EVALUATION OF THE IMPACT OF INVESTMENT CLIMATE ON NIGERIA'S ECONOMIC DEVELOPMENT

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A DISSERTATION SUBMITTED TO THE DEPARTMENT OF ECONOMICS, FACULTY OF SOCIAL SCIENCES, NNAMDI AZIKIWE UNIVERSITY, AWKA, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DOCTOR OF PHILOSOPHY (Ph.D) IN ECONOMICS.

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CERTIFICATION

This is to certify that this dissertation titled: Evaluation of the Impact of Investment Climate on Nigeria's Economic Development (1981-2015) was carried out by Eshiobo, Samuel Shola with registration number 2012117017F. It is an original research carried out by me except where references were made to published literatures and the work has not been submitted anywhere before now for the award of any certificate, diploma or degree.

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APPROVAL

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DEDICATION

Dedicated to all lovers of academic excellence

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ACRONYMS

CBN – Central Bank of Nigeria.
DFRRI – Directorate of Food, Roads and Rural Infrastructure
DCO – Electricity Distribution Companies.
ECM – Error Correction Mechanism.
EDUC – Education.
EMPL – Employment.
ELECT – Electricity.
FDI – Foreign Direct Investment.
GCF– Gross Capital Formation.
GDP – Gross Domestic Product.
GDPG – Gross Domestic Product Growth
GNICAP– Gross National Income Per Capita.
GNI– Gross National Income.
HDI– Human Development Index.
IHDI- Inequality-adjusted Human Development Index.
ICOR- Incremental Capital Output Ratio.
INFR- Infrastructure.
LIFE- Life Expectancy.
LEEDS- Local government Economic Empowerment and Development Strategy.
NBS- National Bureau of Statistic.
NPA- Nigeria Ports Authority.
NDPL- National Development Plan.
NIIMP- National Integrated Infrastructural Master Plan.
NSE- Nigerian Stock Exchange.
NIPP- National Integrated Power Project.
NIPC- Nigeria Investment Promotion Commission.
NEEDS- National Economic Empowerment and Development Strategy.
NPC- National Planning Commission.
NECO- National Examination Council.
NABTEB- National Business and Technical Education Board.
PPP- Purchasing Power Parity.
PAP- Poverty Alleviation Programme.
PQLI- Physical Quality of Life Index.
PSCR- Private Sector Credit.
PHCN- Power holding company of Nigeria.
SEEDS- State Economic Empowerment and Development Strategy.
SSCE- Senior School Certificate Examination
SAP- Structural Adjustment Programme.
SAM- Social Accounting Matrix.
SECU- Security
TRDF- Trade Facilitation.
UNESCO- United Nations Educational, Scientific and Cultural Organisation.

ABSTRACT

This study evaluated the impact of investment climate on Nigeria's economic development. Successive governments have tried to harness the country's abundant resources to promote rapid socio-economic development but had experienced problems from the investment environment. Previous studies on this topic have equally tried various methods to address the economic challenges facing the country but to no much success. Most of the studies could not provide in-depth evaluation and analysis of the underlying microeconomic factors that affected the investment climate and economic development. This gap in knowledge in these previous studies, informed the use of the multi-method triangulation principle on a modified Neo-Classical production function. To explore the fundamental factors that affect Nigeria's investment climate and economic development, the study used the co-integrated OLS regression technique and the exploratory dicriminant factor analysis to estimate the models of relationships. The ex-post facto research design adopted used the time series data of the primary investment climate determinants from 1981 to 2015. The study found that SECU, ELEC, TRDF, INFR and their underlying factors had significant negative impact on Nigeria's investment climate (MCAP) and economic development indicators of GNICAP, LIFE, EDUC, EMPL, CAPD. Also PSCR and NDPL which have positive impact on investment climate and economic development were not significant. The result revealed a cointegrated relationship between investment climate factors and economic development indicators at order I (1) with an average ECM speed of adjustment of 50% per annum. The study recommends, among others, that the government should seriously address the problem of insecurity, electricity supply, foreign trade and infrastructure from the base of their underlying factors. They should encourage and support agro-allied industrial ventures to create jobs, protect pipes conveying gas to electricity generating stations, prevent vandalisation and theft of electrical parts, promote foreign trade policy, improve sea and air port facilities and increase the annual capital budget allocation to 50% while also avoiding its misapplication to finance recurrent budget deficit.

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Nigeria is Africa's most populous nation with about180 million people, abundant natural and human resources, low cost labour and largest potential market in sub-Saharan Africa for investment (US Dept of State, 2015). These economic potentials were expected to promote rapid economic development subject to the vagaries of the investment climate. The correlation between investment climate and economic development, made many countries strive for a better investment climate that can promote investment and high standard of living (World Bank, 2011; Silva-Leander, 2005).

Investment climate is essentially the overall economic and environmental conditions of a place or country that affect the willingness of individuals and businesses to invest or lend money and acquire a stake in the businesses operating in that place or country (Harvey, 2012). It consists of a set of factors in a given location that provide incentives and opportunities to investors (Dollar, 2005). Investment climate can be friendly or hostile to investment and economic development. A friendly investment climate fosters investors' confidence to invest to boost the capacity utilisation of the manufacturing sector to attract foreign and domestic investments (Basu, 2015). A hostile investment climate on the other hand, discourages investors and scares them away.

Nigeria's investment climate and economic development had faced significant challenges since 1981, when there was oil glut in the international energy market and a barrel of crude oil sold for less than $10 as against $40 in 1980. This had resulted to significant decline and shortfall in the revenue that accrued to the federal government to finance economic programmes, especially the fourth National development plan (Osagie, 2007). The economic situation had led to serious economic hardships and social consequences that affected the standard of living of Nigerians. The situation had forced the federal government to embark on adhoc economic policies such as 'austerity measures' or 'operation tight your belt' to check the fast depreciating naira-dollar exchange rates, the low foreign exchange reserve, low foreign direct investment inflow and the deteriorating standard of living. In 1982, the economic stabilization Act was introduced to articulate policies to stabilise the economy on the path of development. In addition economic reform programmes were introduced such as the structural adjustment programme (SAP) (1986),

directorate for food, roads and rural infrastructure (DFRRI), family economic advancement programme (FEAP) and the national poverty alleviation programme (PAP). Others were perspective or long-term plans in 2000 starting with Vision 2010 (2001- 2010) to Vision 20:2020 (2011- 2020) (NPC, 2012).

A survey of the interaction between Nigeria's investment climates, proxy by the manufacturing sector's capacity utilisation, and major economic development indicators such as gross national income per capita, life expectancy, educational attainment, employment and capital development showed the following results:

Capacity utilisation of the manufacturing sector declined from 73.3% (1981) to 38.8% (1986) and resulted in negative growth rates of13.1% (1981) and 8.8% (1986) in real gross domestic product (RGDP). The average capacity utilisation for the period 1981 to 2015 was 46.2% while the average annual growth rate of real gross domestic income was a paltry 2.9% (CBN, 2015).

The decline in the capacity utilisation of the manufacturing sector from 73.3% in 1981 to 38.8% in 1986, no doubt, had also resulted to the decline in the gross national income per capita from $3555 (1981) to $3029 (1984). The increase in capacity utilisation recorded from 53.8% (2008) to 56.2% (2011) must have caused the increase in national per capita income from $4340 (2008) to $4970 (2011) (World Bank, 2015). National income per capita grew steadily between 2005 ($3623) and 2015 ($5546). The average national income per capita from 1981 to 2015 was $3392 as against the planned target of $4000 for the period in the Vision 2020 economic blue print (NPC, 2012)

Life expectancy index for the country was low with an averaged 47.5years (1981-2015) which was far below the expected 80years (World Bank, 2015).

In educational attainment in Nigeria, an annual average of 5.4million persons (1981-2015) acquired basic primary education. The literacy level in Nigeria was 61% in 2015 as against the 90% target set for the country in 2015 by the United Nations' millennium development goal policy (UNDP, 2016).

The trend of capacity utilisation and employment rates showed a decline was recorded in both variables from 1981-1985. The average employment rate was 89.8% in the period 1981-2015 as

against the expected 97% target for 2010-2015 (NPC, 2012). The average unemployment rate of 10.2% made the economy to be below full employment level.

In the ease of doing business in Nigeria since 2005, the country was ranked low indicating that there were barriers to business development and investment in the country.

Capital development and availability in Nigeria, as measured by the capital-output ratio declined steadily for 24years of the period of analysis, 1981-2015. This implied that there was no enough capital to stimulate investment to promote economic development.

Summarily on the average, there was a disturbed interaction between investment climate (captured by the manufacturing sector's capacity utilisation and ease of doing business) and economic development indices (gross national income per capita, life expectancy, literacy and employment). Also, little improvement was achieved in the investment climate and economic development compared to what obtained in comparator's countries like Malaysia, Indonesia, South Africa and Ghana as summarised on Table 1.1 below. From the Table Nigeria has the lowest average human development index of 0.51 point (51%) on a composite scale of 1 (100%) compared to Malaysia's 0.77 (77%), Indonesia's 0.67 (67%), South Africa's 0.66 (66%) and Ghana's 0.56 (56%). Nigeria was ranked 152nd position out of 189 countries used for the global human development ranking in 2014 (World Bank, 2015).

Table 1.1: Some Economic Development Indices of Nigeria as Compared with Two African and Two Asian Countries.

S/No	Indicator	Nigeria	Malaysia	Indonesia	S/Africa	Ghana
1	Average Human Development **Index** (HDI) from 2010-2014(***b***)	0.5	0.77	0.67	0.66	0.56
2	Average annual GDP growth rate **(%)** from 1981-2015 ***(b)***	2.90	5.94	5.48	2.41	4.54
3	Average annual national income per capita**($)** from 1981-2015 ***(b)***	$3392	8,530	2,687	6,541	1,277
4	Average life expectancy at birth from 1981-2015(**years**) ***(b)***	47.5	72	72	57.5	56.5
5	% of population that is literate in 2015 (**%**) ***(b)***	60	95	94	94	77
6	Average unemployment rate 2010-2015 (**%**) ***(b)***	10.2	3.2	6.5	24.7	4.3
7	% of total population living below poverty line in 2014 (**%**) ***(c)***	70	3.8	11.7	31.3	28.5
8	Per capita electric power consumption in 2013 (**Kwh**) ***(b)***	142	4,512	788	4,326	382
9	Ranking of ease of doing Business in 2015 (***a***)	170th	18th	114th	43rd	70th
10	Average annual net-FDI flow (**$m**) 1980-2013 (***b***)	1937	2696	3542	1537	578
11	Average annual net per capita FDI in **($)** from 1981-2014 (***b***)	10.8	87	14.2	30.1	21.4
12	Getting Electricity Supply (2014) ranking(***a***)	187th	27th	78th	158th	71st
13	Getting Credit or Finance (2014) ranking (***a***)	52	23	71	52	36
14	Protecting minority investors (***a***)	62	5	43	17	56
15	Innovation index (2014) Ranking (***a***)	110th	33rd	33rd	53rd	96th
16	Transparency or less corruption index (ranking 175 countries (***b***)	136th	50th	107th	67th	61st

Source: World Bank (2015): (***a***) Ease of doing business (www.doingbusines.org /ranking
(***b***) World Development indicators (www.data.worldbank.org)
(***c)***. Poverty Index (www.indexmundi.com)

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1.2 Statement of the Problem

Nigeria with her abundant natural and human resources ought to witness rapid economic development characterised by a better investment climate and a high human development rating and performance. The country is supposed to experience high economic growth rates, high national income per capita, longevity of life, high quality education, low level of unemployment and poverty, and high level of capital development.

Statistics on Nigeria's economic performance showed that the average annual economic growth rate (1981-2015) was a paltry 2.9% and less than the World Bank's 5% minimum and the 9% policy target planned by the government. The average annual growth rate of gross national income per capita was 2.8% as against the planned 3.5% while life expectancy was 47.5years. The country's life expectancy rate is one of the lowest in the world and poor in comparison to Malaysia and Indonesia's 72years, South Africa's 57.5years and Ghana's 56.5years. The level of primary education and adult literacy (age 15+) is 60% of the adult population in 2015 compared to the 80% policy target (Adamu, 2017, World Bank, 2016 & NBS, 2016). The literacy level affected the supply of quality skilled manpower needed to drive the economy on a fast path of development.

The level of unemployment, especially youth unemployment, is high with an annual average of 16.9% as against the 3% average expected in 2003-2012 plan period (NPC, 2012). Poverty level was extremely high with an annual average of 61.8% compared to the planned rate of 5% making the country to be ranked 3rd poorest country in the world in 2014 (Jim-Yong, 2014). The average per capita foreign direct investment inflows (FDI) of $10.8, the ease of doing business ranking of 170th in 2013, and the per capita electricity consumption of 142Kwh were all very low and poor.

A further evaluation of the state of the Nigerian economy showed that the average annual growth rates of the manufacturing sector's capacity utilisation was 7.7% which was below the 10.4% target objective while the average capacity utilisation of 46.2% (1981-2015) was below the 62.2% target planned for the period (NPC, 2012). Nigeria was placed first in the corruption index in 2013 while in innovation index she was last. The annual growth in credit supply to the private sector averaged 29.4% as against the 30% target while inflation rate and price stability was 12.4% compared to the 9.8% target (NPC, 2012) Electricity supply of annual average of

4,600MW was poor compared to the 20,000 MW projected for 2015. The level of insecurity was high with a global peace index rating of 155th out of 163 countries in 2015 (Institute of Economics and Peace, 2015). Capital development and efficiency was unimpressive with low foreign direct investment (FDI) inflow to the country in addition to poor domestic capital supply for investment.

Over the years, various regimes of government in Nigeria have made frantic efforts to improve the state of the economy to fast-track economic development. This desire had made them to embark on various investment climate and economic reform programmes. It is disheartening to note that in spite of all these efforts by the government, the economy was still sluggish to growth. All the planned development targets were never met as indicated on Table 1.2. The development performance of the country economically, seriously lagged behind that of the comparator's countries like Malaysia, Indonesia, South-Africa and Ghana which have less economic potential than Nigeria.

The above economic position of Nigeria had led to high rate of divestment to other countries. For instance, multinational companies like Dunlop tyres, Michelin tyres, Patterson Zochonis (PZ) cosmetics, Unilever, Pharmaceuticals companies like Pfizer and Glaxo-Wellcome left Nigeria to Ghana and other countries in 2009 (Kehinde, Adeleye & Edward, 2009). Their action was said to be predicated on inadequate power supply, high cost of doing business, declining returns to investment (capital inefficiency) as well as increasing insecurity in the country (Nwagbosa, 2012). The exit of these firms, no doubt, increased the unemployment rate, reduced tax revenue to government for financing economic development programmes and thus worsened the level of poverty in the country.

It is crystal-clear from the above discussion that Nigeria has serious economic challenges hindering her economic development. This state of development requires urgent and serious attention from the government and other stakeholders of the economy. The economy need to be saved from imminent collapse and the perpetuation of abject poverty in the land so as to improve human welfare and high standards of living. It is to this end and to be part of the solution to Nigeria's economic problems that this study emerged. The study evaluated the detail impact of investment climate on Nigeria's economic development in the past 35years starting from 1981.

Although similar studies were carried out by scholars in this area, but their methods were not as robust as the one used in this study. Their methods could not achieve much success in resolving the economic and social problems of the country as they mainly focused on some few primary factors affecting the investment climate and economic growth without resort to the underlying factors of the investment climate and economic development. It should be noted that these underlying factors significantly affect or impact on the outcome and behaviour of the primary factors. This is to say that what is behind the mask is even greater than the mask itself. Besides, only very few of the studies tried to use the 1995 human development index (HDI) of the United Nations Development Programme (UNDP). This study, on the other hand, evolved a comprehensive and in-depth analysis of the primary and underlying factors affecting Nigeria's investment climate and economic development. The study adopted the 2010 UNDP inequality-adjusted human development index (IHDI), which was rarely used by others, and present a better measurement of economic development than the HDI (UNDP, 2016). The HDI measures potential growth in income, health and education of a country while the IHDI measures the average achievement recorded in them. Furthermore, a cointegrated regression analysis was used to explore the relationship between the primary investment climate determinants and economic development while the discriminant factor analysis was used to explore the underlying factors of the primary determinants. These techniques are capable of aiding and helping to fine-tune economic policies to meet the stated economic development objectives of the nation.

Table 1.2: Projections and Actual Performance of Selected Targets under the NEEDS Programme in Nigeria (2003-2012).

Variable	Performance	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Average
Real GDP Growth(%) *(a)*	Planned	10.2	5	6	6	7	10.7	10.5	11.5	11.7	12.5	9.1
	Actual	10.4	6.2	3.4	8.2	6.8	6.3	6.9	7.8	7.43	6.58	7
Growth of manufacturing(% *(c)*	Planned	7	7	7	7	7	12.7	13.3	13.9	14.3	14.5	10.4
	Actual	19.9	2.1	-11.1	15.7	7.1	12.7	7.85	7.57	7.5	7.55	7.7
Manufacturing cap. utilisation % *(c)*	Planned	53	53	53	53	70	70	70	70	85	85	66.2
	Actual	56.5	55.7	54.8	53.3	53.4	53.8	55.5	55.1	56.2	56	55
Per capita income growth rates (%) *(c)*	Planned	2	2	2	2	2	5	5	5	5	5	3.5
	Actual	1.2	2.7	2.5	2.6	1.1	2.2	3.64	4.63	4.4	3.58	2.8
Unemployment rate (%) ;*(b)*	Planned	3	3	3	3	3	3	3	3	3	3	3
	Actual	12.6	12.6	12.6	12.6	14.6	14.9	19.7	21.1	23.9	24.3	16.9
Power/electricity supply('000MW *(d*	Planned	4	4	7.98	10.9	12.1	13.6	15.1	17.4	17.4	17.4	12
	Actual	6.2	2.8	2.8	3	4.1	5.7	6.3	6.5	4.53	4.2	4.6
Annual poverty level (%) *(e)*	Planned	5	5	5	5	5	5	5	5	5	5	5
	Actual	78	61.8	70	68	70	70	70	62	35.2	33.1	61.8
Private sector credit growth rate (%)*(c)*	Planned	30	30	30	30	30	30	30	30	30	30	30
	Actual	26.9	26.3	31.1	31	84.8	61.8	24	-4.9	4.5	8.6	29.4
Inflation rate (%) *(e)*	Planned	9	10	10	9	9	9	9	11.2	12	9.5	9.8
	Actual	23.8	10	11.6	8.5	6.6	15.1	13.9	11.8	10.3	12	12.4

Source: *(a)* NPC: Second National Economic Empowerment and Development Strategy, 2008-2011 (2007)
(*b*) NPC: Seven Point Agenda (2012); *(c)* CBN: Statistical Bulletin (2013)
(d) NPC: Performance Report on the Nigerian Economy (2012)
*(e)*World Bank: World Development Indicators (2013);
(*f*) NBS: Annual Abstract of Statistics (2008)

1.3 Research Questions

Many questions readily come to mind in the attempt to find out the impact of investment climate on economic development in Nigeria. Pertinent questions to be asked are:

i. What are the factors affecting the conduciveness of Nigeria's investment climate to affecting economic development?
ii. What is the nature of relationship between economic development indicators (gross national per capita income, longevity, literacy, employment etc) and the investment climate determinants in Nigeria?
iii. How has Nigeria's investment climate impacted on capital development and efficiency to promoting economic development?

1.4 Objectives of the Study

The major objective of the study is to evaluate the impact of investment climate on Nigeria's economic development. Specifically, the study aims to:

(i) Examine the primary and secondary factors and policies that affect the conduciveness of Nigeria's investment climate with a view to promoting a sound investment climate for the country.

(ii) Evaluate the effect of investment climate factors or determinants on Nigeria's economic development indicators.

(iii) Determine the effect of investment climate factors on the status of capital development and efficiency in Nigeria.

1.5 Research Hypotheses

The following hypotheses were formulated for the study.

1. **H_0:** Investment climate determinants such as private sector credit supply, trade facilitation, electricity supply, infrastructures, security, national development plans and their underlying factors have no significant positive impact on Nigeria's investment climate to make it conducive for investment.

   H_1: Investment climate determinants such as private sector credit supply, trade facilitation, electricity supply, infrastructures, security, national development plans and their underlying factors have significant positive impact on Nigeria's investment climate to make it conducive for investment.

2. **H_0:** Nigeria's investment climate determinants have no significant impact on economic development indices such as gross national per capita income, life expectancy, educational attainment and employment.

   H_1: Nigeria's investment climate determinants have significant impact on economic development indices such as gross national per capita income, life expectancy, educational attainment and employment.

3. **H_0:** Nigeria's investment climate has no positive impact on capital development and efficiency to promoting economic development.

   H_1: Nigeria's investment climate has positive impact on capital development and

efficiency to promoting economic development.

1.6. Significance of the Study

This study will be of utmost benefit to the government, economic planners, investors, individuals, consumers, research persons and others.

Investment climate assessment studies are known to provide data and information to policy makers in a country for efficacious policy making. Therefore the full information and in-depth analysis of Nigeria's investment climate provided by this study will be of immense benefit to the government in the design of effective economic reform policies. Such refined policies are capable of impacting positively on economic growth, job creation, poverty reduction, per capita income, medical care, life expectancy and improved literacy level. The study will provide a solid guide to the government for proper foreign trade and investment policy for the country.

To economic and development planners, the study will provide them with the knowledge of the underlying secondary factors affecting both investment climate and economic development indicators for effective policy making. This will help policy makers to design appropriate intervention and reform policies to stimulate growth in capacity utilisation of manufacturing sector and capital efficiency to checkmate the spate of divestment to other countries. The knowledge of the investment climate factors affecting capital development and efficiency and the impact on economic growth and standard of living would be very relevant to economic development planning in Nigeria.

Investors, both foreign and local, will find the information from the study very useful for optimal investment decision making especially in the area of infrastructural development, security networking, government's policies, building capacity utilisation of manufacturing sector, improving rate of returns on investment, capital development and efficiency.

Individuals and consumers will obtain useful information regarding employment opportunities, educational services, health and security details that can improve their life spans and standard of living.

Finally, the study will add valuable information to the existing knowledge on Nigeria's investment climate conditions and the impact it has on economic development for other research persons or students to benefit.

1.7 Scope and limitations of the Study

This study focused on the impact of Nigeria's investment climate factors on economic development over the period 1981-2015. The investment climate factors covered include the gross domestic product, private sector credit supply, electricity, trade facilitation, infrastructure, security and national development planning. The indices of economic development covered were gross national income per capita, life expectancy, educational attainment, and employment in Nigeria. The study delved into the underlying or secondary factors that affect the value of the primary investment climate variables and economic development indicators.

Foreign direct investment inflows to Nigeria and domestic investment or gross capital formation were incorporated in the study and used in determining the value of capital efficiency and development.

The study is however limited by the following factors. There were difficulties in getting complete data for some variables in some years in the period 1981-2015. There were cases of different /values of the same data depending on the source of the data particularly between World Bank, International Monetary Fund, Index Mundi, Central Bank of Nigeria and National Bureau of Statistics. However, World Bank data was preferred. Interpolation method was used to link up data for some years where there were jumps due to no available data. This was particularly glary on the number of graduates from Nigeria's educational institutions. To overcome the problem the enrolment data for higher level of education was taken to be the number that graduated at the lower previous level of education attained Candidates for the final year examination or assessment, was also used as an indicator of a completed educational level.

1.8. Organization of the Study

This study was organized into five chapters. Chapter one was basically introductory as to the background of the interaction between investment climate and economic development in Nigeria. The chapter discussed the objective, scope, problem statement and limitations of the study.

Chapter two focused on the review of related theoretical and empirical literature on investment climate factors and economic development indicators while chapter three covered the theoretical framework, model specification, method adopted in the treatment of data and the sources of data.

Chapter four was devoted to data presentation, interpretation, analysis, hypothesis testing, and discussion of results while chapter five summarised and concluded the study with useful findings and recommendations

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter identified and reviewed previous scholarly works on investment climate and economic development with a view to identifying the problems and filling the knowledge-gaps created in both the theoretical and empirical literatures. The theoretical literature examined the theoretical explanations of economic development, investment climate, their basic theories, factors affecting them and the methods of measuring their values. The empirical literature examined and discussed the specific investigations carried out by scholars in particular places or countries or regions on investment climate and economic development. Such investigations end up with findings and recommendations for policy making. The empirical literatures reviewed were summarised in a tabular form at the end of the chapter.

2.1 Theoretical Literature Review

2.1.1 Review of Conceptual Issues

A. Concept of Economic Development

Economic development is a broader concept concerned with the expansion of social and economic wellbeing of man characterised by improvement in national income per capita, long and healthy living, increased literacy or education and employment (Magarinos, 2005). It is a multidimensional process involving significant positive changes in social structures, popular attitudes, national institutions, real gross domestic income growth (GDP), reduction in income inequality gap and the eradication of poverty (Todaro & Smith, 2005). It focused on the provision of the material comfort of life such as food, shelter, healthcare and education (Conteras, 2014). It is a process that leads to improvement in the quality of life of the people through higher incomes, better education, higher standard of health/nutrition, less poverty, cleaner environment, better housing, greater freedom among others (World Bank, 2005). Economic development essentially focused on improving human development indices such as per capita consumption, literacy level, life expectancy at birth and reduction in poverty rate (Moris 2014; Elumene, 2009). Economic development occurs when there is increase and improvement in real national income per capita, literacy or education standard, life expectancy, quality housing and environmental standards that lead to poverty reduction (Agarwal, 2017).

Before 1990, measurement of economic development focused more on economic growth data such as GDP (commodities) and less on the human development potentials (capabilities). It is

imperative to note that human development potentials matter much in the evaluation of conditions for economic development. The United Nations' development programme (UNDP), in its human development index (HDI) metric, emphasised the World bank's view of economic development as the improvement in real gross national per capita income, life expectancy and adult literacy that could lead to long-healthy life, knowledge and decent standard of living (Jhigan, 2005).

Since the 1990s, socio-human development indices such as national income per capita, longevity of life, literacy, human capital development, better health services, employment, poverty reduction, better shelter, high consumption of electricity and others have increasingly been used to assess economic development.

The inequality-adjusted human development index (IHDI) was introduced by the United Nations' Development Programme (UNDP) in 2010 to assess the actual basic human needs that can improve the conditions of living to a high standard (UNDP, 2016). Human capabilities and functionality on a sustainable level are now being incorporated as essential indicators of economic development (Sen, 1999).

Given the discussion above, it is certain that economic development has to do with sustained provision of goods and services to improve the quality of human life and wellbeing in terms of higher national income per capita, better education, higher health and nutrition status, better shelter, higher employment and less poverty. These are the most important development indicators that promote high standard of living and health of the people of a specific country or locality (UNDP, 2016).

B. Concept of Investment Climate

Investment climate is the economic and financial conditions of a country that influences whether individuals and businesses are willing to lend money and acquire stake in the businesses operating in that country. It is a broad concept that has to do with a set of location-specific factors that shape the opportunities and incentives for firms to invest productively, create jobs and expand (World Bank, 2005). Investment climate is affected by a multiplicity of factors such as poverty, crime, infrastructure, manpower, national security, political instability, regime uncertainty, taxes, rule-of-law, property rights, government policies and regulations, level of

economic growth, transparency and accountability (Larossi, Mousley & Radwan, 2009). It focused on questions of efficiency of institutions, governance, macroeconomic policies stability and infrastructural development that affect not just the level of capital invested but also the productivity of existing investments (Nwogwugwu & Onwuka, 2012). Investment climate is the general conditions or characteristics of a set of social, economic, political, institutional, legal and cultural factors that determine the attractiveness and feasibility of investing in a particular place or region (Chanynikova in Glebova & Kotenkova, 2016).

Investment climate can be friendly or hostile to investors. A friendly and sound investment climate has positive effect on the level of investment in an economy as it attracts and encourages investors, especially the foreign ones, to invest and strengthened their confidence on better returns on their investment (Basu, 2015).

It suffices to say that the capacity utilisation of the manufacturing sector gives a fair idea of how conducive the investment climate of a country is, especially with respect to its level of friendliness or otherwise to manufacturers and investors (Boccardo-Jessica, 2004). Capacity utilisation also reflects the ease at which manufacturing firms do business in a country or locality to increase productivity (World Bank, 2014). It was observed that firms operating in a friendly investment environment were found to operate at high capacity utilisation to create about 90% of the jobs in the economy, supply goods and services that can improve the standard of living of the people and pay the bulk of taxes to the government to fund public development programmes (Smith & Hallward-Driemeier, 2005). Friendly investment climate can improve human development indices such as national income per capita, life expectancy and literacy (Robert, 2010). Investment climate affects the fortune and stir up competition among businesses to affect their operational value and impact on development (Okafor, 2010).

In recent years, investment climate has become a key issue in international development discourse as to how to create enabling business environment to promote private-sector-led international investment flow to enhance sustainable global economic development. It is an accepted fact that a sound investment climate is critical for private-sector-led economic growth and development (World Bank, 2011). This fact had led to the clarion call for a better investment climate that can provide opportunities and incentives for firms to invest productively to promote income growth, employment creation and poverty reduction (Silva-Leander, 2005). The critical

nature of the investment climate made the World Bank and many other countries to embark on investment climate assessment surveys. These surveys provided policy guide that can boost expansion of capacity utilisation of firms to increase productivity, employment and income among others. The World Bank's investment climate assessment surveys in different countries over the years revealed that good governance and effective business regulatory policy make a better investment climate. Other factors were better infrastructure, proper economic planning, better reform policies and implementation, proper contract enforcement, respect for property rights, free and fair competition and skilled manpower through education (International Finance Corporation, 2016). It was also observed that conflict ridden and insecure countries, especially the developing ones, have weak enabling investment environment that hampers their economic development potentials and made them incapable of attracting high volume of foreign investment for development (Whyte & Griffin, 2014).

A better investment climate is characterised by increased productivity, economic growth, high profitability level, better infrastructures, increased capacity utilisation, capital efficiency, friendly government policies and high rate of power supply (Larossi, Mousley & Radwan, 2009). In addition, low security threats, lower prices of commodities, fair tax system, government and society's commitment to investment climate reforms, quality labour, entrepreneurial management skills, efficient technology and job opportunities characterised a good investment climate (Nwogwugwu & Onwuka, 2012)

An unfavorable investment climate is a high risk operating environment with many hindrances to investment and economic development. To ameliorate the impact of a hostile investment environment on economic development, investment climate assessment surveys of countries were embarked upon by countries with some sponsored by the World Bank. Investment climate assessment survey per se evaluates the conditions under which private sector investors operate in a country or region to promote economic development (Larossi & Clarke, 2011).

From the foregoing, investment climate can be said to be the totality of economic, human and environmental factors of a place, region or country that influence the willingness and readiness of investors to invest over time. This submission stems from the fact that the constraints in the

investment environment are rooted in the economic problems of a nation such as resource availability, governance, social problems, natural disasters and environmental problems.

2.1.2 Review of Basic Theories

The idea of economic development is modern, being the result of the great economic depression of 1930 which brought in new thought about economic development as distinct from economic growth. Before this time economic growth theories had dominated economic literatures and growth in output was assumed to have a direct relationship with improvement in human welfare. The term economic growth and economic development were often used synonymously to mean one and the same thing such that many economic development theories took the form of growth theories. Countries with high growth rates in gross national income (GNP) were adjudged to experience economic development whereas the human conditions of living of the people were far from being satisfactory. This fact made many countries to place emphasis on increasing the growth rates of their gross national or domestic income or gross national income per capita in pursuance of economic development (Todaro & Smith, 2014). Economic growth cannot be sensibly treated as an end itself but a means to an end of economic development (Sen, 2004).

Essentially economic development theories are concerned with the activities of government and its policies that are meant to promote industrialisation to increase output, employment, reduce poverty, provide security and increase the overall living conditions of the citizens. They provide a systematic analysis for harnessing the social, economic and institutional mechanisms of public and private sectors to create or improve the standard of living of the people (Jhingan, 2014). Development theories are multidimensional using a combination of dynamic factors and complex analysis to explain self sustained growth, structural changes in production, technological upgrading, social, political, institutional modernization as well as wide spread improvement in human conditions of living (Adelman, 2004; Owen, 2012).

For analytical simplicity, and the fact that economic growth is an inclusive process of economic development, growth and development theories have been discussed under the following groupings: Human development theories, linear-stage theories, structural change theories, international dependence theories, Neoclassical counter revolutionary and market fundamentalism and the modern theories.

A. Human Development theories

There had been increasing focus on human welfare and quality of life as a fall out of the process of economic development. Prominent proponents of this new development thought were Dudley Seer and Amartya Sen. Sen had in 1988, through his human capabilities thesis, introduced the human development indices of life made up of things or programmes that improve human welfare and comfort (Sen, 1999). These human development indices include the level of personal consumption, healthy living and educational attainment for improved capabilities to function, housing, freedom of expression and others which should be used as yardstick to measure economic development (Tadaro & Smith, 2005). These economic and social indices were developed and popularised in 1990 by the United Nations' development programme (UNDP) into what is now popularly referred to as human development index (HDI) (UNDP, 1990). The HDI emphasised the use of indices such as gross national income per capita, life expectancy and literacy levels that can improve human welfare to measure and assess the development track of a nation. Over time HDI had been improved upon to what is now inequality-adjusted human development index (IHDI) introduced in 2010 (UNDP, 2016). This IHDI theory inform the basis of the disaggregate method applied to economic development by this study for easy measurement of the component indicators of human welfare.

B. Linear-Stages Theories of Economic Development

In 1950s and early 1960, the process of development was seen as a series of successive linear stages of economic growth. Growth in output was seen as a linear function of labour, agriculture and industrialisation. There was focus on right quantity and mixture of savings, investment and foreign aid to impact on agriculture and industrialisation to alter the structure of production and employment to bring about economic development (Todaro & Smith, 2005). These variables were certified to be necessary for developing nations to proceed along an economic growth path that could lead to development. Thus Rostow declared five stages of economic development for nations to follow which are: traditional society, pre-conditions for take-off into self sustaining growth, take-off, drive to maturity and high mass consumption. Rostow's classification is meant to focus the attention of government in mobilising domestic and foreign savings for investment in the take-off stage to record economic development. Harrod Domar growth model emphasised a linear relationship between savings, investment and economic growth and that addition to

capital stock (incremental capital) decreases the capital-output ratio to increase capital efficiency for economic growth (Jhingan, 2005). Karl Marx's historical materialism and growth of society followed a linear stage that poor saving rate of less than 15% - 20% of GDP for investment, constitutes great obstacles and constraints to rapid economic growth. Therefore low level capital formation or capital constraint is an impediment to growth (Todaro & Smith, 2005). One greatest criticism of the linear stage theories is that investment, which is the core of their economic growth, is only a necessary but not a sufficient condition for the economy to grow.

C. The Structural Change Model

These theories of development proposed dynamic methods of achieving rapid economic development. They surfaced at the later part of the 20th century and include the work of Hollis Chenery, Simon Kuznet and Irma Adelman whose theories emphasized nonlinear development pattern and a leap-frog jump over a few stages of development to catch up with the advanced countries. Low level equilibrium trap and the big push theories were also other theories here.

Structural change models focused on the sequential processes through which economic, industrial and institutional pattern of an underdeveloped economy can be transformed to permit new industries to replace traditional agriculture as the engine of growth. They focused on the transformation of the domestic economy from traditional subsistence agriculture to a modern manufacturing industrial and service economy. The model employs the tool of neoclassical price and resource allocation theory to effect structural changes in virtually all economic units such as production, composition of consumers' demand, international trade, resource usage, urbanization and population distribution. Lewis model of patterns of development analysis and Chenery's patterns of average development focused on the factors influencing the development process such as resource endowment, government policies and objectives, availability of external capital, technology and international trade. The structuralists acknowledge the existence of these domestic and international constraints affecting economic development which require special attention for resolution.

D. International Dependency Theories

In the 1970s, international dependency theories gained prominence among developing countries who were disenchanted with both linear stage and structural change theories. The theories view developing countries as having institutional, political and economic rigidities in both domestic

and international sphere and in a dependence relationship with rich countries. The theories emphasised economies of trade between the developed and developing countries, such that the developed countries do facilitate the economic development of the developing ones (countries with no growth in industrialization status). Dependency theories of Hans Singer, Ragner Nurkse and other theories of inequality took the stage to address the issue of mutual economic inter-independence between nations as basis for rapid economic growth and development. Ricardian theory of comparative advantage or specialization and Adam Smith's free trade theory were resurrected to create markets for industrial goods of developed countries and primary products from underdeveloped countries. The theories explained the basis for the flow of technology, capital and finance from the developed countries to the developing ones for their development in the era of the so called 'transfer of technology' to developing nations. The gains in trade between developed and developing countries however were disproportionate with capital flow coming with both positive and negative externalities. This situation calls for protectionist policies which emphasized the role of government and institutions in the protection and enhancement of economic development.

Other dependency theories are false-paradigm and dualistic theories which are cases in the neocolonial dependence of Marxist origin that expressed a dominant relationship between developed countries (centre) and the underdeveloped countries (periphery). It is difficult for the periphery to be self reliant and develop without the centre. Thus Baran's neo-marxism attributed underdevelopment of developing countries to the industrial policies of the developed countries. The false paradigm theory attributes underdevelopment to faulty and inappropriate ethnocentric international advice provided by experts from the developed countries. Their advice relegated local, traditional, social and institutional factors to the back ground of their development drive but these factors play significant role in a country's development.

Dualistic theory looks at the existence of two set of conditions, the superior and inferior which co-exist to promote unbalance development. The superior elements (developed countries) do not help the cause of the inferior element (underdeveloped countries) and therefore the increasing divergence between the rich and poor in development needs to be checked.

E. Neo-Classical Counter Revolution and Market Fundamentalism Theory

In the 1980s the neo-classical brought revolution in economic theory and policy which favoured the supply side macroeconomic policies, rational expectation theories and privatization of public corporations in developed economies. In the developing countries it calls for free market operation and the dismantling of public ownership, statist planning and government regulation of economic activities. The neo-classical favours free markets, public choice and market-friendly approaches to economic development. This approach is said to be capable of removing restrictions to economic growth and development. In the view of neo-classical, underdevelopment result from poor resource allocation due to incorrect pricing policies and too much state intervention and regulation by the governments of developing nations. The neo-classical counter revolution argued that third world countries are underdeveloped because of the predatory hand of state control of the economy which is characterized by corruption, inefficiency and lack of economic incentives. Politicians, bureaucrats and citizens do use political influence to obtain special benefit (rent) from government policies (e.g import licenses, foreign exchange allocation), and thus have access to important resources to consolidate and maintain their positions in power and authority. This situation often leads to the misallocation and cornering of public resources to individual's use with a consequent reduction in the welfare and freedom of the less opportune citizens (Todaro and smith, 2014). Therefore minimum government's interference is required for the economy to grow. However, the market-friendly neoclassical approach admitted and acknowledged that there is market failure and imperfections in product and factor markets in developing countries. Therefore government needs to intervene minimally by providing physical, social, health and education infrastructure to provide a suitable investment climate for private enterprises. The problem created by market failure such as poor investment, poor environmental coordination, incomplete information on externalities, in skills and economies of scale in production have given rise to the new or endogenous school of economic thought in the 1980s. These theories call for the management of negative externalities such as pollution and degradation of the environment from the total process of development. This brought about theories of sustainable development that advocated resource conservation policies and efficiency in resource utilization. This fact led to the reconsideration and reordering of the goals and processes of development which became the focus of new theories of Amartya Sen,

UNDP and Dudley Seer that centred on the social or human development aspect of economic development.

Certainly the point must be made clear here, that economic growth theories are not synonymous with economic development theories, but that the process of economic growth is not an end itself but a means to an end which is economic development (Sen, 2004). Growth theories can be said to be the microeconomic foundation of development theories. For this reason the neoclassical counter revolution growth models of the 1980s were treated here. They are the traditional neoclassical growth theory, Solow-Swan (1956) exogenous growth theory, Romer's (1982) endogenous growth theory, Lucas (1988) human capital endogenous theory and Barro (1990) public spending endogenous version. Development in human index must first start from the growth processes that determine how much of that human welfare good is available to the human being. Gross national income per capita, health and education will require growth first before considering the other factors of development. Growth theories were incorporated in our studies to give microeconomic foundation to our development analysis to achieve in-depth exploratory factor analysis.

i. Exogenous Growth Theory

Exogenous growth model is also known as the Neo-Classical or Solow-Swan growth model. The model which was initially developed by Solow (1956) dwelt on the conditions of attaining long-run economic growth and the causes of the differences in growth rates and income between countries of the world. It asserted that long-run steady-state growth in capital accumulation, labor or population, productivity or technical progress was determined by factors outside the production system. The neoclassical economists identified technical progress as the engine of economic growth and which grows automatically from the influence of exogenous factors. It stated that in the absence of external shocks of capital or technological change, economies will have zero growth (Solow, 1956). Thus the bulk of economic growth depends on the technological progress process which is independent of the production system or is exogenously determined

The model used the Cobb-Douglas production function for its analysis and added a second factor of labour to Harrod-Dormar's capital while at the same time introducing a third independent variable of technology. He classified capital as having two components of physical and human

aspect. The production function is predicated on the assumption of aggregate constant-returns-to-scale which combines capital (with diminishing marginal returns) and labour to produce composite goods in the economy. Savings in the economy are assumed to be a fixed fraction of output while technology improves at an exogenous rate. Using the Cobb-Douglas production function, economic growth takes the form:

$Y = AK^{\alpha}L^{1-\alpha}$ 1

Where; $0 < \alpha < 1$

Y = Total output

L = Labour or number of workers employed in the production process

K = Capital stock (Human and physical capital),

A = Level of technology,

$\boldsymbol{\alpha}$ = elasticity of output of capital or share of capital contribution to output

This aggregate neo-classical production function was further decomposed into "contributions" from the different sources of input. For instance, the growth rates of factor inputs was weighted by their competitive factor shares (contribution of factors), plus a residual which is often called Solow's residue. Solow's residue is the difference between the growth in output and the sum of the weighted growth in inputs. By dividing both sides of the equation of the production function by labour we have;

Y/L = y, i.e Output per worker or output-labor ratio

K/L = k, capital-labor ratio.

The production function is thus given as

$y = Ak^{\alpha}$ 2

Capital accumulation is given by

$K = sy - (\eta - \delta)k, \quad 0 < s < 1, \quad 0 < \delta < 1, \eta > 0$ 3

Where, s denotes the propensity to save, η the exogenous rate of population growth, and δ the rate of depreciation of physical capital.

In addition, the neoclassical brought its free market argument to explain growth, noting that national markets should be liberalized or opened up to attract both domestic and foreign investment to increase the rate of capital accumulation and consequently economic growth (Todaro & Smith, 2005). Capital accumulation, in terms of gross domestic product (GDP)

growth, is like raising domestic savings rate to stimulate increase in capital-labor ratios of especially developing countries that are capital poor.

ii. New or Endogenous Growth Theory

This theory came in response to the failure of the neoclassical exogenous growth theory. Romer (1986), introduced the model while Lucas (1988), Barro (1990), King and Rebelo (1990) and other scholars developed different versions of it to explain that steady-state growth can be generated within the system governing the production process (endogenously). This means that steady growth can occur in an economy without any exogenous technical progress but from factors of taste, internal technology and tax policy (Nzeribe, 2013).

Basically, the exogenous model isolates the determining factors of technical progress from the influence and decisions of economic agents at the firm's level. But economic agents at the firm's level are known to generate significant actions and interactions to influence technical progress, human capital development and other variables in production. It has been observed that 2/3 of the growth in total factor productivity is explained by endogenous factors while only 1/3 is attributable to exogenous factors (Morley, 2015). Hence, economic growth is primarily the result of internal process than the external ones. Human capital, innovation and knowledge are greatly influenced at firm's level in terms of the quantity and quality to be used in production. This therefore makes technical progress to depend more on the firm's internal activities such as product innovation, on-the-job skill training/ development of labour, capital accumulation/savings rate, profit plough-back policy, personal/community/public relations among others. It should be noted that labour input in production adjust faster and easier at firm's level to increase aggregate productivity in the long-run than the capital. Labour is fundamental to increasing productivity and the differences among firms in its supply, quality and efficiency cause the variation in the growth rates of the firms in the same business environment. An efficient labour can combine with an inefficient capital to still generate greater output than when an inefficient labour is combined with an efficient capital.

Romer's endogenous growth model was based on the fact that a firm is experiencing increasing returns to scale at the economy-wide level, but constant returns to scale at the firm's internal level. He assumed that the economy-wide capital stock (K) positively affect output at the industry level with increasing returns making the growth process to be derived from the firm's

level producing at constant returns to scale. A high growth rate can be achieved if the externality associated with investment (technological spillovers) is internalised (Romer, 1986). This fact made the Romer's model popular with a spawn of large literature trailing it.

