International Review of Business Research Papers
Volume 6. Number 6. December 2010 Pp.153 –163

The trends and dynamics of the determinants of investment in Nigeria

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This study analyzes the trends of the determinants of investment within the period 1970-2008. We adopt the cointegration econometrics method to estimate the dynamics of the variables in the study such as, the real and lagged values of investment, exchange rate and capital performance and the real values of market size, macroeconomic stability and political stability. This is in order to assess their behaviors over time and evaluate how these have either hindered or encouraged the growth of investment in the Nigerian economy. These variables indicate basic statistical significance and it was detected that past outcome of domestic investment strongly influence the present levels of investment in Nigeria. It was also observed that market fundamentals do not encourage domestic investment, previous values of the rates of exchange had stronger effects on the levels of domestic investment and that macroeconomic and political conditions reveal reasonable levels of instability that inhibits the progress of domestic investment in the economy both on the long and short term basis. These results have implications for policy makers, investment prospectors, foreign and domestic investors.

Field of Research: Macroeconomics, Economics Policy

1. Introduction

Investment is an essential component of aggregate demand and fluctuations in investment have considerable effect on economic activities and long-term economic growth. The view that capital formation is a key to growth is reflected in the development strategies and plans of many countries (Serven and Solinano 1993). With a view from government's positive reactions to promote the levels of investment in Nigeria, in light of the prevailing barriers hindering the levels of investment in the economy and despite all the strategies adopted. We deduce that a lot of factors are contributing to the fluctuation in aggregate investment in Nigeria. Hence, using aggregate data, this study aims at explaining these trends in close collaboration with some key determinants and their implications for investment in the Nigerian economy.

A clear understanding of these determinants is essential in order to find the major sources of fluctuations in aggregate investment in the economy. Therefore, this study seeks to find the degree of influence of previous values of investment on present aggregate levels of domestic investment in the Nigeria economy: Examine if the market size has corresponding effect on the levels of domestic investment in the Nigeria economy; Estimate how the intensity of improved macroeconomic stability measures have significantly developed the levels of domestic investment in Nigeria; Assess the effect of exchange rate policies on the improvement of domestic investment; Detect the magnitude of the effect of credit performance in the private

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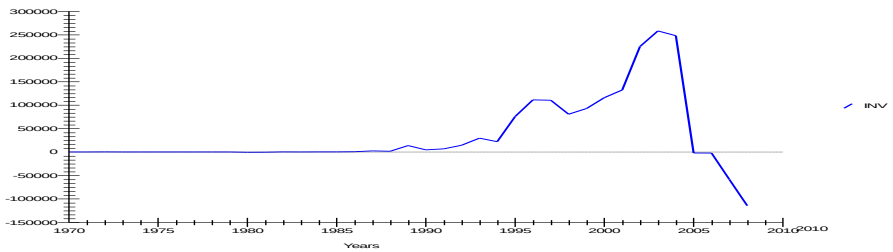
sector; and how it has contributed to the growth of domestic investment in Nigeria; Evaluate the extent to which persistent political policy measures have affected the levels of domestic investment in Nigeria.

This study comprises of five sections, section one introduces the study. In section two, the literature review is considered. The third section of the study deals with the methodology. Section four dwells on the discussion of the findings. Section five gives the conclusion of the study.

2. Literature Review

A close examination of the aggregate domestic investment income shows that the collapse of investment which began in the early 1970s was broad-based. With aggregate income levels between N128.6 to N297.8 million in the early 1970s, it fell to as low as -N404.1 and -N334.7 million in the early 1980. Although in 1987 the levels of investment in Nigeria rose to as high as N2452.8 million, this encouraging signs increase consistently, and persisted till 2004, recording its highest income, 258,388.6 million in 2003. But from 2004, domestic investment in Nigeria has witnessed a continuous decline which has fallen below any other level of loss ever recorded in this sector since independence. With as low as -N1921.2 in 2005 to as drastically low as -N114484.4 in the year 2008, the levels of domestic investment in the Nigeria economy has fallen with over 145 percent below its 2004 position (see figure 2.1).

