

Original Research Article

Deposit Money Banks' Credit and Investment Drive of Developing Economies: Empirical Evidence from Nigeria

ABSTRACT:

The study analyzed the impact of the Deposit Money banks credit on investment in Nigeria from 1981 to 2012. In order to achieve this objective, Deposit Money banks credit to the private sector of the Nigeria economy is used to estimate its impact on Nigeria's investment. Using the ordinary least square it was found that the Deposit Money banks credit has significant effect on the investment in Nigeria while interest rate also has a significant positive effect on investment which is however at variance with the a priori expectation. Based on the findings the study recommended that greater efforts should be made to make available short, medium and long term loans to productive sectors like the manufacturing sector, agricultural sector and SMEs as they constitute an integral growth process of the economy since this will induce employment and income of the various economic agents. Also Interest rate on credit facility granted to private sector should be significantly reduced, Deposit Money banks' should grant soft loan to this important sector of the economy and they should also remove stringent policies that hinder the supply of credit to productive sectors of the economy. This will make Deposit Money banks' credit to the real sector to have a robust effect on investment and economic growth of the various sectors of the economy.

Key Words: Deposit Money Banks, Credit, Investment, Agricultural Output

1.1 Introduction

Deposit Money banks have traditionally played an important role in financing various sectors of the economy especially in developing nations such as Nigeria. As such a rapid and sustained output growth of the domestic economies of developing nations have been canvassed to be of paramount importance to solving the numerous challenges such as unemployment, balance of payment and exchange rate volatility that has bedeviled the developing economies of the world through suitable programs and policies. Consequently, various governments in Nigeria have implemented several national developmental plans and programmes directed at boosting productivity efficiency, as well as, diversifying the domestic economic base.

Considering the foregoing, the infrastructural and capital resources required for the realization of these goals have however been scarce. This has obliged the intervention of deposit money banks credit in these economies via the provision of the required mammoth capital outlay necessary for extensive production in substantial industrial activities. This vibrant role of deposit money bank credit in spawning growth in an economy has been widely acknowledge for instance Imoughele, and Ismaila (2013), Ali (2013), Abdulsalam and Ibrahim (2013), Hesse, (2007) established that banking sector facilitate technological innovation through their intermediary role. They emphasized that efficient allocation of savings through identification and funding of entrepreneurs with best chances of successfully implementing innovative product and production are tools to achieving real economic performance.

There is also a consensus in theoretical literature that the basic activities of banks are acceptance of deposits and lending to a large number of agents, holding of liquid reserves against predicated withdrawal demand, issuing of liabilities that are more liquid than their primary assets and eliminating or reducing the need for self-financing of investments. In particular, by providing liquidity, banks permit risk adverse savers to hold bank deposits rather than liquid (but unproductive) assets. The funds obtained are then made available for investment in productive capital (Nwaeze, Onyedikachi and Nwabekee, Chidinma, 2014).

Nwanyanwu (2012) noted that the banking sector help to make credit available by mobilizing surplus fund from depositors who have no immediate needs of such money and channel it in form of credit to investors who have brilliant ideals on how to create additional wealth in the economy but lack the necessary capital to execute the ideals. The study further reveals that the role of credit in an economy has been recognized as credit are obtained by economic agents to enable them meet operating expenses. For instance business firm obtained credit to buy machinery and equipment, farmers obtained credit to purchase farm input such as fertilizers, seeds, farm buildings and the government obtained credit to meant various kinds of government expenditure either recurrent or capital expenditure.

Abdulsalam and Ibrahim (2013) succinctly reasoned that a developed financial sector should replicate the ease with which entrepreneurs with sound projects can obtain financial resources, and the poise with which investors expect adequate returns. The system should also be able to measure, segment, and spread problematic risks, letting them rest where they can best be borne and should be able to do all these at low cost. With this, more savings, investment and high productivity will be ensured and hence economic growth.