To Romer, firm commonly employ capital and labour inputs which can be influenced by positive externalities and spill-over of knowledge in its production function. The firm's capital stock includes knowledge gained from working and training at the firm's level. This knowledge from "learning by investing" is a public good (because it has spillover effect to the other firms in the economy who do not pay directly for its use) like technical progress 'A' in Solow's model. The knowledge capital spillover is external to the firm because it does not take the spillover into account, but the economy as a whole absorb them to experience increasing returns to scale. This is why the firm experience constant returns to scale and a non-optimal competitive equilibrium while the economy experience increasing returns to scale. The new growth model identified investments in capital, education, research and development as policy measures to be taken by government to affect economic growth, at least in the long run.

Lucas' version (1988) of endogenous growth incorporated the spill-over effects of human capital accumulation on growth. The model was built on the idea that individual workers are more productive, regardless of their skill level. Human capital is accumulated through explicit "production" where a part of the individual's working time is devoted to accumulating skills.

In a formal presentation let k denote physical capital per worker and h human capital per worker or "knowledge" capital. The production process is specified as follows

$$Y = Ak^{\alpha} [\mu(h)]^{1-\alpha,}\ 0 < \mu < 1 \quad \ldots\ldots 2.10$$

Where, μ denotes the fraction of time that individuals devote to producing goods. The growth of physical capital depends on the savings rate (I = sY), while the growth of human capital is determined by the amount of time devoted to its production:

$$^{h}/_{h} = \mu(1 - \alpha), \quad 0< \alpha < 1 \quad \ldots\ldots 2.11$$

This means that the long-run growth rate of both capital and output per worker is μ (1 - α). The rate of human capital growth and the ratio of physical capital to human capital converge to a

constant. In the long-run, the level of income is proportional to the economy's initial stock of human capital and savings rate which will have no effect on the growth rate.

The important implication of Lucas model is that under purely competitive market equilibrium there is an under-investment in human capital accumulation because private agents do not take into account the benefits of human capital accumulation. This implies that a government subsidy to human capital formation or schooling could potentially result in a substantial increase in the rate of economic growth (Nzeribe, 2013).

Barro (1990) version of endogenous growth model incorporated major government's economic activities such as public spending in infrastructures, schools, sanitation among others that are financed through income taxes. Public investments complement and raise the level of productivity of private investments hence higher taxes can be associated with an increase or decrease in growth.

Generally, countries of the world have tried to use one or two forms of these development theories to fast track their development aspiration. However, this has not been easy to come by due to the differences in resources, economic history and socio-economic challenges facing nations which made it difficult for them to apply the same economic development model, strategy or design to obtain the same result (Sharron, 2016). Sharron went further to state that all economies do not follow the same path and sequence of development because of the differences in their culture. It was observed that the commonest development problem facing nations has to do with the creation, accumulation and distribution of wealth among its members which is culture affiliated. Significant strides have been made to improve the understanding of economic development process from the ideas put forward by these various theories, particularly in the identification of the impediments as well as catalyst to development. The role of government, private sector, national resources and the culture of the people have significantly intervened and affected the economic development of many nations.

F. Modern Theories of Economic Development

In the 1990s, new development theories and paradigms that emerged focused on the complementarities, coordination, strategic governmental intervention and public- private partnership of the conditions and factors necessary for development (Hecer, 2015).

Complementary economic activities or actions taken by one firm are capable of increasing investment incentives for other firms or economic agent to take similar actions that will further development. New schools of economic thought such as endogenous, structuralists' growth theories emerged and explained that the problems of the markets in less developed countries especially on market information, externalities, skills, knowledge or learning, affected the attainment of economies of scale and efficiency. The theories advocated the co-ordination of the behaviour and activities of economic agents to solving the problems of poor infrastructure, inadequate institutional structure, imperfection in capital and goods market, under capacity utilisation, low income, low savings, poor income distribution, high population growth, unemployment, low human capital accumulation and resource allocation inefficiencies to bring about economic development and modernization. The theories recognised the strategic role of the government as a catalyst to development through the provision of basic infrastructural support and *market friendly* policies that could assist in the transformation of the economy from subsistence and resource-based economy to a highly productive and consumption-based economy. The crucial role of government in spurring development was ably demonstrated by the development success of the East Asia countries popularly referred to as the *East Asian Miracle.* Modern theories of economic development observed that partnership between government and private sector in organising economic activities and not competition promotes economic development.

New theories of the 2000s focused on the review, re-alignment and repositioning of existing development theories to address emerging issues of trade liberalization, market efficiency, democratisation, governance, institutional restructuring, health, environmental development, good communication, equality in gender opportunities, population control, human capital development, upgrade of life expectancy and poverty reduction which are new indices being focus for assessing economic development (Todaro & Smith, 2014). Hence, economic development was thus redefined to a broader spectrum of economic and human development on a sustainable level which is the ultimate goal of development (Sen, 1999). The United nations

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since 1990 had increasingly used and emphasized human development index (HDI) of real national per capita income, longevity and life expectancy at birth, literacy level, and other indices as human power index, human asset index, gender development index, empowerment index and economic vulnerability index in the measurement of economic development. Beside this, existing economic development theories are being re-aligned and adjusted to meet the United Nations' post millennium development goal of enhancing global sustainable development in various economies.

2.1.3 Review of Other Theories

A. Theories of Investment Climate

Theories of investment climate fundamentally deal with the conditions of the investment environment and how it can be improved to impact positively on economic development. The theories encouraged the use of investment climate assessment surveys which are supposed to be conducted in a space of three years (World Bank, 2011). Investment climate assessment surveys (business environment surveys) originated from United States of America (USA) in the early 20th century when increased competition between western and eastern states was measured to find out the pull and push factors in the respective regions. The results of such surveys were used to construct index of business-attractiveness to guide firms from across the states, places or regions. The dynamic nature of the investment environment made many theories of investment climate to be focused on aggregate factors affecting the business environment and their implication for economic development. Below are some of the theories:

i. Complexity Theory of Investment Climate

This interdisciplinary theory, which is drawn from natural sciences, used the complex adaptive system to describe uncertainty and non-linear series. It helps to explain how firms or organisations adapt to their environment to cope with the uncertainty of the environment. (Ramalingam & Jones, 2008). Investment climate parameters are usually macro or economy-wide variables but which impact is observed at micro or firm's level. Complexity theory advocated that the dynamic complex relationship of the investment climate variables be examined at both firm and economy wide levels in an integrated form (Sergei, 2003). According to Sergei these determining variables of investment in a country borders on current opportunities, environmental threats, financial development, interest rate, institutional arrangement,

information constraint, political factors, degree of capital safety, transaction cost or cost of doing business, income level for potential patronage, government spending and degree of monopolization of the economy to conscript competition.

ii. Location-Factor Theory of Investment Climate.

This theory emphasised the identification of investment promotion factors that attract private investors to a particular location or locality. Location factor index are thus constructed to describe the degree of attractiveness of the regions to investors. In early times, natural resources and size of market for the output of a firm were used as main indices of investment attraction to a place (Lahimer, 2007). But in later years, human capital development (quality labour/expertise), institutional quality, geographical factors and others were incorporated in the index equation. Geographical factors are natural environmental factors such as raw materials, mineral resources, adequate rainfall and sunshine while institutional factors border on human factors such as social groupings, culture, consumption pattern, governance, regulations and provision of infrastructures.

The most important investment climate factors for consideration today are: reduction in cost of production and transportation, market size, labour availability, production infrastructures, low tax rate, friendly regulations, security, international trade, better ownership system, favourable macroeconomic policies, good governance, and others (World Bank, 2011). Location factor theory has extended to international dimension where international trade rules, regulatory policies and treaties are used in assessing the suitability of an investment environment by investors. In this regard, international conglomerates and multi-national corporations have established a sort of checklist of investment climate conditions that must hold in a country before coming to such a country to do business (Independent Evaluation Group, 2013). The check list include imponderables which are factors and issues that are generally not explicitly included in the investment climate assessment surveys but which are critical to the incentives required by investors to invest and made the returns for all types of firms high. These factors are geographical, rainfall regimes, sunlight, natural disasters (floods, erosion, spillages, fire outbreak, earth quake, wind ravage, tsunamis etc), external shocks from other economies, accident rate, sanitation, health, epidemic, market size and niche, localisation and agglomeration

advantage, level of economies of scale to be enjoyed by a firm and the degree of response of consumers and competitors to business strategies etc.

Localisation of firms can boost up rapid infrastructural development for use by all the firms' in the locality, area or region to reduce the cost of doing business. For instance, if the government provides electricity in a localised area of firms, it will help to minimise the purchase and use of individual power generating sets which are expensive to run as well as increase the cost of production. Conducive weather condition, climate, timely rainfall or sunshine can be an incentive to firms and investors (especially those in agribusiness). Some diagnostic locational factors and possible action of government to mitigating them are set out in the table below.

Table 2.1: Summary of Diagnostic Factors and Government Actions on a Healthy Investment Climate

S/N0	Investment climate factors	Factor details	Government action towards healthy investment climate
1	Macroeconomic environment	Economic policies, Policy uncertainties.	Better macroeconomic, regulatory and investment-friendly policies.
2	Political Atmosphere	Political instability, anxiety, electoral manipulations.	Increasing political stability; Credible elections, smooth succession; Reduction of anxiety.
3	Legal System	Rule of law, Human Rights, Patent, property right, Justice	Upholding rule of law; reduction in human rights abuses as well as patent and property rights; Promoting Justice and judicial freedom
4	Tax	High and excessive taxes, multiple tax	Grant tax holidays to new investors; Avoid double or multiple taxation
5	Infrastructures	Electricity/Power supply, Roads, Rail, Water, Telecom, Airports, Health and educational/training institutions.	Regular supply of electricity and water; Construction of good roads, rail system; Provision of standard airports, health centres, education and manpower training institutions
6	Security	Robberies, Kidnappings, Assassinations, Stealing, Insurgences, Vandalisms	Provision of better security arrangements for investors through effective and well equipped police and other security networking.
7	Business Regulation	Registration, patent/trade mark, remittances, social responsibilities, trade, tariff, product standard regulations etc.	Providing easy/fast registration; Granting of patent or trade mark; Placing less social responsibility burden on businesses; Relaxing external trade restrictions; regulating product standard.
8	Financial Access	Loan/credit facilities' availability, collaterals hindrances	Developing financial institutions to provide credit at low interest rate or cost; Demanding less collaterals from investors
9	Labour Policies	Skills, entrepreneurship, technical-know-how, minimum wage, contract terms, gender-labour issues	Provide skill training for labour development; Evolving friendly labour contract terms; Providing protection for female entrepreneurs
10	Corruption	Red-tape and delays in administration, denial of access to public or official service/facility	Fighting corruption, transparent leadership, accountability and commitment; Open transactions in public places to create unsafe environment for corruption.
11	Competition	Shield market, subsidies	Government to avoid `frequent market interventions that discourages competition.
12	Imponderables	Firms' agglomeration, rainfall, sunshine, natural disasters, external shocks, economies of scale, accident, sanitation, health, epidemic, market size, niche, competitors' powers etc.	Government to take quick ad-hoc ameliorative measures when they occur.

Source: Researcher's Compilation from

(i) IEG World Bank Portfolio Review Table on Investment Climate Intervention p.38 (2015). (ii) Nwogwugwu & Onwuka's Factors that Shape Opportunities and Incentives for Firms to Invest, Table p.2 (2012).

The essence of investment climate diagnoses is to provide a better understanding and informed-basis for policy decision on what reforms to embark upon to regulate and improve the investment environment as demonstrated on Table 2.1.

iii. Comprehensive Investment Climate Theory

This theory emphasised a comprehensive or aggregate factors approach to making the investment climate attractive to both producers and consumers. The theory emphasised complementarities, scrutiny and integration of both endogenous and exogenous factors of the investment climate for aggregate indexing of its state beyond the frontiers of the country to international level (Silva-Leander, 2005). It is important to note that the condition of the investment climate of a country is not only affected by domestic factors but also by international or external factors from other countries' economic and political activities. Thus the comprehensive investment climate theory proposes that both micro (firm level) and macro (economy-wide and rest of the world level) variables of the investment environment be put together and integrated for social benefit of firms and individuals of a country. The comprehensive theory advocated an in-depth analysis of the numerous aspects of the investment climate such as the interaction between business firms and the consumers of their products as vital element of promoting economic development. For instance, the firm in its activities can create job opportunity, training, provision of social amenities for host community of operation while the community in turn provides labour and security services as well as market for the firm's products.

B. Overview of Nigeria's Investment Climate

Studies by the World Bank and others on Nigeria investment climate, revealed that the best investment climate states in the country are Bauchi, Abuja, Kano, Anambra, Enugu, Kaduna, Abia, Lagos and Ogun in that order while the worst are Cross-Rivers and Sokoto (Larossi, Mousley & Radwan, 2009; World Bank, 2016). For ease of analysis the investment climate was discussed under the following headings; civilian, military administrations and a survey of the state of the investment climate.

a. Period of Civilian Administration

The civilian administration ruled for 19years (1981- 1983, 2000-2015) in the period under study. The civilian administration introduced the following investment climate and economic development plans; 4th National Development Plan (NDP) 1981-1985, poverty alleviation

programme (PAP) 2000-2015, national economic empowerment and development strategy (NEEDS) 2003-2010, banking sector recapitalization reform 2005, 7-Point Agenda 2007-2010, Vision 20:2020 to be implemented in three medium national development plans, 2010-2013, 2014-2017 and 2018-2020, (NPC, 2009),

The 4th national development plan was characterised by increasing government involvement in industrial activities (Nwogwugwu, 2005). But the plan however, witnessed shortage of funds for implementation due to the fall in federal government revenue as a result of the 1980 global oil glut. Thus the plan did not achieve much and the investment climate was not really conducive for investment and economic development. The macroeconomic weaknesses and falling oil revenue caused negative economic growth rates of -13.1% (1981), -1.1% (1982), -5.1% (1983), -2% (1984) (World Bank, 2014). In fact the investment climate was dominated by undefined set of relationship between the pervasive public sector and the private firms (Okafor, 2010). The manufacturing sectors' contribution to GDP during the period declined from 9% (1980-1985) to 6.3% (1986-1992). Most of the other programmes did not do much to improve the lives of Nigeria (Odah, 2009).

Civilian democratic regimes were found to be much better in articulating reform programmes in the investment climate. In Nigeria, the gross national income per capita, per capita capital formation and international reserve per capita have better performance during the civil democratic regimes than during the military (Anyiwe & Oziegbe, 2006). This supports the claim of Pel's (1999), that countries with high degree of political openness (demoractic) achieve higher average annual per capita income growth rate of 2.53% compared to 1.4% achieved by closed (dictatorial, military junta) political system.

Nigeria is the 4th largest democracy in the world with about 180million people, but poor in good governance rating clinching 13th position out of 16 countries in West Africa in 1999 and 41st out of 54 countries in Africa in 2013 (Ibrahim, 2013). However, Nigeria witnessed economic decline during the civilian regimes leading to rising poverty, inflation, unemployment, policy summersaults, declining foreign reserve, corruption, reduction in real income, slow pace of infrastructural development and declining GDP growth which averaged 5.4% (Eminue, 2006).

b. Period of Military Administration

The military administration in Nigeria ruled for 16years (1984-1999) of the period under study. The military introduced the following programmes to promote the investment climate and economic development viz: the structural adjustment programme (SAP) 1986, directorate for food, roads and rural infrastructure (DFRRI) 1986, better life for rural women 1986, mass mobilisation for self reliance, social justice and economic recovery (MAMSER) 1987, national directorate of employment (NDE) 1989, 5th national development plan (NDP) 1988-1992, 6th NDP 1990-1995 of a 3-year Cycle in a rolling plan and the family economic advancement programme (FEAP) 1997.

There were no development plans in the period 1986-1989 because of the structural adjustment programme (SAP) that was introduced to restructure, diversify investment opportunities and liberalize the economy to make it competitive and attractive to foreign investors (Nwagbara, 2011).

Basically, the military administrations did not have concise economic development blue print and were often not accountable to any one and there were no checks and balances of their actions. The regimes often employ "commonsense" adhoc approach to resolving economic problems (Osagie, 2007). Transparency and good governance were no serious issues of policy consideration hence they weakened national institutions, promote corruption and created a horde of rent seeking entrepreneurs who have no visible means of livelihood except proximity to state power to weaken the investment climate (Soludo, 2005). In terms of regulatory laws, infrastructure and human capital development, the military exhibited a high level of waste. There was high arbitrariness of actions which replaced formal institutions and procedures to promote informal interpersonal relationship that resulted in the failure of public policies (Okafor, 2010). There were no articulate plans to improve national income per capita, life expectancy, literacy rate, employment to reduce poverty levels and capital development. Some actions of the military regimes, such as fear of confiscation or expropriation of businesses, were known to have scared away investors from active participation in the economy (Osagie, 2007).

c. A Survey of the State of Nigeria's Investment Climate

The impact of major determinants of Nigeria's investment climate on the economic development were assessed in this section. These determinants were economic growth rate, private sector credit supply, trade facilitation, electricity supply, infrastructure, security, national development plan and others.

i. Economic Growth

Economic growth spurs investors to establish enterprises to increase the volume of economic activities to create jobs, new income, increase in consumption, reduction in poverty rate and raise the level of returns or profitability on investment to investors (Schirach, 2016). Evaluating the economic growth of Nigeria over the period 1981-2015, showed that the annual growth rates were very low and negative in some years viz; 13.1% (1981), 1.1% (1982), 5.1% (1983), 2% (1984), 8% (1986), 10.8% (1987), 0.6% (1991) and 0.3 (1995). The average growth rate for the entire period was 2.9% and below the 5% minimum benchmark set by the World Bank for economic growth (World Bank, 2006). The low economic growth rate could not stimulate investment for rapid economic development.

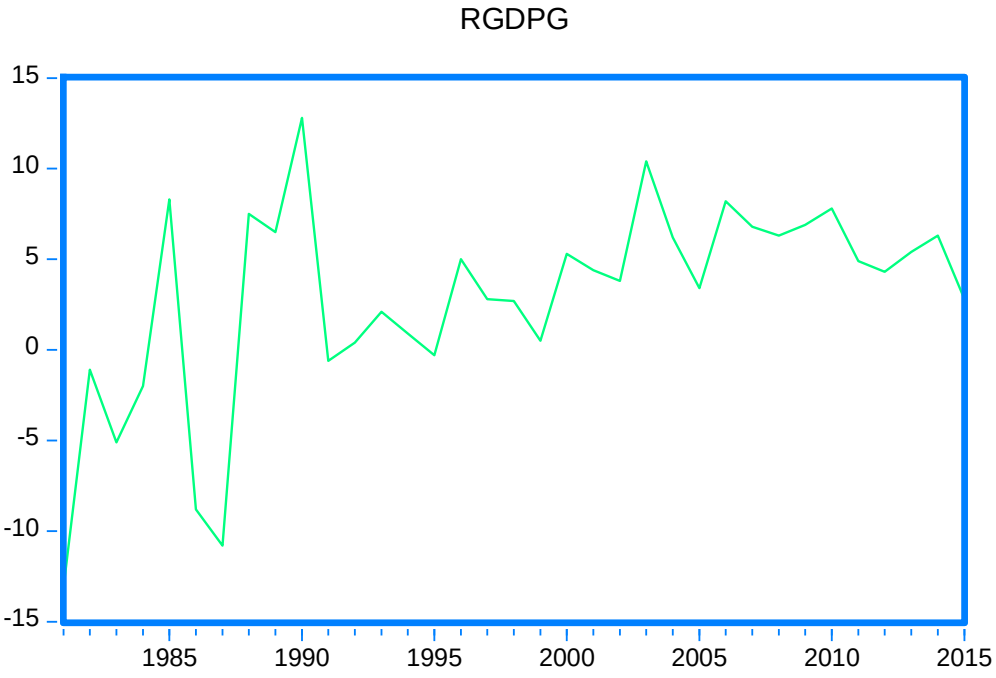

Figure 2.1: Trend of Economic Growth Rate (%), 1981-2015.

The growth rates of the economy, from Figure 2.1, showed an undulating trend with lowest negative growth of 13.1% in 1981 and highest positive growth rate of 12.8% in 1990. The negative growth recorded in the early 1980s was attributed to the global economic recession then that resulted from the global oil glut of 1980. At this time the price of a barrel of Nigeria's crude oil plummeted to $8 in 1981 from its peak of $40 in 1980 (Osagie, 2007). This economic quagmire hampered the implementation of Nigeria's 4th National development plan (1981-1985) as well as other economic development plans of the country.

ii. Private Sector Credit

In Nigeria access to finance by investors had been a serious problem where about 80% of firms and investors who applied for bank loan were not given and only about 5% could be given at an exorbitant lending rate of interest (Larossi, Mousley & Radwan, 2009). Private sector credit supply by commercial banks, as a percentage of gross domestic products over the period of study, was below the 20% minimum benchmark set by the World Bank to significantly influence investment and promote economic development.

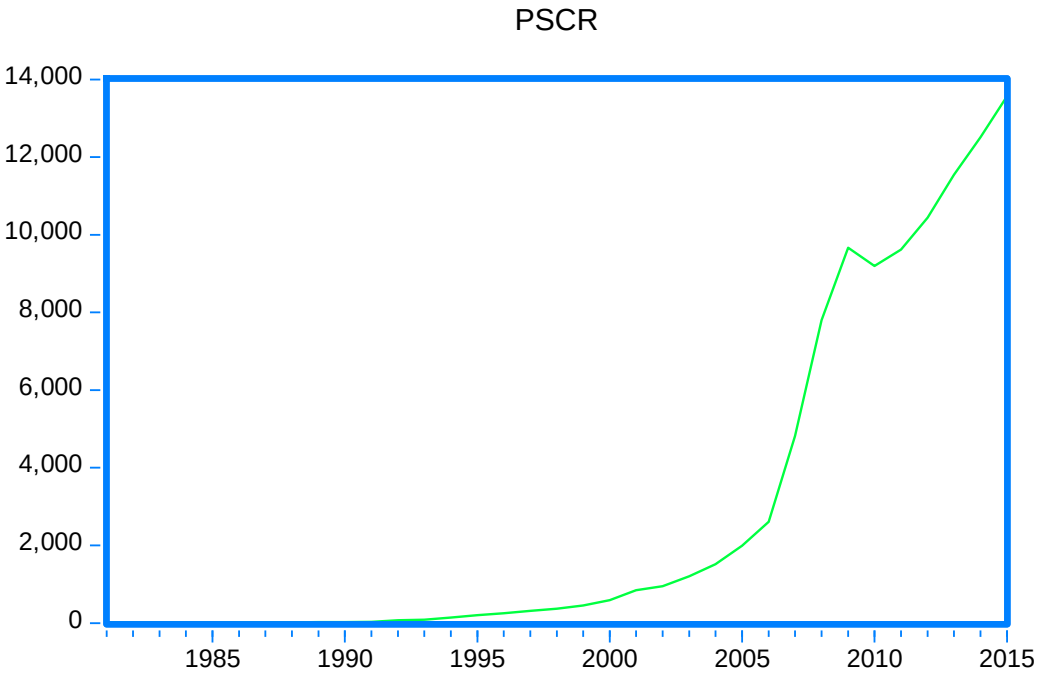

Figure 2.2: Trend of Growth of Private Sector Credit Supply (₦bn), 1981-2015.

Figure 2.2 showed that private sector credit supplies to the economy grew poorly from N8.3billion in 1981 to N13, 569 billion in 2015 but with a significant increase in 2005 possibly

from the banking consolidation programme of government in that year. The average percentage growth in private sector credit supply by commercial banks annually in the periods 1981-1990 was 20%, 1991-2000 was 184%, 2001-2010 was 99% and 2011-2015 was 8.2%. The period that witnessed highest supply of private sector credit (184%) was the post structural adjustment programme where perspective plans with a 3-year rolling plan cycles were introduced by the government. This was followed by the period of banking consolidation programme where commercial banks were encouraged to give credit facilities to the private sector especially micro and small business enterprises.

iii. Trade Facilitation

In trade facilitation, the number of cargo tonnage loaded and discharged at the Nigerian ports was low with a fluctuating trend. Highest peak of activities was recorded in 1991 (86.7million tones) and 1995 (98.5 billion). The low tonnage activities at the ports could be due to the poor port facilities and insecurity. From Figure 2.3 there was a sharp drop in cargo handling at the Ports in 2001 possibly due to the increased activities of Niger Delta militants that disturbed oil production and export.

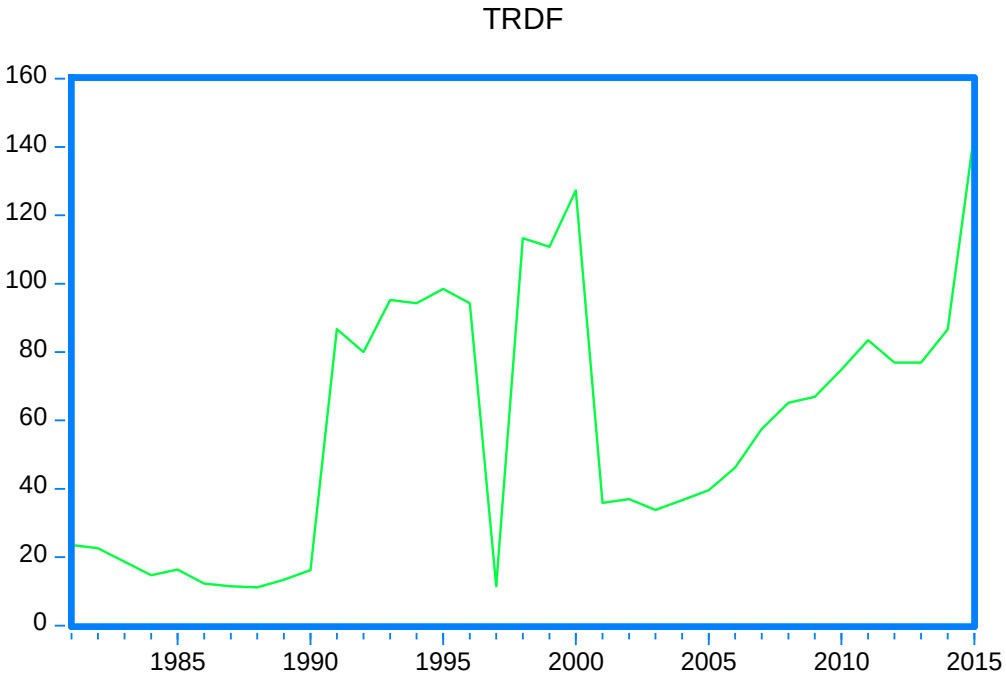

Figure 2.3: Trend of Growth of Cargo Loading and Discharge at Ports (million tons), 1981-2015.

iv. Infrastructural Development

Nigeria has not had a comprehensive and all embracing infrastructural development plan for the country from 1981-2014 as it is the case with comparator countries like Malaysia, South-Africa, Indonesia and Ghana. Ad-hoc infrastructural plans were adopted and which were often not adequately funded from the annual capital budget to implement infrastructural development and maintenance. From Figure 2.4 net capital budgets for infrastructural development was very low and negative in 1988 (₦ -7.7bn), 1989 (₦ -10.4bn), 1991(₦ -14.9bn), 1993 (₦ -63.9bn) and 2010 (₦ -241.7bn). This scenario made infrastructural development difficult with attendant bad roads that do cause accidents and delays in business transactions. The sordid state of Nigeria roads is worrisome given the fact that road transport is used to deliver 2/3 of the inputs used in production and distribution of manufactured goods (Larossi, Mousley & Radwan, 2009).

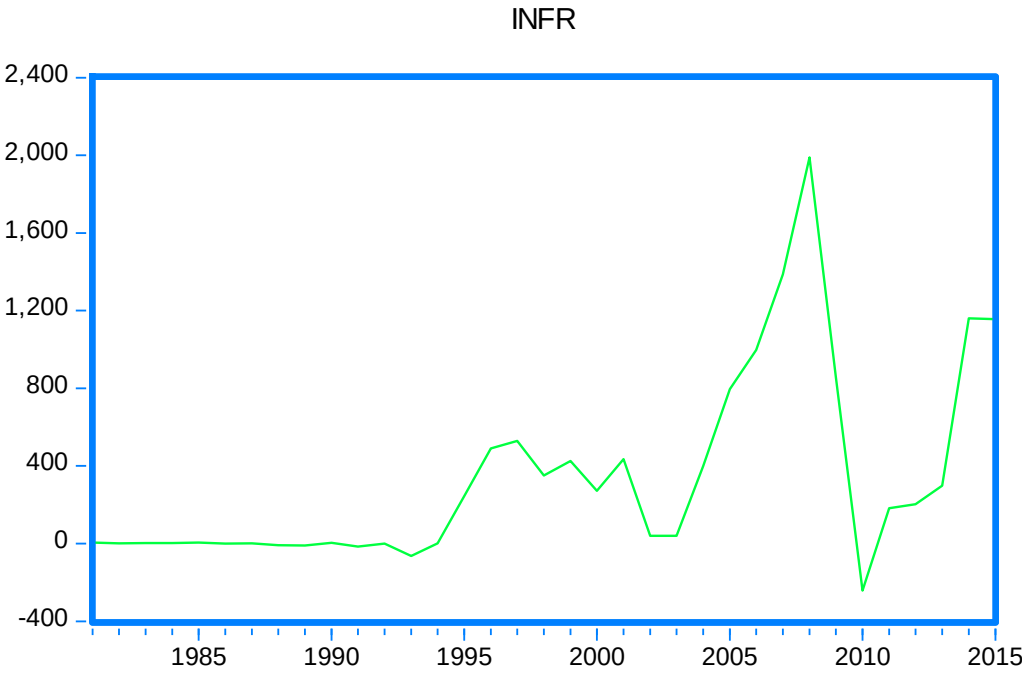

Figure 2.4: Trend of Growth of Net Capital Budget for Infrastructural Development (₦ billion), 1981-2015.

The net capital budget, which actually influenced the rate of infrastructural development in the economy, was low over the period 1981-2003 recording negative values in 1988, 1989, 1991, 1993 and 2010. The highest value ever recorded was in 2008 (₦1989.6bn) a year after Umaru Yar'Ardua assumed office as President of Nigeria. Yar'Ardua was much worried about the poor state of infrastructure in the economy that he incorporated it as part of his government's 7-Point economic Agenda. The annual capital budget itself, from which the net is derived, was less than

30% of the annual budgets for many years. Besides, the capital budget is often misapplied to finance recurrent budget deficit and starving capital projects of funds.

v. Electricity Supply

Electricity supply in Nigeria was erratic, epileptic and inadequate to spur economic activities. In all, electricity supply was only available for 1-4 hours in a day and 17% of the population that had access to electricity was in total darkness throughout the day. The highest generating capacity of 4518MW was recorded in 2012 (NBS, 2012). About 97% of firms in Nigeria experienced power outages and 86% owned private generators to supply 61% of their electricity need (Larossi, Mousley & Radwan, 2009)

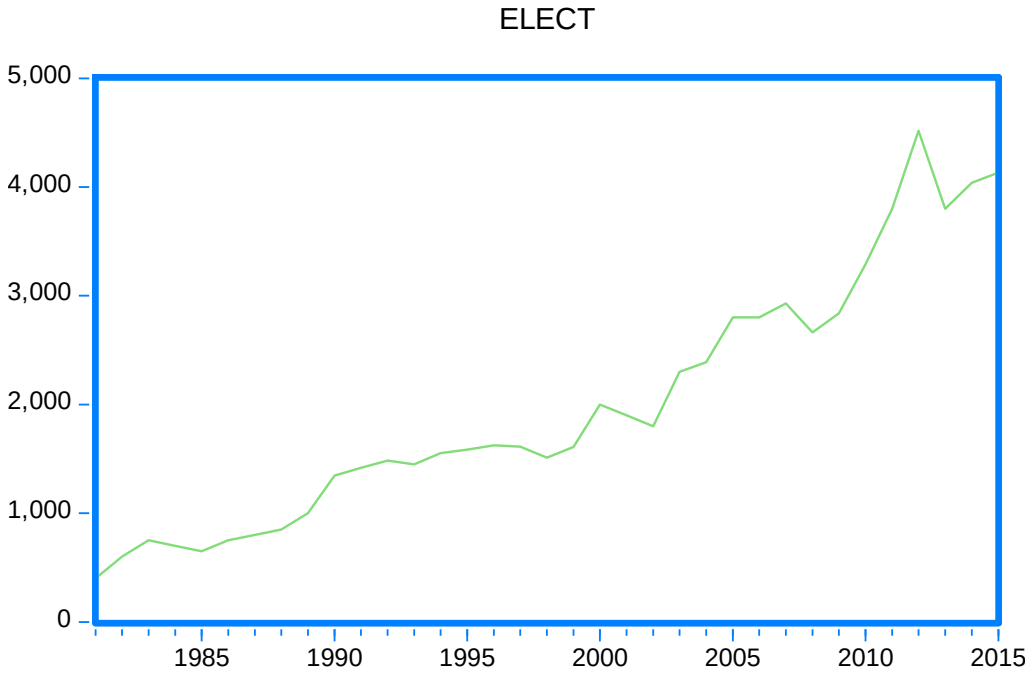

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Figure 2.5: Trend of Growth of Electricity Supply in Nigeria (Mega Watts), 1981-2015.

In an enterprise survey in Nigeria conducted by the World Bank from April 2014 to February 2015, about 85% of firms ranked electricity as the most disturbing problem of Nigeria's investment climate affecting manufacturing and leading to under capacity utilisation of firms (World Bank, 2016).

From Figure 2.5 electricity supply in Nigeria increased progressively from 400MW in 1981 to a highest peak of 4,518MW in 2012. This peak was grossly inadequate compared to the required 20,000MW to drive the economy to higher manufacturing capacity utilisation and industrial

production (Jonathan, 2015). Also the per capita electricity consumption of 156 Kwh in 2015 is far below the expected rate of 5,000Kwh that can enhance rapid socio-economic development (Etukudo, Ademola and Olayinka, 2015). The low per capita electricity supply and consumption had led to low industrial activities and a resultant low standard of living and poor economic development (Ofoegbu and Emengini, 2013). In 2014 the World Bank ranked Nigeria 187th out of 189 countries for ease of getting electricity supply for business (World Bank, 2015). Serious attempts by the government to increase electricity supply came in 2005 when the electric power reform Act was introduced to deregulate electricity supply. The Act led to the handing over of the national electric power authority (NEPA) to private electricity distribution companies (DCos) under the Nigerian national integrated power project (NIPP) initiative of 2004. The NIPP resorted to build or refurbish several new power stations in the south, due to the availability of petroleum gas in the area, to generate about 882MW at the cost of $414million. However, the change in government from Obasanjo to Yar'Adua in 2007 interrupted the funding of the scheme for more than two years until about $8.26billion was put into the power sector by the Jonathan administration in a bid to generate about 4,700MGW (Jonathan, 2015). After 10years of NIPP inauguration, there were still implementation delays which had made some power projects yet to start by the government (Kunle in Okafor, 2016). Over the years, Nigeria had no serious and comprehensive infrastructural development plan like Ghana, Malaysia and South Africa. Comparatively Ghana has an annual $1.5billion fund for infrastructural development while the government of Malaysia, under the Malaysian infrastructural development plan, consistently spends about $2billion annually since 2005 on infrastructural development and upgrading (Wong, 2014). South-Africa has a national infrastructure plan which spent $51billion in 2013-2014 to provide mostly hard infrastructure such as roads, rails, electricity, ports, hospitals, schools, water and others (Gordhan, 2014). It was only in June, 2014 that the government of Nigeria introduced a national integrated infrastructural master plan (NIIMP) for a 30-year period (Emejor, 2014). About ₦485trillion ($3.05trillion) expenditure was proposed for the plan in September, 2014 by the Federal Executive Council (FEC) for the period (Ugwuanyi, 2014). This implied that an average of ₦16.2trillion is to be spent annually to meet the objectives of the plan. But a careful look at Nigeria's past annual budgets showed that the highest ever was below N8trillion with high deficit ratios financed by borrowed funds. The federal annual collectable revenue is not up to average of N14 trillion and yet the government proposed to spend N16.2

trillion annually on infrastructural development. Going by the fact of Nigeria's average annual budget of less than ₦8 trillion the provision of average ₦16.2 trillion annually to implement the infrastructural development plan is likely to be a colossal failure.

vi. Security

Nigeria faced serious security challenges particularly from 2004 when the Niger Delta militants and North-east Boko-Haran insurgence activities increased and resulted to high profile crimes such as armed robberies, kidnappings, terrorisms, assassinations, cultisms, ritualisms, herdsmen's killings, religious riots and ethnic agitations. It is important to note that insecurity can shorten macroeconomic policies and leads to frequent change of policies. It also take a chunk of the country's annual budget in the form of security vote, it increase business risks and cost, discourages inflow of investment, causes divestment, worsen unemployment and increase poverty level. (Zouhaier & Kefi, 2012 & Nwagbosa, 2012). The security challenges in Nigeria made the investment climate unsafe for investors to foster economic activities, investment and development. Many businesses had stopped operating in the troubled North-East and Niger-Delta areas and some businesses have relocated to other countries like Ghana, Malaysia and South Africa. The incessant attacks by the Fulani herdsmen on farming communities in the country had crippled agro-allied investment, creating farm unemployment and making the food security programme of the country a mirage with about 20% food inflation (Adekoya, 2018).

The national security council of Nigeria has not been able to put in place a functioning national security frame work and this had worsened the security situation (Atelhe, Adams & Abunimye, 2016). It was no wonder that Nigeria was placed 155th position out of 163 countries in the global peace index of 2015.

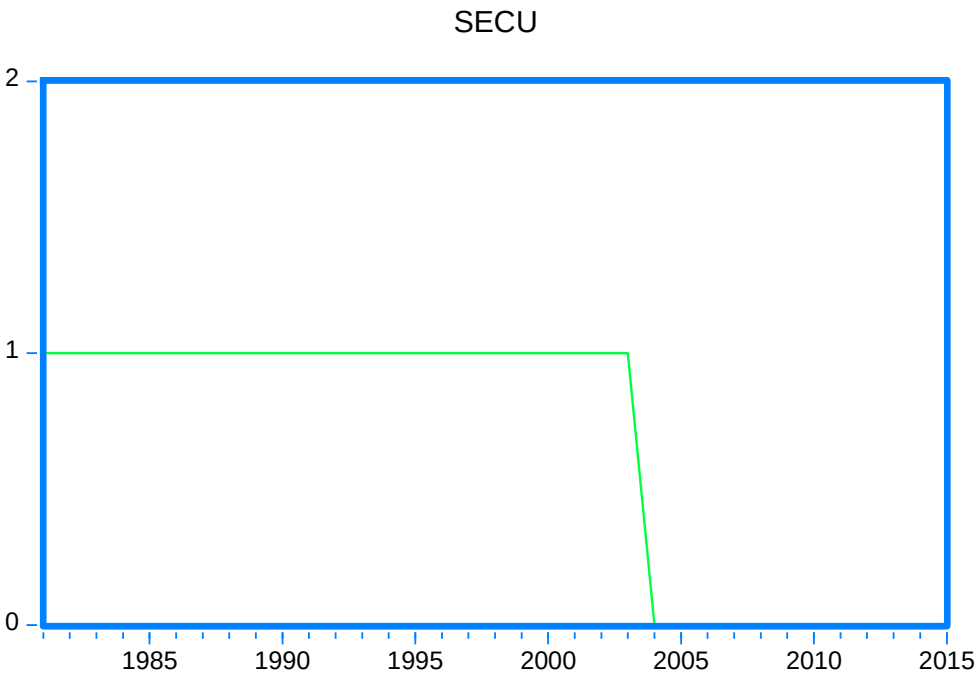


Figure 2.6: Trend of Growth of Security in Nigeria (Dummy Variable, Peace=1; No Peace=0), 1981-2015.

From Figure 2.6 major security challenges involving killings and destruction of properties were experienced from 2004-2015 when there were increased activities of militants in the Niger Delta (1994) and Boko-Haran in north-east (2002). High scale kidnapping and damaging of gas pipes to cut off supply to power generating stations, vandalisation of oil pipelines and stealing of crude oil started in 2004. Indiscriminate killings by the Boko-Haran insurgence escalated in 2009 and made the North-East region of Nigeria hostile to investors with the resultant decline in the manufacturing capacity utilisation and competitiveness.

National Development Plans

The period under study witnessed the 4th national development plan, 1981-1985 followed by a 4-year period of no plan (1986-1989) and thereafter perspective plans were introduced to replace the short term planning technique. There were development plans for about 31years (89%) of the period under study which implied that economic plans were no problem of development except their implementation (Larossi & Clarke, 2011)

vii. Bribery and Corruption

Bribe taking from firms or investors to get things done on time in accordance with laws governing business operations in Nigeria had increased the cost of doing business in the country. World bank's enterprise survey conducted in Nigeria (2014- 2015), showed that 45% of the firms in Nigeria ranked corruption as the second most vexed problems facing investors (World Bank, 2016). Bribery and corruption place high cost burden on firms' operation and reduce their profit margin. Corruption perception index ranking by transparency international ranked Nigeria at average 139th position out of 174 countries from 2005 to 2015. From Table 2.2 increased in corruption by dropping from position 121st in 2008 to 143rd in 2011, 139th in 2012 but increased again to 136th position in 2014 and 2015.

Table 2.2: Corruption Perception Index of Nigeria, 2005-2015

Year	Total points Scored (%)	Position or Rank	Total countries surveyed
2005	19	152nd	158
2006	22	142nd	163
2007	22	147th	179
2008	27	121st	180
2009	25	130th	180
2010	24	140th	178
2011	24	143rd	183
2012	27	139th	176
2013	25	144th	177
2014	27	136th	174
2015	26	136th	165

Source: Transparency International (2016).

viii. Trend of Overall Investment Climate using Ease of Doing Business

The trend of overall ease of doing business in Nigeria declined from 91st position in 2005 to 170th position in 2015. This implied that there had been increasing difficulties in doing business in Nigeria from 2005 to 2015 which had affected the volume of investment, employment and resulted in low human development index values. From Figure 2.7, the increasing positioning of the country showed that the conditions of doing business in Nigeria relative to the rest of the world is falling.

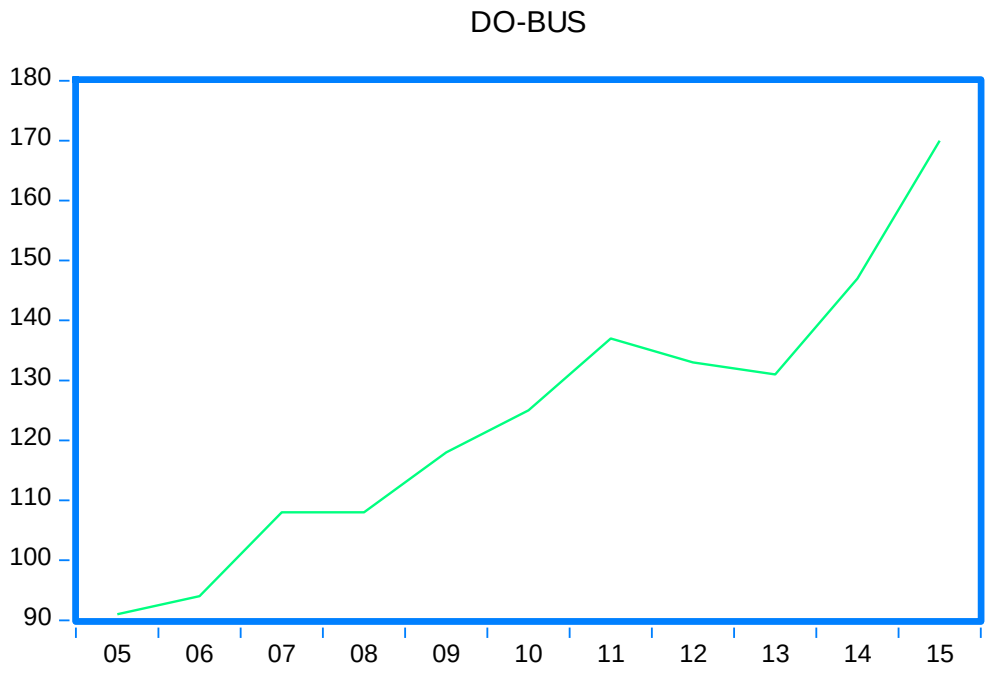


Figure 2.7: Trend of Doing Business in Nigeria (World Bank Ranking), 2005-2015.

C. Overview of Nigeria's Economic Development.

Since the 1980s, Nigeria had introduced various investment climate and economic development programmes and policies to improve her economic performance. How these programmes and policies have fared to affect the economic development indicators is the focus of this section.

i. Growth in Gross National Per Capita Income

The trend of growth of gross national per capita income has not been impressive as it declined regressively from $3555 in 1981 to $2804 in 2003. The average economic growth rate (1981-2015) was 2.9% and the average national income per capita was $3,392. The national income per capita was low to promote high standard of living of the people.

From Figure 2.8 the lowest per capita income of $2312 was recorded in 1987 during the period of the structural adjustment programme (SAP). The gross national income per capita however increased from $3632 in 2004 to $5,546 in 2015 and showed an average annual growth rate of about 5%. Large increase in national per capita income was recorded from 2010 to 2015 and this could probably be due to the increasing income remittances back home by Nigerians abroad.

