

Effect of Economic Recession on the Performance of SMEs in Nigeria

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Abstract

This study assesses the effect of economic recession on the performance of SMEs in Nigeria proxy as SMEs output. The continuous rise in interest rate, exchange rate, inflation rate and unemployment rate in Nigeria affect the output of SMEs in Nigeria. The research design adopted was ex-post facto and data was collected from secondary sources covering a period of 15 months from Jan 2016-March, 2017 and this data were obtained through the CBN Statistical bulletin and National bureau of statistics. The population of the study includes all the SMEs in Nigeria. Unit root test and ordinary least square of multiple regression analysis were used to analysis data using e-view software statistical package. The result shows that there is a significant relationship between economic recession and performance of SMEs in Nigeria. Other findings were that there is a significant relationship between interest rate, exchange rate and unemployment and output of SMEs in Nigeria. The study therefore recommends that Government of Nigeria should embark on policies that will stop economic recession in Nigeria and should try to enforce agencies that will control exchange rate, interest rate as well as planned strategic actions to reduced unemployment in Nigeria since it leads to output of SMEs in Nigeria.

Keywords: *Economic recession, Performance, Interest rate, Exchange rate, Unemployment and output*

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Background to the Study

Economic recession is a time of economic slowdown indicating low output, illiquidity, unemployment, high exchange rate, high interest rate, low GDP, higher prices of goods and services in the market. Economic recession have negative effect on small and medium scale enterprises in Nigeria by reducing the output of SMEs in the market. SMEs in Nigeria started reducing the value of their product or quality and quantity of these product and increased the prices of their product in the market to meet up with economic recession, this is to cover the cost of interest rate (borrowing from the banks), cost of high exchange rate (export and import: from USA to Nigeria) and downsizing their workers during this period to able SMEs to pay salaries of workers. However, recession is caused by two factors which are internal (endogenous) and external (exogenous). The internal factor is as a result of conflict of ideas, misapplication of economic theory and regulatory negligence or policy inconsistency in Nigeria which affect the SMEs output. The other factor is exogenous to the economy over which policy makers have little or no control such as natural disaster, climate change, revolution and wars which Nigeria have not fully experienced.

The SMEs sectors in Nigeria are the engine that drive the growth of Nigerian economy but due to policy inconsistency, the SMEs sectors have failed and this failure have contributed to high exchange rate, high inflation, high interest rate and increase in unemployment in Nigeria. Some are associated with sharp changes in the prices of the inputs used in producing goods and services. Declining in certain macroeconomic indicants like GDP, employment, investment spending, capacity utilization, household income, business income, and inflation, with the attendant increase in the rate of unemployment, interest rate and exchange rate which reduce the output of SMEs in Nigeria. The product quality and quantity produce by SMEs in Nigeria have reduced and there is high increase in the prices of these products due to economic recession in terms of exchange rate and interest rate and even the SMEs downsized workers in Nigeria to make the workers unemployed in Nigeria.

Previous studies such as Chukwu, Liman, Enudu and Ehiaghe (2015) examine the effects of economic recession in textile manufacturing industries in Nigeria while Hanna (2013) study the effect of recession on the operational performance of luxury goods companies in Kenya. Bawuah, Yakubu and Alhassan (2014) study interest rate on micro, small and medium enterprises' (MSMEs) in Wa municipality of Ghana while Otuori (2013) investigate the determinant factors of exchange rates and their effects on the performance of commercial banks in Kenya. Tadesse (2015) examine the composite impact of exchange rate on the profitability (ROE) of commercial banks in Ethiopia. However, this study is different from the above studies since no studies have been conducted using SMEs in Nigeria that the researcher have contact with during the cause of this research. There is a need to carry this study since the research used three different variables to measure economic recession and output of SMEs to measure performance which other authors have not used them as mentioned.

The objective of this study is to examine the effect of economic recession on the performance of SMEs in Nigeria and the specific objectives of this study are to: determine the effect of interest rate on output of SMEs in Nigeria, to evaluate the effect of exchange rate on the output of SMEs in Nigeria and to examine the effect of unemployment on the output of SMEs in Nigeria.

The scope of this study is restricted to effect of economic recession on the performance of SMEs in Nigeria. The period of study covered 15 months from Jan 2016-March, 2017 and this period was chosen because recession started in Nigeria at this period and National Bureau of Statistics (NBS) has confirmed that the 2016 economic recession was a full year recession and the worst to the economy.

