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Financial Deepening, Foreign Direct Investment and Output Performance in Nigeria

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Abstract

This study examines the relationship between financial deepening, foreign direct investment and output performance in Nigeria from 1980-2015 using the Autoregressive Distributed Lag (ARDL) Bound Test approach. A long-run relationship was established between financial deepening indicators, foreign direct investment and output performance in Nigeria. Foreign direct investment and market capitalization as a percentage of the GDP exerted significantly on output performance both in the short-run and in the long-run periods. It is recommended that financial depth should be enhanced through improved and highly efficient provision of credit by banks to the real sector of the Nigerian economy.

Keywords: financial sector; co-integration; output; Nigeria.

JEL classification: C32; E44; E51; G20.

1. INTRODUCTION

The financial system plays a key role in the mobilization and allocation of savings for productive use, provide structures for monetary management, it serves as basis for managing liquidity in the economy. It also assists in the reduction of risks faced by firms and businesses in their productive processes help to improve portfolio diversification and the insulation of the economy from the vicissitudes of international economic changes. The primary role of the financial sector in any economy is that of intermediation as it channels savings from the area of surpluses to that of deficits. Governments of many economies try to develop the financial sector in a bid to achieving sustainable economic growth and development (Ugbaje and Ugbaje, 2014). The extent of the development of the financial

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sector goes a long way in dictating the pace and overall level of economic activities in a country. Apart from domestic investment that can engender economic growth, external flows to the economy in form of foreign direct investment (FDI) may be crucial to achieving better economic output, particularly when the domestic savings and investment seem to be low. Foreign direct investment (FDI) is often perceived as a catalyst for economic growth in the developing economies as it exerts on growth via promotion of technology transfer, stimulation of domestic investment and increase in capital formation in the recipient countries.

The debate on finance and growth nexus is still ongoing. Schumpeter (1911) posited in his pioneering paper that a well-developed financial system engenders technological innovation and economic growth through the provision of financial services and resources to entrepreneurs who have the highest probability of implementing innovative products and processes. Since then, the issue of nexus between finance and growth became topical and has received a great attention from scholars. Empirical studies investigating the relationship between finance and growth have either been country-specific (Oriavwote and Eshenake, 2014; Odhiambo, 2008; Nzotta and Okereke, 2009; Odeniran and Udeaja, 2010) or cross-countries (Khan and Senhadaji, 2000; Levine *et al.*, 2000; Apergis *et al.*, 2007; Abu-Bader and Abu-Qarn, 2008; Bangake and Eggoh, 2011). Studies on the subject matter have produced mixed results across countries and periods as evidence in the literature. These divergent views may not be unconnected with the fact that different estimation procedures and theories were employed by these studies. In the same, the literature is replete with studies examining the relationship between FDI and growth without due consideration for the role of financial deepening (see Wafure and Nurudeen, 2010; Georgantopoulos and Tsamis, 2011; Umoh *et al.*, 2012). Meanwhile, studies such as Lee and Chang (2009); Zadeh and Madani (2012), Shuaibu and Salisu (2013) and Pradhan *et al.* (2014) have investigated the linkage between FDI, financial deepening and economic growth while there have been several studies on financial sector development and economic growth. However, most of them considered one component of the financial sector in relation to economic growth. The use of one component of the financial sector like capital market or domestic credit to the private sector as a representative of the entire financial sector tends to be deficient and inappropriate. To address this gap in the literature, this study employs three different measures of financial deepening- domestic credits to private sector by banks, money supply and market capitalization using the auto-regressive distributed lag model for the period of 1980-2015. With this methodology, we were able to juxtapose the effects of these variables on output performance in the short run and long run periods.