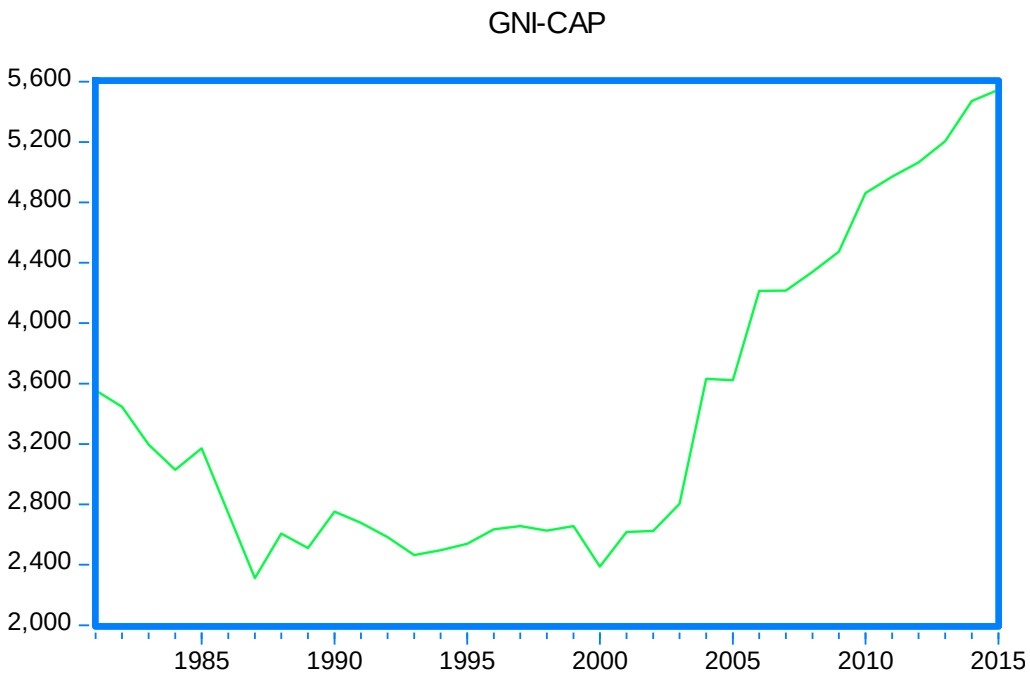
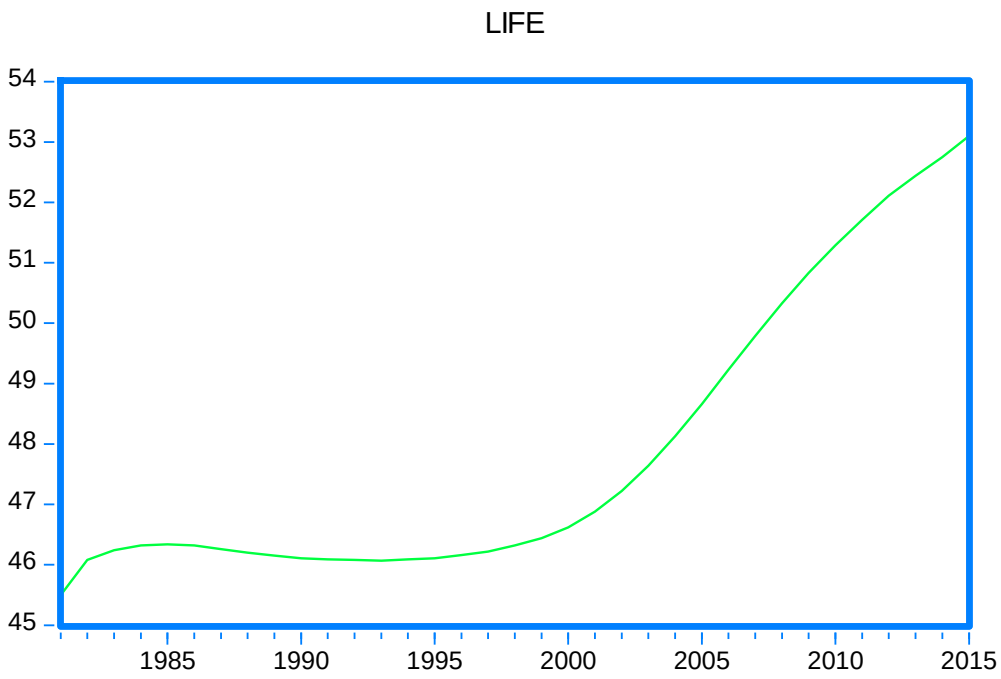


Figure 2.8: Trend of Growth of Per Capita Income in Nigeria ($), 1981-2015.

ii. Improvement in Life Expectancy

Life expectancy level in Nigeria was very low averaging 47.5years (1981-2015) compared to Malaysia (72years), Indonesia (72years), S/Africa (57.5years) and Ghana (56.5years). From Figure 2.9 life expectancy was below 50years for 27years from 1981- 2007 and the oldest in the entire period of study is just 53 indicating that many Nigerians die young, possibly from the stress of the business environment, poor health facilities, insecurity and others (Osagie, 2007). The short life expectancy affects skill and experienced labour supply for the economy since many died at their youthful age when they barely finished their education to acquire professional skills.



2.9: Trend of Growth of Life Expectancy in Nigeria (years), 1981-2015.

iii. Educational Attainment

The annual turn out of graduates from primary, secondary and tertiary institutions in Nigeria since 1981 to 2015 had fluctuated between 2-10million. Between 1981-1983 educational opportunities expanded in Nigeria, especially at the secondary and tertiary levels, where some states offered free education in primary, secondary and some time tertiary education.

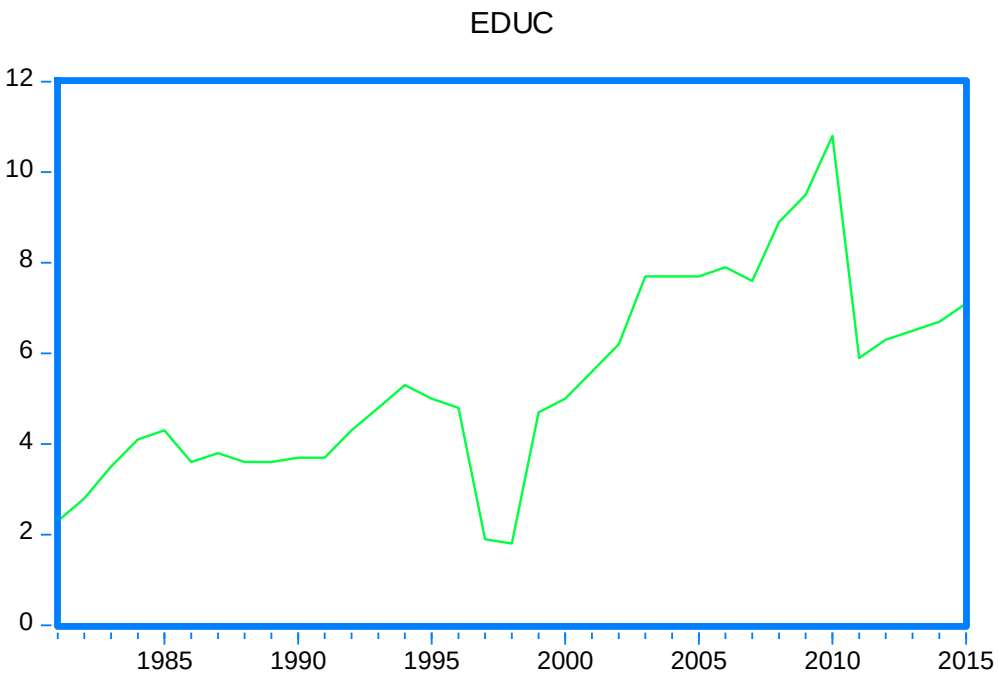


Figure 2.10: Trend of Growth of Educational Attainment in Nigeria (million) 1981-2015

From Figure 2.10 educational output of school leavers increase persistently from 2.3million in 1981 to 4.3million in 1985 and then fluctuated to a lowest 1.8million in 1998.It increased persistently again from 4.7million in 1999 to the peak of 10.8million in 2010. The average turn out from basic primary education (1981-2015) was 6million (5.8%) which was far below the 80% target set for the group by 2015 in Nigeria's Vision 2010 plan (Federal Ministry of Education, 2008). The low literacy level posed challenges to economic, political and individual development to be able to conquer poverty, ignorance and disease (Yusuf, Ladan & Halilu, 2013).

iv. Growth in Employment

Employment opportunities in Nigeria declined in relation to increase in population, number of graduates, poor business environment and managerial skills within the individual firms (Larossi, Mousley & Radwan, 2009). From Figure 2.11 the rate of employment in relation to the population declined progressively from a highest 98.1% in 1995 to a lowest 72.6% in 2012 and 86.7% in 2015 to increase the level of poverty and standard of living of Nigerians.

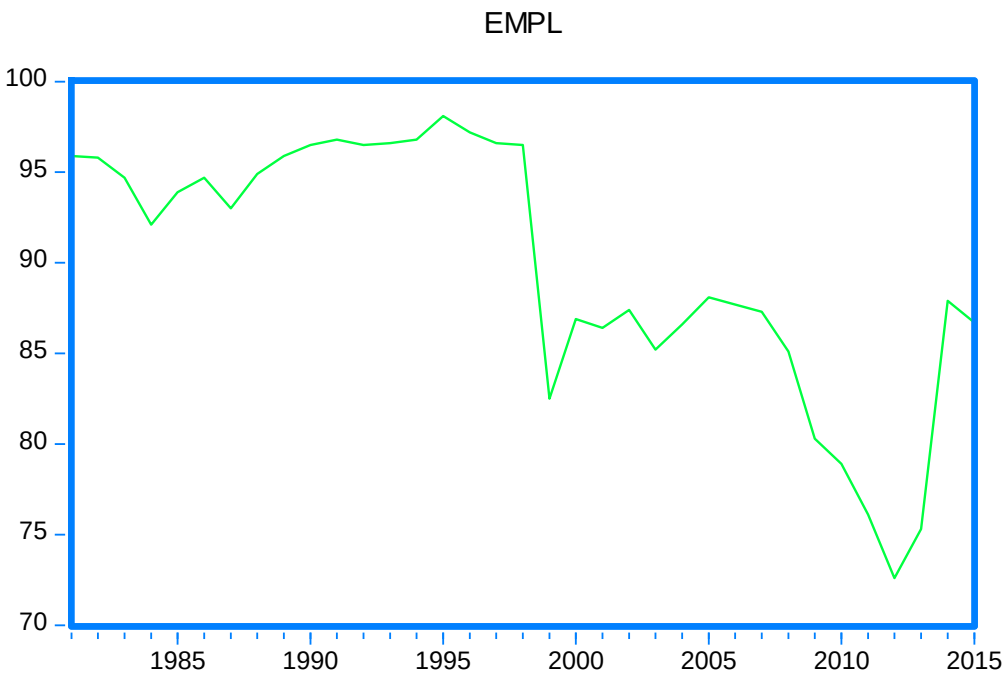


Figure 2.11: Trend of Growth of Employment in Nigeria (%), 1981-2015.

v. Trend of Growth of Capital Development and Capital Efficiency

Gross capital formation influences the level of capital development and efficiency in an economy. The growth in capital formation or domestic investment in Nigeria was limited as it declined regressively from ₦133.22billion in 1981 to ₦120.27billion in 2009 and a lowest value of ₦6.33billion in 2001. However, it increased sharply from N101.7bn in 2012 to N10, 636.33bn in 2015 as shown in Figure 2.12(a). Various factors as savings rates and habits, rate of inflow of foreign capital, among others, must have been responsible for this trend.

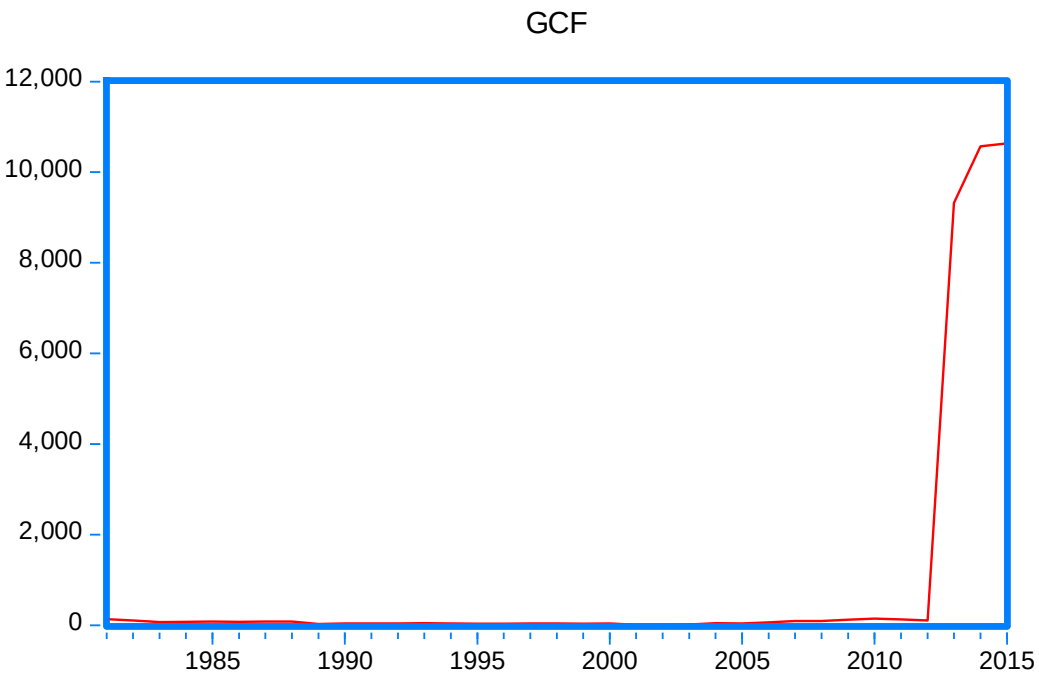


Figure 2.12(a): Trend of Growth of Gross Capital Formation in Nigeria (₦bn), 1981-2015.

For instance, the inflow of foreign direct investment to Nigeria, aside the oil industry, had been low due to the state of the investment climate which had sometime encouraged divestment and capital flight. The capital-output ratio (COR), which measures over all capital availability for production and capital efficiency (CE), which measures the growth in output resulting from a unit increase in investment, were very low from 1981-1999. This indicated that capital investment in Nigeria was not significantly developed to promote economic development. From Figure 2.12(b), capital investment gradually increased from 2005 to 2015 as a result of the impact of the 2005 banking consolidation reform programme in Nigeria. Both domestic and foreign capital flow grew steadily from N62.6billion (1994) to N28,269 billion (2015) to strengthen capital development in the country.

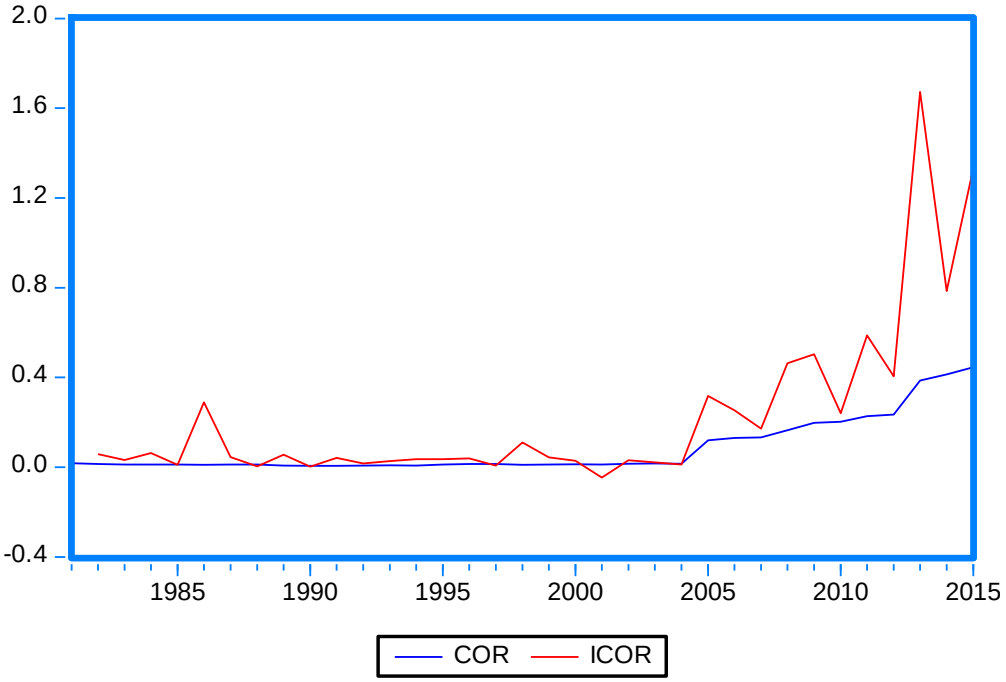


Figure 2.12(b): Trend of Growth of Capital-Output ratio (COR) and Incremental Capital-Output Ratio (ICOR) in Nigeria 1981-2015.

vi. Trend of Overall Economic Development using the Human Development Index

Nigeria has a low human development index rating of average 0.5 (50%) having increased consistently from 0.47 point (47%) in 2005 to 0.53 point (53%) in 2015. By this, the country is on the lower rug of human development.

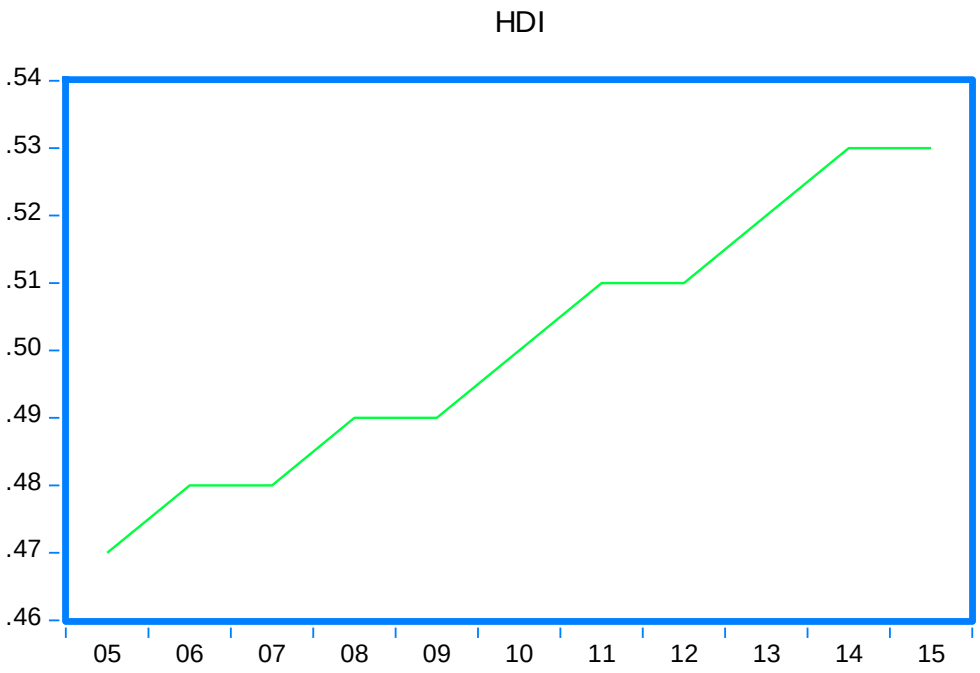


Figure 2.13: Trend of Growth of Human Development Index in Nigeria (%), 2005-2015.

D. Evaluation of Nigeria's Reform Policies on Investment Climate and Economic Development

Investment climate and economic development reforms in Nigeria came in different dimensions ranging from macroeconomic to institutional policies. These reforms and policies affected the state of the investment climate and economic development to varying degree of success. This section is best discussed under economic programmes and reforms, macroeconomic policies, institutional provisions, financial reforms, infrastructure, security, transparency and anti-corruption policies.

i. State of Investment Climate and Economic Reform Programmes

Historically economic reform programmes in Nigeria, 1981-2015, started with the introduction of the structural adjustment programme (SAP) in 1986. The programme was adopted to restructure, diversify investment opportunities, reduce unproductive public sector investment, promote non-inflationary growth and achieve fiscal stability and surplus balance of payment position (Nwagbara, 2011). SAP implementation policies include, among others, privatisation and commercialization of public enterprises to reduce waste and unproductive investments (Act

1988 amended 1999). Others were price deregulation especially in the oil sector and foreign exchange market to liberalise the economy to make it open, competitive and make the investment climate attractive to both local and foreign investors to foster their confidence on the economy (Eshiobo, 2009).

Other economic reform programmes and policies adopted by the then military administration of General Ibrahim Babangida include the directorate for food, roads and rural infrastructures (DFRRI) established in 1986. DFRRI was to promote rural development, reduce rural poverty and improve the quality of life of rural dwellers. To achieve this the directorate was to construct rural feeder roads to promote agriculture and achieve self-sufficiency in food production, provide rural electricity, water, housing schemes and mobilise the rural populace for self help projects. In 1986 also, the better life programme (BLP) for rural women was also introduced to improve the standard of living of rural women through improved food production, transport facilities, health care to reduce the level of rural poverty, squalor, illiteracy and rural-urban migration.

In 1987 the mass mobilization for self reliance, social justice and economic recovery (MAMSER) programme was introduced to build individual capabilities for attaining self fulfillment and contribute to socio-economic and political development of the nation.

In 1989, the national directorate of employment (NDE) was established to implement programmes that can help reduce unemployment through the development of works that are labour intensive (Ibrahim, 2013).

In 1994 the family support programme (FSP) was introduced to alleviate poverty of families most especially those in the rural areas.

The family economic advancement programme (FEAP) was introduced in 1997 to promote small scale farming and establishment of cottage industries for persons of low income in rural areas to produce, process and preserve food to reduce food importation, create employment and reduce rural-urban migration.

The period 2000-2003 witnessed the introduction of the poverty Alleviation economic programme (PAP) by the Obasanjo's civilian administration to address the increasing incidence of poverty among Nigerians. The programme was encapsulated in a 10year perspective plan

tagged ‘vision 2010’. The vision had two cycles of 4-year programmes of the national economic empowerment and development strategy (NEEDS 1&2). NEEDS 1 is from 2003-2007 while 2 is from 2008-20011. The Vision 2010 programme was extended to Vision 20:2020 economic pact to influence effective resource allocation and utilisation. It was intended to effectively organize institutional patterns to stimulate economic growth to generate employment, income and reduce poverty level to improve the standard of living of Nigeria (National Planning Commission, 2012).

President Yar’Adua introduced the 7-Point Agenda economic programme in 2007 to tackle the problem of power and energy supply, food security, wealth creation, agricultural production, land reforms, transport, security and education.

In 2012 the subsidy reinvestment and empowerment programme (SURE-P) was established to manage the federal government savings from oil subsidy removal to create employment for the unemployed graduates through graduate internship in public works.

Assessing SAP and other economic development programmes enumerated above, it pertinent to state that the programmes have not really meet the respective objectives set for them hence the persistent poor economic development and poverty experienced in the country (Ogbimi, 1992). For instance, SAP failed to promote non inflation economic growth, fiscal and exchange rates stability, creation of employment and overall economic development. The manufacturing sector could not adjust fast to the new backward integration plan of SAP and the economy could not achieve self sufficiency in food production and this had resulted to high food import bill that puts high pressure on foreign exchange demand to create balance of payment deficit for the country.

Some reasons for the failure of the programmes include the neglect or lack of proper evaluation of the underlying microeconomic factors of the reform programmes by policy makers (Silva, 2009). This had led to improper diagnosis of the necessary and sufficient conditions that need to be met before floating the programmes to avoid situations of policy invariance which had characterised most of the programmes. For instance Nigeria’s economy, as at 1986, had a poor local raw materials utilisation capacity for industrial production and a low capacity or elasticity to increase non-oil exports to meet international demand. It should be noted that capacity to produce more exports by a country is a necessary condition for benefiting from SAP’s naira

devaluation, foreign exchange deregulation, loose fiscal policies and price deregulation policy that affect the gains of international trade (Falae, 2017). These facts made SAP policy to rather worsen the situation of the Nigerian investment climate and economic development. It caused under capacity utilisation of the manufacturing sector, depreciation of naira-dollar exchange rates, increase the debt burden of Nigeria, create mass unemployment, high budget deficits and inflation rates (Ogbimi, 1992 & Falae, 2017). The naira-dollar exchange rates during SAP increased from ₦0.999 (1985) to ₦ 5.35(1988), foreign debt increased from ₦17.3bn (1985) to ₦134bn (1988) and import increased from 7.1bn (1985) to 21.4bn (1988) (CBN, 2017). Other reasons for reform programmes failure were poor planning of top-bottom technique (instead of bottom-top) which excludes stakeholders and benefiting community from participation. Others were poor funding, poor investment in labour intensive ventures, poor application of information and communication technology to agricultural practices, poor programme implementation, corruption in implementation of reform programmes and the gap of discontinuity of programme (s) when regimes of government changed hands (Kamar, Lawal, Babangida & Jahun, 2014).

ii. Macroeconomic Policy Reforms

Macroeconomic policy affects the largest part of the investment climate but which is arguably the least concern of government for promoting and maintaining growth in gross national income, investment, employment, consumption, government expenditure and financial stability in the economy. The government introduced macroeconomic policies in the area of price deregulation of the downstream oil sector, repel of indigenization decree of 1977 in 1989 and trade liberalisation to make the economy more attractive and competitive to the private sector investors (World Bank, 2005, Meseko, 2015).

Nigeria's monetary policy reforms since 2008, after the banking consolidation exercise of 2005, were focused on influencing the growth of money supply that is consistent with the growth rates of gross domestic product to ensure financial stability and the maintenance of stable and competitive exchange rates (CBN, 2017). Prior to this period, the focus had been on inflation tracking and growth of the capital base of financial institutions to provide adequate credit facility for investment.

Public finance and fiscal policy reforms took the form of tax incentives granted to both local and foreign investors. The industrial development income tax relief Act No. 22 of 1971 as amended in 1988 provides incentives to labour intensive industries. For instance in 2011, seventy-one (71) industries were given 100% tax holidays for five years and industries using between 60-80% local raw materials were given 30% tax relief for 5years (US dept of state, 2015). Joint tax board was established in 2004 to among others, harmonise tax administration to resolve the problem of double, multiple and over taxation prevalent in Nigeria, as well as, determining appropriate tax waivers. The local content Act of 2010 was introduced to protect domestic producers against the precarious dependence on imported raw materials for their industries which had brought imported cost-push inflation to Nigeria due to the high naira-dollar exchange rate for importing raw materials.

Series of regulatory reforms were made in the petroleum industry to make the sector attractive to investors and increase the benefits of the industry to Nigerians. This had culminated in the passage of the Petroleum Industry Bill (PIB) in 2012.

It is sad that the monetary and fiscal policies of government failed to achieve their targets. Evidence from the economy showed that the growth rates were very low, inflation rates were high; naira-dollar exchange rates, unemployment rate and foreign debt were also very high. Commercial banks' lending rates and budget deficits were high with poor tax administration. Bank lending were still subjected to administrative barriers of collaterals, liens, high lending rates and short period of loan repayment. The banks hardly give long term loan which can promote meaningful investment.

The failure of government's macroeconomic policies to improve the investment climate for economic development was partly due to the poor fine tuning of the macro policy instruments themselves to reflect the microeconomic foundations of the programmes themselves. This prevented the macro policies from tracking the actual constraints of the behaviours of the individual economic unit with respect to the stated macroeconomic objectives (Lucas, 1976). Microeconomic foundation of exploring macroeconomic policy promotes 'policy deepening' behaviour of macroeconomic analysis for efficacious policy implementation to prevent policy invariance (Silva, 2009).

iii. Economic Institutions' Reforms

The government had established institutions to make the investment climate friendlier to both local and foreign investors in Nigeria to boost economic development (Akanji, 2009). In 1990 the Corporate Affairs Commission (CAC), which registers all companies operating in Nigeria, was established courtesy of the Companies and Allied Matters Act (CAMA) of the same year. This was followed by the Nigerian Investment Promotion Commission (NIPC) in 1995 (Act No. 16) to coordinate investment activities in the country (CAC, 2012). The NIPC is charged with the responsibility of promoting, coordinating, monitoring, initiating and providing measures to make the investment climate of Nigeria conducive for both Nigerian and non-Nigerian investors (NIPC, 2014). NIPC was specifically to protect and guarantee foreign investors that "no enterprise shall be nationalized or appropriated by the government of the federal republic of Nigeria" (NIPC Act, 1995 S.1). This provision thus gives assurances to foreign investors and encourages them to invest in Nigeria. However, services like grant of business entry permit, licenses, authorization among others, still experience delays despite the introduction of the one-stop-investment centre (OSIC) computer system to hasten business documentation and transactions by NIPC.

SMEDAN was established in 2003 to create an efficient environment for micro, small and medium scale enterprise (MSME) through entrepreneurship funding of micro, small and medium scale enterprises to promote

The national agency for food and drug administration and control (NAFDAC) was established in 1993 to regulate, control the manufacture, importation, exportation and use of food, drugs, cosmetics and medicals in Nigeria. These institutions have not achieved much with respect to the objectives of their establishment and this is attributable to the official corruption in them to which ICPC and EFCC institutions were further established to tackle.

iv. Financial Reform

Financial reforms have been evolved to provide easy access to finance for investment. In 1995 Nigeria's foreign exchange market was deregulated and the stock exchange market internationalized to promote capital flow for both domestic and international investors.

In 2005 the banking sector witnessed capitalization and consolidation reforms of the capital base for investment funding. Some development banks (Bank of industry, Agric cooperative and rural development bank, mortgage bank, commerce and industry bank, urban development banks etc) were established to provide easy loans to medium and long term borrowers. Microfinance banking scheme of the central bank of Nigeria (CBN) came in 2005 to provide uncollateralised loans to micro, small and medium enterprises (MSME). Despite all these reforms, adequate lending to investors is still very low (below 20%) with high cost of fund, short repayment period and others.

v. Infrastructural Reform

Roads, ports and electricity infrastructural reform were examined and not much was done other than the routine maintenance carried out on roads by the federal roads maintenance agency (FERMA) established in 2002. Reform on the power sector brought in power holding company of Nigeria (PHCN) and electricity distribution companies but this has not improve the poor power supply experienced in the country. Below 5000MW is supplied out of the expected 20,000KW that can carry the economy in the present time. Roads connectivity and conditions of the roads between states in Nigeria is poor.

Under port reforms, the cabotage Act of 2007 was put in place to bring efficiency to the use of the ports to reduce delays in loading and off-loading of imports and exports. However, delays are still experienced at the ports in addition to insecurity.

vi. Anti-Corruption Reform.

Under the transparency and anti-corruption reform, the government had established the independent corrupt practices and other related offences commission (ICPC) in 2000 and the economic and financial crime commissions (EFCC) in 2004 to fight against corruption to reduce the cost of doing business in Nigeria. Due process in procurement, (Procurement Act, 2010), treasury single account (TSA) and the activities of transparency international were put in place to check the spate of corruption in the country.

vii. Security Reforms

The most essential function of any government is to have peace which is a pre-condition for economic development (Atelhe, Adams & Abunimye, 2016). This statement implied that government need to tackle security challenges with the seriousness it deserves by embarking on its reforms. In Nigeria, reforms have been carried out to foster collaborative security network among the police, military and paramilitary forces. Security training institutions, such as the Nigeria defense academy (NDA), National war college (NWC), Police colleges, Nigeria institute for policy and strategic studies and other security surveillance groups such as the Nigeria security and civil defense corps (NSCDC) (2003), Federal road safety corps (FRSC) (1988), Neighbourhood watch (Vigilante groups) (2010) were established to boost up security network to protect life and property. Police reform of 2010- 2015 had provided for the training of many officers to increase their professionalism. It is a fact that despite these Nigeria still has security challenges most especially Boko-haran insurgences, Niger delta militants, Fulani killer-herdsmen, cultists, kidnappers, robbers, ritualists etc.

In summary, the reforms discussed above were essentially expected to affect the conditions of the investment climate to play leading role in contract enforcement, business regulation, provision of infrastructure, effective labour policy, provision of easy access to finance, fight against corruption and provide incentives to attract both foreign and local investors (Olowu & Hamza, 2013). The end objectives of the reforms were to boost productivity, generate employment, raise national per capita income and consumption, and overall enhance overall economic development.

Most of the reform programmes however have myriads of problems facing them which made them to fail to meet their policy targets. Most of the programmes did not consider the interest and fundamental needs of the people they are meant to serve to appropriately capture the possible gains of the projects floated to elicit cooperation in implementation from the people. The beneficiaries of the programmes were never integrated or incorporated in the planning and implementation of the programmes for proper monitoring and benefit-cost assessment (Taiwo & Agwu, 2016).

There was lack of continuity and sustainability of most programmes from one regime of government to another especially when government changes to a new regime. Each regime wants to be identified with its own new programme at the expense of continuity of lofty and well articulated programmes.

There was poor budgeting and funding of most economic programmes of government. There was substantial lack of facilities, working tools, trained and skilled personnel to handle projects which had led to the abandonment of many projects uncompleted in the country.

There was also lack of cooperation and synergy among the three tier of governments in policy vision, design and implementation. The poverty alleviation and national economic empowerment and development strategy (NEEDS) programmes of the Obasanjo's regime of 2000, suffered from this problem. Lack of transparency, accountability and corruption had caused poor coordination of programme implementation as well as embezzlement of project funds by implementation officials.

2.2 Empirical Literature Review

The empirical literature examined the work of scholars on the factors that affect investment climate and economic development. Expectedly, there were differences in the results of these scholars due to the different approaches, techniques and metric standard adopted. More over the yard stick for measuring economic development and investment climate had considerable variations and subjected to wide debate and views over time (World Bank, 2011).

Determinants of Investment Climate and Economic Development

In a World Bank sponsored survey study titled 'An assessment of the investment climate in Nigeria', Larossi, Mously and Radwan (2009), found the major factors affecting Nigeria's investment climate to be poor electricity supply, limited access to credit, poor transport, high indirect cost and corruption in that order. Of the 23,000 firms surveyed over 11 states in Nigeria in 2007 and 2008, 85% owned private generators because of the erratic electricity supply and 70% of the energy need of firms comes from this source of power. This problem made many micro enterprises to shut down their businesses because they could not afford to maintain generators to supply power. The study found that only 20% of the small and medium enterprises that applied for loan get one. A 4% annual loss in sales is said to be attributed to transportation

problem while another 10% is lost to corruption. The negative investment climate factors were found to have caused low productivity, under capacity utilisation of the manufacturing sector and leading to less employment, income, poverty reduction and general underdevelopment. Analysing the impact of productivity growth on employment, the study found that a 1% increase in productivity generates a paltry 0.41% employment while youth unemployment is on the high side of 60%. The study identifies Bauchi, Abuja, Kano, Anambra, Enugu and Kaduna as the best investment climate states in that order while Sokoto, Cross Rivers, Abia, Lagos and Ogun are the worst. The study is a World Bank sponsored policy support programme for Nigeria's 7-Point Agenda and recommends that federal reforms should be across all states to recognise and complement each state's peculiar investment climate reform programmes to remove the constraints in the investment climate to stimulate growth in productivity, employment, income and poverty reduction.

In another follow up survey study titled 'Nigeria: An assessment of the investment climate in 26 States', Larossi and Clarke (2011), found the major factors affecting Nigeria's investment climate to be inadequate electricity supply which is topmost, followed by poor access to and cost of credit, transportation, taxes, corruption and unstable macroeconomic environment. The cost of finance is found to be as high as160% of the value of the loan taken with most small firms using high collateral such as their houses. The study found 15% of Nigerian entrepreneurs to be females who need credit facilities more than the males and that there is high preference for female workers than male workers. The survey carried out in 2009 and 2010 with 3000 firms in 26 states however observed that firms in the economic free zone areas (FZ) especially in Calabar and Port-Harcourt enjoy better investment climate incentives (financial aid, easy credit facility, more electricity supply, better infrastructure) than those outside the zones.

In a study of the obstacles to investment environment of developing countries, Biau and Pfister (2014) in their study titled 'Creating an environment for investment and sustainable development' found that a conducive investment environment is imperative to sustainable economic development and that the ingredients that make a conducive investment environment are: creating a regulatory and legal capacity for managing investment inflows, promoting and facilitating investment, attracting private investment in infrastructure, strengthening the links between investment and trade, and promoting responsible business conduct by multinational

enterprises. The study, which used the statistical database of the organisation for economic co-operation and development (OECD), also found that sustainable development depends much on the quality and not the quantity of investment attracted by a country to create employment, encourage technology transfer, be internationally competitive and spur growth of domestic enterprises and industries.

The study recommended that policy makers in a country should put in place policy framework to address the "push" and "pull" factors of the investment environment to make it conducive for investment and development. The pull factors should be addressed through ensuring effective and transparent regulations, linkage of foreign with domestic enterprises to create jobs and promote development, supply credit from institutional investors, domestic capital markets and provide innovative forms of concessional and non-concessional financing from bilateral and development finance institutions. The push factors should be addressed to make the investment climate attractive to investors through the removal of investment restrictions policies, providing easy access to land, development of infrastructure market, transparency, non-discriminatory policy, security check and protection of property.

The World Bank (2016) in a general household survey in Nigeria in 2013 titled 'An assessment of the investment climate in Nigeria: the challenges of the Nigeria's private sector' found that electricity and road infrastructure significantly affected the investment climate such that it could only support low wage employment of 17% spread into 15% in the south and 2% in the North. Also innovation was found to be poor and could not be diffused into the production system to increase GDP per person employed and there is also low investment in knowledge capital.

In a survey study of investors in Nigeria in 2015 titled 'investment climate in Nigeria and effects on economic development' Meseko (2015), using likert scaling and t-test analysis, found that efficient financial institutions, stock exchange market, telecommunication, Nigerian culture and values system, less natural disaster and ease of getting credit facilities have positive effect on Nigeria's investment climate to affect economic development in terms of rising per capita income, healthy living, employment and poverty reduction. On the other hand, security threats (hinder free movement of people and goods), inadequate infrastructures (electricity roads, rails, airports and sea-ports), corruption and absence of rule of law all have negative effect on the investment climate and economic development.

In a study titled ‘Investment climate, competition policy and economic development of Latin America’, Khemani and Carrasco-Martin (2008), using percentage and comparative variance analysis, found that competitive policies in an investment climate promote economic efficiency by making goods and services more affordable to increase the consumers’ welfare and per capita income for broad-based economic development. The study found that countries with antitrust laws and policies promote economic deregulation and trade liberalisation to improve on the quality of their investment climate to encourage investors and foster sustainable development. They found out that competitive policy of government affects rivalry between enterprises and the structure of their industries to affect prices, trade, investment, output, employment, entry and exit of firms and thus recommended the enforcement of competition laws and advocacy to remove unnecessary public policy impediments to doing business in the investment environment.

In a study titled ‘Investment climate of region: Approaches to its assessment, actual problems of development of social and economic systems’ and using factor analysis method, Obukhova (2013), found access to finance or credit, regulatory policies and infrastructure (plant and equipment) to be the major factors of the Russian investment climate which affected its economic development. Obsolete plant and equipment technology had affected innovation and effective investment mechanism to spur productivity, employment and other development activities in the region. It therefore recommended the update of plant, equipment technology and innovation to promote effective economic development.

Cardenas-Garcia and Pulido-Fernandez (2014), in their study ‘Does the investment climate determine the transformation of tourism growth into economic development?’ found a direct relationship between investment climate factors, tourism growth and economic development. The study carried out in Spain covers 144 countries in Europe and Africa which were classified into two groups of ‘more economically’ and ‘less economically’ developed countries before applying factor analysis and least square method on the principal component factors. The study found that the major factors affecting growth in tourism were regulatory policies on businesses, financial markets development and innovation which affected growth in investment, GDP, export and government revenue. These are the development variables that transmit to improving the living conditions of the population in terms of increase in income per capita, longevity, increased literacy and employment in the more economically developed countries. The study

however, found that regulation of businesses and financial market developments of the investment environment were not statistically significant in influencing tourism for economic development in these more developed countries. The less economically developed countries do not have this valid relationship of the investment climate spurring tourism growth to impact on economic development. The study recommended countries, especially the less economically developed ones, to first resolve the issues affecting their investment climate before investing in tourism.

Connolly, De Leoz, Gorospe & Sebastian (2014), in their study titled "Determinants of having high human development index: A qualitative analysis of countries all over the world" used the logistic regression method and found that education has the highest impact (41.8%) on human development followed by life expectancy (12.22%) and GDP per capita (0.008%). They also found that education has direct effect on human development and a low level educational attainment or quality increases the chances of poverty among the people. They found that healthy individuals are less prone to sicknesses and are more economically productive and that inflation has no significant effect human development. They recommended that education should be expanded both in quantity and quality by government as well as the provision of free medical care.

Table 2.3: Summary of Empirical Literature Reviewed.

Author(s)/ Year	Location	Research Topic	Variables Used	Method of Analysis	Findings/Result	Knowledge Gap in Literature
Khemani and Carrasco-Martin (2008)	Chicago USA	The investment climate, competition policy and economic development of Latin America	Competition policy, Investment, Per capita income, Prices	Percentage and comparative variance analysis technique	The study found competitive policies in an investment climate promote economic efficiency making goods and services more affordable to the consumers to increase their per capita income and welfare for broad-based economic development	The study did not delve deep to explore the basic factors affecting the investment climate and economic development
Larossi, Mousley & Radwan (2009)	Nigeria	An assessment of the investment climate in Nigeria	Electricity supply, Credit supply, Transport, Indirect cost of doing business, Infrastructure, Insecurity, Corruption, Productivity of manufacturing sector and Employment.	Enterprise Survey of 23000 firms in 11 states using percentage and covariance analysis	The major problems of Nigeria's investment climate and economic development were identified as inadequate electricity supply, poor access to credit, poor transport, high indirect cost of doing business, poor infrastructure, high crime rate, insecurity and corruption. The factors led to low capacity utilisation and productivity of the manufacturing sector, low employment and high poverty level in the country.	The study had no wide coverage of the 36 states of Nigeria and did not adequately address the underlying factors affecting the identified investment climate variables.

Table 2.3: Summary of Empirical Literature Reviewed (Continued)

Author(s) / Year	Location	Research Topic	Variables Used	Method of Analysis	Findings/Result	Knowledge Gap
Larossi & Clarke (2011)	Nigeria	Nigeria 2011: An assessment of the investment climate in 26 states	Electricity supply, Credit supply, Transport, Indirect cost of doing business, Infrastructure, Insecurity, Corruption, Productivity of manufacturing sector and Employment	Enterprise Survey of 3000 firms in 26 states using percentage and covariance analysis	The study identified problems of Nigeria's investment climate and economic development as inadequate electricity supply, poor access to credit, poor transport, high indirect cost of doing business, poor infrastructure, high crime rate, insecurity and corruption. The factors led to low capacity utilisation of the manufacturing sector, low employment and high poverty level in the country. 15% of Nigeria's entrepreneurs are females who need credit more than the male. The cost of finance is high, 160% of the value of the loan given with most small firms using their houses as collaterals.	The study did not address the underlying causes of inadequate electricity supply for production, consumption. It did not also bring out the fundamental causes of insecurity in the investment environment and the effect it has on the standard of living of the citizens.
Obukhova (2013),	Russia	Investment climate of region: Approaches to its assessment, actual problem of development of social and economic systems'	Financial access, Regulation, Plant and equipment, Innovation, Investment, Productivity and Employment	Factor analysis method	The study found access to finance/credit, regulatory policies and infrastructure to be the major investment climate determinants that affected productivity, employment and other economic development variables of Russia. Obsolete plant and equipment affected innovation, effective investment mechanism and development	The study covered limited variables and no in-depth factor analysis.
Biau & Pfister (2014)	Developing countries in OECD	Creating an environment for investment and sustainable development	Regulatory and legal policy, Investment, Infrastructure, Trade, Security, Employment	Percentage and Variance analysis	The study found non-discriminating regulatory/legal policies, investment promotion, trade policies, infrastructure, and business conduct of multinational enterprises to be the major ingredients affecting the investment environment to drive sustainable development. It also found that sustainable development depends on the quality and not the quantity of investment of a country to create employment, be internationally competitive and spur the growth of domestic enterprises and industries. The study recommended a policy framework that can address the "push" and "pull" factors of the investment environment to make it conducive for development.	The study did not address the detail factors affecting the identified investment climate variables

Table 2.3: Summary of Empirical Literature Reviewed (Continued)

Author(s)/ Year	Location	Research Topic	Variables Used	Method of Analysis	Findings/Result	Knowledge Gap in Literature
Cardenas-Garcia & Pulido-Fernandez (2014)	Spain	Does the investment climate determine the transformation of tourism growth into economic development?	Legal regulation, Financial market, GDP Per capita income, Life expectancy, Literacy, Employment	Principal component factor analysis and least square method.	The study found a direct relationship between investment climate factors, tourism growth and economic development in more economically developed countries. Investment climate factors such as regulatory policies, financial markets development, innovation and productivity affected growth in tourism. This growth transmitted to improvement in living conditions, income per capita, life expectancy, literacy and employment in the more economically dev. countries.	The study did not cover exchange rate for doing business in the environment. This is a very important factor that can affect the level of spending, the potential welfare and attraction of tourists to a country from other countries.
Connolly, De Leoz, Gorospe & Sebastian (2014)	USA	Determinants of having high human development index: A qualitative analysis of countries all over the world	GDP Per capita income, Life expectancy, Education, Inflation	Logistic regression method,	The study found that education has the highest impact (41.8%) on human development followed by life expectancy (12.22%) and GDP per capita (0.008%). That education has direct effect on human development and a low level education attainment or quality increases the chances of poverty. It was also found that healthy individuals are less prone to sicknesses and are more economically productive. Inflation has no significant effect on human development. It was recommended that government should expand education and provide free medical care for the people.	The study covered limited economic development variables such as GDP per capita and educational enrolment instead of GNP per capita income and educational attainment. Also inflation does not directly affect human development as do employment.
Meseko (2015)	Nigeria	Investment climate in Nigeria: Effects on Nigeria's economic development	GDP growth rate, Financial institutions, Land acquisition, Governance, Security, Credit access, Infrastructure, Corruption, Communication, Natural disaster, Culture & value system	Likert scaling and t-test analysis.	Found that there was efficient financial institutions, Stock exchange market, ease of getting credit facilities; better communication, low natural disaster, Nigerian culture and value system have positive effect on Nigeria's investment climate and economic development. On the other hand, security threats, infrastructures, corruption and rule of law negatively affected the investment climate and economic development.	The study did not cover important development indices such as gross national per capita income, literacy and life expectancy. Also it did not adequately address the underlying factors affecting the investment climate determinants.