However, Imoughele, and Ismaila, (2014) argued that despite the significant role played by Deposit Money Banks in the growth of the real economy by directing funds from savers to borrowers in an efficient and high productive manner to enable investment in physical capital, spur innovation which adds to economic growth that will ensure poverty reduction, job creation and the stabilization of macroeconomic indices in developing economies such as Nigeria have seemingly yielded little or no positive results.

Based on the above assertion, this study examines the extent to which intermediation or credit to the private sector of the Nigerian economy has influenced the investment considering the seemingly non significant improvement in the investment and domestic production of the Nigerian economy.

2.1 The Links between Deposit Money Banks and Investment

The functions of deposit money banks are numerous, all aimed at satisfying the financial needs of the various sectors of the economy such as agriculture, industry, trade, communication etc, accordingly they play very momentous role in a process of economic and social needs.

The prompt and sustained output growth of the domestic economy of Nigeria since the political independence in 1960 has been of principal importance to successive governments in the country. Thus, governments have since executed several national development plans and programmes designed at enhancing productivity, as well as, diversifying the domestic economic base. The infrastructural and capital resources necessary for the realization of these objectives have however been limited (Imoughele and Ismaila, 2013). This has obliged the intervention of deposit money banks credit in the economy via the provision of the required huge capital outlay needed for large-scale production in industries and for the provision of other credit facilities for economic growth.

The impact of Deposit money banks credit on the various economic agents which is regarded as bank loans and advances aid in financial intermediation between deficit unit and surplus units enhances productivity, impacting positively on economic growth. Yakubu and Affoio (2014) strongly support financed lead growth hypothesis, which hypothesized that financial sector play a key role in channeling savings into productive investment, particularly in the formal sectors of the economy.

The banking sector is the key channel for financial intermediation in the economy. The vital role of deposit money banks credit in ensuring growth in an economy has been widely acknowledged. Rousseau and Wachtel (2000) established that banking sector enable technological invention through their intermediary role, Oluitan,(2010) hypothesized that effective allocation of savings through identification and funding of entrepreneurs with best chances of successfully implementing innovative product and production are apparatuses to achieving real economic performance. Nwanyanwu (2012) posits that the banking sector help in the provision of credit by organizing surplus fund from depositors who have no instant needs of such money and consequently channel it in form of credit to investors who have wonderful ideals on how to create additional wealth in the economy but lack the required capital to implement the ideals. This further reveals that the role of Deposit Money Banks credit is recognized as suitable source to the economic agents to enable them meet both new investment opportunities and operating expenses.

In other to strengthen the banking sector to meet up with this herculean task of providing credit in the economy, various banking reforms have been established by the monetary authority in Nigeria in enhancing credit accessibility (Lemo, 2005). The overall objectives of these reforms have been to guarantee financial stability so as to influence the growth of the economy and also enhance bank to play their role of financial intermediation in provision and accessibility of credit in the Nigerian economy. These various reforms have led to the improvement of banking services to the economic units (Nnanna, 2004).

Available information from Central Bank of Nigeria reveals that the total loans and advances to the Nigerian economy as at 1986 was N15701.6 million immediately after deregulation of the Nigerian Banking sector it increase to N31306.2 million in 1991. It further increase to N144569.2 million, N508302.2 million, N1976711 million and N9611990 million in 1995, 2000, 2005 and 2010 respectively (Olukayode and Somoye, 2013).

However, Abdulsalam and Ibrahim (2013) claimed that despite series of efforts through bank reforms and other policies aimed at strengthening the bank's ability to ensure efficient services delivery and funding the real sectors so that it will enable the Nigerian economy to become more vibrant and very dynamic, the problems of inefficient allocation of funds to the real sector, lack of long-dated funding, deterioration in domestic credit by the banking sector to the private sector, high concentration of loans to few sectors and mismatch of liquidity in the Nigeria economy still lingers (Imoughele and Ismaila, 2013).