Figure 2.1: Trend line of Nigeria aggregate domestic Investment, 1970-2008

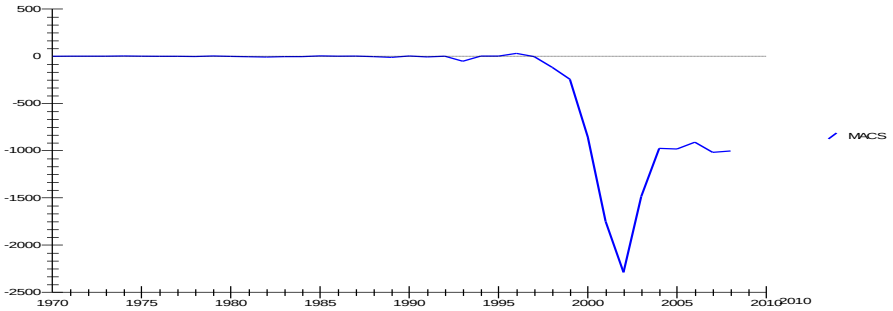


Source: Authors Estimation, with data from CBN 2008

Apparently, if private investment remains at the current low level, it will slow down potential growth and reduce long-run levels of per capital consumption and income, thus militating against the sustainability of economic growth and any hopes of meaningful poverty alleviation (Iyoha, 1999).

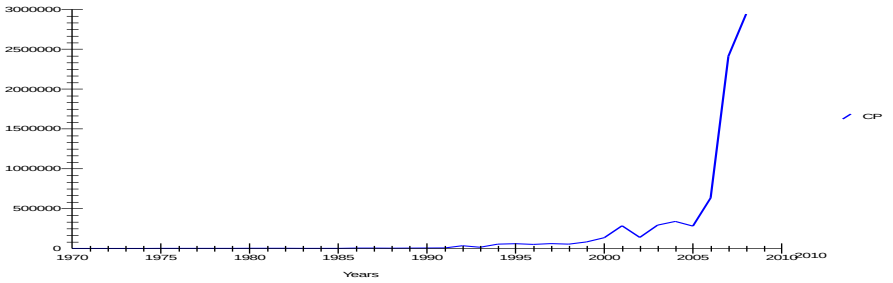
The sharp reduction in aggregate domestic investment was not very obvious until 1989 when it was basically -12.4 but from the year 1999, the economy recorded higher levels of instability which stood at -117.5. In the year 2000, the level of instability became astonishingly high and fell as low as -856.4; this degenerated into unprecedented levels of instability in 2002 when macroeconomic stability was as unstable as -2289.2 (see figure 2.2). Theoretically, it is expected that positive changes in macroeconomic adjustments are expected to trigger a significant resurgence of private investment resulting from increases in domestic capital performance and acceleration of investment flows (Iyoha 1998). By and large, these promised benefits of macroeconomic adjustments have not materialized in Nigeria.

Figure 2.2: Trend line of Macroeconomic stability in Nigeria, 1970-2008



Source: Authors Estimation, with data from CBN 2008

Figure 2.3: Trend line of capital performance in Nigeria, 1970-2008



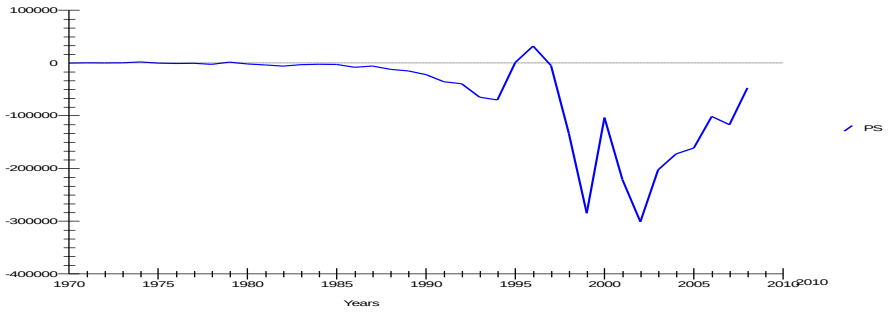
Source: Authors Estimation, with data from CBN

Political reforms include incentives to enhance domestic investments, these, notwithstanding a number of problems inhibiting domestic investment in Nigeria are at play. For example, the level of technical know-how is still very low while supply of basic infrastructural facilities remains grossly inadequate with the few available being very epileptic in nature. Telecommunication services, water, electricity, transportation facilities; such as road and rail are basically inefficient thereby constituting serious problems to investment in Nigeria.