The study is significant to the policy makers to understand certain economic recession variables and how to control them to abstain from economic recession in the country. The study also is significant to SMEs owners and managers to understand what to do during economic recession and how to minimize the effect of economic recession on their businesses to increase performance in terms of output. The study is also significant to academia and researchers who want to research in this area and this study will serve as the reference material to them. The study is also significant in the sense that it filled a research gap in knowledge and established a model that explained economic recession and this study is significant because it will added to knowledge.

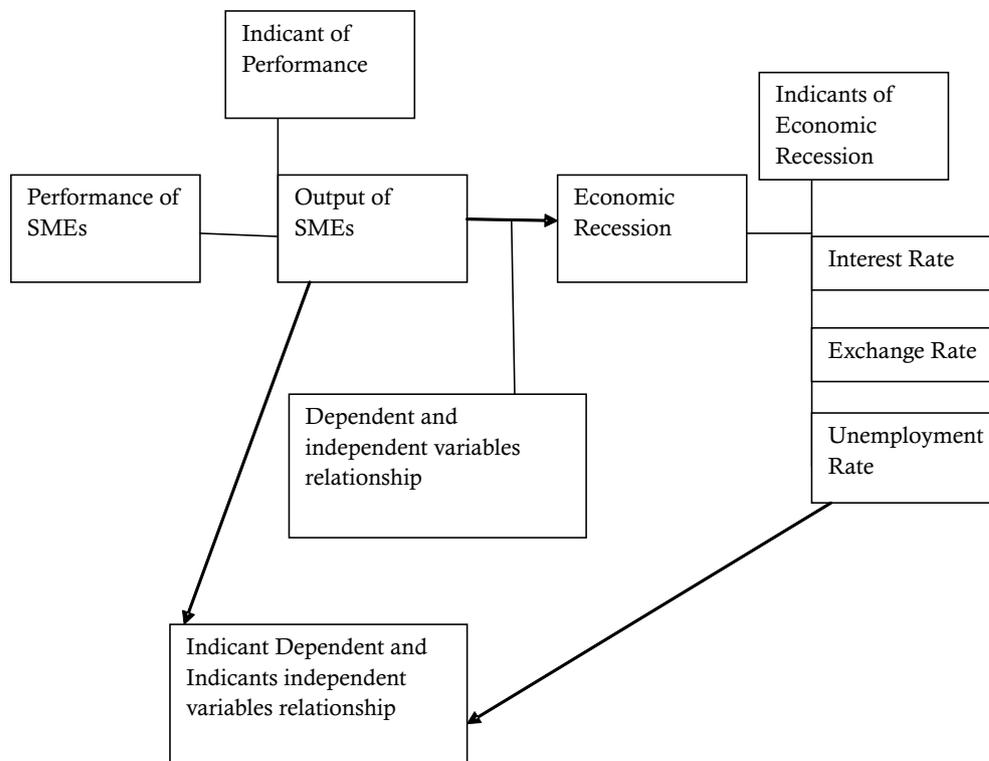
The hypotheses of this study are slated below:

H₀₁: Interest rate has no effect on output of small and medium scale enterprise in Nigeria

H₀₂: Exchange rate has no effect on output of small and medium scale enterprise in Nigeria

H₀₃: Unemployment has no effect on output of small and medium scale enterprise in Nigeria

Conceptual Framework



Opusnwa Model of SMEs in Recession, 2017

Concept of Economic Recession

Meriam-Webster (2008) recession is a business cycle contraction which slowdown economic activity in the country and National Bureau of Economic Research (2008) notes that economic recession is significant decline in economic activity across all the sectors in the economy, lasting more than a few months, usually visible in real GDP, real income, employment, industrial production and whole sale- retail sale. To them also, it is a period of time when a nation's GDP per capita declines for at least two consecutive quarters in a quarter-to-quarter comparison. Also, Central Bank of Nigeria agreed with definition of (NBER) and defined it as a business cycle contraction, and it refers to a general slowdown in economic activity for two consecutive quarters which is in lined with Meriam-Webster (2008) but different because of two consecutive quarters. Economic recession is the decline in economic policies, principles, concepts and rules which help to losing the economic activities and give rooms to economic slowdown that resulted in high unemployment, high exchange rate and interest rate.