It suffice to state that financial intermediaries by providing these services to the economy, influence savings and allocation decisions in ways that may alter long-run growth rates hence banks play effective roles in the economic growth and development of any country in the world. This role they perform excellently by helping to mobilize idle savings of the Surplus Unit for onward lending to the Deficit Units, thus helping in the capital formation of a nation (Ujah and Amaechi, 2005). It is in realization of the importance of bank's role in financial intermediation that successive governments in Nigeria have been allocating deliberate roles to them in various National Development Plans Nwaeze, Onyedikachi, and Nwabekee (2014).

2.2 Significance of Deposit Money Banks Credit on Investment

The significance of banks in engendering growth in an economy has been extensively discussed by several scholars. Many believed that financial intermediaries play important roles in economic growth. Studies by Ali (2013), Nwaeze, Onyedikachi and Nwabekee (2014), Imoughele and Ismaila (2013), Dada, (2014), confirm that well-functioning banks fast-track economic growth. Furthermore, a seminal study conducted by King and Levine (1993) on seventy seven countries made up of developed and developing economies showed that finance not only follow growth; finance seems important to lead economic growth. Ali (2013) also observed that financial institutions yield better information, improve resource allocation and thereby prompt growth. These studies further strengthen the proclamation that financial intermediation stimulate economic growth. Notwithstanding the above opinions, some scholars believe that finance is a relatively insignificant factor in economic growth. They hypothesize that economic growth is a causal factor for financial development. Oluitan (2010) argue that as the real sector grows the

124 increasing demand for financial services stimulate the financial sector and as such a holistic approach
125 should be considered to ensure a robust investment in the economy of developing nations.

126 **2.3 Summary of Deposit Money Banks' Credit to the Private Sector of the Nigerian** 127 **Economy**

128 According to the CBN bulletin 2012 edition reveals that the share of Deposit Money Bank's bank loan
129 advanced to the economy shows a fluctuation from 1981 to 2012 with an average value of 14.89% with
130 the maximum value of 37.77% in 2009 while the least value was 0.97% in 1990. The disparity value
131 recorded by the overall credit share in GDP is as a result of various monetary policy by the monetary
132 authority to regulate the supply of money by bank to the public and private sector in order to stemmed
133 inflation in the Nigerian economy Imoughale and Ismaila (2013). The average value indicates that there is
134 poor financial development in the Nigerian economy despite the various reforms to restructure the sector
135 and facilitate credit accessibility by the private sector.

136 Comparatively, using the average credit allocation to the various sectors, the manufacturing sector
137 received the highest credit allocation in Nigerian economy followed by the agricultural sector while the
138 services and economic sector received the least. The Deposit Money bank's credit advanced to the
139 agricultural sector showed a dynamic value for the period under review with an average of 3.39%. The
140 maximum value was 6.56% in 1986 immediately after the deregulation of the Nigeria financial market
141 which allowed the market forces to determine the demand and supply of credit in the economy.

142 The Deposit Money banks' loans advanced to the real and manufacturing sector averaged 83.13% and
143 the maximum value was 167.15% in 2009 while the least was 53.48% in 1989. The Deposit Money
144 bank's credit advanced to the services sector has an average of 11.16% with maximum value of 73.74%
145 in 2010. Comparatively, the manufacturing sector dominates the credit allocation in Nigerian economy
146 followed by the services sector and the agricultural sector. However the total amount of deposit money
147 bank's loans to the private sector witnessed a steady upward trend with the manufacturing sector taking
148 the bulk of the credit allocation between 2011 and 2012.

149 **2.4 Theoretical Framework**

150 **2.4.1 Supply-Leading Hypothesis**

151 The "supply-leading" hypothesis posits that the financial sector exists primarily to mobilize and transfer
152 funds to the real sector, all the idle savings that are left idle in the traditional sector hence, providing
153 investment capital and acting as engine of growth. The proponent of this theory argues that a highly
154 developed state of economic growth is characterized by mutual co-existence and re-enforcement of each
155 other by the financial and real sectors. The relationship becomes contemporaneous and causality runs bi-
156 directionally as opposed to the un-directional. Supporting this assertion Onodugo, Kalu, Anowor, (2013),
157 Ikechukwu & Godfrey (2014) posit that state of no significant causality between financial and the real
158 sector is further, both theoretically and empirically feasible and is recognized as the Schumpeterian
159 independent hypothesis.

