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A STUDY ON FINANCIAL DEVELOPMENT AND FDI IN NIGERIA

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ABSTRACT

This paper uses time series data to investigate the impact of financial market development on foreign direct investment (FDI). In doing this, the paper poses three questions namely; a) Is there any significant relationship between financial development and FDI inflows to Nigeria? b) Is there any causal relationship between financial development and FDI in Nigeria? c) To what extent does financial sector help in harnessing the FDI benefits in Nigeria? In a bid to answer these questions, the paper explores both the long run and short run relationship between the dependent and independent variables and also conducted a causality test to establish if there is any causal relationship or feedback transmission from them. However, the presence of unit root in the time series data was tested using Augmented - Dickey - Fuller and Philips - Perron unit root tests, while the long run equilibrium relationship among the variables was estimated using Johansen and Juselius (1990) cointegration tests. Furthermore, the long run impact of financial development on FDI was established by normalizing the long run coefficients of the variables, while the short run dynamics were tested using the dynamic vector error correction model, adopting Hendry's general to specific approach until parsimonious model is achieved. The study therefore finds that; 1) financial deepening does not play any significant impact on foreign direct investment; 2) that financial development does not induce or encourage FDI inflow to Nigeria, and at the same time, FDI is not assisting the growth of financial assets in Nigeria; 3) finally, that financial markets in Nigeria do not help the economy in harnessing the benefit of FDI. Finally, the paper recommends that since foreign direct investment is very crucial to the growth of the economy, the country's financial sector should be developed, to attract more FDI inflow to the economy and serve as a good absorptive capacity through which FDI benefit can be harnessed.

KEYWORDS: *Foreign Direct Investment, Financial Development, Human Capital, Absorptive Capacity, Economic Growth.*

1. INTRODUCTION

Foreign direct investment (FDI) can promote economic growth in the host country through a variety of channels. It provides incentives to competition, innovation and economic development. FDI often leads to a transfer of technology to the affiliates of multinational firms in the host countries through the interaction between multinational firms and domestic suppliers, customers and worker mobility (Al Nasser and Gomez, 2009).

To analyze this paper, three questions emanate which require careful elucidation. They include; a) Is there any significant relationship between financial development and FDI flows to Nigeria? b) Is there any causal relationship between financial development and FDI in Nigeria? c) To what extent does developed financial sector help in harnessing the FDI benefits in Nigeria? To this end, the rest of the paper is structured as follows; section 2 reviews the Empirical Literature; while section 3 deals with the Methodology. Section 4 is the Empirical Result, whereas section 5 discusses the result. Finally, section 6 concludes the paper.

2. METHODOLOGY

2.1 Variables of the Model:-

The variables of the model are; foreign direct investment net flows (FDI), financial deepening (FD) variables – financial sector credit to the private sector as a ratio of GDP (PCR), per capita real money balances (PCRMB), banking sector credit to the private sector as a ratio of GDP (BANK), ratio of liquid liability to GDP (LLY), ratio of commercial bank assets to central bank plus commercial bank assets (BTOT) and ratio of broad money to GDP (M2), and other control variables which may affect the dependent variable, namely; Per Capita GDP (PCG); domestic investment (DI), real exchange rate (RER),

inflation rate (INFLR), human capital index (HDI), government expenditure (GOVEX), and population rate (POPR).

2.2 Model Specification:-

The researcher employs Mankiw *et al.* (1992) specification as used in Alfaro *et al.* (2004) to establish the impact of financial development on Foreign Direct Investment (FDI) and we specify the model in this form:

$$\ln FDI = \varphi_0 + \varphi_1 \ln PCG + \varphi_2 \ln DI + \varphi_3 \ln HDI + \varphi_4 \ln FD + \varphi_5 \ln GOVEX + \varphi_6 \ln INFLR + \varphi_7 \ln POPR + \varphi_8 \ln RER + v_t$$

Note: The variables are defined in the variables of the model: φ_i is the coefficient and v_t is the error term. FD represents all the financial deepening variables used in the study as defined above.