Interest Rate

According to Lloyd (2006) and McConnell (2009), interest rates are a price paid for borrowing funds expressed as a percentage per year. To them also, it is a price a borrower needs to pay to the lender for transferring purchasing power to the future. Crowley (2007) defined interest rate as money borrower pays for the use of money they borrow from a lender/ financial institutions or fee paid on borrowed assets. Brock and Rojas-Suarez (2000) defined interest rate spread as margin between interest income and interest expense as a percentage of total earning assets. Interest rate is the premium recovered by the lender after a stated period of time (Amonoo et al., 2003). Interest rate is the price lenders expect for exchanging current claims for greater future claims to goods and services.

Interest rate is the cost of capital that the investor collected from the bank at the time of obtaining a loan and intended price to be paid from borrowing capital which is usually paid weekly, monthly and even yearly normally expressed in percentage.

Exchange Rate

It is the price of a unit of a currency expressed in terms of another currency, or price at which a foreign currency can be bought with a domestic currency (Owolabi & Adegbite, 2013). Exchange rate is the price of one unit of the foreign currency in terms of the domestic currency (Mejekomi, 2000). Exchange rate is the value of one currency in relationship of another currency. Exchange rate is the amount which a product in one country can be expressed or measured with other country product and this process is accomplish through transaction that involved money.

Unemployment

According to Balami (2006) unemployment is a situation where employees are involuntarily out of work. Unemployment is state of joblessness and it is when people are without jobs and they have actively sought work within the past four weeks(International Labour Organization, 2009) Jhingan (2001) unemployment is the number of active youth who are unemployed in an economy, often given as a percentage of the labour force. Aminu and Anono (2012) Unemployment is the total number of people who are willing and able to work, and make themselves available for job at the prevailing wage but no work for them. Unemployment is conceptualize as active youth or men who are jobless as result of not wanting to want, actively

searching job, wanting to work at a particular wage rate but there is no such rate, wanting to work but are not qualify for the work and wanting to work but there is no place to work.

Concept of Performance

According to Wu (2009) performance is a measure of how effective and efficient the industry or firm operated in the business. Liargovas and Skandalis (2008) performance of a business is the overall profits and losses during a particular year or time. Performance is the outcome of business activity or it is the effort the business ensured to produce profit or return on investment, return on asset, return on equity, customer satisfaction, efficiency and effectiveness in the organization. Performance is the output of input used in the organization.

Small Medium Scale Enterprises

According to Jamodu (2000) Small and Medium Scale Enterprises is the basis of employment, which employed 1-10 workers in micro/cottage industries, 11-100 workers in small scale industries, 101-300 workers in medium scale industries. Alarape (2008) defines SMEs as an enterprise with a labour size of 11-100 employees or a total cost of not less than N50 million, including working capital but excluding cost of land. Small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43million euro (Gunter, 2005). The UK definition of SMEs is that business organisations which have sales turnover between 6.5m pounds and 25.9m pounds, Net assets between 3.26m pounds and 12.9m pounds and number of employees between 50 and 250 (Lucas, Prowle & Lowth, 2013).

SMEs is business which capital formation is not more N1 million excluding land but employed more than 1-10 employees and obtain sales of product or services not more N200000 per year.

Output of SMEs in Nigeria

Oluba (2009) note that there are about 8.4million SMES operating in Nigeria with - enterprises comprise 80 per cent of the total output or number (about 1.3 million), small business constituting 15 percent (around 420,000) (Oluba, 2009). In terms of SMEs contribution to national output in Nigeria. It has been reported that the SMEs, by revenue, contribute about 75 per cent of all entrepreneurial activities that make up Nigeria's gross domestic output, 21 per cent within the -enterprises while 4% belong to the large complex organizations, 21 per cent within the -enterprises while 4% belong to the large complex organizations (Adoyi, Agu, Adoli & Inalegwu, 2015).

