

Causal Relationships between Financial Development, Foreign Direct Investment and Economic Growth the Case of Nigeria

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Abstract

This study examined the causal relationships among financial development, foreign direct investment and economic growth in Nigeria over the period 1970 to 2009. The study utilized the Augmented Dickey-Fuller (ADF) for unit root test and the variables were found to be stationary, though not in their level form but in their first difference. The Johansen and Juselius (JJ) co-integration technique indicated the presence of co-integration among the variables. The tri-variate vector error correction model (VECM) test for the causal relationships showed the presence of causality among financial development, foreign investment and economic growth. The study concluded that financial development and foreign direct investment have a statistically significant causal influence on economic growth.

Keywords: Financial Development, Foreign Direct Investment, Economic Growth, Granger Causality, VEC Model

1. Introduction

It's no doubt that the Nigerian government has implemented various policy reforms over the years with a view to stimulating aggregate output. At the core of these reforms was the promotion of financial market development along with policies aimed at stimulating increased capital inflows into the Nigeria economy. At the early stage of this policy reform, especially in the later 1980s and early 1990s, emphasis was placed on financial intermediaries, relaxation of bank regulation, interest rate deregulation and the restriction on bank licenses was lifted. Also, monetary policy framework shifted from direct to indirect approach and market was being used more to regulate the flow and cost of credit. Despite these measures, the flow of credit to the real sector was below expectation and inadequate to meet the needs of real sector. The failure by the banking institution to provide long term finance and the need for alternative sources of long term finance for the dying real productive sectors led to the resurgence of interest in the development of stock market as alternative source of finance for the real sector (Oyejide, 2002; Nnana, 2002; Sanusi, 2002).

More so, the need to reverse declining domestic investment, called for pro-capital inflows policy reforms which includes; the deregulation of the exchange rate regime, removal of restriction on foreign capital flows, granting of tax incentives and other waivers to foreign investors and the establishment of investment promotion body. The aim of all these policy initiatives was to stimulate the growth of the domestic economy. However, the unwholesome condition and disappointment of the Nigerian real sector to respond positively to all policy palliatives is worrisome and has become a concern not only for the policy makers but also scholars and analysts alike. This suggests that there is a missing link in the empirical literatures on the issue of causality among foreign direct investment, financial development and economic growth, that is, "Does FDI and financial development cause economic growth or does economic growth cause FDI inflow and financial development"? This study therefore, attempts to examine the direction of causation among financial market development, foreign direct investment and economic growth in Nigeria using data spanning 1970 to 2009.

The rest of the paper proceed as follows: section two presents a review of literature while the measurements of variables as well as the data sources are presented in section three. Section four presents the methodology for the study while in section five the findings were discussed. Finally, section six summarizes the major findings and offers some concluding remarks.

2. Literature Review

The emergence of the endogenous growth theory on the relationship between financial variable (financial development and capital inflows) and economic growth, awoke the intuitions of researchers in examining the validity/otherwise of the direction of influence between financial development and economic growth on one hand; and between capital inflows (foreign direct investment) and economic growth on the other hand.

Patrick (Patrick, 1966) clearly dichotomized the direction of influence between financial development and economic growth into 'demand following' and 'supply leading' hypothesis. In the demand following hypothesis causality runs from economic growth to financial development while in the supply leading hypothesis causality runs from financial development to economic growth. Relatedly, empirical evidence by Goldsmith (Goldsmith, 1969), Hicks (Hicks, 1969), McKinnon (McKinnon, 1973), Shaw (Shaw, 1973) found credence for supply leading hypothesis while evidence from studies by Robinson (Robinson, 1952), Kuznets (Kuznets, 1955), Friedman and Schwartz (Friedman & Schwartz, 1963), Lucas (Lucas, 1988), Kar and Pentecost (Kar & Pentecost, 2000), Hermes and Lensink (Hermes & Lensink, 2003) and Alfaro et al. (Alfaro et al., 2004) found credence for demand following hypothesis. Contrary to the above, studies by Demetriades and Hussein (Demetriades & Hussein, 1996), Ünalmiş (Ünalmiş, 2002), Claessens, Klingebiel and Schmukler (Claessens, Klingebiel & Schmukler, 2002) and Yucel (Yucel, 2009) found a bi-directional causality between financial development and economic growth while Ram (Ram, 1999) did not find any relationship between financial development and economic growth.