Investment opportunities in Nigeria are in addition to the foregoing stifled by the increasing levels of uncertainties in the macroeconomic environment of doing business. For example, the shift in economic policies from one of the regulation to that of deregulation and back to that of guided deregulation with a yet possible return to regulation in some sectors of the economy. These explain all smacks of policy inconsistencies that have meted deleterious effects on the economy through disinvestments resulting from capital flight which it engenders.

The role of political instability in the inhibition of investment opportunities is also worthy of mention. Unstable political climate serve to deter both domestic and foreign investors. Asante's (1994) empirical study of the Ghanaian economy revealed that political instability has a significant negative effect on private investment in Ghana.

Figure 2.4: Trend line of political stability in Nigeria, 1970-2008



Source: Authors Estimation, with data from CBN 2008

Nigeria has experienced unstable political climate since independence. Outright civil hostilities lasted from 1967 to 1970. Thereafter, coups led to political disorder. Unfortunately, the civil administration ought to encourage stability but with increased inconsistencies in socio-economic and political policies, high levels of instability persisted. Relatively, political instability in Nigeria was expected to stabilize with the introduction of the National Economic Empowerment and Development Strategy (NEEDS) program in 2004, and the successful completion of the banking recapitalization and consolidation reform program in 2005. These however, have not been able to return the economy to its previous levels of political stability. Despite the widely propagated positive influences of these policies on investment, macroeconomic condition and financial debt remain unstable. Thus, from the above contending issues, there is need for a comprehensive investigation of the determinants of domestic investment in Nigeria.

3. Methodology

3.1 Model Specification

The model adopted in this study took into consideration the structural economy and policy changes through the periods of financial deregulation, trade liberalization and the present financial sector reforms, as represented by the macroeconomic stability variable. The data are expressed in aggregate value as stated in the Central Bank of Nigeria (CBN) statement of account 2007; 2008, Statistical bulletin 2007 and the 50 years special anniversary report. The choice of selecting data from 1970 is due to fact that data from 1960 may most likely be inconsistent and volatile because of the levels of social unrest, political crisis and the civil war during that period.

Furthermore, analyses will be carried out on the market size which captures the total value of tradable goods and services that were generated within the economy. Capital performance was captured by changes in the ratios of commercial bank credit to private sector. The real rate of exchange measures the rates of exchange risk as a direct domestic risk. Political stability captured by the impact of the ratio of fiscal balance in the economy and investment represented by gross fixed capital formation. The functional form of the model for the study is presented thus:

$$INV = f(MKTS, MACS, CP, EXR, POLS) \quad - \quad - \quad (3.1)$$

Transforming this function to a linear equation, the model becomes:

$$INV = a_0 + a_1 MKTS + a_2 MACS + a_3 CP + a_4 EXR + a_5 PS + U_t \quad - \quad - \quad (3.2)$$

Where:
INV=Investment, a= Intercept, MKTS= Market Size, MACS = Macroeconomic Stability, CP= Credit Performance, EXR= Real Exchange Rate, PS= Political Stability, U_t= Stocastic Error Term
The presumptive (a priori) signs are: $a_1>0$, $a_2>0$, $a_3>0$, $a_4>0$ and $a_5>0$.

3.2 The Cointegration Test

In order to estimate this model we tested for the presence of unit root in the series. This is necessary in order to carry out a detailed investigation on the study and arrive at a stable result. Both the Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) unit root test were used to determine the order of each series (Gujarati, D. 2002). The DF test is based on equation 3.3 as follows:

$$\Delta INV_t = a_o + a_1 MKTS_{t-i} + a_2 MACS_{t-i} + a_3 EXR_{t-i} + a_4 CP_{t-i} + a_5 PS_{t-i} + U_t \quad - \quad (3.3)$$

Subsequently, we try to establish if there is a deterministic trend ($b\neq0$) and/or a drift ($a\neq0$) in the model. The error term, U_t should be white noise, if INV_t is a first order auto-regressive process (AR(1)), then the single lagged value of the variable will be sufficient to ensure this condition. If the process is not AR (1), then the single lagged value of the variable will be insufficient to ensure this condition and equation 3.3 needs to be differenced to make U_t white noise, hence, the ARDL test is therefore based on equation 3.4 as presented below:

$$\Delta INV_t = a_o + \sum_{i=1} a_1 MKTS_{t-i} + \sum_{i=1} a_2 MACS_{t-i} + \sum_{i-1}^{3} a_3 EXR_{t-i} + \sum_{i-1}^{2} a_4 CP_{t-i} + \sum_{i-1} a_5 PS_{t-i} + U_t \quad - \quad (3.4)$$