Review of Empirical Studies

Hanna (2013) study effect of recession on the operational performance of luxury goods companies in Kenya from 2007 to 2010. The sample consists of a hand collected data set of 20 publicly traded global luxury goods companies and a peer group of 20 public premium goods companies also operating globally. The financial data is gathered from Thomson One Banker and the companies financial statements. He found that luxury goods companies' performance during the financial crisis and the following economic downturn. Luxury goods companies were not found to be immune to the recession, their performance was on aggregate positive despite the hostile operating environment. In addition, the positive performance was significantly better when compared to the peer group, which suggests that luxury goods companies indeed outperform their premium peers. The variables contributing to this

performance were measured with sales growth, financial flexibility and initial profitability and were controlled for size. The findings of the multivariate analysis suggest that initial profitability and size are negatively associated with the performance

The above study was conducted in Kenya in 2013 but the study failed to use modern statistical software package like e-view, greetl, SPSS, Minitab and Matab. Chukwu, Liman, , Enudu and Ehiaghe (2015) study the effects of economic recession in textile manufacturing industries in Nigeria. A cross sectional survey was used to collect data and data collected from questionnaire instrument were also analyzed using percentages. The research finding show that the effect of economic recession in manufacturing industries are low capacity utilization and factory closure, horrendous nosedive in stock market prices, delisting of share at the stock exchange, fall in commodity prices and low foreign direct investments. The variables that were hypothetically tested as the effect of economic recession has significant effect on Textile industries in Nigeria

The above study were studied in Nigeria but only concentrated in Textile Industries in Nigeria but the researchers used only percentage to analyse the data but this study only percentage cannot indicate the cause and effect relationship between the variables. The study could have used regression that can explain the variables relationship.

Bawuah, Yakubu and Alhassan (2014) study the effect of interest rate on micro, small and medium enterprises' (MSMEs) in Wa municipality of Ghana. A multiple research method and descriptive survey were employed using quantitative and qualitative data collection techniques and data analysis procedures. 200 enterprises were chosen for the research. Evidence from the analysis shows that majority of MSME businesses have resorted to the use of equity financing for their operations. This was attributed to several factors of which interest rate was the leading cause. It emerged that interest rate affects choice of financing decision of MSMEs in Wa municipality.

The above study cannot indicate a good finding that can be adopted in further studies or analysis because the tool of analysis the researchers used were not well explained the researchers view point or argument.

Evans, Munir, Douglas and Stephen (2015) study the effect of loan interest rate on the performance of small and medium size enterprises in Lurambi Sub-County, Kenya. The study population were all microenterprises in Lurambi Sub- County and a representative sample of 365 SME owner/managers was used. The data for the study was collected by the use of questionnaire and Cronbach's Alpha of coefficient test and test-retest were used to test reliability of the instruments. They used descriptive research design and correlation and the finding indicates that a statistically significant positive effect of loan interest rate on the performance of SME's in Lurambi Sub-County, Kenya. The above study was conducted in Lurambi Sub Country, Kenya and the study did not apply modern software statistical package to analyse the data.

Tadesse (2015) examine exchange rate on the profitability (ROE) of commercial banks in Ethiopia using a balanced panel data set of banks over the period of 2000-2014. The independent variables included as control variables in the regression analysis, loan growth rate and GDP growth are found to have statistically significant positive impact on bank profitability

in Ethiopia, while loan loss expense ratio (Loan loss expense to total loan) is found to have statistically significant negative impact on bank profitability in Ethiopia. Similarly, from control variable included in the loan growth model, number of bank branches, lending interest rate and deposit to loan ratio are found to have statistically significant negative impact on the bank loan growth in Ethiopia. The above study did not even state the research design and tools that were employed to measure the variables but only indicated the variables in the study and their relationships.

Otuori (2013) investigate the determinant factors of unemployment and their effects on the performance of commercial banks in Kenya. The study adopted a descriptive design and primary data was collected through self administered questionnaires. He use survey research design, regression analysis and the population is the entire population of Kenya and the findings indicate that employment negatively affect performance of Commercial banks in Kenya.

Theoretical Framework

The Keynesian Theory

The Keynesians' believed that money does not play any active role in changing prices in an economy. According to them, changes in prices are mainly caused by structural factors which is may be recession. Keynesian theory does not offer much insight into movements of the price level in the economic. Keynesian theory proposes that money is transparent to real forces in the economy, and that visible recession is the result of pressures in the economy expressing themselves in high prices of good and services in the market. As monetarists assert that the empirical study of monetary history shows that recession has always been a phenomenon in the economic by contrast, Keynesians typically emphasize that the role of aggregate demand in the economy rather than the money supply in determining recession (Jiay, 2007). The above theory limitation are noted, the theory concentrated in the changes prices of goods and services in the economy that will give room to recession but further theory is develop to guide this study and this theory observed the deficiencies in the above theory.