In addition to the traditional growth theory, the Solow's growth model reiterated the role FDI in influencing growth through the introduction of new technologies, such as new production processes and techniques, managerial skills, ideas, and new varieties of capital goods (Grossman & Helpman, 1991; Barro & Sala-i-Martin, 1995). Relatedly, plethora Studies on FDI-growth relationship exists, nevertheless, ambiguity still existed on the direction of causality between FDI and economic growth. Kumar and Pradhan (Kumar & Pradhan, 2002) observed that in most cases, the direction of causation between growth and FDI is not pronounce; Hansen and Rand (Hansen & Rand, 2006) found that foreign direct investment and growth have a positive relationship, but the direction of causality is unclear while Mwlina (Mwlina, 2003) and Carkovic and Levine (Carkovic & Levine, 2002) concluded that FDI does not have a robust independent influence on growth.

Empirical studies (Isimbabi, 1997; Hermes & Lensink, 2003; Omran & Bolbol, 2003; Kholdy & Sohrabian, 2005; Ljungwall & Li, 2007; Choog & Lim, 2009) on the tri-variate relationship between financial development, foreign direct investment and economic growth, focused on the role of financial development in enhancing the positive relationship between FDI and economic growth, but failed to examine the extent of causality between these variables. In addition, most of these studies (with exception to Choog & Lim, 2009) used cross-sectional analysis. Evidence from cross sectional analysis have been found to provides pool estimates of the link between variables and such estimate disregard country specific factors. Another pitfall of cross-sectional studies according to Abu-Bader and Abu-Qran (Abu-Bader & Abu-Qran, 2007) is that when economic growth is regressed on a wide spectrum of variables, researchers tend to interpret a significant coefficient of the measure of financial development as a confirmation of causality from financial development to economic growth. A significant coefficient of financial measures in such a regression can be equally compatible with causality running from financial development to economic growth, with causality running from economic growth to financial development or with bi-directional causality between the two variables. Such inadequate

assessments of the causal relationship in a static cross section setting have led to a search for more dynamic times series analyses to unravel whether financial development causes economic growth or vice versa.

Apart from the above, previous studies on finance-growth nexus in Nigeria have only focused on the causal link between financial development (using bank based variables) and economic growth, without taking into account the role of stock market development; and to the author's knowledge, no existing study has examined the causal nexus between financial development, foreign direct investment and economic growth in Nigeria. It's in the light of the above weaknesses, that this study examined the causal nexus between financial development, foreign direct investment and economic growth in Nigeria.

3. Measurement and Data Sources

As argued above, most studies on the relationship between financial development and growth on one hand and between financial development, FDI and economic growth on the other hand used bank based variables as a measure of financial development without taking into account the role of stock market development. For this study variables representing financial market development are categorized into two: The first category represented the banking sector or primary credit market while the second category represented the stock market or secondary credit market.

Following Guariglia and Poncet (Guariglia & Poncet, 2006), three groups of bank based variables were identified. The three groups of indicators are measures of financial depth; misallocation of financial resources; and market-oriented financing respectively. These indicators allow us to account for both size and quality effect of financial development and intermediaries. To measure financial deepening or banking sector size, two measures are defined. The first is defined as the ratio of saving deposits to GDP (*FD 1*). The second indicator is defined as the ratio of total credits to GDP (*FD 2*). These two indicators measure the financial resources that are available for investment in Nigeria.

To evaluate the specific impact of misallocation of funds, the study relied on an indicator measuring the role of government interventionism induced distortions in financial sector. The indicator is the ratio of loans to deposits, which served as a proxy for cash relending (*FD 3*). The study followed the previous literature and considers this to be a measure of the Central Bank's credit to banks aimed at helping the Central Bank to meet their lending quotas (Guariglia & Poncet 2006). Thus, this is a measure of the interventionism of the Central Bank. In Nigeria, while the volume of deposits is determined by economic activity, the volume of lending is largely determined by policy objectives of CBN and is set through credit guidelines independently of banks to finance the lending target from deposits.