2. REVIEW OF LITERATURE

2.1 Theoretical literature

The Internalization theory tries to explain the growth of transnational companies and their motivations for achieving foreign direct investment. The theory was initially put forward by Coase in 1937. Hennart (1982) further developed the idea of internalization by offering models between the two types of integration: vertical and horizontal. Under this arrangement, transnational companies organize their internal activities so as to develop specific advantages, which are eventually exploited. Several theories have also provided explanations on the growth process in an economy. Among the various growth theories, the

traditional neoclassical and the endogenous growth theories were largely used in the literature to explain how FDI influence growth but contingent on the level of financial sector development. The neoclassical theory emphasizes the role of new technologies in the growth process that arises through FDI flow into a country. This remains the pathway linking FDI, financial development and economic growth (Grossman and Helpman, 1991; Barro and Sala-i-Martin, 1995; Shuaibu and Salisu, 2013). The endogenous growth theory focused on the role of financial sector depth in influencing FDI and how technology brought through FDI may help the economic growth of host countries (Ljungwall and Li, 2007). There are two main hypotheses explaining the direction of causality between financial development and economic growth. The first hypothesis is the demand-leading hypothesis that relates that causality runs from economic growth to financial development while the supply leading hypothesis posits that causality run from financial development to economic growth (Patrick, 1966). These two main hypotheses have been tested by scholars. They have reported mixed results (see Hermes and Lensink, 2003).

2.2 Empirical review

Extant empirical literature is replete with several studies linking financial development, FDI and economic growth. A number of the studies have reported positive findings indicating that FDI engender economic growth but contingent on financial markets development (Eller *et al.*, 2006; Hansen and Rand, 2006; Saini, Law, *et al.*, 2010; Zadeh and Madani, 2012; Adams and Opoku, 2015; Mishra and Narayan, 2015). On the other hand, several other studies indicated negative relationship between financial development, FDI and economic growth (Ahmed, 2012; Gui-Diby, 2014; Ductor and Grechyna, 2015).

Hansen and Rand (2006) found a positive relationship between FDI and growth but the direction of causality is not clear. Saini, Law, *et al.* (2010) equally reported positive relationship between FDI and economic growth but noted that for FDI to engender growth, financial market development remains crucial. Ductor and Grechyna (2015) evaluated the interdependence between financial development and real sector output and the effect on economic growth. The study submitted that the effect of financial development on economic growth depends on the growth of private credit relative to the real output growth. Equally the authors related that the effect of financial development on growth becomes negative, if there is rapid growth in private credit not accompanied by growth in real output. Mishra and Narayan (2015) opined that as long as a country's domestic credit and private credit are above their cross-sectional mean, they would have positive effect on GDP growth. They also found that market capitalization exerted a significant positive effect on the growth of GDP, while stocks traded has a statistically insignificant effect on GDP growth in their panel study of 43 countries. Eller *et al.* (2006) examined the impact of financial sector and foreign direct investment on economic growth via the efficiency channel. They found a hump-shaped relationship between financial sector, foreign direct investment and economic growth. Financial sector and foreign direct investment seem to spur economic growth but depend on a higher human capital stock. The study concluded that the level and quality of foreign investment influences the financial sectors contribution to growth in emerging markets.

Shuaibu and Salisu (2013) found that a long-run relationship exists between FDI, financial depth and economic growth. A study on Nigeria by Adegboyega and Odusanya (2014) examined the nexus between financial sector development and economic growth. Their findings indicate that positive relationship exist between credit to private sector to

gross domestic product, foreign direct investment, gross fixed capital formation, stock market capitalization to gross domestic product and liquid liabilities to gross domestic product. On the other hand, an inverse relationship existed in relation to interest rate spread. Their results support the view that the extent of financial sector sophistication matters for the benefits of private sector development to translate into better economic growth.

Obviously, the literature has provided mixed and inconclusive findings on the linkage between foreign direct investment, financial development and economic growth. This may be as a results of sample periods covered, estimation techniques and variable measurement. A host of studies employed structural breaks estimators (Shuaibu and Salisu, 2013) while other study like Saini, Baharumshah, *et al.* (2010) employed panel data estimators.

3. DATA AND METHODOLOGY

3.1 The data

Annual time series data were obtained on the gross domestic product (GDP), foreign direct investment (FDI); domestic credit to private sector by banks (CPS), money supply (MS) and market capitalization (MCP), all as proxies for financial sector development. Domestic credit to private sector by banks (CPS), broad money (MS) and market capitalization (MCP) were all expressed as percentage of GDP. Data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, Volume 26, December, 2016 and World Development Indicator, 2015 of the World Bank. The choice of broad money supply as one of the measures of financial deepening is hinged on the fact that Nigeria is a developing economy with a financial sector that is still characterized with trading in cash. It is also in line with the study by Kakar *et al.* (2011) on Pakistan.