Opusunwa Theory of SMEs in Recession

The theory explain the economic recession which manifested itself in the form of high exchange rate, high interest rate and unemployment in a country affect performance of SMEs in any given country negatively. This recession made SMEs firm to downsize their workers to meet up with operating cost in order to stay in the business and increase their performance in terms increase in output but since recession has eating deep in the economy and this made SMEs firms to continuously faced with a lot of challenges such of paying high interest rate, import part at a very high exchange rate and downsizing experienced workers who can add value to the SMEs performance. The theory believes that SMEs reduced the quality and quantity of their product because of recession in order to pay-off their loan due to high interest rate charge. The theory also explained that high exchange rate have effect on SMEs when they imported goods and service or import part dominated the market and the exchange keep on increasing the market and the rate at which the prices of imported goods are cost is due to exchange rate and the value of the product drastically increase daily which negatively affect output of SMEs in Nigeria. This theory can also be applied in all sectors of the economy to indicate the influence of one variable in another.

Methodology

The research used ex-post facto research design and the reason is that the researchers employed historical data from Central Bank of Nigeria statistical Bulletin and this is because interest rate, exchange rate and unemployment, aggregate output of SMEs data are recorded in Central Bank of Nigeria statistical Bulletin. Multiple regressions was used to analyze data. The reason for using multiple regressions is that the researchers established causes and effect relationship between the variables. The population of 17.3 million SMEs in Nigeria is considered according to NBS (2013). The e-view statistical software was adopted and data obtained from Central Bank of Nigeria statistical Bulletin were tabulated and tested for stationarity of data using unit root test by applying Augmented Dickey Fuller (ADF). The reason for using this is to asses if the data are stationary or not which helps to avoid spurious regressions. The decision rule is that stationarity is attended if the absolute ADF value is higher than any of the absolute Mackinnon critical values at 1%, 5% and 10% levels of significance. Also, data were analyzed using multiple regression models. The regression model is stated below:

$$SMEs_{OUT} = \alpha + \beta INR + \beta EXR + \beta UNM + \mu \dots\dots\dots 1$$

Where

- $SMEs_{OUT}$ = SMEs output,
- INR = Interest Rate,
- EXR = Exchange Rate
- UNM = Unemployment
- $\beta 1$ = is the coefficient of determination
- α = constant term
- μ = is the stochastic variable or error term.

The null hypothesis is rejected if the p-value is less or equal to the critical value at 0.05.

Data Analysis

Table 1

Variable	Level of stationarity	ADF-statistic	Significant values 1%, 5%, 10%	Prob.
$SMEs_{OUT}$	I(2) at constant linear trend (exogenous)	4.98	-4.00, -3.09, -2.69	0.0018
INR	I(1) at constant (exogenous)	12.96	-5.12, -3.93,-3.42	0.0001
EXR	I(1)at constant (exogenous)	4.18	-4.12, -3.14, -2.71	0.009
UNM	I(2) at constant linear trend (exogenous)	4.98	-4.00,-3.09,-2.69	0.0018

Source: Author's Computation using E-view 7.00 (Appendix A)

From the table, the data sets of the variables were stationary at first level difference and second level difference implying that the variables were integrated at the different order levels. SMEsout were stationary at second level difference at a constant linear trend and intercept at

1%, 5% and 10% level of significance, INR which is interest rate were stationary at first level difference at exogenous with a constant and intercept at 1%, 5% and 10% level of significance and EXR which means exchange rate were also stationary at first level difference at exogenous with a constant and intercept at 1%, 5% and 10% level of significance and UNM which is unemployment were stationary at second level difference at a constant linear trend and intercept at 1%, 5% and 10% level of significance

However, data were converted at first level different and second level difference which implies that the four variables were stationary and formula used were stated below:

Genr SMESoutd2 = SMESout-D2(SMESout).....1
 Genr INRd = INR-D(INR).....2
 Genr EXRd = EXR -D(EXR).....3
 Genr UNMd2 = UNM-D2(UNM).....4
 Genr. = generate, d= is the difference, D2 is the second level difference.