160 In consonance with the above Prince & Ikechukwu, (2014) submit that Deposit money banks operate
161 within the business environment and essentially, trade on mobilized deposits in addition to other related
162 services. Financial institutions are net liability takers. However, the possible effects of their credit related
163 transactions on the economy could be routed in the theory of financial intermediation and associated
164 hypotheses that attempt to explain the interactions between economic growth vis-As-vis investments.
165 Godfrey Ajie (2006) relates financial intermediation to the process of mobilizing saved resources from
166 surplus saving units in the economy by financial intermediaries (institutions) at market determined rates
167 and onward lending of same or part thereof, to efficient spending units for productive investment
168 purposes.

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171 2.4.2 Theory of Financial Intermediation

172 The theory of financial intermediation was initially formalized in the studies of Goldsmith (1969), Shaw
 173 (1973) and Mckinnon (1973), they observed that the pivotal role played by financial markets in economic
 174 development, attributing the differences in economic growth across countries to the quantity and quality of
 175 services provided by financial institutions. Other empirical results that support the foregoing are the
 176 studies by Nwaogwugwu, (2008) and Dabwor, (2009) on the Nigerian financial market development and
 177 economic growth. However, this contrasts with Robinson (1952), who argued that “financial markets are
 178 essentially hand maidens to domestic industry, and respond passively to other factors that produce
 179 cross-country differences in growth. Moreover there is general tendency for supply of finance to move
 180 along with the demand for it.

181 2.5 Empirical Review

182 Several empirical studies have examined the impact of commercial bank credit and economic growth of
 183 the Nigerian economy generally. For instance Onodugo, Kalu,, Anowor and (2013), Prince, Ikechukwu &
 184 Godfrey, (2014), Orji, (2012), Aliyu, Yusuf, (2013), Jude ,(2014), Emeche & Ibe, (2014), Yakubu and
 185 Affoi (2014), Uzomba, Chukwu and Jumbo, (2014) The studies concluded based on their findings that
 186 deposit money banks' loans and advances have contributed significantly in financing capital investments
 187 and stock market development in Nigeria.

188 3.1 Methodology

189 The study employs annual time series data covering the period 1981 -2012. This period is chosen
 190 because of the availability of data on the relevant variables. More importantly, the period witnessed
 191 tremendous bank reformed that enhanced financial mobility. Data for the study was obtained from Central
 192 Bank of Nigeria (CBN) statistical Bulletin and CBN Annual Report and Statement of Accounts various
 193 issues.

194 3.2 Model Specification

195 The study adopted the econometric model as used by Abdullahi and Adamu (2013), Onodugo, Kalu, and
 196 Anowor (2013). This model is specified in order to capture the research objectives of the model. This
 197 research work employed a linear regression model using Ordinary Least Square (OLS) estimation
 198 because of its reliable traits as the best linear unbiased estimator. Its error term is also assumed to have
 199 a minimum and equal variance.

200 In order to achieve the stated objective, the hypothesis is specified in a null form:

201 H0: Deposit Money Bank's credit has no significant impact on investment Nigerian

202 The hypothesis will be tested at 5% level of significant.

203 The functional relationship is specified thus:

204 $INV = f(DMBC, INTR)$ ----- (1)

205 The econometric model of this functional relationship is given as:

206 $INV = \beta DMBC1 + \beta INTR2 + \mu$

207 Where:

208 INV = Investment

209 DMBC= Total Credit Extended to Private Sector by deposit money banks.

210 INTR = DMB's Interest rate.

211 β = Coefficient

212 μ = Error term

213 A priori Expectations: $\beta1 > 0$; $\beta2 > 0$

4.1 RESULTS AND DISCUSSION

This chapter presents the analysis and interpretation of the results relating to the data collected, which is attached in the appendix. the Ordinary Least Squares (OLS) multiple regression technique was used for data analysis with the aid of E-view to test the formulated hypotheses and ascertain the relationship between DMBC on invesmentt from 1981 to 2012.