3.2 Model specification

The econometric model for analysing the inter-relationship among foreign direct investment, financial development and economic growth in Nigeria, in line with Oniore (2014), is expressed as:

$$GDP_t = \gamma_0 + \rho FSD + \vartheta FDI + \mu_t \quad (1)$$

where GDP = output level; FSD = financial sector development, FDI = foreign direct investment, γ_0 = constant, ρ, ϑ = slope, and t = time, μ = Error term. Since our measure of financial sector development comprises of domestic credit to private sector by banks (CPS), money supply (MS) and market capitalization (MCP), equation (1) is expressed as:

$$GDP_t = \gamma_0 + \rho_1 CPS + \rho_2 MCP + \rho_3 MS + \vartheta FDI + \mu_t \quad (2)$$

The autoregressive distributed lag (ARDL) bounds testing approach to co-integration developed by Pesaran and Shin (1999) and Pesaran *et al.* (2001) is adopted in the study. This approach is applied due to its advantages over other forms of co-integration test like Engle and Granger (1987), Johansen and Juselius (1990). The ARDL co-integration approach is applicable for a number of reasons. One, the order of integration of the series i.e. I(0) or I(1) is not a concern. It is also quite an efficient estimator when sample sizes are

small and some of the regressors are endogenous. It is also possible for the variables to have different optimal lags. Moreover, a dynamic unrestricted error correction model (UECM) which incorporates both the short-run dynamics and long-run equilibrium could be easily derived from the ARDL bound testing.

Since the critical bounds become invalid when the order of integration of any variables exceeds one, then it is very essential to test for the unit root in line with the core assumption of the ARDL co-integration approach. Consequently, the Dickey-Fuller GLS test is used in confirming the order of integration of the variables. The choice of Dickey-Fuller GLS test over the traditional PP and ADF unit root tests is due to their inherent problem of poor size and power properties, as they tend to accept H_o when it is false especially when the observations are not large (Ozturk and Acaravci, 2013). The dynamic unrestricted error correction models (UECM) are:

$$\Delta \ln GDP_t = \gamma_{0GDP} + \sum_{j=1}^{p} \vartheta_{jGDP} \Delta GDP_{t-j} + \sum_{k=0}^{q} \rho_{kCPS} \Delta CPS_{t-k} + \sum_{l=0}^{r} \rho_{lMCP} \Delta MCP_{t-l} + \sum_{m=0}^{s} \rho_{mMS} \Delta MS_{t-m} + \sum_{n=0}^{t} \vartheta_{nFDI} \Delta FDI_{t-n} + \eta_{1GDP} GDP_{t-1} + \eta_{2CPS} CPS_{t-1} + \eta_{3MCP} MCP_{t-1} + \eta_{4MS} MS_{t-1} + \eta_{4FDI} FDI_{t-1} + \mu_t \quad (3)$$

where Δ is the first difference operator and the parameters η_1 to η_5 are the respective long-run multipliers. Also, the parameters ϑ_j, ρ_k, ρ_l, ρ_m and ϑ_n are the short-run dynamic coefficients of the underlying ARDL model in the equations, while μ_t denotes the error terms. The existence and significance of co-integrating relationship among the variables or the joint significance of the coefficients of the lagged level of the variables are confirmed using F-test. The null hypothesis specifying that there is no long-run relationship among the variables i.e. $H_0 : \eta_1 = \eta_2 = \eta_3 = \eta_4 = \eta_5 = 0$ is tested against the alternative hypothesis i.e. $H_0 : \eta_1 \neq \eta_2 \neq \eta_3 \neq \eta_4 \neq \eta_5 \neq 0$ implying the existence of long-run relationship i.e. They are tested based on equation (2) above. In testing for the existence of co-integration, two asymptotic critical bounds: upper bound I(1) and lower bound I(0) are used. If the calculated F-statistics falls below the lower level of the bound, the null hypothesis of no co-integration cannot be rejected. However, when the F-statistics exceeds the upper level of the bound, it is inferred that the long-run relationship exists among the variables and the null hypothesis is rejected.