2.3 Time Series Properties:-

Primary concern of this study is to find the long run and short run relationship between financial development and FDI in Nigeria. In doing that, the Johansen and Juselius cointegration approach offers useful insights towards testing for the long run relationship, while the Error Correction Mechanism will be appropriate to test for the short run dynamics. In principle, two or more variables are adjudged to be cointegrated when they share a common trend. Hence, the existence of cointegration implies that causality runs in at least one direction (Granger, 1988). For the unit root test, we employ the Augmented Dickey Fuller, (1981) and Phillips-Perron (1988) tests.

2.4 Data Sources:-

The data used in this work were sourced from the World Development Indicator (WDI) data base of World Bank, International Financial Structures (IFS) data base, Central Bank

of Nigeria (CBN) statistical bulletin, and Federal Bureau of Statistics. The data cover the period 1970 – 2008. Meanwhile, the problem of data variability was resolved by converting the data to natural logarithm. Time series properties were tested to ascertain the stationarity of the data.

3. EMPIRICAL RESULT

3.1 Unit Root Test:-

The result of this study begins by testing if the variables of the model have unit roots. In this test, we employ both the ADF and PP tests. The results of this exercise are presented in Table 1 in the appendix. The test shows that all variables except inflation rate are stationary at first difference using both tests. Banking sector credit to private sector (Bank) is stationary at level in the two tests at 5 percent level of significance, but at first difference, it is stationary at 1 percent level of significance. Population rate is stationary at first difference in ADF test only. This result is consistent with the findings of several other works which show that most macroeconomic variables follow a 1(1) process. It also suggests that the variables under investigation are candidates for a cointegrating relationship.

3.2 Cointegration Test:-

To conduct this test, we utilize the Johansen and Juselius (1990) Maximum Likelihood Procedure. The results are in Tables 2a and 2b. The essence of cointegration test is to test whether there is long run relationship between financial sector variables and foreign direct investment (FDI). The results indicate such a relationship. In the tables, both trace and maximum eigen- value statistics detect multiple cointegrating vectors respectively, implying that the variables in the model are cointegrated. In other words, there is long run relationship among the variables.

3.3 Long Run Relationship between Financial Development and Foreign Direct Investment:-

Furthermore, to investigate the effect of financial deepening on foreign direct investment (FDI), there is need to normalize the long run coefficients of the FDI – FD model in order to establish the long run relationship between the dependent and independent variables. The results of the test are reported in Table 3. The results show that in the long run, PCG, DI and INFLR have positive and significant relationship with FDI, while HDI, GOVEX, POPR and RER have negative and significant impact on FDI. The financial deepening (FD) variables though have positive coefficients but are statistically insignificant in most of the columns except in columns 6 and 7. In column 6, BTOT has negative and significant relationship, whereas LLY has positive and significant relationship with FDI. Thus, in the long run, financial deepening does not have robust significant impact on foreign direct investment. This also implies that Nigeria may not be benefitting from FDI due to low absorptive capacities. Human capital, government expenditure, population growth and real exchange rate play negative role in FDI inflows to Nigeria. While per capita GDP, used to proxy the size of domestic market and domestic investors complement FDI flows.

3.4 Short Run Dynamics:-

The dynamic ECMs of the FDI – FD model are reported in Table 4. In this model, we present 7 columns ranging from column 1 to 7. Column 1 is the column for non financial variables which can affect FDI in flows negatively or positively as the case may be. Here, most of the variables do not conform to a prior expectation. For instance, domestic investment (DI) has insignificant effect on FDI at level period. When we impose higher order lags, it becomes negative and statistically significant. This result suggests that there is a crowding out effect of DI on FDI. In fact, they do

not play complementary role to each other. Human capital index (HDI) has insignificant effect on FDI at level, and becomes positive and significant in lag one period. Inflation rate (INFLR) has positive and significant impact on FDI at level period, but remains insignificant in lag periods. Also, population rate (POPR), government expenditure (GOVEX) and real exchange rate (RER) have negative and insignificant effects on FDI, though, RER becomes negative and significant during lag 2 period.

