from June 2016 and another one starting from July 2017 which marked the periods of economic recession and exit from the recession. The Chow test revealed that the economic recession significantly affected the industrial sector with increased industrial sector' growth and GDP growth rate having a significant impact on industrial sector's output.
3. The study revealed that during the period of economic recession (i.e. June 2016 to June 2017), industrial output shrank by ₦23.622 billion with GDP growth and inflation rates accounting for ₦0.1907 and ₦1.3361 billion decrease in industrial output. This shows that the industrial sector witnessed a significant break from its positive growth for the short period under economic recession.
4. The period after the economic recession (June 2017 till Dec 2017) recorded a positive industrial growth of 1087.83 and positive contributions of GDP and inflation rate for the period.

The positive contributions of both variables were not significant based on the individual test hence the sector still grappled with the after effects of the recession.

5. GDP growth rate and inflation rate accounted for 82% and 99% of the changes in industrial sector's output for the periods before and after the economic recession respectively while during the recession period, the variables accounted for 56% of the changes in industrial sector's output.

5. Conclusion

Observations from the study revealed that the period of economic recession significantly increased the industrial sector's output. Despite the negative perception of stakeholders and economic analysts, increasing inflation rate and negative GDP growth positively affected the industrial sector which is adduced to the indispensable role the sector plays in the economy notwithstanding the fact that other sectors, based on analysts view, were negatively affected by the recession. However, considering the post-recession recession from July 2017 to December 2017, it is observed that industrial output shows a negative growth but looking at the entire period under study i.e. January 2016 to December 2017, the industrial sector posted positive growth.

A structural break in the relationship between economic recession and industrial growth in Nigeria was identified as a result of the economy recording negative GDP growth rates for two consecutive quarters. The structural break led to inflation rate and GDP affecting industrial output negatively but the sector quickly recovered in July 2017 to record a positive growth both in intercept and coefficients.

6. Recommendations

Based on the findings made here, it is recommended that the industrial sector be further strengthened by way of favorable foreign exchange controls to make the sector accessible to needed raw materials and machineries needed to stimulate industrial production, consumption and economic growth in Nigeria. The positive growth of the industrial sector despite the structural change brought about by the economic recession calls for a savings culture which will make funds available to the industrial sector in periods of want to further save the sector from being drastically affected by continuing rising inflation rates and harsh economic conditions.

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Appendix

Chow Breakpoint Test: 2016M05 2017M06
Null Hypothesis: No breaks at specified breakpoints
Varying regressors: All equation variables
Equation Sample: 2016M01 2017M12

F-statistic	12.53531	Prob. F(6,15)	0.0000
Log likelihood ratio	43.05866	Prob. Chi-Square(6)	0.0000
Wald Statistic	75.21187	Prob. Chi-Square(6)	0.0000

Pre-Recession Period
Dependent Variable: INDOPT
Method: Least Squares
Date: 11/28/17 Time: 01:08
Sample: 2016M01 2016M05
Included observations: 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	33.35616	7.561545	-4.411289	0.0477
GDP	8.167774	2.626806	3.109394	0.0897
INF	3.380908	0.872847	3.873427	0.0607

R-squared	0.911348	Mean dependent var	-2.079600
Adjusted R-squared	0.822695	S.D. dependent var	2.491867
S.E. of regression	1.049264	Akaike info criterion	3.217765
Sum squared resid	2.201911	Schwarz criterion	2.983427
Log likelihood	-5.044412	Hannan-Quinn criter.	2.588827
F-statistic	10.28002	Durbin-Watson stat	1.789832
Prob(F-statistic)	0.088652		

Estimation Command:
==========
LS INDOPT C GDP INF

Estimation Equation:
==========
INDOPT = C(1) + C(2)*GDP + C(3)*INF

Substituted Coefficients:
==========
INDOPT = 33.3561590969 + 8.16777440514*GDP + 3.38090829638*INF