The second category of financial markets development represents the stock market. Brasoveanu, Dregota, Catarama, and Semenescu (Brasoveanu, Dregota, Catarama & Semenescu, 2008) classified the stock market indicators into categories namely (i) size variable and (ii) liquidity variable. These sets of stock market development variables had been used severally in the literature. The size variable is proxy by market capitalization ratio (*FD 4*) which is defined as market capitalization/GDP as used by Campos, Hanousek and Filer (Campos, Hanousek & Filer, 1999), while the Liquidity variables are proxy by (i) value traded ratio (*FD 5*) defined as trading volume/GDP and (ii) turnover ratio (*FD 6*) defined as trading volume/market capitalization as used by Levine and Zervos (Levine and Zervos, 1998).

The Foreign Direct Investment (*FDI*) variable is measured by the direct investment items in the balance of payment account of Nigeria while economic growth is measured by the real gross domestic output (*Y*) calculated by dividing the nominal gross domestic output by the consumer price index.

The data on Stock market indicators were collected from various editions of publication of the Nigeria Stock Exchange Market while private credit and liquidity liabilities will be collected from the World Bank Indicator database Online. Data on FDI and gross domestic output would be collected from the International Financial Statistics of various years.

4. Methodology

4.1 Unit Root Test

The unit root tests have become an increasingly popular path to ascertaining the properties of macroeconomic time series variables. This development is a consequence of the fact that most macroeconomic time series variables exhibit non-stationarity behaviour; capable of invalidating the quality of empirical inferences drawn from such estimates if appropriate measures are not taken. Consequently, one class of econometric instrument that has been indispensable in guarding against the pitfall of spurious regression result arising from non-stationary time-series variable is the unit roots test: the Dickey-Fuller (DF) test and the Augmented Dickey-Fuller (ADF) test developed by Dickey and Fuller (Dickey & Fuller, 1981), the Phillip-Perron (PP) test developed by Philip and Perron (Philip & Perron, 1988). Taking into cognizance the foregoing, this study commenced its empirical analysis by ascertaining the stationarity properties of the

variables. In this wise, the Augmented Dickey-Fuller (ADF) test was utilized to infer the number of unit roots (if any) or non-stationarity of the variables, before the co-integration test among the variables are examined.

4.2 Granger Causality Test

The Granger causality approach measures the precedence and information provided by a variable (X) in explaining the current value of another variable (Y). It says that Y is said to be granger-caused by X if X helps in predicting the value of Y. In other words, the lagged values of X are statistically significant. The null hypothesis H_0 tested is that X does not granger-cause Y and Y does not granger-cause X.

Several studies (Marin, 1992; McCarville & Nnadozie, 1995; Darat, 1996; Pomponoi, 1996) have used the traditional granger causality test in determining the co-integration between variables, however the use of simple traditional granger causality test has been identified (Engel & Granger, 1987; Shan & Morris, 2002) as inappropriate when variables are I(1) series. This is because the simple F-test statistics does not have a standard distribution (Jordaan & Eita, 2007). Therefore, proper statistical inference can only be obtained by analyzing the causality test on the basis of vector error correction model (Yucel, 2009).

4.3 Model Specification

In order to analyze the extent of the causal nexus among financial development, foreign direct investment and economic growth, this study employs a VAR model of the form:

$$U(\text{VAR}) = (\text{FD}, \text{FDI}, Y) \quad (1)$$

Where: Y = output; FD = Financial Development; FDI = Foreign Direct Investment; Equation (1) can be expressed more explicitly as.

$$X_t = \alpha + B_1 X_{t-1} + B_2 X_{t-2} + B_3 X_{t-3} + \dots + B_q X_{t-k} + u_t \quad (2)$$

Where: $X_t = [Y \quad \text{FD} \quad \text{FDI}]^i$

X_t is a 3×1 – dimensional Vector of the endogenous variables, α is a $k \times 1$ - dimensional vector of constant and B_1, \dots, B_q are $k \times k$ dimensional autoregressive coefficient matrices and u is k -dimensional vector of the stochastic error term normally distributed. Equation (2) can be expressed in VECM form as:

$$\Delta Y_t = \mu + \Gamma_1 Y_{t-1} + \dots + \Gamma_{p-1} \Delta Y_{t-p+1} + \Pi Y_{t-1} + \varepsilon_t \quad (3)$$