When PCRMB is used as financial deepening variable, the result departs slightly from the first column, without much improvement, in that inflation rate becomes negative and barely significant at lag periods, though insignificant at current level. HDI becomes positive and significant at current and lag one period, while GOVEX becomes insignificant at level, positive and significant at lag one and was removed from the model in lag 2 and 3 periods. The POPR is not significant in any of the periods in this column. Meanwhile, RER is negative and significant at current value and was eliminated in lag periods. The coefficient of PCRMB however, appears negative and significant at lag 2. Moreover, including (BANK) as financial measure in column 3 produces the same result as before, with DI still maintaining negative and significant, PCG remaining positive and significant and HDI maintaining positive and significant effect on FDI. The only exception is the inflation rate is now positive and significant like in column 1. Interestingly, the coefficient of (BANK) is positive and robustly significant at 1% level. In column 4, where BTOT is the financial measure, lag 2 of FDI still maintains positive and significant coefficient, but PCG now becomes insignificant while DI has positive and significant coefficient at level here, and negative and significant effect in lag 3. The coefficients of HDI and INFLR remain as before, where as GOVEX becomes positive and marginally significant at

level, and negative and significant at lag 3. RER has negative and significant in all the columns. Incidentally, the coefficient of BTOT appears negative and significant at level and positive and significant during lag 1 period. Finally, columns 5, 6 and 7 produce basically the same results with the previous columns of the model. However, the coefficients of the financial measures used in these columns are all negative and significant. Only M2 has positive and significant coefficient at level, but still maintains negative and significant coefficient at lag 1. Altogether, we can summarize this model by saying that financial variables do not have robust and consistent impact on FDI inflows to Nigeria in the short run, although the short run dynamics implies that the negativity or positivity of the coefficients of the variables can change in the long run period as the dependent variable approaches equilibrium. We can also suggest that this non consistent impact of financial deepening variables on FDI in both the long run and short run periods may be explained by the low level of development of the financial sector, as well as limited supply of financial assets in Nigeria.

To understand the short term adjustment process more, we need to look at the sign and the magnitude of the error correction term (ECT). Here, the coefficients of the ECT appear negative and significant in all models. The negative coefficients of the ECT imply that FDI converges to its long run equilibrium path in relation to changes in the independent variables. The magnitude of the coefficient lying between -1 and -2 implies that ECT produces dampened oscillations around the long run value of FDI before converging quickly to its equilibrium path. Meanwhile, the statistical significance and the correct sign of the ECT coefficients confirm further the presence of a long run equilibrium relationship between the dependent and independent variables.

Finally, the diagnostic statistics of the models indicate that the models are well specified, fulfilling all the conditions of the tested statistics. The R^2 and adjusted R^2 of 94% and 76% on the average respectively show that variations in the dependent variable are explained by the total variations of the independent variables. The serial correlation test shows that there is no autocorrelation of higher order. While the F-statistic which is significant at 1% critical level indicates the significant relationships between the dependent and independent variables. Similarly, the normality test shows that the error terms are normally distributed. While the ARCH test reveals that there is no heteroscedasticity in the model. Also, the Ramsey Reset test shows that there is no specification error.

3.5 Granger Causality Test:-

Granger causality test is conducted to take care of the reverse causality. This answers the question of whether any of the explanatory variables predict the dependent variable or whether the reverse is the case. The result of the granger causality test is presented in table 5. The causality results show that financial deepening variables do not granger cause FDI. This is because null hypothesis is accepted for all of them. Also, FDI does not granger cause any of these variables except BTOT. This result is in line with the regression results which show that financial deepening does not encourage FDI inflow to Nigeria. Likewise, FDI is marginally helping the growth of financial institutions in Nigeria. The implication of this is that Nigeria has not put appropriate financial policies in place that will enable the economy harness the benefit of foreign direct investment. In fact, this result contradicts the endogeneity of finance as proposed by (Levine, 1997) and the Granger causality paradigm which states that if the variables are cointegrated, there must be at least one way causality (Granger, 1988).