4. RESULTS AND DISCUSSION

The descriptive statistics of the variables used in the analysis are presented in Table no. 1. The table shows that all the series display high level of consistency as their mean and median values are perpetually within the maximum and the minimum values of these series. Also, the results show that all the variables are leptokurtic (peaked) relative to normal as their kurtosis exceed 3 except FDI. Also, all the series are positively skewed. Finally, the probability that the Jarque-Bera statistic exceeds (in absolute term) the observed value is generally low for all the series. This suggests the rejection of normal distribution at 5%.

Table no. 1 – Descriptive statistics

	GDP	FDI	CPS	MCP	MS
Mean	127701.1	2728.704	14.86687	10.43332	24.34430
Median	45262.01	1442.407	13.19436	9.077291	21.89461
Maximum	568508.0	8841.953	38.34862	51.87523	43.26621
Minimum	15789.00	-738.8700	8.692984	1.625743	13.23075
Std. Dev.	165807.5	2849.354	6.079990	9.119523	6.575726
Skewness	1.630909	0.927284	2.510550	2.768519	0.772410
Kurtosis	4.157050	2.349613	9.557800	12.95369	3.407341
Jarque-Bera	17.96734	5.793636	102.3243	194.6021	3.828596
Probability	0.000125	0.055199	0.000000	0.000000	0.147445
Sum	4597238.	98233.33	535.2073	375.5997	876.3949
Sum Sq. Dev.	9.62E+11	2.84E+08	1293.820	2910.800	1513.406
Observations	36	36	36	36	36

Next, we examine the degree of association among the variables. This is shown in Table no. 2.

Table no. 2 – Correlation matrix

	GDP	FDI	CPS	MCP	MS
GDP	1.000000				
FDI	0.808866	1.000000			
CPS	0.087239	0.454892	1.000000		
MCP	0.208539	0.560322	0.481138	1.000000	
MS	-0.136418	0.044219	0.783926	0.050709	1.000000

All the signs tend to conform to a priori expectation while only that of money supply (MS) is contrary to expectation. Foreign direct investment (FDI), domestic credit to private sector by banks (CPS) and market capitalization (MCP) are directly related to the gross domestic product (GDP). However, broad money (MS) has negative sign as opposed to the expected positive sign. However, caution should be exercised in interpreting the results from correlation. This is because simple bi-variate correlation in a conventional matrix does not consider each variable's correlation with all other explanatory variables.

Table no. 3 – Statistical output for unit root test (Dickey-Fuller GLS)

Variables	t-statistics	Lag Length
GDP	-0.757	1
CPS	-3.426**	2
FDI	-1.809	1
MCP	-2.539	1
MS	-3.418**	1
ΔGDP	-3.486**	1
ΔFDI	-4.989*	1
ΔMCP	-5.238*	1

Note: * and ** denote rejection of the null at 1% and 5% levels respectively.

The results of the unit root test are presented in Table no. 3. It is indicated that both domestic credit to private sector by banks (CPS) and broad money (MS) are stationary at level as the null hypotheses are rejected at 5% level of significance.

Foreign direct investment (FDI), domestic credit to private sector by banks (CPS), market capitalization (MCP) and the gross domestic product (GDP) are however stationary at first difference.

Table no. 4 – Results of ARDL cointegration test

Model for estimation	F-statistics	Lower-upper bound at 1%	Lower-upper bound at 5%	Lower-upper bound at 10%
$F_{GDP}(GDP_t/CPS_t/ MCP_t/MS_t/FDI_t)$	10.85*	3.74-5.06	2.86-4.01	2.45-3.52

Note: * denotes the rejection of the null hypothesis at 1% of significance.
The critical values are provided by default using E-VIEWS 9.

It is apt to note that the lag length for our ARDL model is 2 based on the Akaike information criterion (AIC) as shown in the Annex. The ARDL Bounds testing results reported in Table no. 4, we found co-integrating relationship between foreign direct investment (FDI), domestic credit to private sector by banks (CPS), broad money (MS), market capitalization (MCP) and output growth (GDP). Thus, the null hypothesis of no co-integration is rejected. It also indicates the existence of long-run relationship among foreign direct investment (FDI), domestic credit to private sector by banks (CPS), broad money (MS) market capitalization (MCP) and output growth (GDP) in Nigeria.