Where Δ is the first difference operator and ε_t is a vector of white noise residuals. If Π is of rank $1 \leq r < 3$, then it can be decomposed into $\Pi = \alpha\beta'$, where $\alpha_{(3 \times r)}$ and $\beta_{(3 \times r)}$ and equation (3) can be reformulated as:

$$\Delta Y_t = \mu + \Gamma_1 Y_{t-1} + \dots + \Gamma_{p-1} \Delta Y_{t-p+1} + \alpha(\beta' Y_{t-1}) + \varepsilon_t \quad (4)$$

Where the rows of β are interpreted as distinct co-integration vectors and α are the adjustment coefficients (loading factors) indicating the adjustment to long-run equilibrium. The linear combination $\beta' Y_{t-1}$ are stationary processes, therefore all the variables in equation (4) are stationary.

Thus the tri-variate VEC model of equation (4) can be expressed explicitly as:

$$\Delta Y_{1t} = \mu_1 + \sum_{i=1}^r \alpha_{1,h} ECT_{h,t-1} + \sum_{k=1}^{p-1} \delta_{11,k} \Delta Y_{1,t-k} + \sum_{k=1}^{p-1} \delta_{12,k} \Delta Y_{2,t-k} + \sum_{k=1}^{p-1} \delta_{13,k} \Delta Y_{3,t-k} + \varepsilon_{1t} \quad (5)$$

$$\Delta Y_{2t} = \mu_2 + \sum_{i=1}^r \alpha_{2,h} ECT_{h,t-1} + \sum_{k=1}^{p-1} \delta_{21,k} \Delta Y_{1,t-k} + \sum_{k=1}^{p-1} \delta_{22,k} \Delta Y_{2,t-k} + \sum_{k=1}^{p-1} \delta_{23,k} \Delta Y_{3,t-k} + \varepsilon_{2t} \quad (6)$$

$$\Delta Y_{3t} = \mu_3 + \sum_{i=1}^r \alpha_{3,h} ECT_{h,t-1} + \sum_{k=1}^{p-1} \delta_{31,k} \Delta Y_{1,t-k} + \sum_{k=1}^{p-1} \delta_{32,k} \Delta Y_{2,t-k} + \sum_{k=1}^{p-1} \delta_{33,k} \Delta Y_{3,t-k} + \varepsilon_{3t} \quad (7)$$

where $ECT_{h,t-1}$ is the h th error correction term, the residual from the h th co-integration equation, lagged one period and $\delta_{ij,k}$ described the effect of the k th lagged value of variable j on the current value of variable i : $i, j = Y_1, Y_2, \text{ and } Y_3$.

5. Empirical Result

The study commenced its empirical analysis by first ascertaining the unit roots of the time series used for analysis and the result is presented on Table 1. The ADF test on Table 1, showed that all variables were found to be non-stationary in levels but were stationary after first differencing (that is, the variables are integrated of order one), implying that the variables are I(1) series.

5.1 Co-integration Result

The co-integration result among foreign direct investment, financial development and economic growth; using the maximum eigen-value (λ_{\max}) in Table 2, with an optimal lag length of two via the Schwarz Bayesian Criterion (SBC) and Akaike's Information Criterion (AIC); showed the existence of co-integration among FDI, financial development and economic growth when FDI is combined with banking indicators (FD1 and FD2) as observed in panel A and B of Table 2 and when FDI is combined with a stock market indicator (FD4) as observed in panel D. The co-integration results in other panels (C, E and F) of Table 2 revealed no co-integration among foreign direct investment, financial development and economic growth.

5.2 Causality Result

The VECM causality result presented in Table 3, revealed the existence of causality among foreign direct investment, financial development and economic growth, where FD1, FD2 and FD4 are used as a measure of financial development. This implies that financial development and foreign direct investment granger caused economic growth in Nigeria while economic growth also influences foreign direct inflow and financial development. However, evidence from panels C, E and F showed the existence bi-causality between FDI and economic growth while financial development variables ($FD3$, $FD5$ and $FD6$) showed no evidence of causality between financial development and economic growth; and between financial development and foreign direct investment.

An important observation from above is that, the extent of causality among foreign direct investment, financial development and economic growth depends mainly on the variables used to proxy financial development. Thus, based on results from panel A, B and D, foreign direct investment and financial development have significant causal influence on economic growth in Nigeria thereby supporting the result from the co-integration analysis. Furthermore, it is observed from panel A to F on Table 2 that foreign direct investment has a stronger causal influence on economic growth than financial development.