4. DISCUSSION OF THE RESULTS

The results discussed above shows that in the long run, financial deepening does not play any significant impact on foreign direct investment. This stems from the fact that the long run coefficients of most of the financial deepening variables are positively signed, but has insignificant impact on FDI. In the short run, financial deepening does not have robust and consistent impact on foreign direct investment. In fact, by this result, Nigeria may not be benefitting from FDI due to low absorptive capacities. The result lends support to Pradhan (2010) that developing countries need well developed financial markets in order to bring more foreign direct investment to their economies. Moreover, the result supports the general economic theory that financial system improves the absorption capacity of a country with respect to FDI inflows. It is pertinent to note that Nigeria's inability to benefit from FDI is mainly because of low absorptive capacities in form of underdeveloped financial market, underdeveloped human capital and so on. This result explains the inability of the foreign direct investment to impact positively on the growth of output, employment level, trade arrears and other vital aspect of the economy. The causality test shows that financial development does not encourage FDI inflow to Nigeria, and at the same time, FDI is not assisting the growth of financial assets in Nigeria.

5. CONCLUSION

This study tries to establish the link between financial development and foreign direct investment in Nigeria. From the discussion so far, it can be seen that financial deepening is not playing and does not play any significant impact on FDI in both the short run and long run periods. The implication of this is that the level of absorptive capacity that will enable the economy harness the positive spill over of FDI is low in Nigeria. The causality test conducted show

that in Nigerian economy, financial deepening does not improve or induce FDI inflows to Nigeria. In other words, there is no causal relationship between financial development and foreign direct investment. This is in contrast with many international studies which show that in developing countries, foreign direct investment induces financial development, which in turn can give financial assistance to the foreign companies when the need arises. The contradictory nature of these results can be explained by the peculiar nature of Nigerian economy, where all the institutional factors that help financial development are absent, the macroeconomic indicators are unstable, and policy inconsistency is the order of the day. Also, infrastructural failure as well as high risk of doing business and insecurity could be reasons why there is no much link between financial deepening and FDI. Therefore, there is no impressive effect of financial deepening on foreign direct investment domestic investment. This can equally affect the general real sectors development. Finally, the paper recommends that since foreign direct investment is very crucial to the growth of the economy, the country's financial sector should be developed, to attract more FDI inflow to the economy.

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APPENDIX

The regression forms of the ADF unit root test are shown below:

$$\begin{aligned}
 \Delta y_t &= \alpha + \beta t + \sum_{i=1}^p \Delta y_{t-i} + \epsilon_t \\
 \Delta y_t &= \alpha + \beta t + \sum_{i=1}^p \Delta y_{t-i} + \epsilon_t \\
 \Delta y_t &= \alpha + \beta t + \sum_{i=1}^p \Delta y_{t-i} + \epsilon_t
 \end{aligned}$$

Where α is intercept, βt is linear time trend, p is the number of lagged first difference, and ϵ_t is error term. The null hypothesis is unit root and the alternative is level stationarity.

The Phillips – Perron test is based on the statistic:

$$\tau = \frac{\int_0^1 (W_{\tau} - \bar{W}_{\tau})^2}{\int_0^1 W_{\tau}^2} - \frac{T \int_0^1 W_{\tau} dW_{\tau}}{\int_0^1 W_{\tau}^2}$$

Where $\hat{\alpha}$ is the estimate, t is the t- ratio of α , $Se(\hat{\alpha})$ is the coefficient standard error of the test regression, while $\hat{\sigma}^2$ is a consistent estimate of the error variance.