Table no. 5 – Statistical output for long-run regression model

Variables	Coefficient	Std.Error	t-Statistics	p-value
FDI_t	119.274*	19.766	6.034	0.000
CPS_t	13536.491	9142.747	1.4806	0.154
MCP_t	-16205.328*	4773.939	-3.395	0.002
MS_t	-9343.633***	5352.234	-1.746	0.096
Constant	755598.107	63283.900	1.195	0.246

Note: Dependent variable: GDP_t; * and *** denote significance at 1% and 10% respectively.

Results in Table no. 5 show that foreign direct investment exerts positively on output growth at 1 percent level of significance. This implies that an increase in net inflow of foreign investment into Nigeria has substantial effects on aggregate output in the domestic economy. The truism of this finding cannot be overemphasized as improved foreign direct investment tends to promote competition, foster productivity and enhance aggregate output. This is consistent with studies by Saini, Law, *et al*. (2010). It is however contrary to findings from Ahmed (2012), Gui-Diby (2014) and Ductor and Grechyna (2015). In the same vein, activities in the Nigerian stock market as depicted by market capitalization have a highly significant influence on the aggregate output of the economy. While market capitalization exerts negatively on economic output at 1 percent level of significance, domestic credit to private sector by banks (another measure of financial deepening) was found to have an insignificant positive influence on output in the economy in the long-run. The observed relationship between market capitalization and output performance is inconsistent with that of Mishra and Narayan (2015) while that of domestic credit to private sector by banks corroborates their finding. The performance of the Nigerian stock market has indeed being

tremendous since 1999 when the country returned to democracy, though witnessed a downward trend at certain periods. The gains recorded during the periods characterized by high returns on investments probably contributed meaningfully to aggregate output in the economy. In this same manner, it could be deduced that credit provided by banks to the private sector seems to be productivity-enhancing to a certain extent.

But contrary to a priori expectation, increase in money supply was found to lead to diminution in aggregate economic output at 10% level of significance during the reviewed period. This could be attributed to the fact that the overall injection of money by the monetary authority into the economy is not truly beneficial to the real sector. It also portends that there could be leakages in the transmission mechanism through activities like rent seeking, sharp and unwholesome practices in the financial sector and gargantuan corruption that have characterized the Nigerian economy.

Table no. 6 – Statistical output for short-run regression model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔGDP_{t-1}	-0.645**	0.266	-2.421	0.025
ΔFDI_t	12.519**	6.034	2.075	0.051
ΔFDI_{t-1}	-16.638*	4.064	-4.094	0.000
ΔCPS_t	1618.919	2668.898	0.607	0.551
ΔCPS_{t-1}	-2427.894	1569.844	-1.547	0.137
ΔMCP_t	-803.502	692.360	-1.161	0.260
ΔMCP_{t-1}	3596.457*	1215.672	2.958	0.007
ΔMS_t	-2636.026	1646.210	-1.601	0.124
ECM_{t-1}	-0.282**	0.108	-2.622	0.016

Note: Dependent variable: GDP_t; * and *** denote significance at 1% and 10% respectively.

From Table no. 6, the coefficient of one-year lagged gross domestic product was found to be negative at 5 percent level of significance. This indicates that it exerts negatively on the contemporaneous gross domestic product in the short-run period. The coefficient of contemporaneous foreign direct investment was found to be positive and significant at 5 percent. This is quite similar to the long-run during which it exerted a highly significant positive effect on output growth. However, the long-run coefficient is larger than that of the short-run, implying that greater influence is exerted on the gross domestic product by foreign direct investment in the long-run period. Surprisingly, the coefficient of one-year lagged foreign direct investment was found to be negative and significant at 1 percent. By implication, foreign direct investment in the preceding year exerts negatively on output growth in the current year. The coefficients of banks' to the private sector are generally insignificant in driving output growth in Nigeria in the short-run. While the coefficient of one-year lagged market capitalization (a core measure of financial deepening) is found to be positive and highly significant, that of the contemporaneous market capitalization is negative and insignificant. This vividly reveals that stock market activities in the preceding year tend to drive output growth positively in the short-run. This finding is in sharp contrast to what prevails in the long-run when stock market activities are found to have a significant negative effect on output growth. Meanwhile, the coefficient of money supply is found to be negative and insignificant. This is quite similar to what obtains in the long-run period when the effect of money supply on output growth is negative, larger and significant.