4.2 Unit Root Test

In order to determine the stationarity properties of the reform variables used in the study, the Augmented Dickey Fuller Test was performed. The unit root results which indicate the order of integration of each of the variables is presented in table (1) below:

Table 1: Unit Root Test for the Test of Data Stationarity for INV, DMBC, and INTR

Variable	ADF Value	@test Mackinnon value @ 5%	Critical Order of Integration
INV	-1.214285	-2.960411	1(0)
DMBC	-4.033530	-2.960411	1(0)
INTR	-3.752338	-2.960411	1(0)

Author's computation 2016

The results of the Augmented Dikker Fuller Test in the table above revealed that, all the variables are stationary at level and are integrated of order zero. This implies that, no long run information is lost thus, the application of ordinary least squares in the estimation process is therefore appropriate and not likely to yield spurious estimates.

4.3 Diagnostic Test

To ensure that the data for this study was fit for the model, three diagnostic tests were carried out on the data. These include the Breusch-Godfrey serial correlation test, Ramsy Reset test is a test for misspecification of the first order, including incorrect functional form and the exclusion of relevant variables and the Heteroskedasticity white test which test whether the estimated variance of the residuals from a regression are dependent on the values of the independent variables.

Table 2: Diagnostic Test for Serial Correlation Test, RESET Test, Heteroskedasticity white Test

Type of Test		Serial Correlation Test	LM	Heteroskedasticity White test
Model	F-stat	9.440002		4.478915
	P-value	0.0008		0.0045

Author's computation 2016

244 4.3.1 Correlation Coefficient for Serial Correlation

245 The result of the Breusch –Godfrey serial correlation as contained in table (2) above indicates that there
246 is no serial correlation in the model with an F-statistic of 9.440002 and a prob. of 0.0008 which is
247 statistically significant at 5% level.

248 4.3.2 Heteroscedasticity White test

249 The white test is a statistical test that establishes whether the residual variance of a variable in a
250 regression model is constant (i.e Homoskeasticity). In cases where the White test is statistically
251 significant, heteroscedasticity may not necessarily be the cause, but specification errors. In other words,
252 the White test can be a test of heteroscedasticity or specification of error or both. Table (2) above
253 revealed that, the null hypotheses of the presence of heteroscedasticity for the White tests in model is
254 rejected. This is because the F-statistic of 4.478915 and a prob. value of 0.0045 for the model which is
255 statistically significant at 5% alpha level (p-value < 0.05). The conclusion is that, the presence of
256 heteroscedasticity is minimal if not completely absent in the model there by satisfying the classical OLS
257 assumption of homoscedasticity (constant variances). It therefore implies that, the application of OLS on
258 these models will yield Best Linear and Unbiased Estimates (BLUE).

259 Table 3: Variance Inflation Factor

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
DMBC	0.001125	1.113027	1.008713
INTR	0.554493	2.010515	1.008713
C	4.331660	123.6473	1.002126

260 Author's computation 2016

261 In order to ensure that the results are robust, a diagnostic test was performed. In attempt to detect
262 multicollinearity, the variance inflation factor (VIF) test was computed as indicated in the able above.

263 The Variance Inflation Factor (VIF) measures the impact of Collinearity among the variables in a
264 regression model. The Variance Inflation Factor (VIF) is always greater than or equal to 1. There is no
265 formal VIF value for determining presence of multicollinearity. Values of VIF that exceed 10 are often
266 regarded as indicating multicollinearity, but in weaker models values above 2.5 may be a cause for
267 concern (A. Kouisoyiannis, 1977: Gujarati and Sangeetha, 2007).

268 This study adopts the “Rule of thumb” of 10, this shows the appropriateness of fitting of the model of the
269 study with the dependent variable. In addition the tolerance values are consistently smaller than 0.7, this
270 further substantiates the absence of multicollinearity. The two measures for testing multicollinearity
271 indicate that there is no multicollinearity problem in the model. Therefore it is used for our analysis.