Table 2.3: Summary of Empirical Literature Reviewed (Continued)

Author(s)/ Year	Location	Research Topic	Variables Used	Method of Analysis	Findings/Result	Knowledge Gap in Literature
World Bank (2016)	Nigeria	An assessment of the investment climate in Nigeria: the challenges of the Nigeria's private sector	Electricity, Roads, Employment	Percentage and covariance analysis	The study found electricity and road infrastructure to significantly affect investment climate and low wage employment. Total wage employment is 17% with 15% in the south and 2% in the North. Also innovation was found to be poor with low investment in knowledge capital.	The study covers very few variables or factors of the investment climate and economic development. No in-depth explanation of factors affecting the variables

Source: Researcher's Compilation from Literature on Investment Climate and Economic Development (2017).

2.3 Summary of Literature Reviewed

A summary of the literature reviewed in this section was discussed along the lines of conceptual issues, basic theories, other theories and empirical literature on investment climate and economic development.

The concepts of economic development and investment climate have undergone changes in scope and definition over time. In the present times, economic development is seen as the sustained provision of quality goods and services for the population's consumption to improve the quality of human life in terms of higher per capita incomes, better education, healthy living and nutrition, better shelter, higher employment and less poverty (Conteras, 2014; Moris, 2014; Elumene, 2009; World Bank, 2005; Todaro & Smith, 2005 & Sen, 1999).

Most of the reviews see investment climate as the condition of a set of social, economic, political, institutional, legal, cultural, human and environmental factors of a place, region or country that influenced the willingness and readiness of investors to invest in that place or region at a given period of time (Chanynikova in Glebova & Kotenkova, 2016; Bayraktar, 2015; Meseko, 2015; Nwogwugwu & Onwuka, 2012; Silver-Leander, 2005; Dollar, Hallward-Driemeier & Mengistae, 2005).

Literature on basic theories of economic development focused on the systematic analysis of best policy options by nations to harness their economic, social, institutional, human, and natural resources to improve the conditions of human living (Mortley, 2015; Todaro & Smith, 2005 & 2014; Owen, 2012 & UNDP, 1990). Improvement in human welfare often emanates from structural changes in production, technological upgrading, social, political, economic and institutional modernization to increase the level of growth in capital, total productivity and output (Jhingan, 2014; Jhingan, 2005 & Adelman, 2004).

Factors affecting investment climate and economic development indicators were identified and discussed as access to credit, infrastructure, regulatory policies, macroeconomic policies, security challenges, corruption and others (Olowu & Hamza, 2013; Nwogwugwu & Onwuka, 2012; Fabayo, Posu & Obisanya, 2011 & Okafor, 2010). Solow-Swan and the Neo-Classicals observed that long-run economic growth, capital accumulation, productivity and technical progress are determined by exogenous factors outside the system of production while Romer and others claimed that steady-state economic growth result from endogenous factors within the system governing the production process (Morley, 2015, Nzeribe, 2013, Rebelo, 1990, Barro, 1990, Lucas, 1988, Romer, 1986 & Solow, 1956). In fact endogenous factors are said to contribute $^{2}/_{3}$ of total output (Morley, 2015).

Other theories of investment climate reviewed are the complexity, location-factor and the comprehensive investment climate theories. These theories discussed the specific pull and push factors in a locality (natural resource availability, market size, security and infrastructure) and the complex relationship between them. They also discussed the best way to handle the factors to improve on the quality of the investment environment (World Bank, 2011; Lahimer, 2007; Ramalingam & Jones, 2008 & Silva-Leander, 2005).

A review of the investment climate and economic development of Nigerian showed that its economic development had been slow with rising unemployment, poverty level and low human development index which is below average in the past two decades (Olowu & Hamza, 2013; Larossi, Mousley & Radwan, 2009). Various investment climate factors responsible for this unimpressive economic performance were identified and discussed as access to credit, infrastructure, regulatory policies, macroeconomic policies, security challenges and corruption

The empirical literature identified and discussed a plethora of factors affecting economic development and the investment climate of a place. Various quantitative methods were used to measure growth in gross national income, gross domestic income, per capita income, literacy, healthcare, infrastructure, political stability, security, social, cultural, human factors, financial development, employment, governance and institution. The most prominent factors militating against Nigeria's investment climate to affecting level of economic development were electricity supply, access to credit and transportation.

The knowledge gap created in the empirical literature showed that the underlying factors that can influenced the behaviour of the primary investment climate determinants and economic development indicators were not sufficiently explored to identify their impact.

Most of the studies reviewed used per capita gross domestic income and not gross national per capita income to measure the standard of living of the people. It is important to note that per capita GDP excludes income remittances sent from abroad to the residents of a country but income remitted are known to significantly improve the standards of living of the people of a country. Most studies used the human development index (HDI) to measure development which is a potential rather than actual measurement of human development. Again and to the best of the literatures consulted there had be no empirical study in Nigeria that had used the inequality-adjusted human development index (IHDI). Also the same thing can be said of the use of capital-output and incremental capital-output-ratio to measure the state of capital development and efficiency in Nigeria.

2.4 Justification of the Study.

Investment climate, no doubt, significantly influenced the volume of economic activities of a country to impact on her economic development. This is why economic development can only be achieved in a conducive investment environment. Most countries of the world strived to make their investment climate conducive for investors by embarking on investment climate surveys and assessments to constantly avail policy makers with up-to-date information about the investment climate. Nigeria among the comity of nations desires rapid economic development and had to embark on various investment climate reform programmes to achieve this. The country need to make the investment climate conducive and friendly to investors to invest and engage in other economic endeavors to promote economic development. Full information about

the conditions of an investment climate can only be got from in-depth investigative studies of the investment climate to x-ray the push and pull factors of the business environment. Indeed investment climate assessment studies have been carried out in Nigeria to ascertain the level of conduciveness of the business environment. But most of these previous studies did not do much to improve the depth of knowledge regarding the state of the investment climate for better reform policy making. Most of them focused on the effect of only the primary investment climate determinants such as access to finance, trade openness, infrastructure, security and government policy as they affect economic development. They failed to adequately dig deep into the underlying secondary and tertiary factors that affected the primary determining factors of the investment climate which significantly affect its conduciveness for development. This study systematically explored these underlying secondary and tertiary factors of the investment environment determinants. The factors include saving habit of Nigerians, interest rate or cost of borrowing investment fund, loan repayment period granted to borrowers, the state of capital market development for long-term capital finances. Others are ports congestion, demurrage payment, insecurity at ports, airports, rail stations, size of annual national capital budget, infrastructural development policy of government, gas supply and water level capacity of dams for electricity generation, condition of roads, health and educational facilities, rate of vandalisation of existing infrastructure, rate of devastation by natural disasters as thunder storms and erosion, unemployment leading to insecurity and youth restiveness, kidnapping, taking up of arms such as Niger Delta militants and North-East Boko-haran insurgence. There are also political tension, cultism, ritualism, drug abuse, religious fanaticism, porous border for dumping, slow judicial process and corruption, public policies, manifestos/programmes of political party in power, continuity in implementation of existing economic programmes when there is change in government, planning system, nature of economic institutions in national development plan and other factors.

Also, most previous studies commonly used the input based human development indices (HDI) metric of per capita gross domestic income, life expectancy at birth and school enrolment to measure economic development. These metrics of human development were inadequate, limited in scope and less potent to capture the actual state of economic development achieved by a country with respect to human development and welfare. Human development index (HDI) is more or less a mere measurement of human development potentials and not human development

achieved or recorded. For instance the gross domestic income per capita often used in HDI's measurement does not cover income remittances from abroad compared to the gross national income per capita which did. Enrollment in formal school system is a mere intention of formal knowledge to be acquired and not the actual knowledge already acquired by way of graduation (output) from the school system. Life expectancy at birth in HDI focused on preventive medicine in terms of immunization to reduce child mortality rate. It placed little or no emphasis on the environmental stress factors of insecurity, curative medical attention available and psychotherapy all of which can seriously affect the health and longevity of the individual. To resolve these deficiencies in HDI's measurement, this study adopted the best and latest metric of inequality-adjusted human development index (IHDI). It was further modified by the inclusion of empowerment index (employment) which has direct relationship with human development potentials and the reduction of poverty rate among the people. The study exposed the transmission mechanism of the ameliorating power of employment on poverty rate to improve the people's welfare. The achievement measured inequality-adjusted human development index (IHDI) used the gross national income per capita (standard of living), life expectancy (healthy living and longevity), and educational attainment (knowledge acquisition for productive thought and manpower development) as its indices hence it was considered to be a better measurement of economic development than HDI (UNDP, 2016). The gross national income per capita used in IHDI, incorporates income remittances to a country from abroad as well as the use of purchasing power parity ($PPP) to make adjustment for the differences in each country's economic conditions which affect their respective domestic level of purchasing power and human welfare.

Educational achievement, measured by the number graduates that completed formal education at the planned level (output), was adopted by IHDI as against the mere enrolment of persons in formal school system (input) adopted by HDI.

Most previous studies also failed to integrate the investment climate determinants operating at firms' level (endogenous level) with that of government or country-wide level (exogenous level) to exploit their synergy for development. Firms' operations require deeper understanding of in-factors such as workers' conditions of service, training, contribution to infrastructural development and other corporate social responsibilities. Firm's operation can mar or complement government's investment climate and economic reform policies. Government's policies and

actions through economic planning, business regulation, institutional building, reform programmes, infrastructural development and security, among others, can affect the firms' operation and fortunes greatly to affect development. The policy or synergic gulf between government's policies and firms' economic objectives often led to poor development and reform plans and their imminent failure. This study bridged this gap by adopting the triangulation principle (Lewis, 1998) that recommends the use of multi-approaches to deeply explore the characteristics of latent phenomenon such as investment climate and economic development.

Scanty studies exist on the impact of investment climate on capital development and efficiency in Nigeria. This study evaluates the macro and microeconomic basis of investment climate factors that affected the trend of capital development and efficiency via the use of capital-output ratio (COR) and incremental capital-output ratio (ICOR).

From the above discussion, it is certain that some knowledge gaps were created in previous studies of the effect of Nigeria's investment climate on her economic development. These gaps have caused the economy to perform poorly and made the reform policies of government ineffective. The situation had also made it difficult for the country to achieve the objectives of economic development plans over the years to subject the country to perpetual economic underdevelopment. Besides, the objective of the country's Vision 20:2020 economic pact would be difficult to attain going by the present state of the economy. All these economic woes resulted from the poor information obtained from previous studies on the investment climate for policy makers. All these gaps in the economy need to be closed by a comprehensive study as this, to put the economy on a fast-lane of development. The study comprehensively provided deeper explanation and understanding of the root causes of the problems of the Nigerian investment climate and economic development for efficacious policy making.

The knowledge gained from this study will be indispensably useful to economic managers and planners in developing programmes for promoting the investment environment, capital formation, capacity utilisation and overall human and economic development. It will also provide recipe for productivity expansion, entrepreneurship development, increase rate of returns on capital and profitability rate to investors to create employment and improve the standard of living of the people through poverty reduction, increased education and longevity (Jacabsohn, 2015).

CHAPTER THREE
RESEARCH METHOD

This chapter discussed the techniques used for the collection, estimation, interpretation and analysis of data**.** It also examined the design of the study and the theoretical framework which informed the basis of model specification to meet the objectives of the study. The study adopted the ex-post facto design which is a quasi-experimental study method for investigating cause-effect relationship of facts that have already occurred in the past (Salkind, 2010). Investment climate is an efficiency booster of the factors of production and thus treated as part of the input used in a modified neoclassical production function. Economic development was the resultant output of the function. The discriminant factor analysis method was used on the disaggregated economic development indicators of gross national income per capita, life expectancy or healthy living, educational attainment or literacy and employment. Discriminant functional relationships were thus modeled and estimated by the cointegrated linear regression technique and the explorative factor analysis.

3.1 Theoretical Framework

The theoretical foundation of this study is based on the modified neoclassical production function of Kushnirsky (2001). The model was supplemented by the Silva-Leander's comprehensive investment climate theory (2005), Lewis' triangulation theory (1998) and the modified inequality-adjusted human development index of the UNDP (2016).

The neoclassical production function provides a systematic technical relationship of factor combination to produce output to promote economic growth and technological development. The modified neoclassical production function uniquely permits the inclusion of social and institutional factors as addition to the traditional factors of production (labour and capital) to impact on the production system and economic development. The social and institutional factors affect the efficiency of the traditional factors of production. This is why they were incorporated in the neoclassical production function as independent variables that affect the investment climate and economic development indicators (dependent variables). Total factor productivity technique can be used to evaluate their efficiency impact on the traditional factors of production.

The comprehensive investment climate theory, advocated aggregate factors approach to the identification, selection and analysis of the determinants of the investment climate of a country towards achieving economic development. It also provided for integrated synergy between firms' internal factors (endogenous) and the economy-wide external factors (exogenous) of a country. This means that endogenous factors within the firm's operational control such as financial supplies, self power supply, manpower training and development, research and development, innovation, quality of production facilities and internal security system are to be coordinated. Other internal factors of production in the cointegration equation included quality of managerial leadership, employment, wage payment and general welfare packages for workers, consumers' education on product use and compliance with state economic policies. These endogenous factors are often explored for synergic relationship with the exogenous country-wide investment climate factors. The country-wide factors are the social and economic infrastructures provided by the government, macroeconomic and regulatory policies, tax policies, foreign trade policy, institutional quality and others which affect the quality of the investment climate and its impact on productivity, capital efficiency and economic development. It is important to note that the investment climate factors or determinants are inputs which boost the efficiency of the traditional factors of production in the production system to raise productivity (World Bank, 2005). The comprehensive investment climate theory combined the basic tenets of Solow's neoclassical exogenous growth theory with that of Romer's endogenous growth theory to provide in-depth identification and analysis of the determinants of the condition of the investment climate and economic development of a country.

In support of the comprehensive investment climate, the dynamic componential factor theory of leech and Onwuegbuzie advocated the filtration the principal factors of influence with their lag effect, from among the other factors in the functional relationship. The theory emphasised the provision of information about the relative importance of the individual variables and the estimation of the latent or unobserved phenomena as a specified function of the observable factors that can be measured by the maximum likelihood technique (Mordi, Adebiyi, Adenuga et al, 2015).

The triangulation theory of Lewis is a powerful technique that advocated the use of several diverse strategies for investigating a phenomenon with a view to developing a comprehensive

knowledge and understanding of that phenomenon to achieve validity in qualitative research (Guion, Dielh & McDonald, 2018; Ma & Norwich, 2007). Triangulation of data provides opportunity for cross checking data from different sources and search for regularity of their characteristics. Triangulation add richness and depth to research inquiring to promote a comprehensive understanding and balanced view of a phenomenon to capture its different dimensions and characteristics (Altrichter, Feldman, Posch & Somekh, 2008; O'Donoghue & Punch, 2003). Triangulation technique is best for evaluative studies in which data collected are aggregated before they are reviewed for a final analysis and conclusion (UNAIDS Monitory & Evaluation Series, 2010). Iterative triangulation employs systematic interactions between literature review, case evidence and intuition to examine constructs, conjectures and refine concepts of a phenomenon to strengthen its internal validity to enhance better result of understanding and application (Lewis, 1998).

The inequality-adjusted human development index (IHDI) identified the basic welfare needs of man which were the insignia of socio-economic development. These basic IHDI indicators were gross national income per capita, life expectancy or healthy living and educational attainment or literacy level. With a modification of the IHDI, the indicators of employment and poverty reduction, growth in gross domestic product and capital development were incorporated in the model. The conditions of the investment climate affect the economic and productive activities of a country to affect the economic development indicators.

Applying the modified neoclassical production function to our model, the IHDI economic development indicators formed the resultant output of the investment climate conditions as affected by the economic, social and institutional factors.

The application of the comprehensive investment climate and dynamic componential factor theory to the model, involves the identification of the most important primary and underlying determinants of the investment climate. These factors included, among others, access to private sector credit facility, infrastructural development, governance, political stability, security, economic planning and business regulations, external trade, unemployment, property rights and protection, corruption, natural environmental factors and their underlying factors. The dynamic componential factor theory was used to filter out the most significant primary investment climate and economic development factors from the set of multivariate factors affecting them.

In a multi-factors and latent relationship study such as investment climate and economic development, the use of triangulation technique involving diverse methods of investigating the same phenomenon, becomes imperative to explore the different dimensions of the phenomena under study. Thus the iterative triangulation technique was adopted to have a corroborative review of the collected, aggregated and analysed data of the investment climate to form a link and develop a comprehensive knowledge and understanding of the impact and transmission mechanism of the climate on the IHDI's economic development indices. This technique informed the use of quantitative co-integrated multiple linear regressions technique on primary investment climate determinants and qualitative discriminant explorative factor analysis. The co-integrated multiple linear regressions technique is best at establishing cause-effect relationship while the discriminant explorative factor analysis is a statistical tool that helps the researcher to understand better, the relationship between a dependent variable (economic development) and one or more independent variables (investment climate factors).

The impact of the investment climate determinants on the modified inequality-adjusted human development indices was critically evaluated to meet the objective of the study to provide policy guide and direction to economic managers and development planners of the Nigerian economy.

3.2 Model Specification

Investment climate and economic development are latent variables that have qualitative attributes. The measurement of qualitative variables is best performed through diverse observable variables, patterned into functional and structural equation modeling of simultaneous relationship between a set of dependent and independent variables (Cardenas-Garcia & Pulido-Fernandez, 2014). Structural equation modeling therefore permits the identification and interpretation of causal factors (independent variables) and their outcome (dependent variables) in a cause and effect relationship. Thus the specification of our model relates the investment climate factors (independent variables) to the productive outcome of economic development indicators (dependent variables). By discriminant factor analysis, both investment climate and economic development were disaggregated into their component parts for proper evaluation (Norris & Lecavalier, 2009; McLachlan, 2004). The disaggregation brought about the following primary determinants of the investment climate; private sector credit supply, trade facilitation, electricity supply, basic infrastructures, security and national economic plans. The

disaggregation of economic development brought out the modified IHDI indicators of gross national income per capita, life expectancy or healthy living, educational attainment or literacy level, employment and poverty reduction, growth in gross domestic product and capital development.

It is important to note that the productivity of firms constitute the major source of economic growth and full employment in an economy (Dollar, Hall-Driemeier & Mengistae, 2005). Investment climate determinants are inputs that affect the efficiency of the traditional factors of production to promote growth in productivity. The investment climate factors were incorporated in a modified neoclassical production function of firms as inputs (independent variables) while economic development indicators as output (dependent variables). The modified neoclassical production function permits the inclusion of social, economic and institutional factors in its analysis or model of growth because they have great impact on the state of technology of a nation which incidentally is the base of economic growth. The theoretical neoclassical production function as modified is stated below as:

$$Y = f(AK^{\alpha}_{1}L^{\alpha}_{2}M^{\alpha}_{3}F^{\alpha}_{4}). \quad 3.1$$

$$LnY = LnA + \alpha_1 LnK + \alpha_2 LnL + \alpha_3 LnM + \alpha_4 LnF + v_t \quad 3.2$$

Y = Total aggregate gross output

K = index of capital input

L = index of labour input

M= material inputs in total output

F = Variable affecting firm's decision

α_1= share of capital in total output

α_2= share of labour in total output

α_3= share of material inputs in total output

α_4= share of observed productivity shock on firm's decision in total output

v_t = Unobserved productivity shocks

Ln = Natural logarithms

A = index of aggregate state of technology called total factor productivity (TFP).

'A' is modeled as a function of the observed indicators of the investment climate impact and used to capture the effect of the investment climate determinants on the productivity of the firm. The primary investment climate determinants that can affect the value of 'A' are quality of infrastructure, access to finance, regulatory policies, security, economic planning, corruption, trade facilitation and others which affect the productivity of the firms in the same locality in varying degrees. If we are to capture the influence of the investment climate on productivity level then, we need to introduce the term 'A' into the production equation. 'A' was thus modeled as a function of the observable determinants of the investment climate in line with the submission of Suc, Vladusic and Bratko (2004). They declared that quantitative data abstraction from qualitative phenomena in modeling provides the best causal-effect relationship and interaction among qualitative variables. The general form of the models thus expressed the relationship between the investment climate (dependent variable) and investment climate intervening variables or determinants (independent variables) on one hand. On the other hand economic development indicators (dependent variables) were modeled to depend on the investment climate determinants (independent variables). When the investment climate determinants are efficient and used in conjunction with other efficient inputs in production, then exponential growth in output will occur to promote economic development.

Seven models were specified to incorporate the various factors that affect the state or conditions of the investment climate and the economic development.

Model 1

Model 1 explored and enumerated the prominent and the underlying factors of Nigeria's investment climate which affected her economic development. Since investment climate determinants significantly influence productivity the models expressed this relationship in two folds. The first examined the impact of the primary investment climate determinants on productivity growth while the second examined the impact of the underlying secondary and tertiary factors affecting the primary determinants themselves.

Model 1(a)

Model 1a examined the effect of primary investment climate determinants on productivity. The manufacturing sector's capacity utilisation is a good measuring index of the conditions of the investment climate of a country (Boccardo-Jessica, 2004). The capacity utilisation of Nigeria's

manufacturing sector was thus used as a proxy for investment climate condition in Nigeria (dependent variable) to which primary determining factors affinected.

Manufacturing capacity utilisation (MCAP) = *f* (investment climate determining variables).

INVC = *f* (PSCR, TRDF, ELEC, INFR, SECU, NDPL) 3.3

MCAP = *f* (INVC) 3.4

MCAP = *f* (PSCR, TRDF, ELEC, INFR, SECU, NDPL) 3.5

MCAP = $e_o + e_1PSCR + e_2TRDF + e_3ELEC + e_4INFR + e_5SECU + e_6NDPL + U_t$ 3.6

Equation 3.6 is transformed into Log linear form to have a finite proportionality of the relationship between the variables of the system to standardize their respective values to allow for ease of interpretation of their coefficients as elasticity (Amakom, 2006). Log linear coefficient measures the unit impact of the independent variable on the dependent variable and thus conforms to the OLS assumptions of efficiency of linear parameters.

MCAP = $e_o + e_1 LnPSCR + e_2 LnTRDF + e_3 LnELEC + e_4 LnINFR + e_5 LnSECU + e_6 LnNDPL + U_t$ 3.7

Apriori expectation; $e_1, e_2, e_3, e_4, e_5, e_6 > 0$

MCAP = Manufacturing sector capacity utilisation rate is used as a proxy for the state or condition of the investment climate. When the state or condition of the investment climate is good and friendly, manufacturing sector's capacity utilisation will expand but when bad and hostile it will shrink and contract. All the investment climate variables are expected to be directly related to the condition of the investment climate or manufacturing sector's capacity utilisation.

PSCR = Credit supply to the private sector for investment by commercial banks in Nigeria. Private sector credit supply is used as proxy for financial development of the economy.

TRDF = Trade facilitation is the rate at which exports are loaded and imports discharged in Nigeria ports. It is used as a proxy for institutional and ports efficiency in promoting external trade and investment. High trade facilitation index depicts institutional efficiency.

ELEC = Electric power supply infrastructure (Megawatts) for production and consumption

activities in Nigeria. It captured the amount of power generated to drive the economy.

INFR = Infrastructures in the economy used for production. The annual net capital budget of the Federal Government of Nigeria was used as proxy for infrastructural development. Net capital budget is the capital vote that is actually available for infrastructural development to implementing the economic reform programme of government to improve the condition of the investment climate.

SECU = The state of security in Nigeria proxy by a dummy variable. A period of stable government, stable socio-political and economic activities is captured by a dummy variable that takes the value of one (1) while a period of social, political, ethnic, religious tension/ violence, insurgencies, civil war, military coup, other significant security challenges are capture by a dummy variable that takes the value of zero (0)

NDPL = National economic development plans are the economic plans of the government of Nigeria meant to bring about economic development through reform programmes in the investment climate. Dummy variable was used to proxy economic plans. The period of planning takes the dummy value of one (1) while the period of no national plans takes the value of zero (0).

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

$e_0, e_1, e_2, \ldots e_6$ = Parameters of the model

Model 1(b) : Secondary and Tertiary factors affecting Nigeria's investment climate

Model 1(b) involves the use of the discriminant explorative factor analysis to explore the secondary or underlying factors affecting the primary investment climate determinants in Nigeria's. This will provide deeper understanding and qualitative information about each primary investment climate determinants

(i) Private Sector Credit Supply (PSCR)

PSCR = *f* (SAVE, INTR, CMKT, LOAN, RPAY) 3.8

PSCR = $k_0 + k_1SAVE + k_2INTR + k_3CMKT + k_4LOAN + k_5RPAY + U_t$ 3.9

Transforming equation 3.9 into log linear form to have a finite proportionality coefficient measurement of the unit impact of the independent variables on the dependent variable as:

LnPSCR = $k_0 + k_1$LnSAVE + k_2LnINTR + k_3LnCMKT + k_4LnLOAN + k_5LnRPAY +U_t 10

Apriori expectation; $k_1, k_3, k_4, k_5, e_6 > 0$; $k_2 < 0$

Where**:**

PSCR = Credit supply to the private sector for investment by commercial banks in Nigeria. Private sector credit supply is used as proxy for financial development.

SAVE = Level and habit of savings in Nigeria.

INTR = Lending or interest rate charged by commercial banks on loans given out.

CMKT = Capital market development in Nigeria

LOAN = Number of persons granted loans for economic activities by the commercial banks in Nigeria

RPAY= Repayment period of loan granted by commercial banks or credit institutions in Nigeria.

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

$k_0, k_1, k_2, \ldots k_5$ = Parameters of the model

(ii) Trade Facilitation (TRDF)

TRDF = *f* (PFAC, PMGT, DEMU, PSEC, DUTY, CORR, EXCR) 3.11

TRDF = $m_0 + m_1$PFAC +m_2PMGT +m_3DEMU +m_4PSEC +m_5DUTY + m_6CORR + m_7EXCR + U_t 3.12

Transforming equation 3.12 into log linear form to have a finite proportionality coefficient measurement of the unit impact of the independent variables on the dependent variable as:

LnTRDF = m_0 **+** m_1LnPFAC +m_2LnPMGT +m_3LnDEMU +m_4LnPSEC +m_5LnDUTY +m_6LnCORR +m_7LnEXCR +U_t 3.13

Apriori expectation; $m_1, m_2, m_4 > 0$; $m_3, m_5, m_6, m_7 < 0$

Where:

TRDF = Trade facilitation. The rate at which exports are loaded and imports discharged at the

Nigerian ports. It is used as a proxy for institutional and ports efficiency in promoting international trade and investment. High trade facilitation index depicts institutional efficiency.

PFAC = Sea and airports facilities in Nigeria. Sea-port facilities includes harbor for ship berthing, cranes for loading and off-loading, storage tanks/silos for cargos, good access routes to the ports while airport facilities include better aerodrome/hangar for parking by aircrafts, better storage facilities, security check/alarm system and others.

PMGT = Ports management. This involves efficient sea and airport administration, efficient clearing and forwarding system to promote international trade and investment.

DEMU = Demurrage and airport charges. The fee charged per day on ship for berthing in the harbor before loading or off-loading of goods as well as the landing, parking and hangar fees paid by aircrafts.

PSEC = Ports and airport security against theft of goods.

DUTY = Import and export duties imposed by government.

CORR = Corruption or transparency level of regulatory or monitoring agents of economic and business activities.

EXCR = Exchange rate of Nigerian naira to the US dollar.

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

$m_0, m_1, m_2, \ldots m_7$ = Parameters of the model

(iii) Electric Power Supply (ELEC)

ELEC = f (GASS, WTER, DEST, LOAD, EPOL, FAUT, CORR) 3.14

$$\textbf{ELEC} = p_0 + p_1GASS + p_2WTER + p_3DEST + p_4LOAD + p_5EPOL + p_6FAUT + p_7CORR + U_t \quad 3.15$$

By transforming equation 3.15 into log linear form to have a finite proportional coefficient measurement of the unit impact of the independent variables on the dependent variable we have:

$$\textbf{LnELEC} = p_0 + p_1LnGASS + p_2LnWTER + p_3LnDEST + p_4LnLOAD + p_5LnEPOL + p_6LnFAUT + p_7LnCORR + U_t \quad 3.16$$

Apriori expectation; $p_1, p_2, p_5, p_6 > 0$; $p_3, p_4\ p_7 < 0$

Where:

ELEC = Electric power supply infrastructure (Megawatts) for production and consumption activities in Nigeria. It captured the amount of power generated to drive the economy.

GASS = Gas supply to electricity generating stations.

WTER = Water level of rivers Niger, Shiroro and others that drives the turbines in dams to generate electricity in Nigeria.

DEST = Destruction, vandalisation and theft of electricity generating/supply equipment and installations by man and nature.

LOAD = Overloading of electricity supply transmitters and transformers leading to trip offs, load shedding and blackouts.

EPOL = Energy supply policy of government.

CORR = Corruption of and lack of transparency on the part of officials charged with the responsibility of generating and supplying of electricity power to the economy.

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

$p_0, p_1, p_2, \ldots p_7$ = Parameters of the model

(iv). Infrastructures (INFR)

INFR = f (TRAN, HEDU, INFP, CAPB) 3.17

$$\textbf{INFR} = q_0 + q_1 TRAN + q_2 HEDU + q_3 INFP + q_4 CAPB + U_t \quad 3.18$$

Transforming equation 3.18 into log linear form to have a finite proportionality coefficient measurement of the unit impact of the independent variables on the dependent variable as:

$$\textbf{LnINFR} = q_0 + q_1 LnTRAN + q_2 LnHEDU + q_3 LnINFP + q_4 LnCAPB + U_t \quad 3.19$$

Apriori expectation; $q_1 \ldots q_4 > 0$

Where:

INFR = Other infrastructural provision in the economy used for production. The annual net capital budget of the Federal Government of Nigeria was used as proxy for infrastructural development. Net capital budget is the capital vote that is actually available for infrastructural development to implementing the economic reform programme of government to improve the condition of the investment climate.

TRAN = Transport facilities such as roads, rail network, sea and airport facilities

HEDU = Health and education facilities for quality manpower supply.

INFP = Infrastructural development policy of government for the country.

CAPB = Capital budgeting for Nigeria.

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

$q_0, q_1, q_2, \ldots q_5$ = Parameters of the model

(iva) Transport infrastructure (TRAN)

TRAN = f (ROAD, RAIL, PORT) 3.20

TRAN = $t_0 + t_1ROAD + t_2RAIL + t_3PORT + U_t$ 3.21

Transforming equation 3.21 into log linear form to have a finite proportionality coefficient measurement of the unit impact of the independent variables on the dependent variable as:

LnTRAN = $t_0 + t_1LnROAD + t_2LnRAIL + t_3LnPORT + U_t$ 3.22

Apriori expectation; $t_1, t_2, t_3 > 0$

Where:

TRAN = Transport system and network in Nigeria.

ROAD = Road network

RAIL = Rail network.

PORT = Sea and Airport facilities.

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

$t_0, t_1 \ldots p_3$ = Parameters of the model

(ivb) Health and Education Facilities (HEDU)

HEDU = f (HFAC, EDUF, GOHP, GOEP) 3.23

HEDU = $l_0 + l_1HFAC + l_2EDUF + l_3GOHP + l_4GOEP + U_t$ 3.24

Transforming equation 3.24 into log linear form to have a finite proportionality coefficient measurement of the unit impact of the independent variables on the dependent variable as:

LnHEDU = $l_0 + l_1LnHFAC + l_2LnEDUF + l_3LnGOHP + l_4LnGOEP + U_t$ 3.25

Apriori expectation; $l_1, l_2, l_3 l_4 > 0$

Where:

HEDU = Health and educational infrastructure in Nigeria.

HFAC = Health facilities such as health centres, hospital buildings, diagnostic and treatment equipment

EDUF = Educational facilities such as classrooms, lecture halls, library, laboratory equipment and other learning equipment/resources in schools or educational centres.

GOHP = Government's health treatment policy and management programmes involving the provision of skilled medical specialists and personnel for tackling health problems to promote longevity.

GOEP = Government's educational policy to promote research and manpower development.

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

$l_0, l_1 \ldots l_4$ = Parameters of the model

(ivc) Infrastructural development policy (INFP)

INFP = f (GPOL, PMAN, FUND) 3.26

INFP = $u_0 + u_1GPOL + u_2PMAN + u_3FUND + U_t$ 3.27

Transforming equation 3.27 into log linear form to have a finite proportionality coefficient measurement of the unit impact of the independent variables on the dependent variable as:

LnINFP = $u_0 + u_1LnGPOL + u_2LnPMAN + u_3LnFUND + U_t$ 3.28

Apriori expectation; $u_1, u_2, u_3 > 0$

Where:

INFP = Infrastructural development planning policy of government for the country**.**

GPOL = Government's infrastructural development policy for promoting economic development.

PMAN = Political party manifestoes of the government in power.

FUND = Funding of infrastructural budgets and amount made available by the government.

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

$u_0, u_1 \ldots u_3$ = Parameters of the model

(ivd) Capital Budgeting for Nigeria (CAPB)

CAPB = *f* (GOBJ, GREV, REXP) 3.29

CAPB = $i_0 + i_1GOBJ + i_2FGTR + i_3REXP + U_t$ 3.30

We transform equation 3.30 into log linear form to have a finite proportionate coefficient measurement of the unit impact of the independent variables on the dependent variable as:

LnCAPB = $i_0 + i_1$ LnGOBJ + i_2LnGREV + i_3LnREXP + U_t 3.31

Apriori expectation; $i_1, i_2 > 0$; $i_3 < 0$

Where:

CAPB = Capital budgeting for Nigeria annually.

GOBJ = Government's economic objective for an annual budget period.

GREV= Federal government's total revenue available to it for the annual budget of Nigeria.

REXP= Size of federal government recurrent expenditure in the annual budget of Nigeria

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

$i_0, i_1 \ldots i_3$ = Parameters of the model

(v) Security (SECU)

SECU = *f* (UNEM, UDEP, CULT, PRIV, RFAN, PBOD, SJUC) 3.32

SECU = $s_0 + s_1UNEM + s_2UDEP + s_3CULT + s_4DRUG + s_5PRIV + s_6RFAN + s_7PBOD +$

$+ s_8SJUC + U_t$ 3.33

Transforming equation 3.33 into log linear form to have a finite proportionality coefficient measurement of the unit impact of the independent variables on the dependent variable as:

LnSECU = $s_0 + s_1LnUNEM + s_2LnUDEP + s_3LnCULT + s_4LnDRUG + s_5LnPRIV + s_6LnRFAN$

$+ s_7LnPBOD + s_8LnSJUC + U_t$ 3.34

Apriori expectation; $s_{1\ldots\ldots} s_8 < 0$

Where:

SECU= State of security in Nigeria.

UNEM= Unemployment rate in Nigeria

UDEP= Unbalanced development policy of the government of Nigeria.

CULT= Cultism vice which is prevalent among youths to commit violent criminal acts.

DRUG= Drug abuse and addict which encourage high profile criminality leading to the use of

dangerous weapons.

PRIV= Political rivalry leading to thuggery and assassination of opponents.

RFAN= Religious fanaticism leading to frequent upheavals.

PBOD= Porous border that permits influx of criminals and mercenaries.

SJUC= Slow judicial process.

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

s_0, $s_1 \ldots s_8$ = Parameters of the model

(vi) National Economic Development Plans (NDPL)

NDPL = f (GPOL, LEAD, IMPL, DATA, PLAN) 3.35

NDPL = $n_0 + n_1GPOL + n_2LEAD + n_3IMPL + n_4DATA + n_5PLAN + U_t$ 3.36

Transforming equation 3.36 into log linear form to have a finite proportionality coefficient measurement of the unit impact of the independent variables on the dependent variable as:

LnNDPL = $n_0 + n_1LnGPOL + n_2LnLEAD + n_3LnIMPL + n_4LnDATA + n_5LnPLAN + U_t$ 3.37

Apriori expectation; $n_{1.....} n_5 > 0$

Where:

GPOL= Government's development policies

LEAD= Change in leadership of government and effect on the continuity of previous initiated economic programmes

IMPL= Implementation rate of projects and development programmes by government.

DATA= Data for economic and social planning.

PLAN= Planning style such as bottom-top, top-bottom, inclusive and exclusive.

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

n_0, $n_1 \ldots n_5$ = Parameters of the model

Model 2

Model 2 explained the effect of exogenous and endogenous factors of the investment climate (independent variables) on the growth of real gross domestic product (GDPG) (dependent variable).

Economic growth = f (investment climate intervening variables)

GDPG = f (INVC) 3.38

INVC = f (PSCR, TRDF, ELEC, INFR, SECU, NDPL) 3.39

GDPG = f (PSCR, TRDF, ELEC, INFR, SECU, NDPL) 3.40

GDPG = $a_o + a_1PSCR + a_2TRDF + a_3ELEC + a_4INFR + a_5SECU + a_6NDPL + U_t$ 3.41

Equation 3.41 is transformed into Log linear form to have a finite proportionality of the relationship between the variables of the system to standardize their respective values to allow for ease of interpretation of their coefficients as elasticity (Amakom, 2006). Log linear coefficient measures the unit impact of the independent variable on the dependent variable and thus conforms to the OLS assumptions of efficiency of linear parameters.

LnGDPG = $a_o + a_1 LnPSCR + a_2 LnTRDF + a_3 LnELEC + a_4 LnINFR + a_5 LnSECU + a_6 LnNDPL + U_t$ 3.42

Apriori expectation; $a_1, a_2, a_3, a_4, a_5, a_6 > 0$

GDPG = Real gross domestic product growth was used as a proxy for economic growth. It measured the growth in aggregate economic activity over the period of study and the effect on economic development indicators.

PSCR = Private sector credit supply for investment by commercial banks in Nigeria. Private sector credit supply is used as proxy for financial development.

TRDF = Trade facilitation is the rate at which exports are loaded and imports discharged in Nigeria ports. It is used as a proxy for institutional and ports efficiency in promoting external trade and investment. High trade facilitation index depicts institutional efficiency.

ELEC = Electric power supply infrastructure (Megawatts) for production and consumption activities in Nigeria. It captured the amount of power generated to drive the economy.

INFR = Other infrastructures in the economy for production. The annual net capital budget of the Federal Government of Nigeria was used as proxy for infrastructural development.Net capital budget is the capital vote that is actually available for infrastructural development to implementing the economic reform programme of government to improve the condition of the investment climate.

SECU = The state of security in Nigeria proxy by a dummy variable. A period of stable government, stable socio-political and economic activities is captured by a dummy variable that takes the value of one (1) while a period of social, political, ethnic, religious tension/ violence, insurgencies, civil war, military coup, other significant security challenges are capture by a dummy variable that takes the value of zero (0).

NDPL = National economic development plans are the economic plans of the government of Nigeria meant to bring about economic development through reform programmes in the investment climate. Dummy variable was used to proxy economic plans. The period of planning takes the dummy value of one (1) while the period of no national plan takes the value of zero (0).

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

$a_0, a_1, a_2 \ldots a_6$ = Parameters of the model

Model 3

Relating the investment climate variables to each of the economic development indicators we have the following equations:

Economic development indicators = *f* (Economic growth and investment climate intervening variables)

ECODEV = *f* (GDPG, INVC). 3.43

(GDPCAP, LIFE, EDUC, EMPL) =*f* (GDPG, PSCR, TRDF, ELEC, INFR, SECU, NDPL) 3.44

Model 3 expressed the relationship between growth in gross national per capita income (GNICAP) (dependent variable) and economic growth as well as the intervening factors of the investment climate (independent variables).

GNICAP = *f* (GDPG, INVC) 3.45

GNICAP = *f* (GDPG, PSCR, TRDF, ELEC, INFR, SECU, NDPL) 3.46

$$\textbf{GNICAP} = g_o + g_1\,GDPG + g_2\,PSCR + g_3 TRDF + g_4 ELEC + g_5 INFR + g_6 SECU + g_7 NDPL + U_t \quad 3.47$$

Transforming equation 3.47 into log linear form:

$$\textbf{LnGNICAP} = g_o + g_1\,LnGDPG + g_2\,LnPSCR + g_3\,LnTRDF + g_4\,LnELEC + g_5\,LnINFR$$

$$+ g_6 \, LnSECU + g_7 \, LnNDPL + U_t \quad 3.48$$

Apriori expectation; $g_1, g_2, g_3, g_4, g_5, g_6, g_7 > 0$

GNICAP = Real per capita income growth used as a proxy for measuring standard of living and economic development

GDPG, PSCR, TRDF, ELEC, INFR, SECU, NDPL, Ln and U_t remain as explained in model

$g_0, g_1, g_2 \ldots g_7$ = Parameters of the model.

Model 4

Model 4 relates the effect of investment climate intervening variables and economic growth on life expectancy at birth or longevity.

$$LIFE = f \, (GDPG, INVC). \quad 3.49$$

$$LIFE = f \, (GDPG, PSCR, TRDF, ELEC, INFR, SECU, NDPL) \quad 3.50$$

$$\textbf{LIFE} = b_o + b_1 \, GDPG + b_2 \, PSCR + b_3 TRDF + b_4 ELEC + b_5 INFR + b_6 SECU + b_7 NDPL + U_t \quad 3.51$$

Transforming equation 3.51 into log linear form:

$$\textbf{LnLIFE} = b_o + b_1 \, LnGDPG + b_2 \, LnPSCR + b_3 \, LnTRDF + b_4 \, LnELEC + b_5 \, LnINFR + b_6 \, LnSECU + b_7 \, LnNDPL + U_t \quad 3.52$$

Apriori expectation; $b_1, b_2, b_3, b_4, b_5, b_6, b_7 > 0$

Where:

LIFE = Life expectancy at birth is a measure of the health care standard that promotes the longevity of an individual.

GDPG, PSCR, TRDF, ELEC, INFR, SECU, NDPL, Ln and U_t remain as explained in model 2

$b_0, b_1, b_2 \ldots b_7$ = Parameters of the model.

Model 5

Model 5 relates the effect of investment climate intervening variables and economic growth on educational attainment or literacy level.

$$EDUC = f \, (GDPG, INVC). \quad 3.53$$

$$EDUC = f \, (GDPG, PSCR, TRDF, ELEC, INFR, SECU, NDPL) \quad 3.54$$

$$\textbf{EDUC} = d_o + d_1 \, GDPG + d_2 \, PSCR + d_3 TRDF + d_4 ELEC + d_5 INFR + d_6 SECU + d_7 NDPL + U_t \quad 3.55$$

Transforming equation 3.55 into log linear form:

$$\textbf{LnEDUC} = d_o + d_1 \, LnGDPG + d_2 \, LnPSCR + d_3 \, LnTRDF + d_4 \, LnELEC + d_5 \, LnINFR + d_6 \, LnSECU + d_7 \, LnNDPL + U_t \quad 3.56$$

Apriori expectation; $d_1, d_2, d_3, d_4, d_5, d_6, d_7 > 0$

EDUC = Education or literacy level attained which is measured by the basic knowledge level acquired from formal school system for vocational skills and self development.

The total number of graduates from primary, secondary and tertiary schools was used to proxy education.