Also, an important observation from the causality result is that apart from the bank based variable which influenced economic growth; market capitalization (a stock market variable) was also found to have strong causal influence on economic. The neglect of the stock market variable in previous studies on the link between financial development-growth nexus; and between foreign direct investment, financial development and economic growth, may have led to gross underestimation of the role of the stock market in influencing economic growth in Nigeria and also weaken the policy references drawn from such studies; especially in this era impressive growth of the stock market in Nigeria. The inclusion of stock market variable in the estimating model is important for the explanation of the linkage among financial development, foreign direct investment and economic growth in Nigeria.

6. Conclusion and Policy Recommendation

Studies on the tri-variate causal nexus among financial development, foreign direct investment and economic growth have been dominated by cross sectional analysis. Such cross sectional analysis disregard country specific factors such as difference in the level of financial development; adequate measure to proxy financial development and difference in macroeconomic objectives of specific government, thereby limiting the significance of policy references from such cross sectional analysis. It was against this background that this study examined the causal relationship among foreign direct investment, financial development and economic growth in Nigeria over the period 1970 to 2009 within a tri-variate VAR framework.

The study utilized six different measures of financial development including three banking sector indicator and three stock market sector indicator. Though some evidence of co-integration were found among foreign direct investment,

financial development and economic growth where FD1, FD2 and FD3 were used as measures of financial development. The granger causality result supported co-integration result, indicating that financial development and foreign direct investment granger caused economic growth where FD1, FD2 and FD3 are used as measures of financial development. The findings of this study revealed that different measures of financial development influences economic growth differently. Saving deposit/GDP (FD1), total deposit/GDP (FD2) and market capitalization ratio (FD4) had causal influence on economic growth while loan/deposit (FD3), volume traded ratio (FD5) and turnover ratio (FD6) had no influence on economic growth.

The implication from above is that financial development and foreign direct investment can be combined to influence economic growth, this however depends on the measures of financial development combined with FDI. Therefore to achieve economic growth, effort should be devoted to encouraging saving mobilization through making interest rate on saving more competitive while the macroeconomic environment should be made to be investment-friendly to enhance the increased inflow of foreign direct investment into the Nigerian economy. This implied that improving the investment environment through better economic and institutional incentives for savers and investors should be the core operating framework of the Nigerian government.

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Table 1. Unit Root Test Result

Augmented Dickey-Fuller (ADF) Test			
Variables	Level	1 st Diff	Remarks
<i>LFDI</i>	-0.2145	-4.8920*	I(1)
<i>LRGDP</i>	-2.6034	-4.3924*	I(1)
<i>FD 1</i>	0.9337	-4.3924*	I(1)
<i>FD 2</i>	0.9734	-4.0111*	I(1)
<i>FD 3</i>	-2.2595	-5.1958*	I(1)
<i>FD 4</i>	-2.2661	-2.8094***	I(1)
<i>FD 5</i>	0.0621	-4.5913*	I(1)
<i>FD 6</i>	-3.0442**	5.6338*	I(1)

Note: *, ** and *** indicates 1%, 5% and 10% significance level respectively.

Table 2. Co-integration Test Result

Eigenvalue	Likelihood Ratio	5 percent Critical Value	1 percent Critical Value	Hypothesis No of CE(s)
Panel A: FD1 as a Measure of Financial Development				
0.473418	40.80259	29.68	35.65	None *
0.300457	17.07268	15.41	20.04	At most 1 **
0.09886	3.851515	3.76	6.65	At most 2 **
Panel B: FD2 as a Measure of Financial Development				
0.431786	37.38173	29.68	35.65	None *
0.336445	16.46723	15.41	20.04	At most 1 **
0.034314	1.291902	3.76	6.65	At most 2
Panel C: FD3 as a Measure of Financial Development				
0.385314	23.61514	29.68	35.65	None
0.140104	5.60931	15.41	20.04	At most 1
0.000659	0.024377	3.76	6.65	At most 2
Panel D: FD4 as a Measure of Financial Development				
0.430922	29.95855	29.68	35.65	None **
0.155854	9.100262	15.41	20.04	At most 1
0.073668	2.831351	3.76	6.65	At most 2
Panel E: FD5 as a Measure of Financial Development				