Table 1 Unit Root Test

Variable	ADF				PP			
	Level		First Differences		Level		First differences	
	No Trend	With trend	No trend	With Trend	No Trend	With trend	No trend	With Trend
LNPCG	-2.72*	-2.56	-	-4.38***	-1.26	-1.19	-5.83***	-6.03***
LNFDI	-2.49	-4.17**	-8.44***	-8.35***	-2.34	-4.14**	-16.7***	-16.2***
LNDI	-0.97	-1.58	-4.25***	-4.25***	1.14	-1.05	-4.22***	-4.41***
LNHDI	-0.11	-1.99	-8.35***	-8.57***	-0.11	-1.72	-8.56***	-8.57***
LNINFLR	-4.15***	-4.05**	-	-	-3.64***	-3.60**	-	-7.51***
LNGOVEX	-2.05	-2.16	-4.66***	-4.48***	-2.07	-2.20	-4.66***	-4.48***
LNPOPR	-1.19	-1.22	-0.16	-4.13**	-0.07	0.76	-0.81	-2.25
LNRRER	-1.64	-2.83	-4.73***	-4.66***	-1.83	-2.42	-4.73***	-4.66***
LNPCR	-1.60	-1.82	-5.82***	-5.74***	-1.61	-1.93	-5.81***	-5.72***
LNBNK	-3.30**	-2.60	-4.55***	-4.48***	-3.26**	-3.27*	-12.1***	-12.0***
LNLLY	-2.42	-2.24	-5.63***	-5.62***	-2.43	-2.24	-5.63***	-5.60***
LNBTOT	-0.69	-0.35	-6.69***	-3.23*	-0.73	-0.10	-6.67***	-7.23***
LNPCRMB	-1.37	-1.46	-4.49***	-4.41***	-1.63	-1.74	-4.48***	-4.40***
LNLM2	-1.90	-1.89	-5.78***	-5.69***	-1.90	-1.89	-5.76***	-5.68***
Critical values:								
1percent	-3.6	-4.2	-3.6	-4.2	-3.6	-4.2	-3.6	-4.2
5percent	-2.9	-3.5	-2.9	-3.5	-2.9	-3.5	-2.9	-3.5
10percent	-2.6	-3.1	-2.6	-3.2	-2.6	-3.1	-2.6	-3.2

Note: ADF and PP denotes Augmented Dickey- Fuller and Phillips- Perron unit root tests respectively. (***) , (**) and (*) denote significant at 1%, 5%, and 10% critical values respectively. The critical values follow Mackinnon, (1996) p-value.

Table 2a: Johansen and Juselius Cointegration Test Results

-Max test								
H ₀	HA ₁	LNLLY	LNBNK	LNPCR	LNBTOT	LNPCRMB	LNLM2	5% critical value
$r = 0$	$r = 1$	120.7(0.00)	119.6(0.00)	117.1(0.00)	146.2(0.00)	114.0(0.00)	115.1(0.00)	58.43
$r=1$	$r=2$	100.1(0.00)	79.69(0.00)	90.01(0.00)	101.2(0.00)	84.49(0.00)	88.76(0.00)	52.36
$r=2$	$r=3$	52.67(0.01)	57.34(0.00)	47.40(0.04)	82.98(0.00)	57.96(0.00)	47.83(0.03)	46.23
$r=3$	$r=4$	40.23(0.04)	38.01(0.08)	36.78(0.11)	57.52(0.08)	45.30(0.00)	40.69(0.04)	40.08
$r=4$	$r=5$	36.43(0.02)	25.28(0.37)	30.89(0.11)	28.49(0.37)	32.59(0.07)	29.86(0.14)	33.88
$r=5$	$r=6$	18.15(0.48)	21.67(0.24)	16.11(0.66)	26.04(0.24)	18.97(0.41)	17.81(0.51)	27.58
$r=6$	$r=7$	13.25(0.43)	10.80(0.67)	11.42(0.61)	10.08(0.67)	13.44(0.41)	11.01(0.65)	21.13
$r=7$	$r=8$	8.514(0.33)	7.019(0.49)	8.212(0.36)	7.178(0.49)	7.657(0.41)	7.790(0.40)	14.26
$r=8$	$r=9$	0.026(0.87)	0.181(0.67)	0.236(0.63)	0.241(0.67)	0.616(0.43)	0.002(0.96)	3.841

Note: -Max indicates 5, 4, 3,3,4,4 cointegrating eqn(s) for lnllly, lnbnk, lnpcr,lnbtot, lnpcrmb, and lnlm2 models respectively. Figures in parentheses are the p-values.