GDPG, PSCR, TRDF, ELEC, INFR, SECU, NDPL, Ln and U_t remain as explained in model 2

$d_0, d_1, d_2 \ldots d_7$ = Parameters of the model.

Model 6

This model relates the effect of investment climate intervening variables and economic development on employment level in the economy.

EMPL = *f* (GDPG, INVC). 3.57

EMPL = *f* (GDPG, PSCR, TRDF, ELEC, INFR, SECU, NDPL) 3.58

$$\textbf{EMPL} = h_o + h_1 \, GDPG + h_2 \, PSCR + h_3 TRDF + h_4 ELEC + h_5 INFR + h_6 SECU + h_7 NDPL + U_t \quad 3.59$$

Transforming equation 3.29 into log linear form:

$$\textbf{EMPL} = h_o + h_1 \, LnGDPG + h_2 \, LnPSCR + h_3 \, LnTRDF + h_4 \, LnELEC + h_5 \, LnINFR + h_6 \, LnSECU + h_7 \, LnNDPL + U_t \quad 3.60$$

Apriori expectation; $h_1, h_2, h_3, h_4, h_5, h_6, h_7 > 0$

EMPL = Employment rate of the labour force in the economy. It depicts the number of persons in the labour force that are gainfully employed in productive activities in the economy. It was measured by subtracting the percentage of unemployed from a hundred percent (100%).

GDPG, PSCR, TRDF, ELECT, INFR, SECU, NDPL, Ln and U_t remain as explained in model 2

$h_0, h_1, h_2 \ldots h_7$ = Parameters of the model.

Model 7

This model relates the state of capital development as affected by the investment climate factors on economic development in Nigeria.

Capital development =*f*(economic growth, investment climate and marginal capital efficiency)

$$CAPD = f\ (GPOL, FDIN, DINV, INT, CMKT, PSCR, OPIC). \quad 3.61$$

$$CAPD = r_o + r_1GPOL + r_2\,FDIN + r_3DINV + r_4INTR + r_5CMKT + r_6PSCR + r_7OPIC + U_t \quad 3.62$$

Transforming equation 3.62 into log linear form:

$$CAPD = r_o + r\ LnGPOL + r_2LnFDIN + r_3LnDINV + r_4LnINTR + r_5LnCMKT + r_6LnPSCR + r_7LnOPIC + U_t \quad 3.63$$

Apriori expectation; $r_1 \ldots r_3, r_7 > 0$; $r_4 < 0$

Where:

CAPD = Capital development in Nigeria

GPOL = Government's investment policy on capital development.

FDIN = Foreign direct investment flow to Nigeria.

DINV = Domestic investment.

INTR= Interest rate or lending rate charged by commercial bank.

CMKT= Capital market development in Nigeria.

PSCR = Private sector credit supply (financial development)

OPIC = Other primary and underlying investment climate factors that affected model 1.

U_t = White noise random error term or stochastic error term.

Ln = Natural logarithms

r_0, $r_1 \ldots r_5$ = Parameters of the model

3.3 Explanation of Variables

i. Measurement of the Relationship between Investment Climate and Economic Development

Investment climate is the bridge between firms' interest to invest and a country's interest to develop. Thus a sound investment climate promotes economic development and it is characterised by improved institutions and social stability of the firms' operation (Meseko, 2015). Investment climate is central to economic growth and poverty reduction as it is an efficiency booster of the factors of production that increase the value of productivity (World

Bank, 2005). Empirical evidences from studies showed that there is a positive relationship between sound and friendly investment climate and economic growth (Dollar, Hallward-Driemeier and Mengistae, 2005). Essentially investment climate intervening variables and their underlying factors impact on the production system of an economy to improve and promote the level of productivity and development. In other words the intervening factors of the investment climate impact on the efficiency of the production system, often captured by the total factor productivity variable. Investment climate and economic development variables are latent or qualitative variables whose measurement is best performed through diverse observable variables patterned into functional and structural equation modeling of simultaneous relationship between a set of the dependent and independent variables (Cardenas-Garcia & Pulido -Fernandez, 2014). In this regard quantitative abstraction of qualitative phenomena can be used to model a linear relationship which can be estimated to determine impact (Suc, Vladusic and Bratko, 2004).

ii. Measurement of Economic Development

Economic development involves quantitative and qualitative measurement of the economic and social wellbeing of a nation. Economic growth is an important aspect of economic development as it provides goods and services to improve the living conditions of the population, provide employment, income and increase government revenue through payment of taxes used in financing education and health programmes (Cardenas-Garcia & Pulido -Fernandez, 2014). The best means of improving the living standard of the people, particularly the poor, is to provide them with jobs to earn income to increase their consumption potentials. For this reason, economic growth is often considered to be a means to an end of human development and not the end itself. The World Bank had recommended a minimum of 5% growth rate for an economy to significantly promote all round human development (Jhingan, 2005).

Economic development is said to occur when there is increase in the gross national per capita income, level of literacy and education, life expectancy, availability of quality housing, improved sanitation and environmental standards and decline in the level of poverty (Agarwal, 2017). There are thus a variety of indicators or criteria commonly used by economists to measure economic development. Over the years, national per capita income has been the traditional measuring yardstick of economic development, but in modern times, there had been a shift to incorporating new indices. These new indices are those that affect the personal living conditions

of the people in both economic and social life (Kumar and Sharma, 2014). Three main indices of measurement have been adopted and popularized. These are the physical quality of life index (PQLI), the social accounting matrix (SAM) and the human development index (HDI) (UNDP, 1990). The three tend to measure among others, growth in real gross national income (GNP), decline in rate of unemployment and poverty, increase in rate of literacy (better schooling, educational expansion and opportunity), decline in rate of infant mortality and increase in level of life expectancy through improved health care, increase in consumption of real goods and services, provision of adequate food, shelter, sanitation and others. In practice, economic development has been assessed using the tripod dimensional factors as gross national per capita income (standard of living), healthy living for longevity (life expectancy) and educational acquisition (literacy level) (Ogah, 2014). These three indicators formed the basis of Norman Hicks and Paul Streeten's basic needs approach to measuring economic development in 1979 and which the United Nations Development Programme (UNDP) used to develop the human development index (HDI) in 1990. The human development index is a measure of national socio-economic development and human capabilities based on the measures of life expectancy at birth, educational attainment or literacy level and real national per capita income (Todaro and Smith, 2005). In 2010, based on Amartya Sen's work on human capabilities, the UNDP introduced a new improved index known as inequality-adjusted human development index (IHDI). IHDI is a composite measurement of the increase in gross national per capita income (valued at the purchasing power parity of the US$ (PPP$) which measures the standard of living (level of per capita consumption and nutrition), life expectancy or longevity (improved sanitation and health standards) and educational attainment (level of schooling and basic literacy of the people) (UNDP, 2016). The new metric incorporates adjustments of gross national per capita income and other developmental variables to the different local conditions prevailing in each country or region to capture the exact human development level attained as against the potential development measurement of HDI.

In computing national per capita income index, the natural logarithms of the difference between the current national per capita income (eg ₦7000) and the anticipated lowest reasonable per capita income of the country (eg ₦2000) is divided by the natural logarithms of the difference between the anticipated maximum reasonable per capita income which the country aspire to have

for the coming generation (eg ₦30000) and the anticipated lowest reasonable per capita income. (log 7000 – log 2000)/ (log 30000 – log 2000) = 0.572 point on a scale of 0-1.

Life expectancy measures the overall quality of life of the people in a country and summarises the mortality rate at all ages. In computing life expectancy index, the difference between the current population life expectancy years (eg 70years) and the anticipated minimum reasonable life expectancy years (eg 20years) is divided by the difference between the anticipated maximum reasonable life expectancy years (eg 80years) and the anticipated minimum reasonable life expectancy years. (70-20/80-20) = 0.8333point.

Education index measures the adult literacy level and the number of graduates from schools from primary to tertiary. It measures the basic educational attainment of persons of school age. Adult literacy index is the percentage of the total adult population that is literate (eg 75% or 0.75) while gross enrolment index is the percentage of school age population that is enrolled in primary, secondary and tertiary schools (eg 85% or 0.85). Poverty, poor funding of education by government, cultural factors (diverse dialects, agricultural orientation of rural activities, value place on education), poor rural development, educational facilities for rural dwellers, limit literacy level or educational opportunity via poor gross enrolment in schools in Nigeria (Wang, 1995).

A single IHDI value is made up of the average of the three metrics of longevity or life expectancy index, knowledge or education index and Standard of living or real national per capita income index.

IHDI = $^{1}/_{3}$(life index + education index + real per capita income index).

The range of measurement of IHDI is from 0 → 1. Countries of the world had been ranked on the nominal scale as 0.10 - 0.499 (low), 0.50 - 0.799 (medium) and 0.80 - 1.0 (high).

From the above discussion every effort at enhancing economic development was focused at improving these social development indices by examining the underlying factors that affect their rate of growth.

Generally a good development indicator is characterized by policy relevance, simplicity, validity, availability of time series data, ability of aggregate information, sensitivity and reliability of information. In addition to this, scientific measurement is required to satisfy the criterion of validity which a good development indicator should possessed (Haggart, 2000).

The used of gross domestic product (GDP) as base for measuring per capita income or standard of living had been highly criticized. However, despite the numerous criticisms, it still has some clear advantages of contributing to the measurement of the state of welfare of the individual in terms of literacy, health care, investment and employment which accompany its growth. GDP is an objective measure of economic growth which can be used as a proxy for social welfare measurement (Morris, 2015). The use of real gross national per capita income (GNICAP) is much appealing and relevant to economists for measuring development because it is a good proxy for average consumption possibilities in an economy that can reflect the welfare of the individuals (Zielonygrzyb, 2012).

(iii) Measurement of Investment Climate

Investment climate is rather a qualitative phenomenon that affects growth in productivity through its contribution to factor efficiency in production. Investment climate is essentially a factor-efficiency promoter and thus imperative to capture these factors from both within (endogenous) and outside (exogenous) the firm's control in a structural relationship model. In this regard quantitative abstraction of qualitative phenomena was obtained and used to model a cause-effect relationship (Suc, Vladusic and Bratko, 2004). Factor efficiency can be promoted through innovation and improved technology as captured by the total factor productivity (TFP) metric. Total factor productivity is a multi-factors variable which accounts for the residue of total output (Solow's residue) that is not attributed to or explained by the traditional measurable inputs (capital and labour) in the production system. The value of total factor productivity maximizes when each factor of production operates at its best level or capacity to increase output.

Total factor productivity is measured by the popular technique of Joseph Fourier dimensional growth accounting analysis which uses the standard Cob-Douglas production function. The accounting relation used the quantity and prices of capital and labour used in production in an economy annually and then apply divisa indexing (Hulten, 2001). This technique separates the growth in real output into two components of output or productivity (Y) and inputs capital and

labour (K, L). It then establishes a relationship between the different physical quantity and their fundamental dimensions or contribution in the total output for real value costing to determine the relative share of the respective inputs from the output.

$Y= AK^{\alpha}L^{\beta}$ 3.64

$\alpha+\beta = 1$

Y = Total aggregate output

K = index of capital input

L = index of labour input

α = share of capital in total output

β = share of labour in total output

A = index of aggregate state of technology called total factor productivity (TFP)

Y, K, L are independently measured while A, α, β are statistical estimations. A, the TFP, is not a pure number hence it carries no interesting information on itself. Changes in A will result in a shift in the relation between quantitatively measured aggregate inputs (K, L) and outputs (Y) of the aggregate function. Thus the changes in these inputs and outputs are assumed to be caused by changes in technology or efficiency in the scale of operation of the firms (Carlaw & Lipsey, 2000). Technological changes make the unmeasured input (TFP) (which is not modeled in measurable unit) to raise output (Y) without raising measured costs of inputs K and L (Griliches, 1994). This scenario implied that technological change increases the efficiency of an unmeasured input (TFP) and often showed up as an increase in the quantity of other measured inputs (K & L) to leave the TFP understated. This is why change in total factor productivity (TFP) is not regarded as a measure of technological change but a measure of its efficiency. Growth in total factor productivity, though difficult to quantify with precision, can give insight as to how changes in investment climate over time affects the economy (Nwogwugwu & Onwuka, 2012). Total factor productivity helps to differentiate between the notion of investment climate and the stock or quantities of investment.

With given measures of physical inputs of labour and capital and the application of divisia index of inputs (which measures the percentage change in each input weighted by its relative share in input costs), we can obtain the relative share of capital α and labour β in total output (Y) (Griliches, 1994)

$Y = \alpha rK + \beta wL$ 3.65

$\alpha. = \frac{rK}{Y}$, $\beta = \frac{wL}{Y}$, w = wages paid to labour, r = real rental rate of capital

$$\frac{Y}{Y} = \frac{rK}{Y} + \frac{wL}{Y} = \frac{rK}{Y} + \frac{wL}{Y} = 1 \quad \text{(Euler theory)} \qquad 3.66$$

Assigning value to output and input for dimensional homogeneity condition;

Y = PQ (unit price multiplied by quantity of output), $K^{\alpha}L^{\beta} = rK^{\alpha} + wL^{\beta}$ (wage rate price of labour multiplied by relative quantity share of labour in total output and interest rate price of capital multiplied by relative quantity share of capital in total output). Applying the same metric to value the output and inputs and substituting into equation.

$$A = \frac{Y}{K^{\alpha}L^{\beta}} = \frac{PQ}{rK^{\alpha}wL^{\beta}} \qquad 3.67$$

iv. Measurement of Capital Development and Efficiency

Capital-output ratio (COR) and incremental capital-output ratio (ICOR) are used to measure capital development and efficiency respectively**.** Capital-output ratio measures the availability of capital to the economy for growth in productivity while incremental capital-output ratio ICOR provides a measure of the efficiency of the additional capital used in production from period to period.

The computation of capital output ratio and the annual incremental capital-output ratio enable us to evaluate the trend of capital development and efficiency in Nigeria over the years. The measurement is given by the following formulations:

$$COR = \frac{K}{Y_k} = \qquad 3.68$$

When $COR_t > COR_{t-1}$ = capital development

When $COR_t < COR_{t-1}$ = capital underdevelopment

$$ICOR = \frac{\Delta K}{\Delta Y_k} = \frac{(K_t - K_{t-1})}{(Y_{kt} - Y_{kt-1})} \qquad 3.69$$

$$ICOR = \frac{\text{Annual increment in capital}}{\text{Annual increment in GDPG}} = \frac{(\text{Annual increment of FDI} + \text{Annual increment of GCF})}{\text{Annual increment in } GDP_k}$$

$$ICOR = \frac{\Delta FDI + \Delta GCF}{\Delta GDP_k} \qquad 3.70$$

K = capital

Y_k = Output or GDP_k

t = present or current time period

t_{-1} = previous or immediate past period

Δ = change

FDI = foreign direct investment,

GCF = Gross capital formation or domestic investment

GDP_k = Gross domestic product attributed to capital invested used as proxy for economic growth due to capital.

$ICOR_t$ = current year or 2nd period

$ICOR_{t-1}$ = previous year or 1st period

When $ICOR_t < ICOR_{t-1}$ = Investment climate is efficient; $\delta K/\delta Y_k < 0$

$ICOR_t > ICOR_{t-1}$ = Investment climate is inefficient; $\delta K/\delta Y_k > 0$

A lower ICOR value is more preferable to a higher one because it shows that the country's production entity is efficient. For instance, suppose that Country X has an ICOR of 10 this year ($ICOR_t$) implies that ₦10 worth of capital investment is necessary to generate ₦1 worth of extra production. If given that country X's ICOR for last year ($ICOR_{t-1}$) was 12, implies that Country X has become more efficient this year in its use of capital than last year. This means that less unit of capital is required this year than last year to produce a unit of output. The increase in the marginal efficiency of capital can be attributed to improvement in investment climate (Jacabsohn, 2015). If the present ICOR value (t_1) is smaller or a minimum compared to its immediate past value (t_{-1}), then the investment climate is capital efficient but if the present ICOR value (t_1) is greater or a maximum compared to the previous value (t_{-1}) then it is capital inefficient.

Capital-output ratio is used to determine the units of capital required to produce a unit of output in an economy. It is often based on dividing total investment capital by the total value of output (K/Y). But this could be misleading given the fact that total output (Q) is a function of both capital (K) and labour (L): $Q = AK^{\alpha}L^{\beta.}$ It will be reasonable to base capital-output ratio on the productivity of capital alone and not on the total productivity of capital and labour (Jose, 2016). Thus the proportion of real gross domestic product of Nigeria which was attributed to the

contribution of capital was used as the denominator of capital-output ratio or its derivative of incremental capital-output ratio which actually measures the efficiency of capital as more capital or investment is made in the economy. By the technique of Joseph Fourier dimensional growth accounting analysis which uses the standard Cob-Douglas production function to separates the growth in real output into two components of output (Y) and inputs capital and labour (K, L) and then apply divisia indexing we can obtain GDP value attributable to capital (Hulten, 2001). Capital GDP (Y_k) component of total output (Y) is obtained by dividing the natural log (Ln) of the investment made to produce the total output (Y) by the natural log of the total output (Y) itself and multiplied by the physical total output.

$$GDP_k \text{ or } Y_k = \frac{\text{LnK (Y)}}{\text{LnY}}$$

ICOR values $\Delta K/\Delta Y_k$ computed from the data were compared to determine the extent to which additional capital invested is efficient to promoting growth in output. If a present ICOR value ($ICOR_t$) is less than a previous value ($ICOR_{t-1}$) then capital is efficient. This implied that whenever the incremental capital-output ratio indicates capital efficiency over a given period ($ICOR_t < ICOR_{t-1}$) then the investment climate is efficient between the period t and t_{-1} because less unit of capital is required in the present period (t) to produce a unit of output than what obtained in the previous period (t_{-1}).

v. Real Gross Domestic Product Growth (GDPG)

The absolute growth of real gross domestic product estimated at the 2010 constant basic prices to eliminate the impact of inflation from the nominal growth was used as a basic variable affecting economic development. Economic growth or growth in GDP can stimulate increase in investment to provide goods and services to improve the living conditions of the population, provide employment, generate income to reduce poverty and increase revenue to the government through payment of taxes by those gainfully employed. The tax revenue so collected by the government is used to finance education, health and other development programmes to accelerate the pace of economic development (Cardenas-Garcia & Pulido -Fernandez, 2014). Growth in GDP is significantly affected by the condition of the investment climate. Some of these conditions are poor access to finance, infrastructure (electricity supply, bad roads & sea ports), poor legal and regulatory policies (which affects business competition), corruption

(collection of bribes from firms to increase their cost of doing business), insecurity, poor institutions, poor quality of governance all have negative impact from the investment climate to affect the growth capacity of the firms to create employment and improve the general welfare of the people (Amadi, Amadi & Nyenke, 2013; Olowu & Hamza, 2010). Other underlying factors include poor foreign direct investment inflow to Nigeria due to poor macroeconomic policies that conscript competition as well as deteriorating and obsolescing technology for production.

vi. Real Gross National Per Capita Income (GNICAP)

The real gross national per capita income valued at the purchasing power parity valued in U.S dollar (US$PPP) at 2011constant price was used as a proxy for standard of living of Nigerians. Gross per capita income incorporates income enhancement from remittances from abroad and thus has a wider base of impact than gross domestic income. Its adjustment to $PPP value is to enable the consideration of the peculiarities of each country's local conditions in assessing their standard of living. This is so because $PPP takes into consideration level of domestic prices which influence the exchange rate and domestic inflation to affect the living standard of the people in the country and for ease of international comparison. GNI Per Capita measures the per capita consumption of the people of a nation to determine the level of their welfare and standard of living. Investment climate factors significantly affected the level of growth of gross national per capita income in Nigeria with a history of very low growth rate compared to that of the comparator's countries of Malaysia, Indonesia, South Africa and Ghana. Other factors that affect the growth of gross national per capita income are the economic policies of Nigeria's major trading partners' and the exchange rate of the naira to other countries' respective currencies especially the dollar which affects the volume of remittances from abroad. Appreciation of the value of the dollar often encouraged high remittances home by Nigerians abroad.

vii. Private Sector Credit in Nigeria (PSCR)

This is the amount of credit that is supplied to the private sector of the Nigerian economy by commercial banks for the purpose of investment to boost productivity, employment and economic growth. It is a proxy for the level of financial development in a business environment. Easy access to credit by private investors and entrepreneurs in a business environment stimulates greater economic activities to spur economic development. Credit supply to the Nigerian economy was generally poor in the period 1981-2015 compared to the demand for credit by

entrepreneurs and investors. The underlying factors affecting the paucity of credit to the economy among others are weak credit base of most of the commercial banks due to poor saving habits of the people (only 5% of the persons that applied for loan are given), high cost of borrowing fund (average lending rate was 20%), lack of requisite collateral (collateral rate was 160% of the value of the loan applied for), short repayment period for loans (30days from the date of loan receipt), poor education of borrowers leading to poor book-keeping and account records of transactions needed by banks before loans are granted and others (Nwokoma, Idoko & Ebere, 2013). Also there was poor access of investors, especially the small scale investors, to small and medium enterprise investment scheme fund (SMEIS) provided by commercial banks (10% of profit before tax) due to bureaucratic processes and stringent lien conditions for loan, stock exchange market and hijack of ownership of microfinance banks by the rich who cornered the loan funds to themselves and relations (Berger & Udell in Nwokoma, Idoko & Ebere, 2013). Poor access to credit, no doubt, had partly caused the poor economic development and high rate of poverty in Nigeria.

viii. Trade Facilitation (TRDF)

Trade facilitation was used to measure the facilities and efficiency of institutions in promoting economic activities in Nigeria especially international business. The effective management of the seaports facilities in handling the volume of export and import affect the volume of trade to impact on the competitive efficiency of the economy, technological innovation, economic growth, employment generation and poverty reduction. The total tons of export loaded and import discharged at the seaports in Nigeria was used as proxy for the efficiency of the ports in facilitating foreign trade. The factors affecting the volume of business and international trade at the ports are domestic policies, foreign policies of other countries (trade restriction), exchange rate, ports' facilities and security, transportation and others. Favourable domestic and foreign trade policies that promote free and competitive trade, stable and realistic exchange rate, better facilities and security at the ports and efficient transport system to transport and haul goods in and out of the ports to reduce delays and payment of demurrage promote economic development. Trade facilitation is a factor that influences the state or conditions of goodness of an investment climate to facilitating trade development.

ix. Electric Power Supply Infrastructure (ELEC)

Electricity power supply is very essential for manufacturing and industrial production as well as for domestic uses. Its supply and availability is paramount to promoting greater economic activities and employment. It is the most important factor of consideration by investor's in Nigeria's investment climate (Larrosi & Clark, 2011). Electricity supply for production and consumption activities has a bi-directional relationship as electricity consumption influences production and economic growth while economic growth on the other hand cause increase in electricity consumption. Most of the products of economic growth require the complementary use of electrical energy before they can be consumed to increase welfare and a higher per capita income can lead to increase in consumption of more commodities that uses electricity. The underlying factors caused low electricity supply in Nigeria : low volume of water to turn the turbines in the dams (eg Kainji, Jebba & Shiroro) to generate high megawatts of electricity, low gas supply to thermal electricity power plant station due to the unscrupulous activities of Niger Delta militants damaging gas supply pipes, theft of electrical equipment such as almond cables, conductors and transformers by vandals and saboteurs, obsolete generating equipment, aged and overloaded generating plants without maintenance, frequent conductor cuts by accidents of rainstorm, vehicles and man which made power outages inevitable, poor management and high scale corruption in the power sector leading to staff indiscipline and inefficiencies, poor energy policy and poor secondary distribution balancing (Enyong, 2015; Etukudo, Ademola & Olayinka, 2015; Ogundipe & Apata, 2013). Inadequate supply of electricity had discouraged many foreign investors to Nigeria and those already in the country are moving to other countries like Ghana and South Africa where there is adequate supply (Kehinde, Adeleye and Edward, 2009).

x. Infrastructure (INFR)

Infrastructure such as roads, rail, seaports, airports, power plants, health facilities, educational facilities and others helps to boost the productive capacity of an economy. The more available and better they are, the more the opportunity for development. Infrastructure connects firms to their customers and input suppliers and helps them take advantage of modern production techniques (Okafor, 2010). Infrastructures in an economy are assumed to be direct input used in production to enhance productivity and economic growth hence they are often incorporated in sophisticated production functions (Amadi, Amadi & Nyenke, 2013).

Infrastructural development is often made from the capital vote of a nation's budget hence the size or amount of the capital budget is very important to its development. For this reason the actual size of the capital budget that is available for infrastructural development annually is the net capital budget which is the leftover from total capital budget when the overall budget deficit/surplus and recurrent budget deficit/surplus are added to the initial total capital budget (Net capital budget = total capital expenditure vote + recurrent budget deficit/surplus + overall budget deficit/surplus).This showed that most of the recurrent budget deficits of Nigeria were financed primarily by the fund earlier on provided for capital development. This practice of misapplying the capital budget funds to finance recurrent budget deficit had been a bane of the Nigerian economy and the huge infrastructural deficit experienced for years now. This situation is caused by the fiscal indiscipline of the Nigerian government. Beside this, the annual capital budget vote of Nigeria is small (less than 30% of the annual budget). It is this little amount that the recurrent budget deficit is still charged and worsened the size of the net capital budget for infrastructural development had became negative in some years (1988, 1989, 1991, 1993 and 2010). The size of the net capital budget is also influenced by other factors such as available financial resources of the country, the size of recurrent budget expenditure, the size of overall budget deficit/surplus charged to the capital budget and government policy. Because of the relationship between capital budget and infrastructural development, the net capital budget (actual capital budget available) was used as a proxy to capture infrastructural development in Nigeria.

xi. Education and Literacy Level (EDUC)

Literacy is the level of knowledge acquired from formal education to improve one's self awareness and better functioning in personal hygiene, reading of comic stories, jokes, watching and understanding movies to relax, reduction of tension and gaining moral instruction, being able to read road and environmental signs for proper direction and guidance for safety. Education is paramount to human welfare, rapid economic change and it is a powerful instrument for eradicating poverty and promoting prosperity (World Bank, 2018). It is the source of manpower training and human capital development for the nation by equipping the individuals with vocational and professional skills for effective innovation and proper functioning in the economic activities of the state to foster development. Thus education provides the needed skilled labour that would properly function in business undertakings and to be employable by

investors in the business environment. For this reason literacy level is captured by the United Nations as one of the indices of measuring economic development and advised member countries desirous of development to spend not less than 26% of their annual budget on education (US Dept of States, 2014). In measuring literacy level, the number of persons that had passed through the formal school system and had graduated from primary, secondary and tertiary schools put together annually was used for the study. The details include graduates from Primary, Migrant, Adult literacy programmes, Secondary schools, Teacher's colleges, Technical colleges, Colleges of Education, Monotechnics, Polytechnics and Universities. The underlying factors affecting the growth of literacy or education level in Nigeria include but not limited to poor funding where the highest budget ever made was 8.5% of the annual budget in 2012 compared to 26% recommended UNESCO bench mark funding for development, poverty which prevented many who could not afford to pay school and material fees from going to school, campus insecurity with growing cultism and examination misconducts, decayed learning infrastructure, poor education planning and linkage of skills to the need of the industries and society, poor teacher welfare scheme and remunerations and others.

xii. Longevity and Life Expectancy (LIFE)

Life expectancy measures and assesses the state of healthy living achieved by a person to promoting long life and prosperity. It is reflected by the number of years one lived from birth. The higher the average number of years lived by the individuals in a country the more developed that country is assumed to be. In Nigeria the factors responsible for low life expectancy includes bad leadership/governance, corruption, lack of access to Medicare, robbery, kidnapping, cultism, bad roads leading to road accidents, domestic violence, stress from economic uncertainty, unemployment and poor life style without leisure time which often lead to untimely death (Olakunle, 2016). In addition to these are the problems of food security to reduce hunger and malnutrition, accessible and affordability of Medicare to tackle diseases, infant mortality to reduce overall death rate, and the safety of life and property from robbers, assassins and killers. A positive level of these factors makes the investment climate conducive to investors.

xiii Employment (EMPL)

Employment involves engaging persons in economic activities to earn income and enjoy a better standard of living. Employment is the best means of reducing poverty and improving the living

standard of the people particularly the poor, as employment empowers the people with income with which they increase their level of consumption and welfare (Cardenas-Garcia & Pulido - Fernandez, 2014). Higher level of employment in an economy shows that the economy is developed and capable of reducing survival tension in people to increase their welfare and longevity. Employment opportunities depend significantly on the level of investment in an economy while the level of investment itself depends on the conditions of the investment climate. A conducive investment climate increases the potential for employment. The rate of employment was obtained by subtracting the rate of unemployment rate from a hundred percent (100% - rate of unemployed). Factors affecting the level of employment in Nigeria include poor power supply leading to low production and economic growth to create jobs and besides, artisans (e.g welders, electronic engineers, musicians) and other self-employed businesses that could not afford to source power supply from generators fold up throwing themselves and their workers into the unemployment market, poor industrial development, under capacity utilisation of the manufacturing sector, poor education leading to poor innovation and relevant employable skill development, technological progress leading to the use of labour saving machines and less demand for labour, geographical immobility of labour due to cultural differences and discrimination, poor pump-priming policies by the government to create jobs leading to the neglect of agriculture which has high labour absorptive capacity among others.

xiv. Security (SECU)

Security involves the safety of life and property of the individual and this has to be guaranteed in an environment or country before investors can float businesses and stay to manage them to success. Thus security is a potent factor of the investment climate that affects economic development. Security threats like incessant killings, robberies, kidnappings, assassinations, molestation and battery by criminals, police and military personnel, raping and other crimes create tension and fear in the business environment to scare away investors, especially the foreign ones (Zouhaier & Kefi, 2012). This situation of insecurity affects the free flow and movement of goods and people in both internal and international trading activities. A dummy variable was used to capture the security situation in Nigeria by assigning a value of one (1) to years of peace and zero (0) to years of problems with serious political and religious disturbances, Niger-Delta militancy and North-East Boko-Haran insurgency, military coups, violent crimes as robbery, high scale kidnapping, and ethnic violence and upheavals. The years of insecurity in

Nigeria affected the economic growth, employment, life expectancy and the general standard of living as many people live in fears and developed high blood pressure which killed them and others hardly go to leisure and recreational grounds to refresh from the day's toil to improve their healthy living and longevity.

The underlying factors affecting the state of insecurity in Nigeria include: ethno-political jingoism that severed peaceful relationship among ethnics and political groups and caused political rowdiness, thuggery, assassination, high rate of youth unemployment which made them readily available for use as political thugs, kidnappers, assassins and other criminal activities. Corruption is also a factor where public officers and politicians embezzled funds meant to promote economic development.

xv. National Development Plans (NDPL).

National development plans are articulate economic plans of Nigeria meant to carry out reform programmes in the investment climate to promote social and economic development.

They are economic development plans packaged with policies to serve as useful investment guide to investors to promote economic activities and enhance stability of the macroeconomic environment for investment. A dummy variable was employed with an assigned value of one (1) for period of national development plan while zero (0) for periods of absence of national development plans. It should be noted that the 5^{th} national development plan of Nigeria (1986-1990) was suspended and postponed to 1989 by General Ibrahim Babangida's administration. There had been national development plans to cover economic and social reform programmes and activities of government among which are: the structural adjustment programme (SAP), directorate for food, roads and rural infrastructure (DFRRI), family economic advancement programme (FEAP), poverty alleviation programme (PAP), banking sector recapitalization, national economic empowerment and development strategy (NEEDS), privatization and economic liberation policies, fiscal and monetary policies, institutional restructuring and many others.

xvi. Foreign Direct Investment (FDIN)

According to IMF balance of payment manual, foreign direct investment (FDI) is the investment which is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor and with the investor's purpose of having an effective voice and

representation in the management of the enterprise (Obadan, 2004). Foreign direct investment flows to Nigeria to supplement the domestic investment to affect economic performance and capital efficiency status of the investment climate. FDI was used in conjunction with domestic investment to estimate the incremental capital output ratio of the Nigerian economy. This ratio was used to determine whether the investment climate was efficient or not for the various years in the period of study.

xvii. Real Gross Capital Formation or Domestic Investment (GCFG)

Capital formation or domestic investment measures the growth potential of investment to promoting productivity, employment and high per capita consumption capability to improve the standard of living of the people. The real gross capital formation or domestic investment (GCFG) at 1990 constant basic prices of Nigeria was used in conjunction with FDI to estimate the incremental capital output ratio. The combined effects of the two influenced the level of capital efficiency in the economy to promoting economic development. Factors of the investment climate and domestic policies significantly affected the growth of gross capital formation and which in turn affected the growth of gross national income. Domestic conditions of market size and incremental capital output ratio are found to be the main drivers of investment in Nigeria (Nwogwugwu & Onwuka (2012)

xviii. Savings (SAVE)

This is the level of savings mobilised by the commercial banks in Nigeria to increase the credit supply potential of the economy to investors. The higher the national savings the better and stronger the credit base of the economy to promote investment and economic growth.

xix. Interest Rate (INTR)

The Lending interest rate charged by commercial banks on loans given out influenced greatly the amount of credit that investors afford at a particular time. A high interest rate reduces the borrowing capacity of investors to affect the level of investment and productivity in the economy.

xx. Capital Market Development in Nigeria (CMKT)

Capital market development provides opportunity for obtaining long-term loan needed by investors to finance and promote medium and large scale investments in the economy. The more

developed the capital market of a country in terms of increases in equities, the better the supply of long-term funding to businesses for investment and economic development programmes.

xxi. Loan Granted by Commercial Banks (LOAN)

The amount and number of persons granted loans for economic activities by the commercial banks in a country matters much to economic development. Many businesses need affordable loan to survive. In Nigeria micro enterprises need cheap un-collateralised loan to operate and survive. This fact is much worrisome for economic development as over 70% of businesses in Nigeria are micro enterprises.

xxii. Loan Repayment Period set by Commercial Banks in Nigeria (RPAY).

The period set aside to borrowers to repay the loan collected significantly influence the investment plans of entrepreneurs. The longer the loan repayment period granted by the commercial banks the better for the investors because there is the likelihood that their investment will be matured to flow in cash for repayment.

xxiii. Ports Facilities (PFAC)

Ports facilities include standard facilities for both sea and airports in Nigeria. Sea-port facilities includes harbor for ship berthing, cranes for loading and off-loading, storage tanks/silos for cargos, better access routes to the ports while airport facilities include better aerodrome/hangar for parking by aircrafts, better storage facilities, security check/alarm system, fast cash payment/credit facilities and others. All these facilities help to promote international trade and investments.

xxiv. Ports Management (PMGT)

This involves efficient sea and airport administration, efficient clearing and forwarding system to support international trade and investment.

xxv. Demurrage and Airport Charges (DEMU)

Some fees are levied on ships and aircrafts for using the facilities at the sea-ports, wharfs and airports. Such fee include demurrage charged on ship per day for berthing in the harbor before loading and off-loading of goods as well as the landing, parking and hangar fees paid by aircrafts. These fees when high discourage international trade and investment flow.

xxvi. Ports Security (PSEC)

Special security is needed at the sea and airports to guard against theft of cargos or import of hard drugs, contraband and fire arms into the country. Lack of security at the ports can scare investors from the country.

xxvii. Customs Duties (DUTY)

The imposition of import and export duties by government has great impact on the volume of both international and domestic trade. Duties are imposed to achieve the objectives of preventing the importation or exportation of certain goods to protect domestic industries, avoid dumping of harmful goods and generate revenue to the government for economic development programmes.

xxviii. Corruption and Transparency level (CORR)

The level of corruption and transparency exhibited in the regulation and monitoring of economic agents of and business activities by government officials has great impact on productivity and employment in the economy.

xxix. Exchange Rate (EXCR)

The exchange rate for international transactions in Nigerian, particularly the naira (₦) to US dollar ($) rate, affects the volume of business and international investment to affect economic development.

xxx. Transport Facilities (TRAN)

Transport facilities such as roads, rail network, sea and airport facilities when provided in sufficient quantity and quality do contribute positively to economic development. Transport facilities are indispensable to commerce for the movement of goods and economic agents from one location of production to another location of consumption to boost economic and employment activities.

xxxi. Health and Education Facilities (HEDU)

Health and education facilities provided in sufficient and high quality help to produce healthy skilled manpower for the economy. This factor is particularly important to economic and social development in today's knowledge driven economy where information and communication technology is the order of the day.

xxxii. Infrastructural Development Policy (INFP)

Infrastructural development policy of government for the country can significantly affect the provision of infrastructure for the development of the economy. Infrastructural policy makes it possible for new infrastructure and the replacement of obsolete or decayed ones to be provided to promote the efficiency of the factors of production towards increasing output in the economy.

xxxiii. Capital Budgeting (CAPB).

The capital budget of a country set the pace for infrastructural development in such a country. We already know the significant role infrastructure played in the economic development of countries world-wide. A productive economy often commits a greater percentage of the total annual budget on capital projects and expenditure than on recurrent expenditure.

xxxiv. Gas supply (GASS)

Gas supply to electricity generating stations, increase electricity supply for both domestic and industrial uses. An uninterrupted gas supply to power generating stations boosts electricity supply, for production and other economic activities, to promote economic development.

xxxv. Water Level of Dammed Rivers (WTER)

The water level of rivers Niger, Shiroro and others that are dammed to supply hydro electric power affect the capacity of the dams to generate electricity. Low volume of water, as commonly experienced during the dry season, leads to low electricity generation because the dams have no sufficient water to turn the turbines effectively.

xxxvi. Destruction (DEST)

Destruction, vandalisation and theft of installed electrical parts and equipment by man and nature affect the capacity to generate and supply electricity.

xxxvii. Overloading of Electricity Supply Transformers (LOAD)

Overloading of electricity transformers and transmitters can lead to frequent trip offs, load shedding and incessant blackouts.

xxxviii. Energy Supply Policy (EPOL)

The Energy supply policy of government determines how much energy is to be generated for the economy as well as the commitment of successive governments to the implementation of energy programmes. A positive policy will boost power supply to a country.

xxxix. Corruption and Transparency (CORR).

Corruption of and lack of transparency on the part of officials charged with the responsibility to generate and supply electricity power to the economy can affect its supply negatively.

xl. Road network (ROAD)

Network of road infrastructure to promote commerce can be affected by erosion, flooding, poor construction and maintenance of roads, destruction of road by man to cross pipes or telecom wires, obstruction by speed break, cattle crossing, dump of dirt, blockade for social activities and others all affect road usage and economic activities.

xli. Rail network (RAIL)

Rail network infrastructure available in a country can be very useful in the evacuation of mostly bulky goods.

xlii. Sea and Airport Facilities (PORT)

Sea and Airport facilities also promote commerce. A well equipped seaport and airport contribute significantly to economic development.

xliii. Health facilities (HFAC)

The availability of health facilities such as health centres, hospital buildings, diagnostic and treatment equipment help to build a healthy and sound work force to man a country's economy for development.

xliv. Educational Facilities (EDUF)

Educational facilities such as classrooms, lecture halls, library, laboratory equipment and other learning resources in schools or educational centres, helps to train manpower and generate research for the economy.

xlv. Government health policy (GOHP)

Government's health policy meant to tackle health challenges to promote healthy environment and longevity of life of the people.

xlvi. Government's educational policy (GOEP)

A better government's educational policy can promote research and manpower development for an economy to develop.

xlvii. Government's Health Programme (GOHP)

Government's health treatment and management programmes involving the provision of skilled medical personnel, adequate drugs in hospitals, effective vaccination programmes all help to maintain a healthy population to increase the life span of the people.

xlviii. Government's Economic Objective (GOBJ)

Government's economic objectives for a country influenced to a larger extent the size of the annual budget, the development policies put in place, the economic and foreign policy of the country.

xlix. Federal Government's Total Revenue (FGTR)

The size of the federal government's total revenue available to it affects the size of the expenditure commitment of the government to the annual budget. A high revenue profile will permit greater allocation of fund to the capital budget for infrastructural development.

l. Size of Federal Government Recurrent Expenditure (REXP)

The size of the federal government recurrent expenditure in an annual budget influences the amount of fund committed to the capital budget for infrastructural development.

li. Unemployment rate (UNEM)

Unemployment rate is the percentage number of people that are unemployed out of the total labour force of a country. A lower rate indicates that many people are engaged in one economic activity or the other to boost their consumption capacity and reduce their level of poverty. Also when people are gainfully employed in a country the rate of criminality reduces in that country.

lii. Unbalanced development policy of government (UDEP)

Pragmatic government's development policies need to be balanced among the federating groups of a nation. This will promote even development and a sense of belonging of the people to the government of that nation to enhance peace and tranquility. On the other hand government's unbalanced development policy in the national plans do lead to insecurity and ethnic agitations of self rule and resource control as was the case of the Ibos clamouring for Biafra republic and Niger delta craving for the republic of Niger Delta in Nigeria.

liii. Cultism Vice (CULT)

Cultism vice, which is prevalent among the youths, propels them to be committing violent crimes to pose danger to security. In Nigeria, cultism is taken as a status symbol of greatness especially among the youths who are often in competition to commit violent crimes involving killings and ritualism. Cultism vice provides a breeding ground for the training of potential armed robbers in the society or country.

liv. Drug Abuse and Addict (DRUG)

Drug abuse and addict is also common among the youths and connected to cultism to commit high profile crimes involving the use of dangerous weapons and fire arms to heat up the security system of a country. Drug kills the conscience and sense of pity of the drug taker such that they do not value human life any more than a chicken hence they are heartless in killing people like the Boko-haran and Fulani herdsmen. Thus increase in drug abuse and addiction increases the insecurity state in a country while economic and social frustrations can increase drug abuse and addiction among the people.

lv. Political Rivalry (PRIV)

Political rivalry among various political groups can lead to thuggery and assassination of opponents. This creates suspense, fear and general insecurity.

lvi. Religious Fanaticism (RFAN)

Religious fanaticisms do lead to religious upheavals especially in the northern part of Nigeria to cause insecurity. Maitastine group in Kano and Shiite group in Kaduna are typical examples.

lvii. Porous Border (PBOD)

Porous border of a country often permits the influx of criminals and mercenaries into a country to constitute security threats. Smuggling activities and importation of fire arms and other dangerous weapons strive through porous borders.

lviii. Slow Judicial Process (SJUC).

Slow judicial process discouraged the prosecution of criminals in law courts in Nigeria. This situation makes it difficult to punish or sentence criminals to act as deterrent to others. This in addition to corruption can encouraged the level of criminality and insecurity to increase in a country.

lix. Government's Development Policies (GPOL)

Favourable government's economic and capital development policies in national plans do promote economic development. In this regard positive policies can be designed to create employment, reduce poverty and build infrastructure.

lx. Change in Leadership of Government (LEAD)

Changes in leadership of government do affect the continuity of the economic programmes of a previous government. When national plans provides opportunity for rolling over previous plans that have not been executed to the next cycle of implementation for continuity then economic development will be fostered by the planning system.

lxi. Implementation Rate of Projects (IMPL)

The implementation rate at which projects and development programmes are executed by the government promotes economic development.

lxii. Data for economic and social planning (DATA)

Data availability for economic and social planning affects the economic plans of a country. Prominent time series data are needed to evaluate the outcome of plans.

lxiii. Planning Technique (PLAN)

The planning style adopted by a country such as bottom-top, top-bottom, inclusive and exclusive affects the rate of economic development of a country.

lxiv. Capital Development (CAPD)

Capital output ratio was use to proxy capital development. Capital growth can promote rapid economic development in a country. Capital development essentially measures the rate of growth of capital availability in an economy. Specifically the capital-output ratio measures the amount of capital available to produce a unit of output. Increase in capital output ratio implied that capital is increasingly being made available for production in the economy.

lxv. Other Primary Investment Climate Factors (OPIC)

Other primary and underlying investment climate factors that affected model 1 which also affected capital development and efficiency are poor trade facilitation, low electric power supply infrastructure, poor transport, health and educational infrastructure, poor security network and poor national development plans.

3.4 Estimation Technique and Procedure.

The study adopted the exploratory and confirmatory factor analysis technique to build and confirm the expectation of the multiple linear regression technique that relates the effect of investment climate on economic development. Exploratory factor analysis is a statistical method used to uncover the underlying factors or structure of a relatively large set of variables as well as identifying the underlying relationship between the measured variables (Lani, 2010; Thompson, 2004). The technique is used to identify and reduce data to smaller set of summary variables that can describe the various categories of factors that affect a system and which are confirmed on the basis of pre-established theory and apriori expectations. The factor analysis techniques employed other relationship building techniques for a better analysis. A co-integrated multivariate regression analysis was used to establish a relationship between primary investment climate factors and economic development indices because the technique is found to be capable of detecting the nature of relationship. The dynamic componential factor analysis was employed to select the most important primary variables that affected both the investment climate and economic development parsimoniously. The secondary or underlying factors that influenced the primary investment climate factors themselves were highlighted, discussed and the apriori expectation of the parameters confirmed by the confirmatory factor analysis technique. To assess the effect of the investment climate on capital development and efficiency, capital output ratio and incremental capital output ratio measurement were employed. Content analysis was

used to evaluate the performance of the various economic reforms programmes in Nigeria. It is important to note that the relationship between investment climate and economic development is latent, hence the use factor analysis and mediation models to clearly and deeply evaluate such relationship (Rahn, 2016).