The critical t values for the tests were calculated in accordance with Solm, Peseran and Shin (2003). The null hypothesis of non-stationarity is rejected if the t-statistic is less than the critical t-value (Hylleberg and Mizon 1989, Charemza and Deadman, 1997 and Engle and Granger, 1987; 1991).

The proposed error correction model (ECM) of the determinants of investment in Nigeria and the expected short-run model may be expressed in this form:

$$\Delta INV_t = a_o + a_1 L(\Delta\varpi) - a_2 ECM_{t-1} + U_t \quad - \quad - \quad - \quad (3.5)$$

Where
ϖ = the vector of the variable that co-integrated with investment,
L = the general lag operator,
ECM = a representation of the time series of residuals from the cointegrating vector.

Equation 3.5 incorporates a corrective mechanism by which previous disequilibria in the relationship between investment and its determinants in the economy. This indicates that a form of allowance is permitted for any short-run divergence in investment from its long-run levels. Then, the final estimated equation should be in this form:

$$INV_t = a_o + a_1(L)INV_{t-i} + a_2\Delta MKTS_{t-i} + a_3\Delta MACS_{t-i} + a_4(L)\Delta CP_{t-i} + a_5(L)EXR_{t-i} + a_6 PS_{(t-1)} + a_7 ECM_{t-i} + U_t \quad - \quad - \quad (3.6)$$

The ecm negative coefficient supports the existence of co-integration and defines the feedback mechanism amongst the cointegrating variables.

4. Discussions of Findings

Table 4.1: Ratios from DF and ADF unit root test

Variables	Test	ADF tests, an intercept and no trend			ADF tests, intercept and trend		
		Levels	1st Diff.	2nd Diff.	Levels	1st Diff.	2nd Diff.
INV	DF	-1.4680	-4.9739	-9.6355*	-0.9927	-5.0732	-9.5180*
	ADF	-1.9153	-3.3630	-5.8198*	-1.5966	-3.4744	-5.7556*
MKTS	DF	-5.9375	-9.8975	-11.8480*	-5.8449	-9.7588	-11.6668*
	ADF	-4.3071	-8.2089	-11.9201*	-4.2148	-8.1287	-11.7575*
MACS	DF	-1.1205	-3.5343	-5.3423*	-1.9203	-3.5888	-5.2602*
	ADF	-2.1880	-5.1579	-6.3662*	-3.3602	-5.10236	-6.2695*
PS	DF	-2.1681	-6.8040	-9.3454*	-2.8234	-6.7126	-9.2101*
	ADF	-1.8904	-5.8449	-9.4191*	-2.5696	-5.7659	-9.3136*
CP	DF	3.1212	-3.6281	-7.9389*	2.1046	-4.1657	-8.0872*
	ADF	2.3389	-2.6344	-6.2387*	1.4008	-3.2041	-6.5977*
EXR	DF	-0.05446	-6.2016	-10.1223*	-1.8629	-6.2426	-9.9922*
	ADF	-0.0341	-4.3547	-8.5777*	-1.7704	-4.4472	-8.5052*
Critical Value		-2.9422	-2.9446	-2.9472	-3.5348	-3.5386	-3.5426

Source: Authors Estimation, with data from CBN 2008 *Represents statistical significance at one percent

Table 2: The unit root test of the residuals of DDINV on the regressors

Variables	DF Test	ADF Test	Critical Value	Cointegration
DDMKTS, DDMACS, DDEXR, DDCP, DDPS	-9.9707*	-5.2313*	-5.2031	Accept

Source: Authors Estimation, with data from CBN 2008 *Represents statistical significance at one percent