Recession Period
Dependent Variable: INDOPT
Method: Least Squares
Date: 11/28/17 Time: 01:10
Sample: 2016M06 2017M06
Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-23.62282	5.862867	4.029227	0.0024
GDP	-0.190677	0.214201	-0.890179	0.3943
INF	-1.336117	0.338179	-3.950913	0.0027

R-squared	0.630405	Mean dependent var	0.338000
Adjusted R-squared	0.556486	S.D. dependent var	1.346682
S.E. of regression	0.896848	Akaike info criterion	2.819314
Sum squared resid	8.043370	Schwarz criterion	2.949687
Log likelihood	-15.32554	Hannan-Quinn criter.	2.792517
F-statistic	8.528309	Durbin-Watson stat	1.362731
Prob(F-statistic)	0.006897		

Estimation Command:
==========
LS INDOPT C GDP INF

Estimation Equation:
==========
INDOPT = C(1) + C(2)*GDP + C(3)*INF

Substituted Coefficients:
==========
INDOPT = -23.6228218779 - 0.190676755753*GDP - 1.33611732199*INF

Post-Recession Period
Dependent Variable: INDOPT
Method: Least Squares
Date: 11/28/17 Time: 01:14
Sample: 2017M07 2017M12
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1087.834	1307.185	-0.832195	0.4664
GDP	342.2055	410.9431	0.832732	0.4661
INF	0.793522	0.920630	0.861933	0.4521

R-squared	0.999576	Mean dependent var	1.090667
Adjusted R-squared	0.999294	S.D. dependent var	0.022456
S.E. of regression	0.000597	Akaike info criterion	-11.70343
Sum squared resid	1.07E-06	Schwarz criterion	-11.80755
Log likelihood	38.11030	Hannan-Quinn criter.	-12.12024
F-statistic	3539.091	Durbin-Watson stat	1.096384
Prob(F-statistic)	0.000009		

Estimation Command:
==========
LS INDOPT C GDP INF

Estimation Equation:
==========
INDOPT = C(1) + C(2)*GDP + C(3)*INF

Substituted Coefficients:
==========
INDOPT = 1087.83362642 + 342.205483369*GDP + 0.793521853782*INF

Whole Period: Jan 2016 to Dec 2017
Dependent Variable: INDOPT
Method: Least Squares
Date: 11/28/17 Time: 01:17
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.075118	2.156847	-2.816666	0.0103
GDP	0.457896	0.156895	2.918494	0.0082
INF	0.383460	0.135280	2.834564	0.0099

R-squared	0.383252	Mean dependent var	0.022500
Adjusted R-squared	0.324514	S.D. dependent var	1.827766
S.E. of regression	1.502203	Akaike info criterion	3.768212
Sum squared resid	47.38891	Schwarz criterion	3.915468
Log likelihood	-42.21854	Hannan-Quinn criter.	3.807279
F-statistic	6.524790	Durbin-Watson stat	0.952801
Prob(F-statistic)	0.006254		

Estimation Command:
==========
LS INDOPT C GDP INF

Estimation Equation:
==========
INDOPT = C(1) + C(2)*GDP + C(3)*INF

Substituted Coefficients:
==========
INDOPT = 6.07511828394 + 0.457896247859*GDP + 0.383459723575*INF

Dependent Variable: INDOPT
Method: Least Squares
Date: 11/28/17 Time: 04:28
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.204193	4.215629	-1.471712	0.1567
GDP	0.455584	0.173148	2.631188	0.0160
INFR	0.390428	0.138270	2.823664	0.0169
D_1	0.043037	0.016949	2.539206	0.0017

R-squared	0.383292	Mean dependent var	0.022500
Adjusted R-squared	0.290786	S.D. dependent var	1.827766
S.E. of regression	1.539251	Akaike info criterion	3.851480
Sum squared resid	47.38585	Schwarz criterion	4.047823
Log likelihood	-42.21776	Hannan-Quinn criter.	3.903570
F-statistic	4.143423	Durbin-Watson stat	0.951759
Prob(F-statistic)	0.019487		