3.4.1 Ordinary Least Square Estimation Technique

The estimation technique employed in this study was the Ordinary Least Square method (OLS) based on the Classical Multiple Linear Regression Model. The basis for the choice of this technique stems from the fact of empirical evidences that the relationship between variables are better carried out with regression analysis rather than correlation (Anyiwe & Ikelikume, 2006). The technique is best for estimating linear relationship and has the best, linear, unbias estimating properties among other estimators.

3.4.2 Unit Root and Co-integration Testing

The regression of a non-stationary time series data on another non-stationary time series data may produce spurious regression result (Gujarati, 2004). For this reason it is important to carry out unit root test to check if the data are stationary or not before they can be regressed.

The resulting co-integrating vectors are to be estimated by OLS technique to obtain the co-integrating parameters of the model. These OLS estimates from a cointegrated regression are generally better in some sense than the usual traditional regression to achieve super consistency condition and this is the essence of residual-based co-integration and error correction model (Enders, 2010).

Co integration establishes the link between integrated processes and steady state equilibrium making it possible to combine short-run dynamics with long-run equilibrium with the concept of error correction model (Iyoha, 2004).

3.4.3 The Use of Derivative Principle to Estimate the Minimum or Maximum Impact of the Independent Variables on the Dependent Variables in Model 1b

Differential calculus was used to determine the level of impact (minimum or maximum) of the independent variable (underlying investment climate factors) on the dependent variable (primary investment climate factors and economic development indices).

To find the impact of changes in the secondary or underlying factors of investment climate on the primary investment climate factors, growth of capital and economic development indices, we apply the derivative of the function principles of calculus to determine whether each independent variable contributes minimally or maximally to the growth of the dependent variable (Thompson, 2004). The mathematical specification is

$$\frac{\partial y}{\partial x} = 0 \text{ (Extremum value or turning point)} \quad 1^{st} \text{ order condition } (f'_{(x)}) \quad 3.71$$

$$\frac{\partial^2 y}{\partial x^2} > 0 \text{ or } < 0 \text{ (Next change in value from turning point) } 2^{nd} \text{ order condition } (f''_{(x)}) \quad 3.72$$

Where:
y = Dependent variables
x = independent or explanatory variables
∂ = Difference operator or rate of change
2^{nd} order condition $(f''_{(x)})$ was used for decision making of the impact of the independent variables on the dependent variables

$$\frac{\partial^2 DEPENDENT}{\partial INDEPENDENT^2} > 0 = \text{minimum} \qquad \frac{\partial^2 DEPENDENT}{\partial INDEPENDENT^2} < 0 = \text{maximum} \quad 3.73$$

$$\frac{\partial^2 PSCR}{\partial SAVE^2} > 0 = \text{minimum} \qquad \frac{\partial^2 PSCR}{\partial SAVE^2} < 0 = \text{maximum} \quad 3.74$$

3.5.4 Procedure for Treating the Data

A unit root essentially is a stochastic process (Y_t) whose first difference (Y_t-Y_{t-1}) is one or unity, representing non-stationary. In this wise the presence of a unit root in time series data signifies non-stationary of the data. Thus the name unit root is due to the fact that ρ=1 and the terms non-stationary, random walk, and unit root can be treated as synonymous (Gujarati, 2004).

$X_t = b_1 X_{t-1} \ldots\ldots b_k X_{t-k} + e_t$ (unrestricted VAR) 3.75

$\Delta X_t = b_1 \Delta X_{t-1} + b_2 \Delta X_{t-2} + b_{k-1} \Delta X_{t-k+1}$ (ECM form) 3.76

b_k = Long run 'levels solution'

The collected time-series data for the period 1981-2014 were subjected to trend or differenced stationary test, using the Augmented Dickey-fuller (ADF) test;

$$\Delta Y_t = b_o + b_{1t} + b_2 Y_{t-1} + b_i \sum_{i=1}^{n} \Delta Y_{t-1} + \sum u_t \quad 3.77$$

Y_t = relevant time series

$\sum u_t$ = pure white noise error; $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$

Treatment of the Models

The models were treated with ECM specification where all the variables were not stationary at levels such as:

$$\Delta Y_t = b_o + b_1 \Delta X_t + b_2 U_{t-1} + Є_t \quad 3.78$$

Y_t = Dependent variables

X_t = independent or explanatory variables

Δ = First difference operator

$Є_t$ = Random error term

$U_{t-1} = (Y_{t-1} - b_o - b_1 X_{t-1})$ i.e. one period lagged value of the error term.

Error Correction Model (ECM):

Model 1a (MCAP):

$$\Delta \textbf{MCAP} = e_o + e_1 \Delta PSCR + e_2 \Delta TRDF + e_3 \Delta ELEC + e_4 \Delta INFR + e_5 \Delta SECU + e_6 \Delta NDPL + e_7 U_{t-1} + Є_t \quad 3.79$$

Model 2 (GDPG):

$$\Delta \textbf{GDPG} = a_o + a_1 \Delta PSCR + a_2 \Delta TRDF + a_3 \Delta ELEC + a_4 \Delta INFR + a_5 \Delta SECU + a_6 \Delta NDPL + a_7 U_{t-1} + Є_t \quad 3.80$$

Model 3 (GNICAP):

$$\Delta \textbf{GNICAP} = g_o + g_1 \Delta GDPG + g_2 \Delta PSCR + g_3 \Delta TRDF + g_4 \Delta INFR + g_5 \Delta ELEC + g_6 \Delta SECU + g_7 \Delta NDPL + g_8 U_{t-1} + Є_t \quad 3.81$$

Model 4 (LIFE):

$$\Delta \textbf{LIFE} = b_o + b_1 \Delta GDPG + b_2 \Delta PSCR + b_3 \Delta TRDF + b_4 \Delta ELEC + b_5 \Delta INFR + b_6 \Delta SECU + b_7 \Delta NDPL + b_8 U_{t-1} + Є_t \quad 3.82$$

Model 5 (EDUC):

$$\Delta \textbf{EDUC} = d_o + d_1 \Delta GDPG + d_2 \Delta PSCR + d_3 \Delta TRDF + d_4 \Delta ELEC + d_5 \Delta INFR + d_6 \Delta SECU + d_7 \Delta NDPL + d_8 U_{t-1} + Є_t \quad 3.83$$

Model 6 (EMPL):

$$\Delta \textbf{EMPL} = h_o + h_1 \Delta GDPG + h_2 \Delta PSCR + h_3 \Delta TRDF + h_4 \Delta ELEC + h_5 \Delta INFR$$

$$+ h_6\Delta SECU + h_7\Delta NDPL + h_8U_{t-1} + \epsilon_t \quad 3.84$$

Model 7 (CAPD):

$$\Delta CAPD = r_o + r_1\Delta GPOL + r_2\Delta FDI + r_3\Delta DINV + r_4\Delta INTR + r_5\Delta CMKT + r_6\Delta OPIC + U_t \quad 3.85$$

Treatment of Model 1b and Model 7 with Derivative of a Function Principle

When the 1st order derivative is performed and the value is greater than zero ($f'_{(x)} > 0$), then a maximum impact is established but when the value is less than zero ($f'_{(x)} < 0$) a minimum impact is established. The 2nd order derivative is used to confirm if the 1st order derivative value is a minimum or maximum value. When the 2nd order derivative value is greater than zero (positive slope) ($f''_{(x)} > 0$) then a minimum point is confirmed, but when the value is less than zero (negative slope) ($f''_{(x)} < 0$) a maximum point is confirmed. A minimum value implied a reducing effect of the independent variable (underlying investment climate factors) on the dependent variable (primary investment climate factors and economic development indices). A maximum value on the other hand has a positive growth impact of the independent variable on the dependent variable.

Model 1b (i) PSCR

If f' (SAVE, INTR, CMKT, LOAN, RPAY) > 0 = maximising impact on PSCR 3.86a

If f' (SAVE, INTR, CMKT, LOAN, RPAY) < 0 = minimising impact on PSCR 3.86b

Model 1b (ii) TRDF

If f' (PFAC, PMGT, DEMU, PSEC, DUTY, CORR, EXCR)> 0 =maximising impact onTRDF 3.87a

If f' (PFAC, PMGT, DEMU, PSEC, DUTY, CORR, EXCR) < 0 = minimising impact onTRDF 3.87b

Model 1b (iii) ELEC

If f' (GASS, WTER, DEST, LOAD, EPOL, FAUT, CORR)> 0 = maximising impact on ELEC 3.89a

If f' (GASS, WTER, DEST, LOAD, EPOL, FAUT, CORR) < 0 =minimising impact on ELEC 3.89b

Model 1b (iv) INFR

If f' (TRAN, HEDU, INFP, CAPB) > 0 = maximising impact on INFR 3.88a

If f' (TRAN, HEDU, INFP, CAPB) < 0 = minimising impact on INFR 3.88b

Model 1b (iva) TRAN

If f' (ROAD, RAIL, PORT) > 0 = maximising impact on TRAN 3.90a

If f' (ROAD, RAIL, PORT) < 0 = minimising impact on TRAN 3.90b

Model 1b (ivb) HEDU

If f' (HFAC, EDUF, GOHP, GOEP) > 0 = maximising impact on HEDU 3.91a

If f' (HFAC, EDUF, GOHP, GOEP) < 0 = minimising impact on HEDU 3.91b

Model 1b (ivc) INFP

If f' (GPOL, PMAN, FUND) > 0 = maximising impact on INFP 3.92a

If f' (GPOL, PMAN, FUND) < 0 = minimising impact on INFP 3.92b

Model 1b (ivd) CAPB

If f' (GOBJ, GREV, REXP) > 0 = maximising impact on CAPB 3.93a

If f' (GOBJ, GREV, REXP) < 0 = minimising impact on CAPB 3.93b

Model 1b (v) SECU

If f' (UNEM, UDEP, CULT, PRIV, RFAN, PBOD, SJUC) > 0 = maximising impact on SECU 3.94a If f' (UNEM, UDEP, CULT, PRIV, RFAN, PBOD, SJUC) < 0 = minimising impact on SECU 3.94b

Model 1b (vi) NDPL

If f' (GPOL, LEAD, IMPL, DATA, PLAN) > 0 = maximising impact on NDPL 3.95a

If f' (GPOL, LEAD, IMPL, DATA, PLAN) < 0 = minimising impact on NDPL 3.95b

Model 7 CAPD

If f' (GPOL, FDIN, DINV, INT, CMKT, PSCR, OPIC) > 0 = maximising impact on CAPD 3.96a

If f' (GPOL, FDIN, DINV, INT, CMKT, PSCR, OPIC) < 0 = minimising impact on CAPD 3.96b

3.5 Evaluation of Estimates

Evaluation of estimates of the models will be discussed under the following headings:

1. Economic a priori criteria expectation
2. Statistical criteria test: 1st order condition test.

3. Econometric criteria test; 2nd order condition test.
4. Mathematical 1st & 2nd order derivative condition and confirmatory factor analysis

3.5.1 Economic a priori criteria expectation

Economic theory helps to establish relationship between economic variables as to the expected signs and magnitude of the parameters of the relationship. An a priori criterion was used to determine whether the estimated coefficient of the economic relationship was theoretically meaningful, statistically satisfactory and inferentially conforming (Enders, 2010).

Based on economic theory, the independent variables were expected to take the following signs.

Table 3.1: A Priori Expectation of the Parameters of Model 1a; 1-7

Model	Dependent Variable	Independent Variable	Apriori Expectation
MODEL 1	Ln MCAP	LnGDPG	$e_1 > 0$
"	"	Ln PSCR	$e_2 > 0$
,,	„	Ln TRDF	$e_3 > 0$
„	„	Ln ELEC	$e_4 > 0$
„	„	Ln INFR	$e_5 > 0$
„	„	Ln SECU	$e_6 > 0$
MODEL 2	Ln GDPG	Ln PSCR	$a_1 > 0$
,,	„	Ln TRDF	$a_2 > 0$
„	„	Ln ELEC	$a_3 > 0$
„	„	Ln INFR	$a_4 > 0$
„	„	Ln SECU	$a_5 > 0$
„	„	Ln NDPL	$a_6 > 0$
MODEL 3	LnGNICAP	Ln GDPG	$g_1 > 0$
,,	„	Ln PSCR	$g_2 > 0$
„	„	Ln TRDF	$g_3 > 0$
„	„	Ln ELEC	$g_4 > 0$
„	„	Ln INFR	$g_5 > 0$
„	„	Ln SECU	$g_6 > 0$
„	„	Ln NDPL	$g_7 > 0$
MODEL 4	LnLIFE	Ln GDPG	$b_1 > 0$
,,	„	Ln PSCR	$b_2 > 0$
„	„	Ln TRDF	$b_3 > 0$
„	„	Ln ELEC	$b_4 > 0$
„	„	Ln INFR	$b_5 > 0$
„	„	Ln SECU	$b_6 > 0$
„	„	Ln NDPL	$b_7 > 0$
MODEL 5	LnEDUC	Ln GDPG	$d_1 > 0$
,,	„	Ln PSCR	$d_2 > 0$
„	„	Ln TRDF	$d_3 > 0$
„	„	Ln ELEC	$d_4 > 0$
„	„	Ln INFR	$d_5 > 0$
„	„	Ln SECU	$d_6 > 0$
„	„	Ln NDPL	$d_7 > 0$
MODEL 6	LnEMPL	Ln GDPG	$h_1 > 0$
,,	„	Ln PSCR	$h_2 > 0$
„	„	Ln TRDF	$h_3 > 0$
„	„	Ln ELEC	$h_4 > 0$
„	„	Ln INFR	$h_5 > 0$
„	„	Ln SECU	$h_6 > 0$
„	„	Ln NDPL	$h_7 > 0$
MODEL 7	Ln CAPD	Ln GPOL	$r_1 > 0$
,,	„	Ln FDIN	$r_2 > 0$
„	„	Ln DINV	$r_3 > 0$
		Ln INTR	$r_4 < 0$
		Ln CMKT	$r_5 > 0$
		Ln PSCR	$r_6 > 0$
		Ln OPIC	$r_7 > 0$

Source: Researcher's Compilation from Economic Theory Expectation of Effect of Investment Climate Variables on Economic Development Variables (2017)

Table 3.2: A Priori Expectation of the Parameters of Model 1b of Underlying Factors

Model	Dependent Variable	Independent Variable	Apriori Expectation
MODEL 1b (i)	Ln PSCR	LnSAVE	$k_1 > 0$
"	"	Ln INTR	$k_2 < 0$
"	"	Ln CAPD	$k_3 > 0$
"	"	Ln LOAN	$k_4 > 0$
"	"	Ln RPAY	$k_5 > 0$
MODEL 1b (ii)	Ln TRDF	Ln PFAC	$m_1 > 0$
"	"	Ln PMGT	$m_2 > 0$
"	"	Ln DEMU	$m_3 < 0$
"	"	Ln SECU	$m_4 > 0$
"	"	Ln DUTY	$m_5 < 0$
"	"	Ln CORR	$m_6 < 0$
"	"	LnEXCR	$m_7 < 0$
MODEL 1b(iii)	LnELEC	Ln GASS	$p_1 > 0$
"	"	Ln WTER	$p_2 > 0$
"	"	Ln DEST	$p_3 > 0$
"	"	Ln LOAD	$p_4 > 0$
"	"	Ln EPOL	$p_5 > 0$
"	"	Ln FAUT	$p_6 > 0$
"	"	Ln CORR	$p_7 > 0$
MODEL 1b(iv)	LnINFR	Ln TRAN	$q_1 > 0$
"	"	Ln HEDU	$q_2 > 0$
"	"	Ln INFP	$q_3 > 0$
"	"	Ln CAPB	$q_4 > 0$
MODEL 1b(iva)	LnTRAN	Ln ROAD	$t_1 > 0$
"	"	Ln RAIL	$t_2 > 0$
"	"	Ln PORT	$t_3 > 0$
MODEL 1b (ivb)	LnHEDU	Ln HFAC	$l_1 > 0$
"	"	Ln EDUF	$l_2 > 0$
"	"	Ln GOHP	$l_3 > 0$
"	"	Ln GOEP	$l_4 > 0$
MODEL 1b(ivc)	Ln INFP	Ln GPOL	$u_1 > 0$
"	"	Ln PMAN	$u_2 > 0$
"	"	Ln FUND	$u_3 > 0$
MODEL 1b(ivd)	Ln CAPB	Ln GOBJ	$i_1 > 0$
"	"	Ln GREV	$i_2 > 0$
"	"	Ln REXP	$i_3 < 0$
MODEL 1b (v)	Ln SECU	Ln UNEM	$s_1 < 0$
"	"	Ln UDEP	$s_2 < 0$
"	"	Ln CULT	$s_3 < 0$
"	"	Ln DRUG	$s_4 < 0$
"	"	Ln PRIV	$s_5 < 0$
"	"	Ln RFAN	$s_6 < 0$
"	"	LnPBOD	$s_7 < 0$
"	"	LnSJUC	$s_7 < 0$
MODEL 1b (vi)	Ln NDPL	Ln GPOL	$s_1 < 0$
"	"	Ln CGOV	$s_2 < 0$
"	"	Ln IMPL	$s_3 < 0$
"	"	Ln DATA	$s_4 < 0$
"	"	Ln PLAN	$s_5 < 0$

Source: Researcher's Compilation from Economic Theory Expectation of Effect of Secondary Investment Climate Variables on the primary investment climate factors and Economic Development Variables (2017)

3.5.2 Statistical criteria test: 1st order test

The F-statistic and coefficient of determination were used to evaluate the models.

F-statistic

The F-statistic test was used to conduct various tests of significance of the regression model. The most important thing that F-test does is to test the overall significance of the regression, the stability of the regression coefficients and the homoscedastic nature of the variables (Gujarati, 2004).

If computed F-statistic (F*) is greater than the table F-value or the p-value is less than 0.05, then there is a significant relationship between the dependent and independent variable. The reverse is the case if computed F-statistic (F*) is less than the table F-value or p-value is greater than 0.05.

Coefficient of determination (R^2)

The coefficient of determination was used to measure the explanatory power of the independent variables on the dependent variables. It measures the percentage variation in the dependent variable (s) which was explained by the independent variable(s). The higher the R^2 or the closer the value to 1(one), the better is the explanatory power of the independent variable(s) over the dependent variable. In a regression analysis, it shows how good the fit is between the dependent and independent variable(s). On the other hand, if the $R^2 = 0$ it means that the explanatory variables could not explain the changes in the dependent variable. R^2 ranges from -1 to +1 scale.

Adjusted Coefficient of determination (R^2 - Adjusted)

Because R^2 does not take into consideration the loss of degree of freedom from the introduction of additional explanatory variables into a function which in fact raises its value. To correct this defect, R^2 is then adjusted by taking into account the degrees of freedom which decreases it value as new regressors or explanatory variables are being introduced in the function (Iyoha, 2004). The R^2 Adjusted becomes an efficient tool used to capture the explanatory power of the independent variable(s) on the dependent variable. This is a very good test for evaluating multiple regression models.

3.5.3 Econometric criteria test; 2nd order condition test

Econometric criterion test helps to investigate whether the assumption of OLS were met or violated and how they affected the reliability of the desirable properties of unbiasedness and

consistency of the estimates. The following econometric tests were carried out viz; stationarity, normality, autocorrelation, multicollinearity and heteroscedasticity tests.

Stationarity test

Stationarity is said to exist if the mean and variance of a variable are constant over time. If a time series is stationary its mean, variance and covariance (at various lags) remain the same no matter at what point we measure them (Iyoha, 2004). Unit root test was used to carry out stationarity test of the variables to assess their co-integrating powers in the models. The Dickey Fuller (DF) and Augmented Dickey Fuller (ADF) unit root test were used. The decision point was that if the computed ADF, which must be a negative value, is greater in absolute term than the critical or table value which must also be a negative at 5% level of significance, then the null hypothesis that the series has a unit root will be rejected while accepting the fact that there is no unit root meaning that the series are stationary and cointegrated.

Normality test

This test is to check if the variables of the model are normally distributed. Normality condition is sometimes a very important characteristic of a good model. The Jarque-Bera graphical and statistical normality test was used to test the models for normal distribution. The decision point was that if the probability value of Jarque-Bera estimate was greater than 0.05 (5% level of significance) and the F computed value was less than F-critical at 5% (chi-square normal distribution value), then the model can be said to be normally distributed to accept the null hypothesis (H_0).

Auto and serial correlation and test

Autocorrelation refers to the stochastic dependence between successive values of the disturbance error term over a period of time or the dependence of members of a series of observation especially time series data over time. i.e $U_t = f(U_{t-1})$ It is a time-series data problem where the variables tend to clog together. The classical linear model assumes that covariance or autocorrelation does not exist in the disturbance or error term U_i . Symbolically $E(U_i, Uj = 0, i \neq j)$. Autocorrelation causes loss of efficiency and consistency properties of the OLS estimator. Evaluation of the effect of individual explanatory variables on the dependent variable can thus become unreliable when this problem exist (Iyoha, 2004). Durbin-Watson, AR, LM can be used

for this test. The Breusch-Godfrey Lagrange Multiplier test (LM test) which is a good diagnostic test for detecting serial correlation among time series data was used in this study. When the p-value of the LM test statistic is greater than 0.05 (5% level of significance) and the F computed value is less than F-critical at 5%, then there is no auto or serial correlation of the variables of the model and the null hypothesis (H_0) is thus accepted.

Multicollinearity test

The situation where the explanatory variables are highly inter-connected is referred to as multicollinearity. In this case, the explanatory variables formed exact linear relationship with each other and becomes difficult to disentangle to evaluate the separate effect of each of the series of independent on the dependent variable. This problem of multiple regression models causes large standard errors, reduced precision of estimation, makes parameter estimates to be highly sensitive to changes and makes econometric sorting of the effect of each explanatory variable difficult. Akaiki information criterion and Variance inflation factor (VIF) statistic was used to test for multicollinearity. The lower the value of Akaiki the less the multicollinearity and for the VIF if the coefficient of determination of the model is subtracted from one (1) and the result is greater than 0.1 or 0.2, then there is absence of multicollinearity.

Heteroscedasticity test

The absence of identical or constant variance of U_i for all observations of the population causes heteroscedasticity. It should be noted that an important assumption of the classical linear regression model is that the disturbance term U_i of the population have the same or equal variances to be homoscedastic. Heteroscedasticity causes loss of efficiency and consistency properties of the OLS estimator. Since our data are time series data that are not volatile, the Breusch-Pagan-Godfrey generalized autoregressive conditional heteroscedasticity (GARCH) test was used for the work. If the p-value of the heteroscedasticity (GARCH) test statistic is greater than 0.05 (5% level of significance), then there is no heteroscedasticity meaning that the model is homoscedastic to satisfy the OLS assumption of homoscedasticity of the error terms.

3.5.4 Mathematical 1st & 2nd order derivative conditions and confirmatory factor analysis

Derivative is the change in the value of a variable in a functional relationship either positively or negatively. If the extremum value of the 1st order derivative ($f'_{(x)}$) is greater than zero, then the

independent variable has a positive impact on the dependent variable but when it is less than zero it has negative impact. The 1st order derivative was used to evaluate the apriori expectation of the parameters of the models. The value of the second order derivative ($f''_{(x)}$) helps to confirm whether the value obtained from the 1st order derivative is a minimum or a maximum value. A negative value of a 2nd order derivative indicates a declining trend of the value of the independent variable from a previous value to a lower value confirming that the previous point is a maximum point. The reverse will be the case when the second order derivative is a positive value implying an increasing trend of the independent variable from a previous value to confirm that the previous value is a minimum. The exploratory factor analysis helps to scan the secondary factors affecting each primary investment climate factor (independent variable) to determine whether such factors have positive or negative impact on the primary factors and economic development indicators. The confirmatory factor analysis was then used to compare and contrast the estimated coefficient (results) of each independent variable with their already established apriori expectations to confirm the explained relationship.

3.6 Test of Research Hypotheses

The regression results of the seven models were used to test, evaluate and validate the hypotheses of the study.

Hypothesis 1

The result of model 1 was used to test hypothesis one. The respective estimated coefficients and their apriori signs of the primary independent variables (PSCR, TRDF, ELEC, INFR, SECU and NDPL) were used to test whether they have positive or negative effect on the investment climate (MCAP) to make it conducive or not conducive. Furthermore, and to create a deeper understanding of the impact of the factors on the conduciveness of the investment climate, the coefficients of the underlying factors (secondary independent variables) were explore and evaluated with respect to their impact on the primary factors.

Hypothesis 2

The result of models 3- 6 was used to validate this hypothesis. The estimated coefficients of the primary independent variables of GDPG, PSCR, TRDF, ELEC, INFR, SECU and NDPL were

tested with t-test and p-values to determine their significant impact or otherwise on the respective economic development indicators of GNICAP, LIFE, EDUC and EMPL.

Hypothesis 3

Model 7, which explored the primary and underlying factors of the investment climate that affected capital development and efficiency, was used to test this hypothesis.

Year	Gross Domestic Income (GDP_k)	Investment (K) FDI+GCF	Capital-Output Ratio (COR)	Change in Investment (ΔK)	Change in Income (ΔGDP_k)	ICOR $\frac{\Delta K}{\Delta GDP_k}$	$ICOR_t - ICOR_{t-1}$	REM
1981								
”								
2015								

Under the remark column, if $ICOR_t < ICOR_{t-1}$ then the investment climate is efficient over that period. If the value of COR increases, then capital development has taken place as it shows that more capital is being made available for production.

3.7 Sources of Data

Secondary data were collected and used for the study. The data were extracted from the various issues of the Statistical Bulletins of the Central Bank of Nigeria, Annual Abstract of Statistics of the National Bureau of Statistics, World Bank Economic Indicators' Publications, Nigeria Investment Promotion Council, Index Mundi, IMF manuals and publications, Journals, trade summaries, Federal Ministry of Education, Nigeria University Commission, articles in dailies and online resources. Specifically, annual time-series data from 1981 to 2015 on real gross domestic product (GDP), commercial banks' credit to the private sector, net capital budget and electricity supply were obtained from the 2015 series of the CBN Statistical Bulletin while trade facilitation (cargo loading and off-loading at Nigerian Ports), electricity supply, were obtained from NBS Annual Abstract of Statistic for 2008 & 2015 and the Nigeria Ports Authority (NPA). US$PPP gross per capita income, life expectancy, graduates from formal schools and employment rate were obtained from World Development Indicators (2013 & 2016) and Index mundi (2015).

CHAPTER FOUR

RESULT PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

This chapter presented and discussed the empirical results of the collected data for the study. The results of the individual models were presented, interpreted, analysed and discussed under various statistical methods and tests about the relationship between investment climate variables and economic development indices.

4.1 Result Presentation and Analysis

The results of the various statistical tests for the models are presented below in Tables 4.01 – 4.35.

Model 1a

Table 4.01 – Augmented Dickey-Fuller Unit Root Test for Model 1

Variable	ADF constant value	Critical value @ 5% signif	Prob. value	ADF > Critical value	Decision	Order of integration	Conclusion /remark
LNMCAP	-3.5175	-2.9540	0.0137	-3.6029 > -3.5530	No unit root	I(1)	Stationary
LNPSCR	-4.2309	-2.9540	0.0022	-4.1588 > -3.5530	No unit root	I(1)	Stationary
LNTRDF	-7.7385	-2.9540	0.0000	-7.6227 > -3.5530	No unit root	I(1)	Stationary
LNINFR	-8.6978	-2.9540	0.0000	-7.1715 > -3.5530	No unit root	I(1)	Stationary
LNELEC	-5.9608	-2.9540	0.0000	-7.6227 > -3.5530	No unit root	I(1)	Stationary

From Table 4.01, the results of Augmented Dickey-Fuller unit root test for all the variables of the models were stationary at order I (1) indicating a possible linear relationship between investment climate conditions that support economic development and the primary and underlying factors of the investment climate affecting such conditions.

Table 4.02: Result of Johansen Cointegration Test for Model 1a

Date: 06/12/18 Time: 22:20
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: LNMCAP LNPSCR LNTRDF LNINFR LNELEC LNSECU NDPL
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.797008	145.5815	125.6154	0.0017
At most 1	0.684742	92.96016	95.75366	0.0767
At most 2	0.424676	54.86619	69.81889	0.4246
At most 3	0.385905	36.62305	47.85613	0.3655
At most 4	0.289364	20.53208	29.79707	0.3875
At most 5	0.191308	9.259448	15.49471	0.3419
At most 6	0.065975	2.252334	3.841466	0.1334

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.797008	52.62136	46.23142	0.0092
At most 1	0.684742	38.09397	40.07757	0.0822
At most 2	0.424676	18.24314	33.87687	0.8651
At most 3	0.385905	16.09098	27.58434	0.6581
At most 4	0.289364	11.27263	21.13162	0.6201
At most 5	0.191308	7.007114	14.26460	0.4883
At most 6	0.065975	2.252334	3.841466	0.1334

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The result of the Johansen cointegration test on Table 4.02 showed that there was at least one cointegrating equation, which implied a possible linear combination of the stationary variables of the model in a long-run stable equilibrium relationship with the dependent variable.

Table 4.03: Long-Run Normalised Coefficients Result for Model 1a

1 Cointegrating Equation(s): Log likelihood 24.39319

Normalized cointegrating coefficients (standard error in parentheses)

LNMCAP	LNPSCR	LNTRDF	LNINFR	LNELEC	LNSECU	NDPL
1.000000	-98.03119*	193.7079*	3.305401*	-200.1706*	-481.7406*	86.98048*
	(23.8387)	(28.5927)	(5.09033)	(83.6912)	(58.2323)	(53.3350)

*Denotes statistical significance

The long-run coefficients of the model were normalized by using minus one (-1) to multiply them. The result on Table 4.03 showed a positive significant long-run equilibrium relationship between manufacturing capacity utilisation (MCAP) and investment climate factors such as private sector credit (PSCR), electric power supply infrastructure (ELEC) and security (SECU). On the other hand, trade facilitation (TRDF), other infrastructures (INFR) and national development plan (NDPL) had significant negative long-run equilibrium relationship with manufacturing capacity utilisation.

Table 4.04: Error Correction Model 1a

Dependent Variable: D(LNMCAP)
Method: Least Squares
Date: 06/16/18 Time: 00:01
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.393297	1.175928	4.586417	0.0001
D(LNPSCR)	0.061177	0.048541	1.260315	0.2183
D(LNTRDF)	-0.112156	0.051541	-2.176066	0.0385
D(LNINFR)	-0.017882	0.041680	-2.330844	0.0282
D(LNELEC)	-0.184363	0.192867	-0.955910	0.3476
D(SECU)	-0.331348	0.108704	-3.048181	0.0051
D(NDPL)	0.130454	0.104209	1.251849	0.2214
ECM(-1)	-0.724884	0.164209	-4.414398	0.0024

R-squared	0.607017	Mean dependent var	3.797600
Adjusted R-squared	0.519688	S.D. dependent var	0.222933
S.E. of regression	0.154503	Akaike info criterion	-0.715966
Sum squared resid	0.644522	Schwarz criterion	-0.401715
Log likelihood	19.17142	Hannan-Quinn criter.	-0.608797
F-statistic	6.950889	Durbin-Watson stat	0.972144
Prob(F-statistic)	0.000151		

$$MCAP = 5.393297 + 0.06117PSCR - 0.112156TRDF - 0.184363ELEC - 0.017882INFR - 0.331348SECU + 0.130454NDPL + \upsilon_t$$

The result of the error correction model on Table 4.04 showed a high rate of annual adjustment (72.5%) of short-run disequilibrium to long-run equilibrium between MCAP and PSCR, TRDF, ELEC, INFR, SECU, NDPL. This means that 72.5% of the short-run disequilibrium was corrected within one year to the long-run equilibrium relationship of the above time series data used in the study. The ECM was statistically significant (t-value of 4.4) to indicate the possibility of effecting corrections while the negative sign of the ECM coefficient indicated a convergence of the variables towards equilibrium and suggesting a possible correction of any deviation from the long-run equilibrium. The result implied that private sector credit (PSCR), national development plans (NDPL) and some other factors (C) not included in the model positively affected manufacturing capacity utilisation. Of these three, only the constant variable was statistically significant and with a large positive impact (539%) on manufacturing capacity utilisation while PSCR (61%) and NDPL (13%) were not significant and had less impact. On the other hand, trade facilitation (TRDF), electric power supply infrastructure (ELEC), other infrastructures (INFR), and security (SECU) had negative effect on the growth of manufacturing capacity utilisation. Trade facilitation, security and other infrastructures were significant judging by their t-values ($t > 2$). However, the negative impact of the respective variables is minimal (-0.112156, -0.017882, -0.184363, -0.331348). By this result a unit (100%) increase in private sector credit and national development plan will increase manufacturing capacity utilisation by 0.06 (6%) and 0.13 (13%) respectively while a unit increase in trade facilitation, electricity power infrastructure, other infrastructure, and security will decrease the growth in capacity utilisation by 0.11(11%), 0.012 (1.2%), 0.18 (18%) and 0.33 (33%) respectively.

The coefficient of determination R^2 of 0.61 (61%) and the adjusted R^2 of 0.52 were on the average high and showed that about52% of the variation in capacity utilisation of the manufacturing sector was explained by the primary investment climate variables of the model. The F-statistic of 6.95 is fair and complements the R^2 to confirm the goodness of fit of the model and also established the existence of significant linear relationship between manufacturing capacity utilisation and investment climate factors.

The signs of the coefficients for trade facilitation (TRDF), electric power infrastructure (ELEC), other infrastructures (INFR) and security (SECU) were all negative and did not conform to the

apriori expectation but private sector credit and national development plan were positive and thus conformed.

Table 4.05: Residual Diagnostic Tests for Model 1a

Diagnosis	Test	F-Statistic	Prob. value	Critical value	Decision F-Stat < 2.53 Prob > 0.05 Accept H_0	Conclusion
Normality	Jarque-Bera Stat.	1.88	0.41	0.05	H_0 is accepted	The model is normally distributed
Serial correlation	LM	1.79	0.22	0.05	H_0 is accepted	There is no serial correlation
Heteroscedasticity	ARCH	0.64	0.72	0.05	H_0 is accepted	There is no Heteroscedasticity but homoscedasticity
Stability	Ramsey RESET	2.09	0.16	0.05	H_0 is accepted	There is no specification error and the model is stable

The diagnostic tests result reported on Table 4.05 showed that the model was healthy and stable. The Jarque-Bera (JB) test showed a normal distribution of the residuals, the Lagrange Multiplier (LM) test showed absence of serial correlation while the autoregressive conditional heteroscedasticity test (ARCH) indicated that the disturbance terms were homoscedastic with constant variance and high predictability value. The Ramsey RESET test showed that there was no specification error in the regression equation that could affect the stability of the model.

Model 1b: Discriminant Exploratory Factor Analysis of Primary factors in Tabular Form

Table 4.06: Secondary and Tertiary Factors Affecting Primary Investment Climate Factors in Nigeria

Primary Factor Affecting Investment Climate	**Nature of Impact of Factor.**	**Statistical Significance of Factor**	**Explorative Description of the Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor**	**Derivative Evaluation of Impact of Secondary and Tertiary Factors on Primary Factors**	**Concluding Remark**
PSCR	+ 0.06117 (Positive)	Not Significant	The rate of savings in Nigeria is very low due to low income, poverty and poor savings habit (only 5% saves). The low saving reduces private sector credit supply for development. Interest or lending rate is high from 20% and above. Nigeria's capital market is poorly developed leading to poor funding capital and long term projects. About 80% of loan applications to banks are rejected. In addition there is high lien and collateral rate which is often 160% of the value of loan applied for. Loan repayment period granted to borrowers is very short and starts just about 30 days from the date the loan was given.	$f'(SAVE) < 0 = -k_1$ $f'(INTR) < 0 = -k_2$ $f'(CMKT) < 0 = -k_3$ $f'(LOAN) < 0 = -k_4$ $f'(RPAY) < 0 = -k_5$	All the secondary factors have reducing or negative impact on private sector credit supply.
TRDF	- 0.112156 (Negative)	Significant	There is poor port facilities and inefficient management leading to crowded activities at the ports and delay in cargo clearance. Demurrage rate is high. Security network is poor with high theft rate. Custom duties are very high. Corruption among port officials is high leading to under collection of duties into private pockets. High exchange rate of naira to dollar limits volume of trade.	$f'(PFAC) < 0 = -m_1$ $f'(PMGT) < 0 = -m_2$ $f'(DEMU) < 0 = -m_3$ $f'(SECU) < 0 = -m_4$ $f'(DUTY) < 0 = -m_5$ $f'(CORR) < 0 = -m_6$ $f'(EXCR) < 0 = -m_7$	All the secondary factors have reducing or negative impact on trade facilitation and development.

Table 4.06: Secondary and Tertiary Factors Affecting Primary Investment Climate Factors in Nigeria Cont….

Primary Factor Affecting Investment Climate	**Nature of Impact of Factor.**	**Statistical Significance of Factor**	**Explorative Description of the Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor**	**Derivative Evaluation of Impact of Secondary and Tertiary Factors on Primary Factors**	**Concluding Remark**
ELEC	-0.184363 (Negative)	Not Significant	**ELEC** : Poor generating capacity of electricity due to (i). Inadequate gas supply to thermal electricity generating stations caused by the destruction of gas pipelines by militants in Niger Delta. (ii) Low volume of water to turn the hydro-electricity generating turbines in Kainji, Jebba and Shiroro dams. (iii). Destruction and damage of electrical installations by militants, rainstorms, erosion, accidents, man and vandalisation or theft of electrical facilities such as almond cables, circuit breakers, transformers, conductor wires etc (iv). Over loading and poor maintenance of generating plants leads to frequent trip-off of power supply. (v) Poor electricity policy in Nigeria with only adhoc programmes (vi). There is poor response to fault rectification by Staff or officials of electricity distribution/supply companies in Nigeria. This could be due to their indiscipline and corrupt tendency. .	$f'(GASS) < 0 = -p_1$ $f'(WTER) < 0 = -p_2$ $f'(DEST) < 0 = -p_3$ $f'(LOAD) < 0 = -p_4$ $f'(EPOL) < 0 = -p_5$ $f'(FAUT) < 0 = -p_6$ $f'(CORR) < 0 = -p_7$ $f'(TRAN) < 0 = -q_1$ $f'(HEDU) < 0 = -q_2$ $f'(INFP) < 0 = -q_3$ $f'(CAPB) < 0 = -q_4$ $f'(FAUT) < 0 = -p_6$	The derivative of the underlying factors affecting electricity supply showed a reducing or negative impact on its supply and infrastructural development All the secondary factors have reducing or negative impact on infrastructure

Table 4.06: Secondary and Tertiary Factors Affecting Primary Investment Climate Factors in Nigeria Cont….

Primary Factor Affecting Investment Climate	**Nature of Impact of Factor.**	**Statistical Significance of Factor**	**Explorative Description of the Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor**	**Derivative Evaluation of Impact of Secondary and Tertiary Factors on Primary Factors**	**Concluding Remark**
INFR	- 0.017882 (Negative)	Fairly Significant	(vii). Corruption on the part Staff/officials of electricity distribution/supply companies in Nigeria caused under or over-billing of customers. This discouraged them from paying their electricity bill regularly and hence loss of revenue to the government. The officials often demand and collect bribe before they can attend to issues of reconnection/fault rectification **Infrastructure** is affected by poor transport, health and education infrastructure, government infrastructural development policy and the size of federal capital budget. These infrastructures also have their respective underlying factors affecting them to impact on economic development **TRAN**: Transport infrastructure is highly affected by (i). Bad and poor road network caused by rain floods, erosion, poor construction/maintenance, damage by man through crossing pipes, blockade for social activities, speed breaker, cattle crossing, accidents and others. (ii). Rail network are few and abandoned in Nigeria. (iii). Sea and airports facilities are poor. Harbours and bays are not dredged while airports tarmac and weather forecast equipment are poor resulting in plane crashes.	$f'(CORR) < 0 = -p_7$ $f'(ROAD) < 0 = -t_1$ $f'(RAIL) < 0 = -t_2$ $f'(PORT) < 0 = -t_3$	The derivative of the underlying factors affecting transport infrastructure showed a reducing or negative impact on infrastructure development in the economy.

Table 4.06: Secondary and Tertiary Factors Affecting Primary Investment Climate Factors in Nigeria Cont….

Primary Factor Affecting Investment Climate	**Nature of Impact of Factor.**	**Statistical Significance of Factor**	**Explorative Description of the Secondary and tertiary Factors Affecting the Primary Investment Climate Factor**	**Derivative Evaluation of Impact of Secondary and Tertiary Factors on Primary Factors**	**Concluding Remark**
INFR	- 0.017882 (Negative)	Fairly Significant	**HEDU**: Health and educational infrastructure are still lacking in Nigeria. As the population of the country grows there was high demand for health and education facilities (i). Health facilities needed include health centres and hospital structures, drugs, diagnostic and other treatment equipment/machines. (ii). Educational facilities needed include structures for lectures, library, laboratory, learning resources and equipment. (iii). Government's health treatment policy and management programmes involving the provision of skilled medical specialists and personnel for tackling health problems to promote longevity. Programmes include immunisation and vaccination schemes to tackle epidemic, medical insurance, free medical services and others. (iv). Government's education policy and infrastructural backup involving free education, basic compulsory literacy programmes, school system, curriculum design, staff training and funding.	$f'(HFAC) < 0 = -l_1$ $f'(EDUF) < 0 = -l_2$ $f'(GOHP) < 0 = -l_3$ $f'(GOEP) < 0 = -l_4$	The derivative of the underlying factors affecting health and education infrastructure showed a reducing or negative impact on infrastructural development.

Table 4.06: Secondary and Tertiary Factors Affecting Primary Investment Climate Factors in Nigeria Cont….

Primary Factor Affecting Investment Climate	**Nature of Impact of Factor.**	**Statistical Significance of Factor**	**Explorative Description of the Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor**	**Derivative Evaluation of Impact of Secondary and Tertiary Factors on Primary Factors**	**Concluding Remark**
INFR			**INFP:** Government's infrastructural development policy in Nigeria is weak. (i).. Government has no pragmatic infrastructural development plan for the country over the period of study. The first infrastructural development plan in Nigeria introduced in June 2014 existed on paper with no practical action. (ii) Political party manifestoes of the government in power can influence the level of infrastructural development. However, no political party in Nigeria has blueprint on infrastructural development in their manifestoes. (iii) Committed funding of infrastructural development programmes is acute in Nigeria. This is because infrastructural development is merely use as political propaganda by politicians to win votes from the electorate	$f'(GPOL) < 0 = -u_1$ $f'(PMAN) < 0 = -u_2$ $f'(FUND) < 0 = -u_3$	The derivative of the underlying factors affecting government's policy on infrastructural development showed a reducing or negative impact on infrastructural development in the country.

Table 4.06: Secondary and Tertiary Factors Affecting Primary Investment Climate Factors in Nigeria Cont….

Primary Factor Affecting Investment Climate	Nature of Impact of Factor.	Statistical Significance of Factor	Explorative Description of the Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor	Derivative Evaluation of Impact of Secondary and Tertiary Factors on Primary Factors	Concluding Remark
INFR			**CAPB:** The annual capital budget for Nigeria is often inadequate to meet with the infrastructural challenges of the country. Over the years capital budget has been below 30% of the total annual budget. The net capital budget, after recurrent budget deficit is charged to capital account, is even smaller. These underlying factors affect capital budget to reduce the impact on infrastructural development. (i). Government economic objective in Nigeria over the years did not favour infrastructural development and maintenance leading to massive infrastructural decay in the economy. (ii). The total revenue accruing to the federal government to executed capital projects is small and dwindling especially in response to falling crude oil prices at the international market. (iii). The size of the annual recurrent budget of Nigeria is large (above 70%) making the country to persistently run a budget of consumption without investment. Recurrent budget deficit is often charged to the capital budget to further reduce the amount available for infrastructural development.	$f'(GOBJ) < 0 = -i_1$ $f'(GREV) < 0 = -i_2$ $f'(REXP) < 0 = -i_3$	The derivative of the underlying factors affecting government's policy on infrastructural development showed a reducing or negative impact on infrastructural development in the country.

Table 4.06: Secondary and Tertiary Factors Affecting Primary Investment Climate Factors in Nigeria Cont….