0.327571	23.02168	29.68	35.65	None
0.196503	8.337881	15.41	20.04	At most 1
0.006544	0.242937	3.76	6.65	At most 2
Panel F: FD6 as a Measure of Financial Development				
0.264527	18.27863	29.68	35.65	None
0.166174	6.910674	15.41	20.04	At most 1
0.005032	0.186651	3.76	6.65	At most 2

Note: FD1, FD2, FD3, FD4, FD5 and FD6 are saving deposit as a ratio of GDP, total credit as a ratio of GDP, loan as a ratio of deposit, market capitalization as a ratio of GDP, total volume of share traded as a ratio of GDP and total volume traded as a ratio of market capitalization.

* and ** represent 1% and 5% respectively.

Table 3. Granger Causality Test between Foreign Direct Investment, Financial Development and Economic Growth

Panel A	Dependent Variables	Δ LGDP	Δ LFDI	Δ LFD-1	$ECT_{t-1}(t\text{-stat})$
	Δ LGDP	-	1.1973(1.2783)	0.3143(0.6214)	-0.5595(-2.3690)*
	Δ LFDI	0.8352(1.2783)	-	0.2625(0.4354)	-1.3984(-4.2607)*
	Δ LFD-1	3.1821(0.6214)	3.8098(0.4354)	-	0.1560(2.0215)**
Panel B	Dependent Variables	Δ LGDP	Δ LFDI	Δ LFD-2	$ECT_{t-1}(t\text{-stat})$
	Δ LGDP	-	1.6773(1.3037)	0.3562(0.8445)	-0.4114(-2.1979)**
	Δ LFDI	0.5962(0.5620)	-	0.2124(0.5620)	-1.8008(-5.6011)*
	Δ LFD-2	2.8074(0.8445)	4.7087(0.5620)	-	0.1504(2.2258)**
Panel C	Dependent Variables	Δ LGDP	Δ LFDI	Δ LFD-3	$ECT_{t-1}(t\text{-stat})$
	Δ LGDP	-	1.8818(2.2613)	1.1503(1.1965)	-0.3328(-2.1466)**
	Δ LFDI	0.5314(2.2613)	-	0.6113(1.2511)	-1.5901(-4.7157)*
	Δ LFD-3	0.8694(1.1965)	1.6350(1.2511)	-	0.0061(0.6750)
Panel D	Dependent Variables	Δ LGDP	Δ LFDI	Δ LFD-4	$ECT_{t-1}(t\text{-stat})$
	Δ LGDP	-	8.0399(0.2804)	-7.5017(-0.2726)	-0.0923(-5.0658)*
	Δ LFDI	0.1244(0.2804)	-	-0.9331(-2.7763)	-0.5785(-2.0827)**
	Δ LFD-4	-0.1333(-0.2726)	-1.0717(-2.776)	-	-1.4066(-2.4929)*
Panel E	Dependent Variables	Δ LGDP	Δ LFDI	Δ LFD-5	$ECT_{t-1}(t\text{-stat})$
	Δ LGDP	-	1.1632(2.2396)	0.3119(2.5014)	-0.1502(-2.0517)**
	Δ LFDI	-0.8592(2.2396)	-	0.2681(1.5124)	1.4305(4.8298)*
	Δ LFD-5	3.2062(2.5041)	3.7293(1.5124)	-	0.0257(0.1694)

Panel F	Dependent Variables	Δ LGDP	Δ LFDI	Δ LFD-6	ECT _{t-1} (t-stat)
	Δ LGDP	-	0.9635(2.5976)	0.5715(2.6548)	-0.7540(-3.9009)*
	Δ LFDI	1.0379(2.5976)	-	0.5931(2.4711)	-0.9602(-3.6585)*
	Δ LFD-6	1.7498(2.6548)	1.6861(2.4711)	-	0.2781(-1.4307)

Note: FD1, FD2, FD3, FD4, FD5 and FD6 are saving deposit as a ratio of GDP, total credit as a ratio of GDP, loan as a ratio of deposit, market capitalization as a ratio of GDP, total volume of share traded as a ratio of GDP and total volume traded as a ratio of market capitalization.

* and ** represent 1% and 5% respectively.