Dependent Variable: SMES_{OUT}
 Method: Least Squares
 Date: 05/25/17 Time: 09:39
 Sample: 2016M01 2017M03
 Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.628736	13996089	0.402165	0.0000
EXR	0.668229	36.58854	0.455943	0.0000
INR	0.392807	3.766294	0.035255	0.0000
UNM	0.424623	1.443518	0.863323	0.0000
R-squared	0.977002	Mean dependent var		2171248.
Adjusted R-squared	0.874725	S.D. dependent var		3301665.
S.E. of regression	3578501.	Akaike info criterion		33.24196
Sum squared resid	1.41E+14	Schwarz criterion		33.43078
Log likelihood	245.3147	Hannan-Quinn criter.		33.23995
F-statistic	123.5894	Durbin-Watson stat		1.627680
Prob(F-statistic)	0.820658			

Source: Data output using e-view statistical package, 2017

Decision rule: 1% level of significance, 5% level of significance and 10% level of significance. The coefficient of economic recession in terms of exchange rate is positive (0.66) and is significant in achieving SMEs output in Nigeria. The p-value of 0.00 is less than the t-statistic value of 0.45 and the standard error value of 36.58 which is greater than the t-statistic value of 0.45. This implies that a unit increase in exchange rate will affect output of SMEs in Nigeria. Economic recession in terms of interest rate is positive (0.39) and is significant in achieving SMEs output in Nigeria. The p-value of 0.00 is less than the t-statistic value of 0.03 and the standard error value of 3.76 which is greater than the t-statistic value of 0.03. This implies that a unit increase in interest rate will affect output of SMEs in Nigeria.

Economic recession in terms of unemployment is positive (0.42) and is significant in achieving SMEs output in Nigeria. The p-value of 0.00 is less than the t-statistic value of 0.86 and the standard error value of 1.44 which is greater than the t-statistic value of 0.86. This implies that a unit increase in unemployment will affect output of SMEs in Nigeria.

The coefficient of determination (r^2) of 0.97 indicates that 97% of variation in SMEs output can be explained by economic recession: interest rate, exchange rate and unemployment in Nigeria. The remaining 3% can be explained by other related factors not noted in the regression model. The f-statistic value of 123.5894 is significant at p-value of 0.00 and Durbin Watson is 1.62 which indicates that there is a present of auto correlation between the dependent and independent variable. Also, this implies that there is an evidence of existence of linear relationship between economic recession and SMEs output in Nigeria.

Discussion of Findings

From the above analysis, the effect of economic recession on the SMEs performance in Nigeria is significant. This implies that recession affect the output of SMEs in Nigeria and the finding also showed that increase in exchange rate affect output of SMEs in Nigeria. Exchange rate will affect output of SMEs in Nigeria and unemployment will affect output of SMEs in Nigeria. This finding is in line with the finding of Chukwu, Liman, , Enudu and Ehiaghe (2015) and the theory of Opusnwa Theory of SMEs in Recession.

Conclusion and Recommendations

The study concludes that the effect of economic recession on the SMEs performance in Nigeria is significant. This implies that recession affect the output of SMEs in Nigeria and the finding also showed that increase in exchange rate affect output of SMEs in Nigeria. Exchange rate will affect output of SMEs in Nigeria and unemployment will affect output of SMEs in Nigeria. Based on the findings the following recommendations are made that Government of Nigeria should embark on policies that will stop economic recession in Nigeria and should try to enforce agencies that will control exchange rate, interest rate as well as planned strategic actions to reduce unemployment in Nigeria since it leads to output of SMEs in Nigeria. The SMEs should stop downsizing workers and should focused on innovation that will generate employment opportunities without reducing the value of the product in the market but reduce the prices of the product to encourage repeated buying of the product which will help them to increase performance in terms output and to deal with recession.