Table 3: ARDL (3) ECM and Long-run with DDINV on the regressors

	ARDL(3) Schwarz Bayesian Criterion			Error Correction Representation of the ARDL(3)			Estimated Long-run coefficient of the ARDL(3)		
Regressors	Coefficient	T-Ratio	P-value	Coefficient	T-Ratio	P-value	Coefficient	T-Ratio	P-value
INV(-1)	-0.44166	-4.4886	0.000	5.6182	8.8538	0.000	-	-	-
INV(-2)	-2.9354	-7.9461	0.000	2.6827	8.6659	0.000	-	-	-
INV(-3)	-2.6827	-8.6657	0.000	-	-	-	-	-	-
C	4265.6	1.0828	0.291	4265.6	1.0828	0.291	601.6487	1.1033	0.282
MKTS	-16.5378	-0.1748	0.863	-16.5378	-0.1748	0.863	-2.3326	-0.17472	0.863
MACS	171.3749	7.9191	0.000	171.3749	7.9191	0.000	24.1720	9.9482	0.000
EXR	1412.6	4.0226	0.001	1412.6	4.0226	0.001	199.2385	3.7599	0.001
EXR(-1)	1264.1	2.4406	0.023	1264.1	2.4406	0.023	178.3017	2.2990	0.031
EXR(-2)	2150.2	3.7281	0.001	2150.2	3.7281	0.001	303.2813	3.7869	0.001
EXR(-3)	2110.9	5.1372	0.000	2110.9	5.1372	0.000	297.7359	6.1117	0.000
CP	-0.51223	-7.1376	0.000	-0.51223	-7.1376	0.000	-0.07225	-14.7818	0.000
CP(-1)	-0.19524	-4.3383	0.000	-0.19524	-4.3383	0.000	-0.02754	-5.0900	0.000
CP(-2)	-0.68997	-9.5879	0.000	-0.68997	-9.5879	0.000	-0.09732	-13.8889	0.000
PS	-0.39128	-5.8165	0.000	-0.39128	-5.8165	0.000	-0.05519	-7.7831	0.000
ecm(-1)	-	-	-	-7.0898	-11.587	0.000	-	-	0.000
R-squared	0.93025			0.97636			-		
R-Bar Squared	0.88903			0.96240			-		
F-test	22.5687		0.000	69.9027		0.000	-		
D.W. Stat.	2.0055			2.0055			-		

Source: Authors Estimation, with data from CBN 2008

From the results in table 4.1, all the variables were virtually non-stationary at levels, and it became necessary to difference once to obtain stationarity. Differencing once show that the variables in the model were not still stationary. Therefore, at the second difference, the variables in the model were stationary.

Table 4.2 discloses the results of the unit root test for the residuals. The DF and ADF values show that there is a long term equilibrium relationship between the levels of domestic investment in Nigeria and related variables. Consequently, the ARDL (3) based on the Schwarz Bayesian Criterion and the error correction representation for the selected ARDL model was specified.

Furthermore, the long-run equation and the short-run parsimonious investment model estimates are reported in table 4.3. The long-run average of investment is about 2.33, this practically means a little over time, a relationship exist between other variables in the model and that domestic investment adjust to its long-run growth path with time following a disturbance.

Moreover, we probe further by seeking the equilibrium error. The result reveal that short-run changes in investment has a significant effect on market size and about 7.1 of the discrepancy between the actual and long-run value of market size is partially eliminated.

Therefore, in relation to the estimates of other variables in the model, it can be deduced that, the past outcomes of domestic investment was noticed to influence the present levels of investments in Nigeria positively. From the results in table 4.3, investment at its first and second lag, had positive effects on present levels of domestic investment and pass the test of statistical significance at the one percent level. The results reveal that a unit change in domestic investment lag one period will bring about a 5.62 unit increase in the present levels of domestic investment. Also, a unit change in domestic investment lag two periods will yield a 2.68 unit increase in domestic investment. This suggests that previous levels of domestic investment in Nigeria strongly influence the desire of investors to reinvest in Nigeria. The market size variable expresses a negative relationship with the level of domestic investment. Consequently, a unit change in market size will lead to a 16.54 unit decrease in the levels of domestic investment in the economy, although this variable fail the test of individual statistical significance at the one and five percent levels of statistical significance. This suggest that market fundamentals do not encourage domestic investment and they have not been used as an effective economic tool to correct the down turn in domestic investment which started in 2004, the fall of which has persisted till date.

Macroeconomic stability strongly indicates positive outcomes in line with investment and it's statistically significant at the one percent level. Despite this fact a unit change in macroeconomic stability only leads to a 171.4 unit change in domestic investment. This level needs to be improved to enhance the values of related variables that will most likely improve domestic investment.