Table 2b

Trace test								
H ₀	HA ₁	LNLLY	LN BANK	LNPCR	LNBTOT	LNPCRMB	LN M2	5%critical value
r=0	r=1	390.0(0.00)	359.6(0.00)	358.2(0.00)	459.8(0.00)	375.0(0.00)	358.9(0.00)	197.4
r=1	r=2	269.3(0.00)	240.0(0.00)	241.1(0.00)	313.7(0.00)	261.0(0.00)	243.8(0.00)	159.5
r=2	r=3	169.3(0.00)	160.3(0.00)	151.1(0.00)	212.5(0.00)	176.5(0.00)	155.0(0.00)	125.6
r=3	r=4	116.6(0.00)	103.0(0.01)	103.7(0.01)	129.6(0.00)	118.6(0.00)	107.2(0.01)	95.75
r=4	r=5	76.4(0.01)	64.94(0.12)	66.87(0.08)	72.02(0.03)	73.26(0.03)	66.48(0.09)	69.82
r=5	r=6	39.94(0.22)	39.67(0.23)	35.98(0.40)	43.54(0.12)	40.68(0.20)	36.61(0.37)	47.86
r=6	r=7	21.77(0.31)	18.00(0.57)	19.87(0.43)	17.49(0.60)	21.71(0.31)	18.80(0.51)	29.80
r=7	r=8	8.540(0.41)	7.200(0.55)	8.449(0.42)	7.419(0.53)	8.273(0.44)	7.792(0.49)	15.50
r=8	r=9	0.026(0.87)	0.181(0.67)	0.236(0.63)	0.241(0.62)	0.616(0.43)	0.002(0.96)	3.841

Note: Trace test indicates 5, 4, 4 5, 5, 4 cointegrating eqn(s) for these growth - financial market equations respectively. Figures in parentheses are the p- values

Table 3: Normalized long run coefficients for the effect of FD on FDI

	1	2	3	4	5	6	7
Variable		LN M2	LN BANK	LN PCR	LN PCRMB	LN BTOT	LN LLY
LNFDI	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000
LNPCG	4.888 (4.65)***	7.372 (4.26)***	6.681 (5.20)***	8.509 (4.98)***	6.725 (3.72)***	7.814 (12.1)***	10.04 (4.93)***
LNHDI	-1.293 (-6.22)***	-1.048 (-3.78)***	-1.053 (-5.75)***	-1.028 (-4.40)***	-1.270 (-4.38)***	-0.561 (-3.34)***	-0.949 (-3.27)***
LN DI	1.604 (7.13)***	1.236 (3.94)***	1.372 (6.76)***	1.336 (4.47)***	1.341 (3.54)***	1.383 (11.8)***	0.753 (2.10)*
LNINFLR	2.231 (9.92)***	2.810 (9.12)***	2.919 (12.6)***	3.587 (15.2)***	2.297 (16.9)***	0.908 (7.09)***	1.319 (3.88)***
LN GOVEX	-0.641 (-8.43)***	-0.554 (-4.10)***	-0.651 (-8.80)***	-0.677 (-6.16)***	-0.534 (-3.24)***	-1.240 (-40.2)***	-0.221 (-1.51)
LN POPR	-38.38 (-24.9)***	-44.37 (-23.4)***	-38.85 (-27.5)***	-40.33 (-24.6)***	-46.66 (-17.2)***	-25.73 (-32.1)***	-52.85 (-21.4)***
LN RER	-4.240 (-12.7)***	-4.497 (-11.2)***	-4.285 (-14.5)***	-4.835 (-13.0)***	-4.374 (-9.21)***	-4.910 (-23.6)***	-3.807 (-8.71)***
FD	-	0.848 (1.15)	0.142 (0.73)	0.169 (0.29)	1.290 (1.35)	-7.285 (-15.5)***	3.711 (4.16)***

Note: Values in parentheses are the t- statistics. (***) , (**) and (*) indicate rejection of null hypothesis at 1%, 5% and 10% critical values.