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Appendix A

Null Hypothesis: D(EXR) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=3)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.183300	0.0091
Test critical values: 1% level	-4.121990	
5% level	-3.144920	
10% level	-2.713751	

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

Warning: Probabilities and critical values calculated for 20 observations

and may not be accurate for a sample size of 12

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXR,2)

Method: Least Squares

Date: 05/25/17 Time: 08:56

Sample (adjusted): 2016M04 2017M03

Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXR(-1))	-1.977902	0.472809	-4.183300	0.0024
D(EXR(-1),2)	0.554133	0.295752	1.873641	0.0938
C	8.894661	10.97240	0.810639	0.4385
R-squared	0.723096	Mean dependent var	-2.333333	
Adjusted R-squared	0.661562	S.D. dependent var	63.29776	
S.E. of regression	36.82373	Akaike info criterion	10.26248	
Sum squared resid	12203.89	Schwarz criterion	10.38371	
Log likelihood	-58.57488	Hannan-Quinn criter.	10.21760	
F-statistic	11.75113	Durbin-Watson stat	2.083599	
Prob(F-statistic)	0.003094			

Null Hypothesis: D(INR,2) has a unit root
 Exogenous: Constant, Linear Trend
 Lag Length: 1 (Automatic - based on SIC, maxlag=3)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-12.96825	0.0001
Test critical values: 1% level	-5.124875	
5% level	-3.933364	
10% level	-3.420030	

*MacKinnon (1996) one-sided p-values.
 Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 11

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(INR,3)
 Method: Least Squares
 Date: 05/25/17 Time: 09:25
 Sample (adjusted): 2016M05 2017M03
 Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INR(-1),2)	-2.773615	0.213877	-12.96825	0.0000
D(INR(-1),3)	1.049718	0.130257	8.058821	0.0001
C	-3.442605	0.732479	-4.699936	0.0022
@TREND(2016M01)	0.343664	0.076395	4.498513	0.0028
R-squared	0.966803	Mean dependent var		0.181818
Adjusted R-squared	0.952576	S.D. dependent var		3.311138
S.E. of regression	0.721067	Akaike info criterion		2.459118
Sum squared resid	3.639564	Schwarz criterion		2.603808
Log likelihood	-9.525151	Hannan-Quinn criter.		2.367912
F-statistic	67.95481	Durbin-Watson stat		1.941818

Null Hypothesis: D(SMESOUT,2) has a unit root
 Exogenous: Constant, Linear Trend
 Lag Length: 2 (Automatic - based on SIC, maxlag=3)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.547628	0.0253
Test critical values: 1% level	-5.295384	
5% level	-4.008157	
10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
 Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(SMESOUT,3)
 Method: Least Squares
 Date: 05/25/17 Time: 09:34
 Sample (adjusted): 2016M06 2017M03
 Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SMESOUT(-1),2)	-4.196279	0.922740	-4.547628	0.0061
D(SMESOUT(-1),3)	2.029453	0.638056	3.180681	0.0245
D(SMESOUT(-2),3)	0.742333	0.363452	2.042451	0.0966
C	6397750.	5475395.	1.168454	0.2953
@TREND(2016M01)-794332.5	565141.0		-1.405547	0.2188
R-squared	0.922409	Mean dependent var		174732.8
Adjusted R-squared	0.860336	S.D. dependent var		12684293
S.E. of regression	4740322.	Akaike info criterion		33.88796
Sum squared resid	1.12E+14	Schwarz criterion		34.03925
Log likelihood	-164.4398	Hannan-Quinn criter.		33.72199
F-statistic	14.86015	Durbin-Watson stat		2.395061
Prob(F-statistic)	0.005544			

Null Hypothesis: UNM has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=3)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.986756	0.0018
Test critical values: 1% level	-4.004425	
5% level	-3.098896	
10% level	-2.690439	

*MacKinnon (1996) one-sided p-values.
 Warning: Probabilities and critical values calculated for 20 observations
 and may not be accurate for a sample size of 14

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(UNM)
 Method: Least Squares
 Date: 05/25/17 Time: 09:38
 Sample (adjusted): 2016M02 2017M03
 Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UNM(-1)	-1.328059	0.266317	-4.986756	0.0003
C	102.8799	20.56427	5.002849	0.0003
R-squared	0.674512	Mean dependent var	0.714286	
Adjusted R-squared	0.647388	S.D. dependent var	11.19360	
S.E. of regression	6.646886	Akaike info criterion	6.757738	
Sum squared resid	530.1731	Schwarz criterion	6.849032	
Log likelihood	-45.30416	Hannan-Quinn criter.	6.749287	
F-statistic	24.86774	Durbin-Watson stat	1.875778	