The exchange rate variable at its present value shows that a unit change will lead to a 1412.6 unit increase in aggregate domestic investment. At the first, second and third lag a unit change will bring about a 1264.1, 2150.2 and 2110.9 unit increase in investment respectively. It is of interest that these variables pass the test of individual statistical significance at the one percent level and they have positive effects on the levels of investment. Consequently, previous exchange rate values have stronger effects on the levels of investment in the economy.

Capital performance at its present value reveal that a unit change will lead to a 0.512 unit decrease in aggregate investment. This situation was the same for the second and third lags which had 0.195 and 0.690 respectively and these variables were significant at the one percent level. This suggest that capital invested in the domestic economy has not performed up to expectation despite the huge capital the commercial banks gave as loans to the investing public through the period under review (see Figure 2.3). It was noticed that these decrease were inconsistent, fluctuating and uncertain.

Political stability is statistically significant at one percent and shows that a unit change will bring about a 0.39 unit decrease in investment. This means that the political situations in Nigeria during the period observed does not encourage the levels of investment. This suggests strong elements of political instability and unfavorable political policies and a political environment which have largely discouraged the growth of domestic investment.

The ecm coefficient has the expected negative sign and the model passed the test of statistical significance at the one percent level. Therefore, the ecm coefficient of this model reveals a little above 7.0 units of discrepancies between the actual and the short-run level necessary for investment to recover. This implies that domestic investment may revert back to its equilibrium path quickly. Overall, the model has a very good fit and can be used to draw serious conclusion on the situation of domestic investment in the Nigeria economy.

The summary statistics disclose the model has a perfect fit. The R^2 value of 0.98 depicts that about 98 percent systematic variation in domestic investment can be explained by the model, leaving out only two percent to the error term. Also, the F-statistics value of 69.9 which pass the test of individual statistic significance at one percent, reveals that all the slope coefficient are simultaneously significantly different from zero. The Durbin Watson statistics value of 2.0 shows that the model is free from the presence of first order serial correlation. These disclose that the model tested is proficient, the estimated results are good and the implication of the study in line with policies proposed should be taken seriously.

5. Conclusion

The study examines the determinants of investment in Nigeria by assessing the trend of the variables in the model. It also made use of the cointegration analysis to examine the implication of their impact on the levels of investment in the economy. The stationarity was validated at the second difference and the error correction mechanism was used to analysis the short run behavior of the model. All the variables in the model pass the test of individual statistical significance at the one percent level and we discovered that:

Past outcomes of investment strongly influence the possibility for investors to reinvest. Domestic market fundamentals do not encourage domestic investment and they have not been used as an effective economic tool to support the declining state of domestic investment. In spite of present macroeconomic stability measures, disclosed signals are encouraging but the magnitude is quite low. The rate of exchange at its present, first, second and third lags have positive effects on investment. Quite revealing is the fact that previous exchange rate values have stronger effects on the levels of investment. It was also disclosed that despite the astronomic increase in the volume of commercial bank loans to the public, the levels of capital performance in the economy as a determinant of domestic investment is uncertain, fluctuating and continually on the decline. Political stability exhibits reasonable levels of instability which discourages domestic investment.

5.1 Policy Implication and Recommendation

The following policy recommendations are outcomes of the findings of the study.

Since previous exchange rate policies are most likely to spur and speedup the growth and development of the domestic industries and also it has the likelihood to increase investment in this sector. Therefore, necessary adjustments need to be effected for the proper positioning of present exchange rate policies to encourage the investors and investment in the domestic economy.

To correct the level of uncertainty and the inability of capital to perform, capital should be put into productive ventures, which they were meant for, in the economy and banks should follow up the effective utilization of such capital, monitoring them closely to achieve their desired investment objectives.

Also, policies should be developed and properly administered to enhance market instruments in order to effectively support the promotion of domestic investments in the economy.

Macroeconomic policies should be designed to favor domestic investment and other related key determinants which most likely will enhance industrial development and encourage foreign investors.

Political problems, conflicting interest and communal disagreements and other forms of political illegalities (i.e. multiple taxations) should be addressed by policy maker in other to make the economy conducive for foreign investment and domestic investors.

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