Primary Factor Affecting Investment Climate	**Nature of Impact of Factor.**	**Statistical Significance of Factor**	**Explorative Description of the Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor**	**Derivative Evaluation of Impact of secondary and Tertiary Factors on Primary Factors**	**Concluding Remark**
SECU	-0.331348 (Negative)	Significant	Major factors threatening the security of Nigeria are: (i). High rate of unemployment leading to poverty and high class crime rate such as armed robbery, kidnapping, cyber crime, fraud/stealing, political thuggery, touting in airports and motor parks, ritual killings for money, militancy and insurgencies. (ii). Imbalance and uneven development plan of government often leads to fracas of ethnic agitations for resource control and self government. (iii). Cult activities, associated with killings for supremacy and rituals, is on the increase especially among the youths in tertiary institutions. Cultism provides the breeding and training ground for armed robbers, kidnappers, hired killers, ritualists, militants, insurgents, rapists, thieves and others. (iv). Drug addiction makes the drug addict to be bold and conscienceless to perpetuating violent crimes as raping and killings. (v). Political rivalry often leads to the hiring of tugs torture, kidnap and assassinate political opponents.	$f'(UNEM) > 0 = s_1$ $f'(UDEP) > 0 = s_2$ $f'(CULT) > 0 = s_3$ $f'(DRUG) > 0 = s_4$ $f'(PRIV) > 0 = s_5$ $f'(RFAN) > 0 = s_6$ $f'(PBOD) > 0 = s_7$ $f'(SJUC) > 0 = s_8$	The derivative of the underlying factors affecting security showed an increasing magnitude of security threat in the country which negatively affects economic development.

Table 4.06: Secondary and Tertiary Factors Affecting Primary Investment Climate Factors in Nigeria Cont….

Primary Factor Affecting Investment Climate	**Nature of Impact of Factor.**	**Statistical Significance of Factor**	**Explorative Description of the Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor**	**Derivative Evaluation of Impact of Secondary and Tertiary Factors on Primary Factors**	**Concluding Remark**
SECU	-0.331348 (Negative)	Significant	(vi) Religion fanaticism had often led to upheavals and killings especially in the northern part of Nigeria between the Christians and Muslims to heat up the security apparatus of the country. Religious intolerance is very high among the Muslims north. This is why the country frequently experience religious disturbances such as maitatsine, shiites, boko-haram in the north. (vii). Nigeria's borders are very porous leading to influx of arms and criminals into the country. Smuggling and other economic sabotage goes on unchecked and creating problems for investment. (viii). Nigeria's judicial process is slow and delays justice. This makes it look as if criminals are not being punished for their crime to serve as deterrent to others.	$f'(RFAN) > 0 = s_6$ $f'(PBOD) > 0 = s_7$ $f'(SJUC) > 0 = s_8$	The derivative of the underlying factors affecting government's policy on infrastructural development showed a reducing or negative impact on infrastructural development in the country.

Table 4.06: Secondary and Tertiary Factors Affecting Primary Investment Climate Factors in Nigeria Cont….

Primary Factor Affecting Investment Climate	**Nature of Impact of Factor.**	**Statistical Significance of Factor**	**Explorative Description of the Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor**	**Derivative Evaluation of Impact of Secondary and Tertiary Factors on Primary Factors**	**Concluding Remark**
NDPL	+0.130454 (Positive)	Not Significant	Factors affecting national development plans in Nigeria include: (i) (i). There is poor government's economic planning policy in Nigeria which had affected her economic development. The government engaged in disjointed adhoc policies. (ii) Change in leadership of government is often characterised by policy discontinuity by the new government. (iii) Implementation of development programmes is low in Nigeria. (iv) There is poor data collection for effective planning by the National Bureau of Statistics. The plans lack stake holders' input. (v) Misplaced priority and lack of bottom up planning that can capture the needs of the grassroots people. Inadequate funding for plans and the misapplication of budgeted funds. There is conflict of planning objectives most times between the federal, states and local governments. There is also corruption leading to embezzlement of funds for development programmes.	$f'(GPOL) < 0 = -n_1$ $f'(LEAD) < 0 = -n_2$ $f'(IMPL) < 0 = -n_3$ $f'(DATA) < 0 = -n_4$ $f'(PLAN) < 0 = -n_5$	The derivative of the underlying factors affecting national development plan showed a decreasing (negative) magnitude of their impact on economic development.

Source: Researcher's Compilation from Exploratory Factor Analysis of Impact of Underlying Factors **(**2018)

Model 2

Table 4.07 – Augmented Dickey-Fuller Unit Root Test for Model 2

Variable	ADF constant linear trend value	Critical value @ 5% signif	Prob. value	ADF > Critical value	Decision	Order of integration	Conclusion /remark
LNGDPG	-3.6029	-3.5530	0.0450	-3.6029 > -3.5530	No unit root	I(1)	Stationary
LNPSCR	-4.1588	-3.5530	0.0128	-4.1588 > -3.5530	No unit root	I(1)	Stationary
LNTRDF	-7.6227	-3.5530	0.0000	-7.6227 > -3.5530	No unit root	I(1)	Stationary
LNINFR	-7.1715	-3.5530	0.0000	-7.1715 > -3.5530	No unit root	I(1)	Stationary
LNELEC	-4.0477	-3.5485	0.0163	-7.6227 > -3.5530	No unit root	I(1)	Stationary

From Table 4.07, the results of Augmented Dickey-Fuller unit root test for all the variables of the models were stationary at order I (1) indicating a possible linear relationship between economic growth and investment climate variables.

Table 4.08: Result of Johansen Cointegration Test for Model 2

Date: 04/14/16 Time: 13:34
Sample (adjusted): 1984 2015
Included observations: 32 after adjustments
Trend assumption: Linear deterministic trend
Series: LNGDPG LNPSCR LNTRDF LNINFR LNELEC SECU NDPL
Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.964972	261.0645	125.6154	0.0000
At most 1 *	0.808353	153.8135	95.75366	0.0000
At most 2 *	0.666351	100.9463	69.81889	0.0000
At most 3 *	0.577986	65.82097	47.85613	0.0005
At most 4 *	0.459915	38.21404	29.79707	0.0043
At most 5 *	0.280371	18.50114	15.49471	0.0171

At most 6 * 0.220530 7.972523 3.841466 0.0047

Trace test indicates 7 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigen value)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical	Value Prob.**
None *	0.964972	107.2511	46.23142	0.0000
At most 1 *	0.808353	52.86715	40.07757	0.0011
At most 2 *	0.666351	35.12534	33.87687	0.0353
At most 3 *	0.577986	27.60694	27.58434	0.0497
At most 4	0.459915	19.71289	21.13162	0.0780
At most 5	0.280371	10.52862	14.26460	0.1795
At most 6 *	0.220530	7.972523	3.841466	0.0047

Max-eigen value test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The result of Johansen cointegration test on Table 4.8 showed seven cointegrating equations, which implied seven possible linear combinations of the stationary variables of the model in a long-run stable equilibrium relationship among the endogenous variables.

Table 4.09: Long-Run Normalised Coefficients Result for Model 2

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1 Cointegrating Equation(s): Log likelihood 144.9030

Normalized cointegrating coefficients (standard error in parentheses):

LNGDPG	LNPSCR	LNTRDF	LNINFR	LNELEC	SECU	NDPL
1	-0.581605*	-0.665406*	-0.095452*	-3.557297*	-0.118170	0.313562*
	(0.04763)	(0.06312)	(0.01111)	(0.17984)	(0.08338)	(0.06983)

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*Denotes statistical significance

The long-run coefficients of the model were normalized by using minus one (-1) to multiply them. The result on Table 4.09 showed a positive significant long-run equilibrium relationship between economic growth (GDPG) and investment climate factors such as private sector credit (PSCR), trade facilitation (TRDF), electric power supply infrastructure (ELEC) and other

infrastructures (INFR). Security (SECU) had a positive but not statistically significant value while national development plan (NDPL) had a significant negative long-run relationship with economic growth.

Table 4.10: Error Correction Model 2

Dependent Variable: D (LNGDPG)
Method: Least Squares
Date: 04/14/16 Time: 13:48
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.045937	0.011745	3.911316	0.0006
D(LNPSCR)	0.005709	0.037596	0.151855	0.8805
D(LNTRDF)	0.003751	0.010481	0.357871	0.7233
D(LNINFR)	-0.007509	0.003722	-2.017511	0.0541
D(LNELEC)	0.037867	0.060660	0.624245	0.5379
D(SECU)	0.085997	0.041923	2.051299	0.0504
D(NDPL)	0.062454	0.029388	2.125145	0.0432
ECM(-1)	-0.183521	0.096044	-1.996080	0.0571

R-squared	0.619221	Mean dependent var	0.044393
Adjusted R-squared	0.535934	S.D. dependent var	0.042421
S.E. of regression	0.039432	Akaike info criterion	-3.426137
Sum squared resid	0.040428	Schwarz criterion	-3.066993
Log likelihood	66.24432	Hannan-Quinn criter.	-3.303658
F-statistic	11.74165	Durbin-Watson stat	1.685551
Prob (F-statistic)	0.002148		

GDPG = 0.045937+0.005709**PSCR**+ 0.003751**TRDF**+0.037867**ELECT**– 0.007509**INFR**
+0.085997**SECU**+0.062454**NDPL**+υ_t

The error correction mechanism showed a low annual adjustment rate of 18.4% of short-run disequilibrium to long-run equilibrium between GDPG and PSCR, TRDF, ELEC, INFR, SECU, NDPL. The ECM was statistically significant to effect the corrections and the negative sign of the ECM coefficient indicated a convergence of the variables towards equilibrium. There was thus an inherent long-run equilibrium relationship between investment climate factors and economic growth. The result showed that private sector credit (PSCR), trade facilitation (TRDF),

electric power supply infrastructure (ELEC), other infrastructures (INFR), security (SECU), national development plans (NDPL) and other exogenous variables (C) positively affected economic growth. Of these variables security, national development plan and the constant variable were statistically significant in coefficients going by their t-values of 2.05, 2.13 and 3.91 which were above 2. In addition they had low probability values of 0.05, 0.04, 0.00 which were below 0.05 (5%). They had greater positive impact on economic growth than the other factors. Infrastructural development had a statistically significant negative impact on economic growth.

A unit increase in private sector credit, trade facilitation, electric power supply infrastructure, security, national development plans and other exogenous variables will increase GDP growth by 0.6%, 0.4%, 3.8%, 8.6%, and 6.2% respectively. Security and national development plan had greater significant impact on economic growth. A unit increase in infrastructural development would reduce growth in GDP by a negligible 0.8% unit. This implies that there is infrastructural deficit due to inadequate net capital budget to support economic growth.

The adjusted R-square of 0.536, means that 53.6% of the variation in economic growth was explained by investment climate variables. F-statistic of 11.7 which measured the overall statistical significance of the relationship among the explanatory variables is high and good.

The signs of the coefficients of the model conformed to the a priori expectation except for other infrastructure which was negative.

Table 4.11: Residual Diagnostic Tests for Model 2

Diagnosis	Test	F-Statistic	Prob. value	Critical value	Decision F-Stat < 2.43 Prob > 0.05 Accept H_0	Conclusion
Normality	Jarque-Bera Stat.	1.88	0.41	0.05	H_0 is accepted	The model is normally distributed
Serial correlation	LM	1.79	0.22	0.05	H_0 is accepted	There is no serial correlation
Heteroscedasticity	ARCH	0.64	0.72	0.05	H_0 is accepted	There is no Heteroscedasticity but homoscedasticity
Stability	Ramsey RESET	2.09	0.16	0.05	H_0 is accepted	There is no specification error and the model is stable

The diagnostic tests report on Table 4.11 showed that the model is structurally and functionally healthy and valid. The Jarque-Bera (JB) null hypothesis of normal distribution of the residuals was accepted. The Lagrange Multiplier test (LM) of auto or serial correlation showed that the residuals were not serially correlated. The autoregressive conditional heteroscedasticity test (ARCH) revealed that the disturbance terms were homoscedastic with constant variance and high predictability while the Ramsey RESET test showed that there was no specification error in the regression equation that can affect the stability of the model.

Model 3

Table 4.12 – Augmented Dickey-Fuller Unit Root Test for Model 3

Variable	ADF constant linear trend value	Critical value @ 5% signif	Prob. value	ADF > Critical value	Decision	Order of integration	Conclusion/ remark
LNGNICAP	-6.6460	-3.5530	0.0000	-6.6460 > -3.5530	No unit root	I(1)	Stationary
LNGDPG	-3.6029	-3.5530	0.0450	-3.6029 > -3.5530	No unit root	I(1)	Stationary
LNPSCR	-4.1588	-3.5530	0.0128	-4.1588 > -3.5530	No unit root	I(1)	Stationary
LNTRDF	-7.6227	-3.5530	0.0000	-7.6227 > -3.5530	No unit root	I(1)	Stationary
LNINFR	-7.1715	-3.5530	0.0000	-7.1715 > -3.5530	No unit root	I(1)	Stationary
LNELEC	-4.0477	-3.5485	0.0163	-7.6227 > -3.5530	No unit root	I(1)	Stationary

From Table 4.12, the results of Augmented Dickey-Fuller unit root test showed that all the variables are stationary and integrating at order I (1).

Table 4.13: Result of Johansen Cointegration Test for Model 3

Date: 07/29/17 Time: 12:49
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: LNGNICAP LNGDPG LNPSCR LNTRDF LNINFR LNELEC SECU NDPL Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.839923	212.4190	159.5297	0.0000
At most 1 *	0.800661	151.9598	125.6154	0.0005
At most 2 *	0.664440	98.73907	95.75366	0.0307
At most 3	0.569416	62.70455	69.81889	0.1619
At most 4	0.332472	34.89835	47.85613	0.4534
At most 5	0.288218	21.56060	29.79707	0.3236
At most 6	0.191177	10.34115	15.49471	0.2554
At most 7	0.096242	3.339391	3.841466	0.0676

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.839923	60.45923	52.36261	0.0061
At most 1 *	0.800661	53.22072	46.23142	0.0077
At most 2	0.664440	36.03452	40.07757	0.1331
At most 3	0.569416	27.80620	33.87687	0.2226
At most 4	0.332472	13.33775	27.58434	0.8655
At most 5	0.288218	11.21945	21.13162	0.6254
At most 6	0.191177	7.001763	14.26460	0.4889
At most 7	0.096242	3.339391	3.841466	0.0676

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

The Johansen cointegration test result on Table 4.13 showed three cointegrating equations for long-run stable relationship among the jointly endogenous variables.

Table 4.14: Long-run Normalised Coefficients Result for Model 3

1 Cointegrating Equation(s): Log likelihood 137.4051

Normalized cointegrating coefficients (standard error in parentheses)

LNGNICAP	LNGDPG	LNPSCR	LNTRDF	LNINFR	LNELEC	SECU	NDPL
1.000000	-1.073401	0.042723	-0.040215	0.000803	0.653083	0.281728	-0.155851
	(0.07231)	(0.01422)	(0.01352)	(0.00338)	(0.03768)	(0.02786)	(0.01989)

The normalised cointegrating coefficients on Table 4.14 showed that gross national per capita income (GNICAP) has a positive long-run equilibrium relationship with economic growth (GDPG), trade facilitation (TRDF) and national development plan (NDPL). On the other it has negative relationship with private sector credit (PSCR) electric power supply infrastructure (ELEC), other infrastructures (INFR) and security (SECU). Of all the normalised coefficients only other infrastructures (INFR) that is not significant.

Table 4.15: Error Correction Model (ECM) for Model 3

Dependent Variable: D(LNGNICAP) Method: Least Squares
Date: 07/29/17 Time: 12:52
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

C	0.029200	0.019285	1.514124	0.1425
D(LNGDPG)	0.470469	0.213628	2.202277	0.0371
D(LNPSCR)	-0.115512	0.047888	-2.412136	0.0235
D(LNTRDF)	-0.018319	0.012000	-1.526608	0.1394
D(LNINFR)	0.003770	0.004321	0.872439	0.3913
D(LNELEC)	-0.257231	0.077351	-3.325509	0.0027
D(SECU)	-0.190525	0.048277	-3.946521	0.0006
D(NDPL)	0.097686	0.035636	2.741197	0.0111

R-squared	0.769182	Mean dependent var	0.013080
Adjusted R-squared	0.695320	S.D. dependent var	0.080522
S.E. of regression	0.044446	Akaike info criterion	-3.167142
Sum squared resid	0.049387	Schwarz criterion	-2.763105

GNICAP = -0.029200 +0.470469**GDPG** – 0.115512**PSCR** -0.018319**TRDF**– 0.257231**ELECT**
+0.003770**INFR -** 0.190525**SECU**+0.097686**NDPL**+υ_t

The error correction model (ECM) result on Table 4.15 showed that the ECM coefficient of 0.788181 was high and significant at a t-value of 4.5. This means that 78.8% of the short-run disequilibrium was corrected within one year to the long-run equilibrium relationship of the time series data. The analysis showed a positive equilibrium relationship between real gross national per capita income growth (GNICAP) and economic growth (GDPG), other infrastructures (INFR) and national development plans (NDPL). Of the three, other infrastructure was not statistically significant as the t value of 0.8 was below 2. Private sector credit (PSCR), electric power supply infrastructure (ELEC), trade facilitation (TRDF) and security (SECU) have negative relationship with growth in per capita income. Of these four variables with negative relationship only trade facilitation (TRDF) is not statistically significant given a t-value of 1.5. Gross domestic product (GDP) and national development plan (NDPL) had greater positive impact on gross national per capita income (GNICAP) growth in Nigeria while private sector credit (PSCR), electric power supply infrastructure (ELEC) and security (SECU) had greater negative impact.

Economic growth (GDPG) and national development plan (NDPL) significantly contributed most to the growth in real gross national per capita income (GNICAP) by 0.471 (47%) and 0.098 (9.8%) units respectively. On the other hand a unit increase in private sector credit (PSCR), electric power supply infrastructure (ELEC) and security (SECU) will reduce gross national per capita income growth by 0.1155 (11.6%), 0.2572 (25.7%) and 0.1905 (19.1%) units respectively.

The R-square adjusted, used for evaluating the association between the multi-variables of the regression model, was 0.6953. This means that 69.5% of the variation in real national per capita income growth was explained by investment climate factors. F-test, which measures the overall statistical significance of the explanatory variables, was 10.4 and it is significant for a good fit.

The signs of the coefficients that conformed to the apriori expectation are GDPG, INFR and NDPL. All others were negative.

Table 4.16: Residual Diagnostic Tests for Model 3

Diagnosis	Test	F-Statistic	Prob. value	Critical value	Decision F-Stat < 2.43 Prob > 0.05 Accept H_0	Conclusion
Normality	Jarque-Bera Stat.	11.8	0.003	0.05	H_0 is rejected	The model is not normally distributed
Serial correlation	LM	0.54	0.59	0.05	H_0 is accepted	There is no serial correlation
Heteroscedasticity	ARCH	0.99	0.97	0.05	H_0 is accepted	There is no Heteroscedasticity but homoscedasticity
Stability	Ramsey RESET	0.003	0.95	0.05	H_0 is accepted	There is no specification error and the model is stable

From Table 4.16 Jarque-Bera's (JB) normality test failed to confirm normal distribution of the residuals. The model was not normally distributed. The Lagrange Multiplier test (LM) on autocorrelation showed that the residuals were not serially correlated while the autoregressive conditional heteroscedasticity test (ARCH) revealed that the disturbance terms were homoscedastic. The Ramsey RESET test result confirmed that there was no specification error in the regression equation and the model is stable

Model 4

Table 4.17 – Augmented Dickey-Fuller Unit-root Test for the Models

Variable	ADF constant linear trend value	Critical value @ 5% signif	Prob. value	ADF > Critical value	Decision	Order of integration	Conclusion /remark
LNLIFE	-4.8952	-3.6032	0.0010	-4.8952> -3.6032	No unit root	I(1)	Stationary
LNGDPG	-3.6029	-3.5530	0.0450	-3.6029 > -3.5530	No unit root	I(1)	Stationary
LNPSCR	-4.1588	-3.5530	0.0128	-4.1588 > -3.5530	No unit root	I(1)	Stationary
LNTRDF	-7.6227	-3.5530	0.0000	-7.6227 > -3.5530	No unit root	I(1)	Stationary
LNINFR	-7.1715	-3.5530	0.0000	-7.1715 > -3.5530	No unit root	I(1)	Stationary
LNELEC	-4.0477	-3.5485	0.0163	-7.6227 > -3.5530	No unit root	I(1)	Stationary

Augmented Dickey-Fuller unit root test on Table 4.17 showed that all the variables of model 4 were stationary and integrated at order I (1).

Table 4.18: Result of Johansen Cointegration Test for Model 4

Date: 04/14/16 Time: 13:37
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: LNLIFE LNGDPG LNPSCR LNTRDF LNINFR LNELEC SECU NDPL
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.954628	267.8447	159.5297	0.0000
At most 1 *	0.790195	165.7805	125.6154	0.0000
At most 2 *	0.686562	114.2485	95.75366	0.0015
At most 3 *	0.600793	75.96347	69.81889	0.0149
At most 4	0.437477	45.66040	47.85613	0.0792
At most 5	0.326005	26.67475	29.79707	0.1098
At most 6	0.270066	13.65517	15.49471	0.0929
At most 7	0.094250	3.266747	3.841466	0.0707

Trace test indicates 4 cointegrating eqn (s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Maximum Eigen value)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.954628	102.0642	52.36261	0.0000
At most 1*	0.790195	51.53201	46.23142	0.0124
At most 2	0.686562	38.28504	40.07757	0.0785
At most 3	0.600793	30.30308	33.87687	0.1260
At most 4	0.437477	18.98565	27.58434	0.4156
At most 5	0.326005	13.01958	21.13162	0.4504
At most 6	0.270066	10.38842	14.26460	0.1877
At most 7	0.094250	3.266747	3.841466	0.0707

Max-Eigen value test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-value

The result of Johansen cointegration test on Table 4.18 showed that there were four cointegrating equations, which implied that there were four possible linear combinations of the stationary

variables of the model. The cointegrating vectors implied that a long-run stable equilibrium relationship existed among the jointly endogenous variables.

Table 4.19: Long-run Normalised Coefficients Result for Model 4

1 Cointegrating Equation(s): Log likelihood 274.8415

Normalized cointegrating coefficients (standard error in parentheses):

LNLIFE	LNGDPG	LNPSCR	LNTRDF	LNINFR	LNELEC	SECU	NDPL
1	-0.189487	-0.002350	-0.001307	0.000579	-0.079932	-0.013513	-0.007980
	(0.00602)	(0.00132)	(0.00118)	(0.00026)	(0.00297)	(0.00253)	(0.11128)

The results of the normalised cointegrating coefficients on Table 4.19 showed positive long-run relationship between life expectancy (LIFE) and private sector credit (PSCR), trade facilitation (TRDF) electric power supply infrastructure (ELEC), national development plan (NDPL), security (SECU) and economic growth (GDPG). Of these, electric power supply, security and economic growth are significant in coefficients. Other infrastructures (INFR) have negative impact on life expectancy in the long-run but not at a significant level.

Table 4.20: Error Correction Model 4

Dependent Variable: D (LNLIFE)
Method: Least Squares
Date: 04/14/16 Time: 13:58
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003488	0.001778	1.961718	0.0610
D(LNGDPG)	0.051324	0.018770	2.734382	0.0113
D(LNPSCR)	0.008860	0.002751	3.220641	0.0018
D(LNTRDF)	-0.000392	0.001116	-0.351287	0.7283
D(LNINFR)	0.013184	0.007880	0.185130	0.8546
D(LNELEC)	0.017364	0.007894	2.199646	0.0398
D(SECU)	0.011079	0.004511	2.455996	0.0213
D(NDPL)	-0.005272	0.003315	-1.590502	0.1243
ECM(-1)	-0.262985	0.122740	-2.142628	0.0421

R-squared	0.674799	Mean dependent var	0.004286
Adjusted R-squared	0.574734	S.D. dependent var	0.004435
S.E. of regression	0.004029	Akaike info criterion	-7.968706
Sum squared resid	0.000406	Schwarz criterion	-7.564670
Log likelihood	144.4680	Hannan-Quinn criter	-7.830918
F-statistic	3.873391	Durbin-Watson stat	1.528301
Prob(F-statistic)	0.010004		

LIFE = 0.003488 + 0.051324**GDPG** + 0.008860**PSCR** - 0.000392**TRDF** +0.017364**ELECT** + 0.013184**INFR +** 0.011079**SECU** - 0.005272**NDPL**+υ_t

The coefficient of the error correction model on Table 4.20 showed a low annual adjustment rate of 26.3% of short-run disequilibrium being corrected to long-run equilibrium between LIFE and investment climate factors. The ECM was statistically significant by a t-value of 2.1 and prob-value of 0.04 to effect the corrections and the negative sign of the coefficient indicated a convergence of the variables towards equilibrium. This analysis implied that there was a long-run positive equilibrium relationship between life expectancy (LIFE) and investment climate factors such as private sector credit (PSCR), electric power supply infrastructure (ELEC), other infrastructures (INFR), security (SECU), economic growth (GDPG) and the constant variable (C). Of these variables, economic growth (GDPG), private sector credit (PSCR), electric power supply infrastructure (ELEC) and security (SECU) were statistically significant in coefficients going by their t-values of 2.7, 3.2, 2.1 and 2.4 which were above 2 and their low probability values of 0.011, 0.001, 0.039 and 0.021 which were less than 0.05 (5%). Thus economic growth, private sector credit, electric power supply infrastructure and security had greater positive significant growth impact on longevity or life expectancy in Nigeria. Trade facilitation (TRDF) and national development plan (NDPL) had negative impact on growth of life expectancy.

A unit change in economic growth (GDPG), private sector credit (PSCR), electric power supply infrastructure (ELEC), security (SECU) and other infrastructures (INFR) will change growth in life expectancy (LIFE) by 0.0513 (5.1%), 0.0088 (0.8%), 0.0174 (1.7), 0.0111(1.1%), 0.0132 (1.3%) units respectively. Economic growth followed by electricity supply contributed most to the growth in life expectancy. A unit increase in trade facilitation (TRDF) and national development plans (NDPL) would reduce growth in life expectancy by 0.0004 (0.04%) and 0.0053 (0.5%) units respectively.

The adjusted R-square of 0.575 showed that 57.5% of the variation in life expectancy (LIFE) growth was explained by the investment climate factors of the model. The F-test, which measures the overall statistical significance among the variables, is 3.8 and it is significant.

The signs of the coefficients of the model conformed to the a priori expectation except for trade facilitation and national development plan which were negative.

Table 4.21: Residual Diagnostic Tests for Model 4

Diagnosis	Test	F-Statistic	Prob. value	Critical value	Decision F-Stat < 2.43 Prob > 0.05 Accept H_0	Conclusion
Normality	Jarque-Bera Stat.	1.9	0.38	0.05	H_0 is accepted	The model has a normal distribution
Serial correlation	LM	1.79	0.22	0.05	H_0 is accepted	There is no serial correlation
Heteroscedasticity	ARCH	0.64	0.72	0.05	H_0 is accepted	There is no Heteroscedasticity i.e the model is homoscedastic
Stability	Ramsey RESET	2.9	0.11	0.05	H_0 is accepted	Model stable and no specification error

The diagnostic test report on Table 4.21 showed evidence of no diagnostic problem with model 3 and this made the model healthy and valid. The Jarque-Bera (JB) normality test showed that the residuals were normally distributed while the Lagrange Multiplier test (LM) on autocorrelation showed that the residuals were not serially correlated. The autoregressive conditional heteroscedasticity test (ARCH) revealed that the disturbance term of the model was homoscedastic while the Ramsey RESET test result showed that there was no specification error in the cointegrating equation and that the model was stable.

Model 5

Table 4.22 – Augmented Dickey-Fuller Unit root test for the Model 5

Variable	ADF constant linear trend value	Critical value @ 5% signif	Prob. value	ADF > Critical value	Decision	Order of integration	Conclusion /remark
LNEDUC	-5.3065	-3.5530	0.0007	-5.3065 > -3.5530	No unit root	I(1)	Stationary
LNGDPG	-3.6029	-3.5530	0.0450	-3.6029 > -3.5530	No unit root	I(1)	Stationary
LNPSCR	-4.1588	-3.5530	0.0128	-4.1588 > -3.5530	No unit root	I(1)	Stationary
LNTRDF	-7.6227	-3.5530	0.0000	-7.6227 > -3.5530	No unit root	I(1)	Stationary
LNINFR	-7.1715	-3.5530	0.0000	-7.1715 > -3.5530	No unit root	I(1)	Stationary
LNELEC	-4.0477	-3.5485	0.0163	-7.6227 > -3.5530	No unit root	I(1)	Stationary

Result of the Augmented Dickey-Fuller unit root test on Table 4.22 shows that all the variables were stationary and integrated at order I (1).

Table 4.23: Result of Johansen Co-integration Test for Model 5

Date: 07/29/17 Time: 12:59
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: LNEDUC LNGDPG LNPSCR LNTRDF LNINFR LNELEC SECU NDPL Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.909653	215.0822	159.5297	0.0000
At most 1 *	0.796848	135.7469	125.6154	0.0104
At most 2	0.588821	83.15150	95.75366	0.2672
At most 3	0.526319	53.82349	69.81889	0.4692
At most 4	0.302644	29.16518	47.85613	0.7604
At most 5	0.233460	17.27002	29.79707	0.6201
At most 6	0.136321	8.496383	15.49471	0.4139
At most 7	0.104983	3.660106	3.841466	0.0557

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.909653	79.33529	52.36261	0.0000
At most 1 *	0.796848	52.59542	46.23142	0.0092
At most 2	0.588821	29.32801	40.07757	0.4688
At most 3	0.526319	24.65831	33.87687	0.4085
At most 4	0.302644	11.89515	27.58434	0.9368
At most 5	0.233460	8.773640	21.13162	0.8503
At most 6	0.136321	4.836277	14.26460	0.7624
At most 7	0.104983	3.660106	3.841466	0.0557

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

The cointegration test on Table 4.23 showed that there were two cointegrating equations which implied that there were at least two possible linear combinations of the stationary variables of the model in the long-run equilibrium relationship.

Table 4.24: Long-run Normalised Coefficients Result for Model 5

1 Cointegrating Equation(s): Log likelihood 104.6334

Normalized cointegrating coefficients (standard error in parentheses)

LNEDUC	LNGDPG	LNPSCR	LNTRDF	LNINFR	LNELEC	SECU	NDPL
1.000000	-0.221265	-0.628907	0.123761	0.164766	2.024469	-0.243954	-0.442495
	(0.39230)	(0.07650)	(0.07782)	(0.01828)	(0.21701)	(0.14974)	(0.10790)

The result of the normalised cointegrating coefficients on Table 4.24 showed that there was a positive long-run relationship between educational attainment (EDUC) and economic growth (GDPG), private sector credit (PSCR), security (SECU) and national development plan (NDPL). Of these, private sector credits (PSCR), security (SECU) and national development plan (NDPL) had statistically significant coefficients. On the other hand, trade facilitation (TRDF), other infrastructures (INFR) and electric power supply infrastructure (ELEC) had negative long-run equilibrium relationship. Infrastructure (INFR) and electricity supply (ELEC) have significant negative impact.

Table 4.25: Error Correction Model 5

Dependent Variable: D(LNEDUC)
Method: Least Squares
Date: 07/29/17 Time: 13:01
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.039116	0.103095	-0.379419	0.7076
D(LNGDPG)	-0.042132	1.327120	-0.031747	0.9749
D(LNPSCR)	0.256885	0.245635	1.045798	0.3057
D(LNTRDF)	0.021014	0.074378	0.282529	0.7799
D(LNINFR)	-0.047371	0.022407	-2.114124	0.0471
D(LNELEC)	0.195349	0.395009	0.494543	0.6252
D(SECU)	-0.323265	0.160281	-2.016866	0.0347
D(NDPL)	0.100827	0.212942	0.473495	0.6400
ECM(-1)	-0.544827	0.234071	-2.327619	0.0283

R-squared	0.327266	Mean dependent var	0.033153
Adjusted R-squared	0.111991	S.D. dependent var	0.272252
S.E. of regression	0.256555	Akaike info criterion	0.338979
Sum squared resid	1.645511	Schwarz criterion	0.743016
Log likelihood	3.237357	Hannan-Quinn criter.	0.476767
F-statistic	1.520223	Durbin-Watson stat	1.662935
Prob(F-statistic)	0.200307		

EDUC = -0.039116 -0.042132**GDPG** + 0.256885**PSCR** +0.021014**TRDF**+0.195349**ELECT**
- 0.047371**INFR** -0.323265**SECU** +0.100827**NDPL**+υ_t

The result of the error correction model on Table 4.25 showed a moderate annual correction speed or adjustment of 54.5% of short-run disequilibrium to long-run stable equilibrium. The

coefficient of the ECM was statistically significant with a t-value of -2.3 and a prob-value of less than 0.05. There was a long-run positive equilibrium relationship between educational attainment (EDUC) and private sector credit (PSCR), trade facilitation (TRDF), electricity power supply infrastructure (ELEC) and national development plans (NDPL). On the other hand, economic growth (GDPG), other infrastructures (INFR) and security (SECU) had negative impact on educational attainment and development but with other infrastructure and security being statistically significant. A unit increase in private sector credit (PSCR), trade facilitation (TRDF), electricity supply (ELEC), and national development plans (NDPL) increase growth in educational attainment (EDUC) by 26%, 2%**,** 20% and 10% respectively. Thus private sector credit (26%) and electricity supply (20%) were the most important contributing factors to growth in educational attainment. On the other hand a unit increase in economic growth (GDPG), other infrastructure (INFR) and security (SECU) reduced the growth in educational attainment (EDUC) by 4%, 5%, 32% respectively. By this insecurity (32%) poses the greatest challenge to educational development in Nigeria followed by other infrastructures (5%). This means that insecurity and dearth of infrastructure had hampered the output of graduates from the school system.

The adjusted R-square of 0.112 was a weak one that showed that only 11.2% variation in educational attainment (EDUC) was explained by the explanatory variables of the model. The F-test of 0.2 was poor and insignificant in measuring the overall statistical significance among the variables of the model. The signs of the coefficients of the model conformed to the a priori expectation except for economic growth, infrastructure and security.

Table 4.26: Residual Diagnostic Tests for Model 5

Diagnosis	Test	F-Statistic	Prob. value	Critical value	Decision F-Stat < 2.43 Prob > 0.05 Accept H_0	Conclusion
Normality	Jarque-Bera Stat.	31	0.00	0.05	H_0 is rejected	The model is not normally distributed
Serial correlation	LM	1.83	0.18	0.05	H_0 is accepted	There is no serial correlation
Heteroscedasticity	ARCH	1.23	0.32	0.05	H_0 is accepted	There is no Heteroscedasticity meaning it is Homoscedastic
Stability	Ramsey RESET	1.42	0.17	0.05	H_0 is accepted	Model is stable and no specification error

From the diagnostic tests report on Table 4.26, the model was not normally distributed but there was no serial correlation, no heteroscedasticity and no specification error which made the model relatively healthy and dependable.

Model 6

Table 4.27 – Augmented Dickey-Fuller Unit Root Test for Model 6

Variable	ADF constant linear trend value	Critical value @ 5% signif	Prob. value	ADF > Critical value	Decision	Order of integration	Conclusion /remark
EMPL	-5.8526	-3.5530	0.0002	-5.8526 > -3.5530	No unit root	I(1)	Stationary
LNGDPG	-3.6029	-3.5530	0.0450	-3.6029 > -3.5530	No unit root	I(1)	Stationary
LNPSCR	-4.1588	-3.5530	0.0128	-4.1588 > -3.5530	No unit root	I(1)	Stationary
LNTRDF	-7.6227	-3.5530	0.0000	-7.6227 > -3.5530	No unit root	I(1)	Stationary
LNINFR	-7.1715	-3.5530	0.0000	-7.1715 > -3.5530	No unit root	I(1)	Stationary
LNELEC	-4.0477	-3.5485	0.0163	-7.6227 > -3.5530	No unit root	I(1)	Stationary

The Augmented Dickey-Fuller unit root test on Table 4.27 showed that all the variables of model 6 are stationary and integrated at order I (1).

Table 4.28: Result of Johansen Cointegration Test for Model 6

Date: 04/14/16 Time: 13:39
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: EMPL LNGDPG LNPSCR LNTRDF LNINFR LNELEC SECU NDPL
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical	Value Prob**
None *	0.885067	228.1844	159.5297	0.0000
At most 1 *	0.813755	156.7920	125.6154	0.0002
At most 2 *	0.644643	101.3292	95.75366	0.0195
At most 3	0.570293	67.18628	69.81889	0.0796
At most 4	0.404851	39.31274	47.85613	0.2480
At most 5	0.276295	22.18761	29.79707	0.2882

At most 6	0.212786	11.51635	15.49471	0.1816
At most 7	0.103920	3.620945	3.841466	0.0571

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigen value)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.885067	71.39239	52.36261	0.0002
At most 1*	0.813755	55.46279	46.23142	0.0040
At most 2	0.644643	34.14291	40.07757	0.2001
At most 3	0.570293	27.87354	33.87687	0.2194
At most 4	0.404851	17.12512	27.58434	0.5692
At most 5	0.276295	10.67126	21.13162	0.6800
At most 6	0.212786	7.895405	14.26460	0.3894
At most 7	0.103920	3.620945	3.841466	0.0571

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The result of the Johansen cointegration test on Table 4.28 showed that there were three cointegrating equations, which implied that there were three possible linear combinations of the stationary variables of the model. The cointegrating vectors implied long-run stable equilibrium relationship among the jointly endogenous variables.

Table 4.29: Long-run Normalised Coefficients Result for Model 6

1 Cointegrating Equation(s): Log likelihood 4.150893

Normalized cointegrating coefficients (standard error in parentheses):

EMPL	LNGDPG	LNPSCR	LNTRDF	LNINFR	LNELEC	SECU	NDPL
1	-17.67137	-7.612109	-5.223007	-1.375884	-21.60587	-13.82132	5.815930
	(6.47913)	(1.31404)	(1.13074)	(0.28877)	(3.15132)	(2.35003)	(1.63809)

The result of the normalised cointegrating coefficients on Table 4.29 showed that a long-run significant and positive equilibrium relationship existed between employment (EMPL) and

private sector credit (PSCR), trade facilitation (TRDF), electric power supply infrastructure (ELEC), other infrastructure (INFR), security (SECU) and economic growth (GDPG). National development plan (NDPL) had a significant negative long-run relationship with employment.

Table 4.30: Error Correction Model 6

Dependent Variable: D (EMPL)
Method: Least Squares
Date: 04/14/16 Time: 14:11
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.322980	1.364581	-0.969514	0.3416
D(LNGDPG)	13.19357	4.469836	2.951689	0.0272
D(LNPSCR)	0.817403	0.203035	4.025921	0.0002
D(LNTRDF)	1.211883	1.005259	1.205543	0.2393
D(LNINFR)	0.364522	0.354010	1.029695	0.3130
D(LNELEC)	1.548581	0.536283	2.887619	0.0140
D(SECU)	0.161662	0.056798	2.846262	0.0158
D(NDPL)	-0.975009	2.959136	-0.329491	0.7445
ECM(-1)	-0.484959	0.181899	-2.666080	0.0133

R-squared	0.575293	Mean dependent var	-0.270588
Adjusted R-squared	0.444339	S.D. dependent var	3.748659
S.E. of regression	3.666437	Akaike info criterion	5.658245
Sum squared resid	336.0690	Schwarz criterion	6.062281
Log likelihood	-87.19016	Hannan-Quinn criter.	5.796033
F-statistic	3.187085	Durbin-Watson stat	1.685990
Prob (F-statistic)	0.045604		

EMPL = -1.322980 + 13.19357**GDPG** + 0.817403**PSCR** +1.211883**TRDF**+1.548581**ELECT**
+0.364522**INFR +** 0.161662**SECU** - 0.975009**NDPL**+υ_t

The result of the error correction model (ECM) on Table 4.30 showed a moderate annual adjustment rate of 48.5% of short-run disequilibrium being corrected to long-run equilibrium between EMPL and investment climate factors. The error correction coefficient was statistically significant to correcting the short-run dynamics to long-run levels given the t-value of 2.7. The negative sign of the ECM coefficient usually indicates a convergence or movement towards equilibrium. The analysis showed that there is a long-run positive equilibrium relationship between employment (EMPL) and investment climate factors of private sector credit (PSCR),

trade facilitation (TRDF), infrastructure (INFR), electricity supply (ELEC), security (SECU) and economic growth (GDPG). Of these investment climate variables, economic growth (GDPG) private sector credit (PSCR), electric power supply infrastructure (ELEC) and security (SECU) were statistically significant going by their t-values of 3, 4, 2.9 and 2.8 respectively which were above 2 and also their low probability values of 0.024, 0.000, 0.014 and 0.016 which were less than 0.05 (5%). This means that economic growth, private sector credit, electric power supply infrastructure and security had great positive impact on growth in employment while national development plans (NDPL) and the constant variable (C) had negative impact.

A unit increase in private sector credit (PSCR), trade facilitation (TRDF), other infrastructure (INFR), electric power supply infrastructure (ELEC), security (SECU) and economic growth (GDPG) increased employment (EMPL) by 82%**,** 121%, 37%)**,** 155%, 16% and 1,319% respectively. The most significant contributing factors to growth in employment were economic growth (1,319%) and electric power supply infrastructure (155%). A unit increase in national development plan (NDPL) and the constant variable (C) reduced employment growth (EMPL) by 98% and 132% respectively.

The adjusted R-square of 0.444 means that 44.4% of the variation in employment (EMPL) growth was explained by the investment climate factors of the model. The F-test (3.2) which measured the overall statistical significance of the variables of the model was significant.

The a priori signs of the coefficients conformed to expectation except for national development plans and the constant variable which were negative.

Table 4.31: Residual Diagnostic Tests for Model 6

Diagnosis	Test	F-Statistic	Prob. value	Critical value	Decision F-Stat < 2.43 Prob > 0.05 Accept H_0	Conclusion
Normality	Jarque-Bera Stat.	2.06	0.34	0.05	JB H_0 is accepted	The model is normally distributed
Serial correlation	LM	1.14	0.34	0.05	H_0 is accepted	There is no serial correlation
Heteroscedasticity	ARCH	0.17	0.99	0.05	H_0 is accepted	There is no Heteroscedasticity i.e the model is homoscedastic
Stability	Ramsey RESET	0.44	0.51	0.05	H_0 is accepted	The model is stable and no specification error

The diagnostic tests report on Table 4.31 showed that there was no diagnostic problem with the model and it was structurally healthy and reliable. The Jarque-Bera (JB) normality distribution test showed that the residuals were normally distributed while the Lagrange Multiplier test (LM) showed that the residuals were not serially correlated. The autoregressive conditional heteroscedasticity test (ARCH) revealed that the residuals were homoscedastic while the Ramsey RESET test showed that there was no specification error in the co-integrating equations of the model to make it stable.

Model 7

The trend of capital development and its efficiency in Nigeria can be inferred from Table 4.33 on capital output and incremental capital-output ratio

From the discriminant analysis on the impact of investment climate factors on capital development and efficiency on Table 4.32, the following expression hold true of the linear regression equation 3.63 relating investment climate factors to capital development and efficiency.

$$CAPD = r_o + r_1 LnGPOL + r_2 LnFDIN + r_3 LnDINV + r_4 LnINTR + r_5 LnCMKT + r_6 LnPSCR + r_7 LnOPIC + U_t$$

Applying the 1st derivative principle we have:

f' (GPOL, FDIN, DINV, INT, CMKT, PSCR, OPIC) > 0 = maximising impact on CAPD

f' (GPOL, FDIN, DINV, INT, CMKT, PSCR, OPIC) < 0 = minimising impact on CAPD

Table 4.32: Primary, Secondary and Tertiary Investment Climate Factors Affecting Capital Development and Efficiency in Nigeria

Dependent Variable	**Nature of Summary Impact of independent Variable.**	**Explorative Description of the Primary, Secondary and Tertiary Investment Climate Factors Affecting Capital Development and Efficiency in Nigeria**	**Derivative Evaluation of Impact of Primary, Secondary and Tertiary Factors on Capital Development**	**Concluding Remark**
CAPD	Negative	Capital development and efficiency in Nigeria is significantly affected by the following investment climate factors. (i). Government policy on capital development by providing right institutions, favourable investment climate and regulatory environment. Better foreign trade policy can promote inflow of foreign investment. (ii). The volume of foreign direct investment inflow to a country can strengthen the capital base of that country. (iii). The level of domestic investment in Nigeria is low due to poor savings habit (only 5% saves). The low saving reduces private sector credit supply for development. (iv). Interest or lending rate is high from 20% and above. This made the cost of credit to be high and discouraged investment (v). Nigeria's capital market is poorly developed leading to poor fund for capital and long term projects. (vi). Private sector credit supply is low due to poor financial development. About 80% of loan applications to banks are rejected. (v) Other investment climate factors discussed in model 1a	$f'(GPOL) < 0 = -r_1$ $f'(FDIN) < 0 = -r_2$ $f'(DINV) < 0 = -r_3$ $f'(INTR) < 0 = -r_4$ $f'(CMKT) < 0 = -r_5$ $f'(PSCR) < 0 = -r_6$ $f'(OPIC) < 0 = -r_7$	All the secondary factors have reducing or negative impact on private sector credit supply.