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274 4.4 Regression Analysis

275 Following the result of the ADF and the Diagnostic test above, the study adopts the technique of ordinary
276 least squares for the regression analysis. This is based on the premise that, all the variables in the data
277 set are stationary and can yield best linear unbiased estimates.

278 Table 4: OLS Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DMBC	0.316269	0.033541	9.429264	0.0000
INTR	2.038478	0.744643	2.737525	0.0105
C	-4.291184	2.081264	-2.061816	0.0483
R-squared	0.862093	Mean dependent var		4.686744
Adjusted R-squared	0.852582	S.D. dependent var		2.757626
S.E. of regression	1.058790	Akaike info criterion		3.041191
Sum squared resid	32.51007	Schwarz criterion		3.178604
Log likelihood	-45.65906	Hannan-Quinn criter.		3.086739
F-statistic	90.64352	Durbin-Watson stat		1.724169
Prob(F-statistic)	0.000000			

279 Author's computation 2016

280 The regression result in table 4 above revealed that, all the variables passed the t-test at the 5% level of
 281 significance. The results also showed that all the variables are positive and correctly signed. The positive
 282 effect of DMBC showed that, DMBC has a positive relationship with INV. A unit change in DMBC affects
 283 INV by 0.316269. Also, a unit change in INTR, have a positive effect on INV. This means that a unit
 284 change in INTR will affect INV by 2.038478. The result also shows that interest rate (INT) has positive
 285 coefficient, which is not consistent with the a priori expectation that $B_2 < 0$. The coefficient of this variable
 286 is not significant at 0.05significance level. The degree of the coefficient is 2.038478, and a prob. of 0.0105
 287 by implication, one per cent increase in interest rate will lead to 2.038478 per cent increase in investment
 288 which is statistically significant at 5% level. The positive nature of this variable is as a result deliberate
 289 effort to reduce interest rate for the real sector of the Nigerian economy which has the ability to promote
 290 investment and maximum economic output.

291 An adjusted R^2 of 0.852582 showed that 85 percent of the systematic variations in the Investment is
 292 influenced by the combined effect of the explanatory variables put together while 15% is accounted for by
 293 other factors. The robustness of this result is further buttressed by an F-statistic of 90.64352. An
 294 estimated probability values (Prob. (F-stats) of 0.0000 is significant enough to conclude that, the model
 295 has performed well. The coefficient of constant was -4.291184 which determine the value of INV given a
 296 unit increase or decrease in any of the independent variables, while all other variables are rendered zero.
 297 This findings are also in line with the a priori expectation of this study that ($\beta_1 > 0$) but however at
 298 variance in the a priori expectation of ($\beta_2 < 0$) and empirical evidence of (Imoughele, Ismaila, 2013).

299 **Test of Hypothesis**

300 The null hypotheses of the study states that; "There is no significant effect of deposit money bank's credit
 301 on INV in Nigeria was tested at 5% level of significance. Consequently the null hypotheses for the
 302 aforementioned variables are rejected as the result showed that DMBC contribute significantly and
 303 positively on investment.

304 **5.1 Conclusion**

305 This study has investigated the impact of Deposit Money banks' credit on investment for from 1981 and
 306 2012. The study found that the DMBC had significant and positive and significant effect on investment in
 307 Nigeria. The study shows that interest rate has a significant positive effect on investment effect on
 308 investment. This finding is however at variance with the a priori expectation as regards interest rate.

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5.2 Recommendations

Based on the findings in this study made the following recommendations:

1. Greater efforts should be made to make available, short, medium and long term loans to productive investments like the manufacturing sector, Agricultural sector and SMEs as they constitute an integral part of the growth and transformation process of the economy like that of Nigeria as this will induce employment and income of the various economic agent.