Table 4 Short run Dynamic FDI- FD model, (dependent variable: (“FDI

	1	2	3	4	5	6	7
VARIABLE		PCRMB	BANK	BTOT	PCR	M2	LLY
C	0.276 (1.107)	0.816 (2.938)**	-0.721 (2.916)**	-0.256 (-0.837)	-0.367 (-1.010)	-0.522 (-2.286)**	-0.579 (-3.445)***
FDI(-1)	0.686 (3.070)***	0.725 (3.532)***	0.601 (3.107)***	-	0.665 (2.988)**	0.443 (3.213)**	0.528 (4.861)***
FDI(-2)	0.588 (3.080)***	0.424 (2.749)**	-	0.592 (4.862)***	0.673 (4.962)***	0.598 (6.600)***	-
FDI(-3)	0.112 (0.605)	-	-	-	-	-	-0.341 (-4.441)***
PCG	10.75 (2.468)**	13.89 (3.243)***	16.29 (4.113)***	3.619 (1.103)	6.361 (1.720)	8.466 (3.110)**	19.20 (5.130)***
PCG(-1)	-7.495 (-2.136)**	-	-	-	-14.97 (-3.322)***	-15.49 (-6.145)***	-7.845 (-3.559)***
PCG(-2)	-	9.220 (2.230)**	7.227 (2.080)*	-	10.51 (1.729)	-11.09 (-2.552)**	-
PCG(-3)	-	-	-	-	-	-	-21.45 (-6.299)***
DI	0.127 (0.146)	-2.904 (-2.734)**	-3.360 (-3.828)***	1.712 (2.274)**	3.090 (1.940)*	3.646 (3.524)***	1.105 (1.841)*
DI(-1)	-	1.115 (1.265)	2.684 (2.943)**	-	0.740 (1.005)	-	4.410 (7.257)***
DI(-2)	-	-2.898 (-2.792)**	-4.404 (-5.201)***	-2.476 (-3.241)***	2.575 (1.751)	3.393 (3.149)**	-
DI(-3)	-3.553 (-3.403)***	-2.869 (-2.917)**	-2.731 (-3.276)***	-	-3.226 (-3.521)***	-2.786 (-4.345)***	-2.580 (-4.250)***
HDI	-0.472 (-1.511)	0.973 (3.119)***	1.135 (3.781)***	0.623 (2.247)**	0.752 (2.832)**	0.509 (2.706)**	1.376 (7.234)***
HDI(-1)	0.955 (2.800)**	1.361 (3.178)***	1.602 (4.693)***	0.568 (1.928)*	1.197 (3.498)***	0.927 (3.858)***	1.070 (3.697)***
HDI(-2)	-	-0.201 (-0.500)	-	-0.342 (-1.363)	-0.776 (-1.745)	-0.884 (-3.377)***	-1.163 (-6.319)***