The coefficient of the error-correction term (ECM_{t-1}) indicates the speed of adjustment from the short-run to the long-run. This is negative and statistically significant. Bannerjee *et al.* (1998) submit that a significant lagged error term with negative sign indicates the stability of the established long-run relationship and basically confirms the integrity of the long-run relationship among the variables. The value of the ECM_{t-1} (-0.28) implies that output growth is corrected from the short-run towards the long-run equilibrium by 28% each year. This speed of adjustment is quite slow.

The estimated ARDL model is tested for heteroscedasticity, serial correlation, functional form misspecification, parameter stability and normality. The results from these tests are shown in Table no. 7.

Table no. 7 – Diagnostic tests of selected ARDL model

Test	F-statistics	Prob. Value
χ^2 normal	0.7807	0.6768
χ^2 serial	1.2582	0.3068
χ^2 breusch-pagan	3.5626	0.0053
χ^2 ramsey	0.4086	0.5299

As shown in Table no. 7, the model passes the diagnostic tests for non-normality of error term, serial correlation and model specification while there is a slight problem of heteroscedasticity.

5. CONCLUSION

This study examines the relationship between financial deepening, foreign direct investment and output performance in Nigeria from 1980-2015 using the Autoregressive Distributed Lag (ARDL) bound test approach. A long-run relationship was established among financial deepening, foreign direct investment and output performance. It was inferred that output performance is mainly driven by foreign direct investment, stock market activities and money supply in the long-run while credit by banks to the private sector remains insignificant in determining output performance in Nigeria. The short-run analysis indicates that foreign direct investment and stock market activities are the core factors influencing output performance. The discrepancies in the behaviour of the explanatory variables in the long run and short run periods is not unconnected with the fact that policies in many of the sectors in Nigeria (including the financial sector) tend to be highly effective in their earliest period of implementation while these effects fizzle out over time. This is due to lack of proper monitoring and continuity. In the same vein, there has high level of inconsistencies in the formulation and coordination of policies in the Nigerian financial sector over time, especially in the banking sector.

It is recommended that financial depth should be enhanced through improved and highly efficient provision of credit by banks to the real sector of the Nigerian economy in order to increase aggregate output. Likewise, activities of the stock market need to be invigorated so that necessary financial support could be provided to business organizations. In the same vein, efforts should geared towards attracting more foreign direct investment inflows into the economy given its observed impact on output growth.

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ANNEX

Method: ARDL				
Sample (adjusted): 1982 2015				
Included observations: 34 after adjustments				
Maximum dependent lags: 2 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (2 lags, automatic): FDI CPS MCP MS				
Fixed regressors: C				
Number of models evaluated: 162				
Selected Model: ARDL(2, 2, 2, 2, 0)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
GDP(-1)	0.073296	0.245296	0.298807	0.7680
GDP(-2)	0.644584	0.266263	2.420856	0.0246
FDI	12.51930	6.033502	2.074965	0.0505
FDI(-1)	4.492478	4.811947	0.933609	0.3611
FDI(-2)	16.63791	4.063663	4.094312	0.0005
CPS	1618.919	2668.898	0.606587	0.5506
CPS(-1)	-227.8984	1855.707	-0.122809	0.9034
CPS(-2)	2427.894	1569.844	1.546583	0.1369
MCP	-803.5016	692.3599	-1.160526	0.2589
MCP(-1)	-171.8891	1094.461	-0.157054	0.8767
MCP(-2)	-3596.457	1215.672	-2.958411	0.0075
MS	-2636.026	1646.210	-1.601270	0.1243
C	21327.74	22314.09	0.955797	0.3500
R-squared	0.992621	Mean dependent var		131528.2
Adjusted R-squared	0.988405	S.D. dependent var		169960.3
S.E. of regression	18301.20	Akaike info criterion		22.75019
Sum squared resid	7.03E+09	Schwarz criterion		23.33380
Log likelihood	-373.7532	Hannan-Quinn criter.		22.94922
F-statistic	235.4248	Durbin-Watson stat		1.930759
Prob(F-statistic)	0.000000			

Note: Dependent Variable: GDP

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