2. Interest rate on credit facility granted to private sector should be drastically reduced, Deposit Money bank's should grant soft loan to this important sector of the economy and also reduced stringent policy in supply of credit to productive sectors of the economy. This will make Deposit Money bank's credit to SMEs to have a robust effect on growth of the sector.

Authors may use the following wordings for this section: “

ALI, Jude Iggyo designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. 'while JATAU, Simon, ASHAMI Philip managed the analyses of the study. 'ALI, Jude Iggyo JATAU, Simon, ASHAMI Philip Iorlunmun' managed the literature search. All authors read and approved the final manuscript.”

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402
403 **DEFINITIONS, ACRONYMS, ABBREVIATIONS**
404 **Term:** INV: Investment, DMBC: Deposit Money Banks' Credit
405

406 **Appendix I Unit Root Test Result**
Null Hypothesis: INV has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.214285	0.6555
Test critical values: 1% level	-3.661661	
5% level	-2.960411	
10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INV)
Method: Least Squares
Date: 12/01/16 Time: 15:21
Sample (adjusted): 1982 2012
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INV(-1)	-0.040280	0.033172	-1.214285	0.2344
C	0.446225	0.176007	2.535268	0.0169

R-squared	0.048384	Mean dependent var	0.261901
Adjusted R-squared	0.015570	S.D. dependent var	0.499916
S.E. of regression	0.496009	Akaike info criterion	1.497895
Sum squared resid	7.134721	Schwarz criterion	1.590411
Log likelihood	-21.21738	Hannan-Quinn criter.	1.528053
F-statistic	1.474489	Durbin-Watson stat	2.172172
Prob(F-statistic)	0.234435		

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Appendix II Regression Result

Dependent Variable: INV

Method: Least Squares

Date: 12/01/16 Time: 15:21

Sample: 1981 2012

Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DMBC	0.316269	0.033541	9.429264	0.0000
INTR	2.038478	0.744643	2.737525	0.0105
C	-4.291184	2.081264	-2.061816	0.0483

R-squared	0.862093	Mean dependent var	4.686744
Adjusted R-squared	0.852582	S.D. dependent var	2.757626
S.E. of regression	1.058790	Akaike info criterion	3.041191
Sum squared resid	32.51007	Schwarz criterion	3.178604
Log likelihood	-45.65906	Hannan-Quinn criter.	3.086739
F-statistic	90.64352	Durbin-Watson stat	0.724169
Prob(F-statistic)	0.000000		

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Appendix III Diagnostic Test Result

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	9.440002	Prob. F(2,27)	0.0008
Obs*R-squared	13.16827	Prob. Chi-Square(2)	0.0014

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 12/01/16 Time: 15:22

Sample: 1981 2012

Included observations: 32

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DMBC	0.002327	0.027010	0.086157	0.9320

INTR	-0.341246	0.640797	-0.532533	0.5987
C	1.014402	1.798918	0.563896	0.5775
RESID(-1)	0.684379	0.191588	3.572146	0.0014
RESID(-2)	-0.048837	0.208777	-0.233921	0.8168

R-squared	0.411508	Mean dependent var	-3.40E-16
Adjusted R-squared	0.324324	S.D. dependent var	1.024066
S.E. of regression	0.841777	Akaike info criterion	2.635999
Sum squared resid	19.13191	Schwarz criterion	2.865020
Log likelihood	-37.17598	Hannan-Quinn criter.	2.711913
F-statistic	4.720001	Durbin-Watson stat	1.933504
Prob(F-statistic)	0.005106		

411

Heteroskedasticity Test: White

F-statistic	4.478915	Prob. F(5,26)	0.0045
Obs*R-squared	14.80799	Prob. Chi-Square(5)	0.0112
Scaled explained SS	6.465239	Prob. Chi-Square(5)	0.2635

412

Variance Inflation Factors

Date: 12/01/16 Time: 15:23

Sample: 1981 2012

Included observations: 32

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
DMBC	0.001125	1.113027	1.008713
INTR	0.554493	2.010515	1.008713
C	4.331660	123.6473	1.002126

413