HDI(-3)	-	0.303 (1.019)	0.620 (2.573)**	-	-1.379 (-3.084)**	-1.275 (-4.453)***	-
INFLR	1.499 (4.440)***	0.636 (1.780)	1.843 (4.847)***	1.220 (5.107)***	0.950 (4.358)***	1.253 (8.054)***	1.219 (8.054)***
INFLR(-1)	0.318 (0.713)	-0.650 (-1.905)*	1.457 (4.204)***	-	0.766 (1.733)	1.142 (3.412)***	1.360 (5.663)***
INFLR(-2)	-	-0.614 (-2.035)*	-	-	-	-	-
INFLR(-3)	-0.247 (-0.977)	-0.891 (-2.890)**	-0.349 (-1.210)	-0.687 (-2.586)**	-0.604 (-2.644)**	-	-0.975 (-5.666)***
GOVEX	-0.015 (-0.157)	0.014 (0.148)	0.011 (0.122)	0.187 (1.931)*	-0.149 (-1.783)	-0.246 (-3.624)***	-0.073 (-1.368)
GOVEX(-1)	-	0.426 (2.569)**	-	-	-	-1.114 (-6.311)***	0.591 (6.051)***
GOVEX(-2)	-	-	-	-1.047 (-5.387)***	-1.003 (-3.404)***	-	-0.987 (-6.761)***
GOVEX(-3)	-	-	-	-0.425 (-3.173)***	-0.343 (-2.572)**	-0.291 (-3.020)**	-
POPR	-8.351 (-1.154)	-6.946 (-1.058)	-13.21 (-2.380)**	-3.156 (-0.509)	-12.03 (-2.039)*	-68.49 (-2.580)**	-17.94 (-2.719)**
POPR-1	-	-	-	-	-	94.02 (2.155)*	5.270 (0.799)
POPR(-, -2)	-	-	-	-2.264 (-0.362)	17.90 (3.038)**	-37.05 (-1.525)	-
POPR(-3)	-	-	-5.891 (-1.308)	-	-	-	-
RER	-0.015 (-0.877)	-2.293 (-3.926)***	-0857 (-1.460)	-1.447 (-3.031)***	-0.743 (-1.561)	-0.258 (-0.775)	-1.493 (-4.120)***
RER(-1)	-	-	1.842 (2.004)*	-	-	-	-
RER(-2)	-1.658 (-2.178)**	-	-4.221 (-6.381)***	-	-	-	-
RER(-3)	-0.765 (-1.249)	-	-	-4.968 (-6.050)***	-6.643 (-3.780)***	-6.999 (-6.128)***	-6.771 (-8.814)***
FD	-	-2.411 (-1.748)	0.743 (3.456)***	-8.737 (-4.889)***	-	1.452 (2.344)**	-1.640 (-1.872)*
FD(-1)	-	-	0.391 (1.789)	8.029 (4.579)***	-1.942 (-1.963)*	-3.202 (-4.554)***	-
FD(-2)	-	2.999 (2.315)**	-	-	-	-	5.073 (7.570)***
FD(-3)	-	-	0.462 (1.899)*	-	-	-	-
ECT3(-1)	-1.970 (-5.961)***	-1.827 (-6.663)***	-1.823 (-7.576)***	-1.537 (-8.851)***	-2.552 (-8.359)***	-2.334 (-11.79)***	-2.057 (-12.69)***
R²	0.85	0.92	0.94	0.89	0.95	0.97	0.97
ADJ.R²	0.69	0.75	0.82	0.75	0.82	0.90	0.92
F-STATS	5.111	5.661	7.575	6.285	7.359	13.80	17.95
LM	4.563 (0.030)	0.571 (0.584)	0.123 (0.886)	0.579 (0.574)	0.105 (0.901)	3.127 (0.107)	0.005 (0.995)
NORMALITY	0.334 (0.846)	0.467 (0.792)	0.743 (0.690)	1.620 (0.445)	5.799 (0.055)	1.526 (0.466)	3.861 (0.145)
ARCH	0.334 (0.864)	0.024 (0.876)	0.016 (0.902)	0.002 (0.970)	0.073 (0.789)	0.394 (0.535)	0.325 (0.573)
RESET	0.216 (0.649)	0.038 (0.849)	0.170 (0.689)	1.756 (0.206)	0.002 (0.970)	0.374 (0.558)	0.010 (0.923)

Note: values in parentheses are t-statistics. Δ before any variable stands the first difference. (***), (**)
and (*) indicate rejection of null hypothesis at 1%, 5% and 10% critical values respectively.

Table 5 Pairwise Granger Causality Test at lag 3

1	Bank does not granger cause FDI FDI does not granger cause Bank	0.00954 0.06382	0.99869 0.97853	Accepted Accepted
2	M2 does not granger cause FDI FDI does not granger cause M2	0.28303 0.01915	0.83720 0.99631	Accepted Accepted
3	PCRMB does not granger cause FDI FDI does not granger cause PCRMB	0.11757 0.46366	0.94904 0.70992	Accepted Accepted
4	LLY does not granger cause FDI FDI does not granger cause LLY	0.09949 0.08264	0.95963 0.96894	Accepted Accepted
5	PCR does not granger cause FDI FDI does not granger cause PCR	0.69853 0.10281	0.56082 0.95773	Accepted Accepted
6	BTOT does not granger cause FDI FDI does not granger cause BTOT	0.13886 2.39549	0.93592 0.08938	Accepted Rejected

Note: Rejecting the null hypothesis indicates that one variable actually granger cause the other; while accepting the null hypothesis confirms that there is no causation between both variables at 1%, 5% or 10% significance level.