The final estimated model from the discriminant exploratory factor analysis on Table 4.32 becomes

$$CAPD = r_o - r_1 GPOL - r_2 FDIN - r_3 DINV - r_4 INTR - r_5 CMKT - r_6 PSCR - r_7 OPIC + \upsilon_t$$

The result of the model showed that all the coefficients did not conform to apriori expectation. They were all negatives ($r_1 \ldots r_5 < 0$) implying that they had a reducing effect on capital development.

Table 4.33: Computed Result of Capital-Output-Ratio for Trend of Capital Growth and Incremental Capital-Output-Ratio (ICOR) for Capital Efficiency

Year	Real GDP (₦bn) 2010 Constant basic price (RGDG **(i**	Real GDP (₦bn) 2010 Const. b/price Attributed to Capital(GDP_k (Y_k) **(iii)**	Total Investment Capital .(₦bn FDI+GCF (K) **(iii)**	Capital-Output Ratio (COR) K/Y_k **(iii)**	Annual Capital Increment (ΔK) **(iii)**	Annual GDP_k Increment (ΔY_k) **(iii)**	ICOR $\frac{\Delta K}{\Delta Y_k}$ **(iii)**	$ICOR_t < ICOR_{t-1}$ = Efficient **(iii)**	Dummy Var for Capital Efficiency (CAPE) =1 Inefficiency = 0 **(iii)**
1981	15,258	7,753	133.55	0.0172	-	-	-	-	-
1982	14,985	7,232	103.60	0.0143	-29.95	-521	0.0575	Inefficient	0
1983	13,850	6,130	68.06	0.0111	-35.54	-1102	0.0323	**Efficient**	**1**
1984	13,779	6,244	75.13	0.0120	7.07	114	0.0620	Inefficient	0
1985	14,954	6,846	81.53	0.0119	6.40	602	0.0106	**Efficient**	**1**
1986	15,238	6,822	74.61	0.0109	-6.92	-24	0.2883	Inefficient	0
1987	15,264	6,950	80.32	0.0116	5.71	128	0.0446	Inefficient	0
1988	16,215	7,370	81.93	0.0111	1.61	420	0.0038	**Efficient**	**1**
1989	17,295	6,659	42.82	0.0064	-39.11	-711	0.0550	Inefficient	0
1990	19,306	7,439	44.81	0.0060	1.99	780	0.0026	**Efficient**	**1**
1991	19,199	7,490	46.89	0.0063	2.08	51	0.0408	Inefficient	0
1992	19,620	7,889	53.23	0.0067	6.34	399	0.0159	**Efficient**	**1**
1993	19,928	8,681	74.63	0.0086	21.40	792	0.0270	Inefficient	0
1994	19,979	8,346	62.60	0.0075	-12.03	-335	0.0359	Inefficient	0
1995	20,353	9,562	105.72	0.0111	43.12	1216	0.0355	**Efficient**	**1**
1996	21,178	10,603	146.52	0.0138	40.8	1041	0.0392	Inefficient	0
1997	21,789	10,912	148.83	0.0136	2.31	309	0.0075	**Efficient**	**1**
1998	22,333	10,622	117.09	0.0110	-31.74	-290	0.1094	Inefficient	0
1999	22,449	10,874	128.13	0.0118	11.04	252	0.0438	**Efficient**	**1**
2000	23,688	11,896	157.34	0.0132	29.21	1,022	0.0286	**Efficient**	**1**
2001	25,268	12,295	138.73	0.0113	-18.61	399	-0.0466	Inefficient	0
2002	28,958	15,366	233.14	0.0152	94.41	3071	0.0307	Inefficient	0
2003	31,709	17,144	271.39	0.0158	38.25	1,778	0.0215	**Efficient**	**1**
2004	35,021	19,007	292.64	0.0154	21.25	1,863	0.0114	**Efficient**	**1**
2005	37,476	29,010	3472.30	0.1197	3179.66	10,003	0.3178	Inefficient	0
2006	39,996	31,372	4070.93	0.1298	598.63	2,362	0.2534	**Efficient**	**1**
2007	42,922	33,841	4493.70	0.1328	422.77	2,469	0.1712	**Efficient**	**1**
2008	46,013	37,375	6131.04	0.1640	1637.34	3,534	0.4633	Inefficient	0
2009	49,856	41,554	8231.67	0.1981	2100.63	4,179	0.5027	Inefficient	0
2010	54,612	45,712	9231.12	0.2019	999.45	4,158	0.2404	**Efficient**	**1**
2011	57,511	48,872	11085.64	0.2268	1854.52	3,160	0.5869	Inefficient	0
2012	59,930	51,177	12019.10	0.2349	933.46	2,305	0.4049	**Efficient**	**1**
2013	63,219	57,210	22107.00	0.3864	10087.9	6,033	1.6721	Inefficient	0
2014	67,153	61,250	25278.14	0.4127	3171.14	4,040	0.7849	**Efficient**	**1**
2015	69,024	63,494	28269.22	0.4452	2991.08	2,244	1.3330	Inefficient	0
	Average			**0.0861**			**0.2261**	**Low**	

Source :(**i**) CBN: Statistical Bulletin (2015) Pg114 – 116 (**ii**).CBN: Statistical Bulletin (2014), Pg43, 217-222
(iii).Researcher's Computation

Therefore poor government policy on capital development, poor foreign policies to attract foreign direct investment inflow, low domestic investment and capital formation, high interest rate on borrowing and poor capital market development all affected private sector credit supply, insecurity and decayed infrastructures are factors that affected the investment climate to impact negatively on capital development and efficiency in Nigeria. The result on Table 4.33 showed that capital development, measured by capital-output ratio (COR), declined for 24years (1981-2004) while capital efficiency measured by the incremental capital-output ratio (ICOR), was inefficient for 18years (53% of the years under study). The capital output-ratio was low and declined from 0.0172 (1.7%) in 1981 through to 0.0154 (1.5%) in 2004. The average capital-output ratio was 0.0861 (8.6%) far below the minimum quantum or threshold of capital (0.2 or 20%) required to stimulate investment and development.

4.2 Evaluation of the Research Hypotheses

4.2.1 Hypothesis 1

1. **H_0:** Investment climate determinants such as private sector credit supply, trade facilitation, electricity supply, infrastructures, security, national development plans and their underlying factors have no significant positive impact on Nigeria's investment climate to make it conducive for investment.

   H_1: Investment climate determinants such as private sector credit supply, trade facilitation, electricity supply, infrastructures, security, national development plans and their underlying factors have significant positive impact on Nigeria's investment climate to make it conducive for investment.

The result of models 1a and 1b which explored the primary, secondary and tertiary factors affecting Nigeria's investment climate, was used to validate this hypothesis.

Model 1a produced a co-integrated regression result of the primary factors affecting Nigeria's investment climate as shown on Table 4.04. Model 1b produced the derivative result of the exploratory factor analysis of the secondary and tertiary factors affecting the investment climate as shown on Table 4.06. The co-integrated regression result of model1a is as follows:

$$MCAP = 5.393297 + 0.06117PSCR - 0.112156TRDF - 0.184363ELEC - 0.017882INFR - 0.331348SECU + 0.130454NDPL + \upsilon_t$$

Table 4.34: Summary Result of Primary, Secondary and Tertiary Factors Affecting Nigeria's Investment Climate (Combination of Models 1a & 1b Results)

Primary Factor	Nature of Impact of Factor.	Statistical Significance of Primary Factor	Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor	Derivative Impact of Secondary and Tertiary Factors on Primary Factors	Concluding Remark
PSCR	+ 0.06117 (Positive)	Not Significant	**i.** Low savings **ii**. High bank lending rates **iii.** Poor capital market development **iv.** Tight loan access and availability **v.** Short loan repayment time	$f'(SAVE) < 0 = -k_1$ $f'(INTR) < 0 = -k_2$ $f'(CMKT) < 0 = -k_3$ $f'(LOAN) < 0 = -k_4$ $f'(RPAY) < 0 = -k_5$	All the secondary factors have reducing or negative impact on private sector credit supply.
TRDF	- 0.112156 (Negative)	Significant	**i.** Poor ports facilities, **ii**. Poor ports management **iii** High demurrage rate **iv.** Porous Security at ports **v.** High customs duties **vi.** High level of corruption **vii.** Depreciated naira-dollar exchange rate.	$f'(PFAC) < 0 = -m_1$ $f'(PMGT) < 0 = -m_2$ $f'(DEMU) < 0 = -m_3$ $f'(SECU) < 0 = -m_4$ $f'(DUTY) < 0 = -m_5$ $f'(CORR) < 0 = -m_6$ $f'(EXCR) < 0 = -m_7$	All the secondary factors have reducing impact on trade facilitation and development.
INFR **ELEC**	- 0.017882 (Negative)	Fairly Significant	**i**. Low electricity supply. **ii.** Poor transport network. **iii.** Deteriorated health and education infrastructure. **iv.** Poor infrastructural development policy. **v.** Small size of federal capital budget (below 20%	$f'(ELEC) < 0 = -q_1$ $f'(TRAN) < 0 = -q_2$ $f'(HEDU) < 0 = -q_3$ $f'(INFP) < 0 = -q_4$ $f'(CAPB) < 0 = -q_5$	All the secondary factors have reducing or negative impact on infrastructure.
	-0.184363 (Negative)	Not Significant	**Electricity supply** **i.** Low gas supply to power generating station. **ii.** Low volume of water to turn the hydro-electricity turbines in Kainji, Jebba and Shiroro dams. **iii.** Destruction and damage to electrical installations **iv.** Over loading of transformers/generators **v.** Poor electricity policy **vi.** Slow fault rectification **vii.** Corruption of electricity employees/staff/officials	$f'(GASS) < 0 = -p_1$ $f'(WTER) < 0 = -p_2$ $f'(DEST) < 0 = -p_3$ $f'(LOAD) < 0 = -p_4$ $f'(EPOL) < 0 = -p_5$ $f'(FAUT) < 0 = -p_6$ $f'(CORR) < 0 = -p_7$	The underlying factors affecting electricity supply showed a reducing or negative impact on infrastructural development

Table 4.34: Summary Result of Primary, Secondary and Tertiary Factors Affecting Nigeria's Investment Climate Cont….

Primary Factor	**Nature of Impact of Factor.**	**Statistical Significance of Primary Factor**	**Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor**	**Derivative Impact of Secondary or Tertiary Factors on Primary Factors**	**Concluding Remark**
INFR	- 0.017882 (Negative)	Fairly Significant	**Transport infrastructure** **i.** Bad roads caused by rain floods, erosion, poor drainage, and destructive activities of man. **ii.** Poor rail network **iii.** Poor sea and airports facilities.	$f'(ROAD) < 0 = -t_1$ $f'(RAIL) < 0 = -t_2$ $f'(PORT) < 0 = -t_3$	The underlying factors affecting transport infrastructure showed a reducing (negative) effect on impact on infrastructural development.
			Health and educational infrastructure **i.** Poor health facilities and drug supply. **ii.** Poor educational facilities like buildings, library, laboratory and equipment. **iii.** Poor Government's policy on health treatment and management. **iv.** Poor education infrastructural policy.	$f'(HFAC) < 0 = -l_1$ $f'(EDUF) < 0 = -l_2$ $f'(GOHP) < 0 = -l_3$ $f'(GOEP) < 0 = -l_4$	All the underlying factors affecting Health and educational infrastructure showed a negative or reducing impact on infrastructural development.
			Infrastructural Planning: Infrastructural development policy in Nigeria is weak due to: **i.** No workable infrastructure development plan for the country until June 2014 when the national integrated infrastructure master plan (NIIMP 2014-2043) came on board. Even then no practical action taken after many years.	$f'(GPOL) < 0 = -u_1$	Weak pragmatic infrastructure policy has a negative or reducing impact on infrastructural development.

Table 4.34: Summary Result of Primary, Secondary and Tertiary Factors Affecting Nigeria's Investment Climate Cont….

Primary Factor	Nature of Impact of Factor.	Statistical Significance of Primary Factor	Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor	Derivative Impact of Secondary and Tertiary Factors on Primary Factors	Concluding Remark
INFR	- 0.017882 (Negative)	Fairly Significant	**ii**. Poor party manifestoes and blueprint on infrastructure and economic development in Nigeria. **iii.** Lack of commitment by government to fund infrastructural development programmes.	$f'(PMAN) < 0 = -u_2$ $f'(FUND) < 0 = -u_3$	Poor party programs/ blueprint and funding of infrastructure programme have negative impact on infrastructural development.
			Capital budgeting **i.** Poor economic objective of government in annual budgets **ii.** Falling collectable Federal revenue for financing infrastructural development due to dwindling oil prices and associated economic meltdown **iii.** Increasing size of recurrent budget to the neglect of capital budget. Capital budget misapplication	$f'(GOBJ) < 0 = - i_1$ $f'(GREV) < 0 = -i_2$ $f'(REXP) < 0 = -i_3$	Poor economic objective, falling government revenue, poor capital budget allocation and its misapplication have negative or reducing impact on infrastructural development
SECU	-0.331348 (Negative)	Significant	Major factors threatening the security of Nigeria are: **i.** High rate of unemployment leading to high crime rate. **ii.** Ethnic agitations and violence due to uneven and lopsided development policy of government. **iii.** Ritual killings and violent crimes for cult activities. **iv.** Drug addiction that promotes criminal activities.	$f'(UNEM) > 0 = s_1$ $f'(UDEP) > 0 = s_2$ $f'(CULT) > 0 = s_3$ $f'(DRUG) > 0 = s_4$	Increase in unemployment, joblessness, lopsided development policy, increase in cultism Increase in drug abuse & addiction promotes insecurity

Table 4.34: Summary Result of Primary, Secondary and Tertiary Factors Affecting Nigeria's Investment Climate Cont….

Primary Factor	Nature of Impact of Factor.	Statistical Significance of Primary Factor	Secondary and Tertiary Factors Affecting the Primary Investment Climate Factor	Derivative Impact of Secondary or Tertiary Factors on Primary Factors	Concluding Remark
SECU	-0.331348 (Negative)	Significant	**v.** Political kidnapping and assassination **vi.** Religious intolerance, riots and killings. **vii.** Nigeria's porous borders promote smuggling, influx of criminals and mercenaries into the country. **viii.** Slow judicial process, delayed judgments and miscarriage of justice.	$f'(PRIV) > 0 = s_5$ $f'(RFAN) > 0 = s_6$ $f'(PBOD) > 0 = s_7$ $f'(SJUC) > 0 = s_8$	Increase in political rivalry/ killings, religious riots, influx of criminals come across porous borders Slow judicial process promotes criminality in Nigeria.
NDPL	+0.130454 (Positive)	Not Significant	Factors affecting national development plans in Nigeria: **i.** Poor economic planning policy and use of disjointed adhoc plans by government in Nigeria. **ii.** Plan discontinuity due to change in government. **iii.** Low commitment on implementation of development programmes by government. **iv.** Unavailability of relevant planning data. **v.** Lack of people oriented planning system where the needs of the grassroots are considered.	$f'(GPOL) < 0 = -n_1$ $f'(LEAD) < 0 = -n_2$ $f'(IMPL) < 0 = -n_3$ $f'(DATA) < 0 = -n_4$ $f'(PLAN) < 0 = -n_5$	Disjointed adhoc economic plans, discontinuity of development plan by a new government, lack of commitment to plan implementation, poor planning data and lack of bottom-top planning system negatively affected national development plan to affect economic development.

Source: Researcher's Compilation from Exploratory Factor Analysis of Impact of Underlying Factors of Investment Climate **(**2018)

The result of the summary statistics on Table 4.34 showed that four of the primary investment climate determinants (67%) had negative impact on the investment climate with three of them being statistically significant. The negative factors and their t values were security (-3.05), infrastructure (-2.33), trade facilitation (-2.18) and electricity supply (-0.96) in that order. The two factors (33%) that had positive impact on the investments climate and their t values were

private sector credit (1.26) and national development plan (1.25). The two were not statistically significant. On the other hand, the analysis of the impact of the secondary and tertiary factors on the primary determinants of the investment climate shown in model 1b showed that they all had negative impact on the six primary investment climate determinants respectively. This result confirmed the outcome of the cointegrated regression result of model 1a where 67% of the primary investment climate determinants had negative impact on the investment climate. The implication of this result was that investment climate determinants such as private sector credit supply, trade facilitation, electricity, supply, infrastructures, security, national development plans and their underlying factors have no significant positive impact on Nigeria's investment climate to make it conducive for investment. The null hypothesis was therefore accepted.

4.2.2 Hypothesis 2

2. **H_0:** Investment climate determinants such as private sector credit supply, trade facilitation, electricity supply, infrastructures, security, national development plans and their underlying factors, do not have significant positive impact on Nigeria's investment climate to make it conducive for investment.

H_1: Investment climate determinants such as private sector credit supply, trade facilitation, electricity supply, infrastructures, security, national development plans and their underlying factors, do have significant positive impact on Nigeria's investment climate to make it conducive for investment.

The summary result of models 2-6, of relationship between investment climate determinants and economic development indicators, was used to validate this hypothesis

Table 4.35a: Summary of the t-values of the Investment Climate Factors as a Measure of their Significant Impact on Economic Development Indicators for Models 2-6.

DEVELOPMENT INDICATOR	GDPG	PSCR	TRDF	INFR	ELECT	SECU	NDPL	SIGNIFICANT FACTORS (%)
GDPG		+0.2 NS	+0.4 NS	-2.0 **S**	+0.6 NS	+2.0 **S**	+2.1 **S**	All = 50% Negative = 33%
GNICAP	+2.2 **S**	-2.4 **S**	-1.5 NS	+0.9 NS	-3.3 **S**	-3.9 **S**	+2.7 **S**	All = 71% Negative = 60%
LIFE	+2.7 **S**	+3.2 **S**	-0.3 NS	+0.2 NS	+2.2 **S**	+2.5 **S**	-1.6 NS	All = 57% Negative = 0%
EDUC	-0.03 NS	+1.0 NS	+0.3 NS	-2.1 **S**	+0.5 NS	-2.0 **S**	+0.5 NS	All = 29% Negative = 100%
EMPL	+3.0 **S**	+4.0 **S**	+1.2 NS	+1.0 NS	+2.9 **S**	+2.8 **S**	-0.3 NS	All = 57% Negative = 0%

S = Significant; NS = Not Significant; (-) = Negative impact; (+) = Positive impact.

Source: Researcher's Compilation (2018)

Table 4.35b: Summary of Impact of Investment Climate Determinants on Economic Development Indicators.

Model	Economic development **indicators**	Investment climate factors with **positive** impact	Investment climate factors with **negative** impact	Investment climate factors that are **significant**	Remark
1	GDPG	PSCR TRDF ELEC SECU NDPL	INFR	INFR SECU NDPL	3 out of 6 investment climate factors (50%) had significant impact on GDPG
2	GNICAP	GDPG INFR NDPL	TRDF PSCR ELEC SECU	GDPG NDPL PSCR ELEC SECU **40% positive**	5 out of 7 investment climate factors (71%) had significant impact on GNICAP
3	LIFE	GDPG PSCR INFR ELEC SECU	TRDF NDPL	GDPG PSCR ELEC SECU NDPL	4 out of 7 investment climate factors (57%) had significant impact on LIFE
4	EDUC	PSCR TRDF ELEC NDPL	GDPG INFR SECU	INFR SECU	2 out of 7 investment climate factors (29%) had significant impact on EDUC
5	EMPL	GDPG PSCR TRDF INFR ELEC SECU	NDPL	GDPG PSCR ELEC SECU	4 out of 7 investment climate factors (57%) had significant impact on EMPL

Source: Researcher's Compilation.

From Table 4.35b, an average of four investment-climate determinants (53%) out of seven had significant impact positively and negatively on gross national per capita income, life expectancy and employment. The ECM for each of the models was statistically significant to confirm the statistical significant impact of the investment climate determinants on economic development. From Table 4.35a & b, 75% of the economic development indicators were significantly affected

by the investment climate determinants. The investment climate determinants, on the average, had positive significant impact on life expectancy and employment while it had negative significant impact on gross national income per capita and educational attainment. By this result, the alternative hypothesis that Nigeria's investment climate determinants have significant impact on the growth of gross national per capita income, life expectancy, educational attainment and employment was accepted

4.2.3 Hypothesis 3

4. **H_0:** Nigeria's investment climate has no positive impact on capital development and efficiency to promoting economic development.

   H_1: Nigeria's investment climate has positive impact on capital development and efficiency to promoting economic development.

Table 4.32 on investment climate determinants affecting capital development and efficiency and Table 4.33 on trend of capital development and efficiency in Nigeria using capital-output and incremental capital-output ratios were used to validate the hypothesis.

From the result and analysis on Table 4.32, investment climate factors such as inappropriate government policy on capital development, poor foreign trade policy on inflow of foreign direct investment, poor savings habit (only 5% saves) of Nigerians to mobilise credit supply to the private sector, high bank lending rate, poor capital market development and others have negative impact on capital development and efficiency in Nigeria. The result and analysis on Table 4.33 showed that capital development, measured by capital-output ratio (COR), declined for 24years (1981-2004) While capital efficiency, as measured by the incremental capital-output ratio (ICOR), was inefficient for 18years (53% of the years under study). The foregoing analysis implied that the investment climate was not conducive enough for capital development and efficiency for the greater part of the period under study.

From the above analysis therefore, the null hypothesis that Nigeria's investment climate has no positive impact on capital development and efficiency to promoting economic development was accepted.

4.3 Discussion of Findings

The result of the unit root test showed that the variables for each of models 1-6 were stationarity at first difference I (1) to show that there is a linear relationship between investment climate determinants and economic development indicators. There was an average of three cointegrating equations in each model and their residuals integrated at I (0) indicating the existence of long-run linear equilibrium relationship between investment climate determinants and economic development indicators. Specifically, investment climate factors such as gross domestic product, private sector credit, electricity supply and security significantly affected the growth of gross national per capita income, life expectancy and employment respectively. On the other hand educational attainment and trade facilitation were however not significantly affected by the investment climate factors.

The result of hypothesis one showed that Nigeria's investment climate was not conducive for investment in the period under investigation. This was because four (67%) of the six primary investment climate determinants negatively affected the investment climate or capacity utilisation of the manufacturing sector. The four factors in order of impact were security, electricity supply, trade facilitation and infrastructure. The two (private sector credit and national development plan) primary investment climate determinants that had positive impact on the investment climate were not statistically significant.

Security had the greatest negative significant impact (33%) on the investment climate of Nigeria due to the wide scale state of insecurity that had plagued the country since 2004. The country had faced serious security challenges from the activities of Niger-delta militants, north-east boko-haran Islamic insurgents, Fulani herdsmen, ethnic or tribal agitations instigated by lopsided development policies of government and political imbroglios resulting from the transition of one government to another. Others, spurred by the high rate of unemployment were high rate of armed robberies, kidnappings, cultism, ritual killings, drug abuse and addiction, political assassinations, religious riots, youth restiveness/crimes due to the high rate of youth unemployment and the influx of criminals/mercenaries from across the country's porous borders. The state of insecurity in Nigeria had increased proportionately with the growing rate of unemployment since 2004 and constituted serious threats to the country's socio-economic development according to the findings of Ewetan and Urhie (2014). Insecurity has the highest

exponential direct impact on investment and human development than any other primary investment climate determinants discussed in this study. It caused psychological distress, fear of death and torture on the psyche of investors to influence their investment decisions which were negative in most cases. Security challenges involving kidnappings, robberies, ritual killings, political assassinations, menace of Fulani herders, Boko-harans and religious insurgences had caused tension and stress in people and made many Nigerians, especially the well to do, to relocate to other relatively peaceful neighbouring countries. Insecurity in Nigeria had increased business risks and scared away investors, particularly the foreign ones, to other countries like Ghana, Malaysia and South-Africa as found by Uhunmwuagho and Akintoye (2016), Nwagbosa (2012) and Kehinde, Adeleye and Edward (2009). This action had negatively affected the level of investment, business growth, tourism, manufacturing capacity utilisation, crude oil production and export, education, employment and capital development. Insecurity had led to huge increase in budget allocation to security to crowd-out the budget for important economic development programmes (Achumba, Ighomereho & Akpor, 2013). It had also threatened agricultural production and food security in Nigeria through the incessant invasion and attacks by the Fulani herdsmen on farming communities across the country according to Adekoya (2018).

Insecurity was the major problem of the power sector in Nigeria where militants crippled electricity generation and distribution by their incessant destruction of pipes supplying gas to thermal electricity generating stations across southern Nigeria. In addition, there was high rate of vandalisation and theft of electrical installations and equipment such as almond cables, conductors, insulators and transformers which often paralysed electricity transmission and distribution that resulted in regular blackouts. Given the gamut of the effect of the problem of insecurity in Nigeria, it has become the greatest challenge facing the investment climate of the country. This fact is against the claim of electricity being the greatest problem of Nigeria's investment climate and economic development by most previous studies such as that of the World Bank (2016) and Larossi, Mousley and Radwan (2009).

Electricity supply impacted negatively on the manufacturing sector's capacity utilisation to a lower level as a result of the incessant blackouts and power failure caused by low gas supply to power generating stations, low volume of water to turn the hydro-electricity turbines in dams and the incessant damage of distribution facilities. Other problems were the destruction and damage to electrical installations by man and rainstorms, over loading of transformers, slow fault

rectification, absence of electricity supply policy and corruption on the part of electricity workers and officials as noted by Enyong (2015) and Ogundipe and Apata (2013). The inadequate electricity supply had increased the cost of doing business in Nigeria where about 85% businesses have been forced to generate their own electricity at high cost for operation according to US Dept. of State (2015), Larossi, Mously and Radwan (2009) and Ligali (2009). Businesses, especially the smaller ones, that could not afford the use of private generators to power their operations folded up and thereby created unemployment which in turn created insecurity. Other businesses that depended much on electricity such as music, movies, hospitality industries, welding/foundry, telecom, education and others had suffered low productivity and economic growth. Acute electricity supply in Nigeria had caused capacity under utilisation of the manufacturing sector, increased the cost of doing business and scared away investors, particularly the foreign ones, to relocate to other countries like Ghana, Malaysia and South-Africa as observed by Kehinde, Adeleye and Edward (2009).

Trade facilitation had negative impact on economic growth due to the fact of poor export and import management. The situation had led to low foreign direct investment inflow, poor foreign reserve built up, depreciated exchange rate, low income remittances from abroad and balance of payment deficit. Trade facilitation faced challenges that ranged from poor ports (sea & air) facilities, high freight/demurrage charges, poor security network at ports to safeguard cargoes, high customs duties/levies, corruption and extortion at the sea and airports. Nigeria's structural adjustment programme (SAP) negatively impacted on her foreign trade to record poor performance. SAP had caused low non-oil export, increase in naira-dollar exchange rates, increase in foreign debt burden and a deficit balance of payment in line with the submission of Falae (2017) that SAP failed to achieve its objectives and worsen Nigeria's economic development. The failure of SAP was attributed to the poor microeconomic foundation of SAP macroeconomic policies. SAP policy is supposed to benefit and contribute to Nigeria's development through global trade with high volume of export. During SAP the volume of exports from Nigeria had plummeted greatly due to the global oil glut and the non development of non-oil export products which is a necessary condition for the country to gain from SAP.

Infrastructural decay in Nigeria had impacted negatively on the economy to hamper economic development according to Ligali (2009) when he stated that there was near collapse of infrastructure in Nigeria to boost investment drive and that nothing was done over the past

10years to address it. Bad roads had affected commerce greatly due to the traffic congestions and delays on the roads to waste man-hours. It also caused accidents leading to death skilled personnel and destruction of manufactured goods and vehicles as well as being security-trap points at the very bad spots for robbers, kidnappers, assassins and others to operate. Rail, ports, airports, health and education infrastructure were poor and cog in the wheel of economic progress of Nigeria. The problem of infrastructure ranged from bad roads caused by heavy rains with erosion floods, lack of road maintenance, poor rail network, poor sea airport facilities, low annual capital budget (below 20% and in some cases deficit), misallocation of capital budget to finance recurrent budget deficit, deteriorated health and education infrastructure.. There was lack of effective infrastructural development plan and policy in the country as was practiced in Malaysia, Indonesia, S/Africa and Ghana. The 30-year national integrated infrastructural master plan (NIIMP 2014-2043) introduced in June 2014 by the government was yet to take off and translate to action at the end of 2015. Besides, the plan has an unrealistic annual expenditure projection of N16.2trillion for infrastructural development which was far higher than the country's annual average budget of N8trillion. This scenario is analogous to the catholic priest whose benediction prayer was longer than the mass prayer itself. It portends that all is not well with the infrastructural master plan as it is supposed to be an integral part of the national budget as it is practiced in comparator's countries.

The non-statistically significant factor of private sector credit supply had negligible positive impact on investment and economic development as discussed by Larossi and Clarke (2011). This poor result was due to the poor granting of loans (< 20%) to the private sector investors, low savings, high cost of fund (160% of the value of loan taken), poor capital market development and short loan repayment period.

National development planning had negligible positive impact on the investment climate because of disjointed adhoc plans without microeconomic foundations as pointed out by Silva (2009). Other problems leading to the negligible impact of development planning include discontinuity of plans when government changes over, lack of commitment to plan implementation, poor planning data and lack of inclusive planning system that reflects grassroots needs.

From the above discussion of hypothesis 1, it is crystal clear that the primary investment climate determinants and their underlying secondary and tertiary factors have negatively impacted on Nigerian investment climate to make it unconducive for investment.

The result of hypothesis 2 indicated that Nigeria's investment climate determinants on the average have negative significant impact on gross national income per capita and educational attainment and positive significant impact on the growth of life expectancy and employment. The negative significant determinants (60%) of the investment climate that affected per capita income outweighed the positive ones (40%) to adversely affect the development in gross national income per capita or standard of living of Nigerians in conformity with result of hypothesis 1of the unconducive nature of the investment climate.

The gross national income per capita (model 3), was negatively and significantly affected by poor electricity supply, insecurity and poor supply of investment credit to the private sector by commercial banks in Nigeria in that order.

Electricity supply has the greatest adverse impact (25.7%) on the standard of living of Nigerians from the result of the model. due to the problems facing its supply. The erratic supply had caused lull in socio-economic activities, minimise leisure time and hampered the consumption of products that uses electricity power to function. Thus the maximization of utility from the consumption and use of television set, handset/phones, fans, air conditioners, blenders, electric cookers, ovens, refrigerators, deep freezers (for food preservation), pressing irons, reading lamps, washing machines and health treatment machines was affected. Poor electricity supply had also led to under capacity utilisation of the manufacturing sector which led to low productivity, unemployment and rise in poverty level.

The worrisome insecurity condition in the country had caused stress and panic in people to adversely affect the level of economic activities, income generation and social welfare. Insecurity arising from the negative activities of boko-haran insurgents, Niger-Delta militants, kidnappers, armed-robbers, religious fanatics, cultists, assassins, ritualists, herdsmen and others have reduced the standard of living of the people by 19% going by the result of model 3 to confirm Ewetan and Urhie (2014)'s finding that insecurity in a country reduces the standard of living of the people.

Private sector credit supply, as previously discussed, was inadequate to drive the economy to high level of investment, consumption and employment to reduce poverty and increase the gross national income per capita in the country. Poor inflow of foreign direct investment and remittance income from abroad have led to the negative impact of this investment climate determinant on the national income per capita of Nigeria. Other problems that affected the adverse contribution of private sector credit to gross national income per capital according to the finding of Nwokoma, Idoko and Ebere (2013) were poor access to finance, high lending rates and short repayment period all of which increased the level of poverty among Nigerians.

There were poor competition policies in Nigeria's investment climate which have negatively affected economic reform policies of government, productivity and national income per capita. This scenario was at variance with the findings of Khemani and Carrasco-Martin (2008) in Latin America that competitive policies promote economic efficiency by making goods and services more affordable to increase consumers' welfare and national income per capita.

Development in educational attainment (model 5) was affected by two statistically significant investment climate determinants of security and infrastructure in that order. The two determinants have negative or adverse impact on educational attainment.

Insecurity posed the greatest challenge to educational attainment and development with a 32% adverse impact. The growing wave of cultism among students and sometime lecturers leading to incessant campus violence, sexual harassment, rape, killings and others, negatively affected educational attainment. These vices often led to the destruction of school properties and learning infrastructures with the consequent closure of schools and expulsion of students out of the school system.

The dearth of infrastructures in educational institutions in Nigeria had caused negative impact of 4.7% on educational attainment. This situation sometimes made the academic staff of higher educational institutions to go on strike to compel the government to remedy the situation. The overall impact is the incessant closure of schools to halt teaching-learning activities in schools which affect the standard and output of graduates from the educational institutions. These problems have contributed to low literacy level in Nigeria which had adversely affected individual potentials and skilled manpower for development. This in turn had affected worker's ability to contribute to economic development to conquer poverty in line with the finding of

Yusuf, Ladan and Halilu (2013). It is important to note that education is both a social and economic facility and had the highest direct positive impact (42%) on human development. A low educational attainment or literacy level reduces human development and increases the chance of poverty among the people according to the findings of Connolly, De Leoz, Gorospe & Sebastian (2014).

The poor state of infrastructural decay in Nigeria's educational system stems from the fact that education was poorly funded in agreement with the findings of the US Department of State (2014) that the highest Nigeria's education budget ever was 8.6% of the annual budget of 2012. When this rate is compared with the UNESCO suggested bench mark of 26% of the annual budget, then the magnitude of infrastructural problem in the educational system will be better evaluated and appreciated for serious policy action.

On the indicators of life expectancy and employment, four investment climate determinants were statistically significant and had positive impact on the two indicators respectively.

Development in life expectancy (model 4) was positively influenced by four statistically significant primary investment climate determinants which were private sector credit supply, gross domestic product growth, electricity supply and security in that order. Although these factors were statistically significant but their respective impact and contribution to the growth of life expectancy was minimal judging by their coefficients. All the statistically significant factors contributed less than 2% each to the growth in life expectancy except for GDP which contributed 5.1%.

Growth in gross domestic product promotes availability of food for better nutrition as well as medicals and life supporting therapies for healthy living to increase life span. Electricity supply impacted positively on life expectancy by a paltry 1.7%, security by 1.1% and private sector credit supply by 0.9%. Given the marginal or little contributions of these investment climate determinants to life expectancy, it is no wonder that Nigeria had a very low average life expectancy of 47.5years. The underlying factors that affected these determinants were responsible for their low impact.

Nigeria's national development plans negatively affected life expectancy, though not to a statistically significant level, due to the fact that they do not have special life supporting

programmes or policies in them. Such programmes include health, nutrition, sanitation, tension and risk reduction that can promote long life or longevity.

Growth in employment (model 6), was influenced by four statistically significant primary investment climate determinants such as gross domestic product, electricity supply, private sector credit supply and security in order of impact. The factors positively affected growth in employment. Gross domestic product contributed most (1,319%) to employment generation followed by electricity supply (155%), private sector credit supply (82%) and security (16%). It should be noted that economic expansion or growth in GDP promotes investment and employment. Electricity supply provided power for economic activities such as manufacturing, welding, fabrication, galvanized construction, music, film making, electrical/electronic manufacturing, hospitality and recreation, food processing, restaurant/bar bays, information/communication technology, health instrumentation/technology, automobile industries, printing, filling stations and others. All these activities provided employment for many to enhance their income, increase their per capita consumption to reduce poverty and promotes overall economic development. The potency of electricity supply promoting employment was corroborated by World Bank (2016) study of Nigeria in 2013 that found electricity supply and road infrastructure to significantly affect investment climate to support wage employment. Credit supply and security help entrepreneurs to promote investment activities to create jobs in line with the finding of Obukhova (2013). The establishment of microfinance banks in 2005, no doubt made credit facilities available to micro businesses and entrepreneurs to promote self employment. Also there were employments into various security forces such as military (Army, Navy, Airforce) Police and paramilitary organisations (Road safety, Civil defence Corps, Peace corps) to help tackle the increasing security challenges of the country.

The negative effect of national development plan on employment resulted from the fact that most of the plans, especially in the 1980s, did not incorporate pulp priming or employment generating policy in them. Unemployment rate had been on the increase since 1995 and has negatively affected the welfare and standard of living of many to reduce their life span to a low 47.5years out of the expected 80years.

An evaluation of the impact of each of the primary investment climate determinants on economic and human development indicators of hypothesis 2 showed that:
Gross domestic product significantly and positively affected growth in employment, life expectancy and gross national income per capita making a75% coverage of the development indicators excluding educational attainment.

Financial development or private sector credit supply significantly and positively impacted on employment, life expectancy but negatively on the gross national income per capita in that order. 60% of the economic development indicators were significantly covered by this primary investment factor leaving out educational attainment and gross domestic product.

Trade facilitation factor had no significant impact on any of the economic development indicators.

Electric power supply infrastructure significantly affected employment creation, life expectancy positively and gross national per capita income negatively. This primary investment climate factor significantly influenced 60% of the economic development indicators leaving out educational attainment and gross national product.

Infrastructures significantly and negatively impacted on gross domestic product and educational attainment covering only 40% of the development indicators. Thus infrastructure greatly affected economic development in Nigeria negatively in line with model 1a's result where the factor negatively impacted on the investment climate.

Security significantly affected all the development indicators (100%). It positively affected employment, life expectancy and gross domestic product while it negatively affected gross national income per capita and educational attainment.

National development plans significantly and positively affected development in gross national income per capita and gross national product in that order but negatively affected life expectancy. There was thus a 60% significant coverage of the economic development indicators leaving out educational attainment and employment. The negative and insignificant impact of national development plans on employment was due to the fact that the plans have no articulate

programmes or pulp priming policy that can curb the increasing graduate unemployment in the economy.

Most of the economic reform programmes of government in Nigeria, designed to promote economic development indicators, failed to meet their objectives because of the poor microeconomic foundation of the macroeconomic policies. It has been asserted that microeconomic evaluation of the underlying factors and structure of a macroeconomic policy is a sine qua non to the efficacy and effectiveness of a policy according to Silva (2009). He stated in 'Lucas critique of macroeconomic modeling' that microeconomic evaluation of macroeconomic policy provides richness of depth to policy making to prevent policy invariance and ineffectiveness. Thus SAP, rural development and other policies in Nigeria fail to achieve their goals because there were no proper microeconomic evaluations of the state and foundation capacity of the economy to synergistically promote the policy. The policies failed to evaluate the export-capacity of the economy which was a prerequisite for benefiting from SAP policy as well as the failure to perform discriminant need-assessment of the rural dwellers in policy configurations. Agriculture and agribusiness policies had particularly suffered this problem in the past years which had resulted to perpetual agricultural underdevelopment and a threat to food security in the country.

The result of hypothesis 3 showed that Nigeria's investment climate had no positive impact on capital development and efficiency to promoting economic development.

This was because most of the primary investment climate determinants and their underlying factors negatively affected capital development and efficiency to impact on investment and economic development. Some of these investment climate factors include poor credit supply to the private sector, poor capital market development, low domestic and foreign direct investment, low rate of return on investment, insecurity, political uncertainty and others. The underlying factors to inadequate credit supply to investors were poor savings by Nigerians and the high cost of lending charged by the financial institutions. Capital development in Nigeria had declined from 1981-2004 (24years) partly due to the oil glut of 1980 that caused sharp drop in government revenue and the poor capital base of the financial institutions to promote investment. However, increase in growth of capital supply was recorded from 2005-2015 (11years) due to the bank consolidation policy of the government in 2005. The consolidation policy increased the minimum capital base of commercial banks from ₦25million to ₦25billion with the

establishment of Microfinance banking system with ₦1billion capital base. Capital efficiency was on the average inefficient in the period of analysis due to the aforementioned problems that made the investment environment unconducive for investment.

4.4 Policy Implication of the Findings

Findings of the study showed that Nigeria's investment climate was not conducive for investment and economic development. Factors as security challenges, electricity supply, trade facilitation, and their underlying factors negatively impacted on the investment climate and economic development. Private sector credit supply and national development plans that have positive effect were insignificant. Security challenges due to the activities of kidnappers, robbers, Boko-haran insurgence, Niger Delta militants and ritualists is the worst problem confronting Nigeria's economic development. Insecurity had caused divestment from the country, worsened unemployment situation and caused inadequate gas supply to thermal electricity generating stations to put the country in constant blackout. All these problems have affected the manufacturing sector's capacity utilisation, encourage divestment, slow down farming and commerce activities, and discourage inflow of foreign direct investment and capital thus leading to poor capital development and efficiency. The situation had also led to increase in poverty, poor standard of living, short life span and illiteracy of the people.

The co-integration test result of the models at I(1) and the average ECM adjustment speed of 50% per annum shows that investment climate problems can be effected through a reform policy that can be implemented over a two-year cycle to affect economic development indicators of GNICAP, LIFE, EDUC, EMPL and MCAP. With one year of policy evaluation and simulation a three-year cycle of planning for economic reforms programmes will be appropriate.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter summarised the findings of the study and made useful recommendations for effective policy making to address the problems of Nigeria's investment climate and economic under-development.

5.1 Summary

The study evaluated the impact of investment climate on Nigeria's economic development and identified the following primary investment climate determinants: private sector credit supply or financial development, trade facilitation, electricity or power supply, infrastructure, security network and national development plans.

The underlying factors that affected the primary investment climate determinants were unemployment which causes security threats, low savings, high bank lending rates, poor capital market development, tight access to loan and short loan repayment period for capital development. Others were poor ports facilities/management, high freight/demurrage charges, poor security to safeguard cargoes, high customs duties/levies, high level of corruption and extortion at sea and air ports and the depreciated naira-dollar exchange rate for trade facilitation factor. Electric power supply was affected by low gas supply to the power generating stations due to the activities of militants in the Niger Delta, low volume of water to turn the hydro-electricity turbines in the dams, destruction and theft of electrical distribution and installations parts by man and natural forces. There were also the problems of over-loading of transformers/generators, slow fault rectification, lack of electricity supply policy, corrupt practices by electricity workers while bad roads/rail network, poor airport facilities, low annual capital budget (below 20% and in some cases deficit) and the misapplication of capital budget fund to finance recurrent budget deficit. Deteriorated health and education infrastructure, absence of infrastructural development policy, poor policy implementation and the dwindling government revenue for infrastructural development are not left out of the problems.

Insecurity is caused by the high rate of unemployment, youth restiveness, lopsided development policies of government which sparked off ethnic agitations, cultism, ritual killings, drug abuse or addiction, armed robberies and kidnappings. It has also caused political rivalry leading to assassinations, religious dogmatism and intolerance causing riots, influx of

criminals/mercenaries across porous borders and slow judicial process/ miscarriages of justices. Also there were disjointed adhoc plans, discontinuity of plans by new regimes of government, poor data for planning and absence of grassroots-oriented planning system in the national development plans.

A combination of these primary, secondary and tertiary investment climate factors affected the development status of gross national income per capita, life expectancy, educational attainment, employment, and capital development and efficiency.

The study adopted the ex-post facto research design and used the modified neo-classical production function as the basis for modeling the relationship between investment climate determinants (input) and economic development indicators (output). The modified inequality-adjusted human development indicators used were gross national income per capita (standard of living), life expectancy (longevity), educational attainment (literacy), employment (poverty reduction), and capital development and efficiency.

To achieve the objective of a comprehensive analysis, the triangulation principle was adopted to treat the modified neo-classical production function. The triangulation principle advocated the use of multi methods of investigation of a phenomenon to have a comprehensive knowledge and understanding of the different dimensions and characteristics of such a phenomenon. The triangulation principle had informed the use of the cointegrated least square regression method and the discriminant explorative factor analysis for the treatment of the data collected for the study.

The cointegrated least square regression method treated the nature and impact of relationship between the primary investment climate determinants and the economic development indicators. The discriminant explorative factor analysis, on the other hand, explored the underlying factors that affected the primary investment climate determinants to gain deeper knowledge and understanding of the various aspects, dimensions and relationship between investment climate and economic development.

Secondary time series data on the primary investment climate determinants were regressed against the economic development indicators via the co-integrated regression technique to establish the relationship between them. The discriminant explorative factor analysis was used to examine the effect of latent secondary and tertiary investment climate factors that affected the

investment climate itself and economic development indicators to capture their impact. The summary of the findings of the study are stated below:

- There was a stationary and cointegrated relationship between investment climate determinants and economic development indicators.
- The ECM result showed average speed of adjustment of 50% per annum, indicating that short-run disequilibrium or shocks in investment climate determinants and economic development indicators had a 2-year period of adjustment to the long-run equilibrium .

- Nigeria's investment climate was not conducive for investment because of the significant negative impact of the primary investment climate determinants such as security, electricity supply, trade facilitation and infrastructures in that order. This was why the country was ranked low in the global ease of doing business index from 2005 to 2015.
- Security had the greatest negative significant impact (33%) on Nigeria's investment climate conditions making insecurity the greatest problem of the investment climate and economic development. Insecurity has high direct negative impact on the psyche of human development, investment decisions, electricity supply and other factors to cause low manufacturing capacity utilisation and the exodus of investors to comparator's countries like Ghana, South Africa and Malaysia.
- The country's security challenges resulted from the underlying factors of Niger-delta militants' destruction of oil, gas feeder pipes and electrical installations, north-east boko-haran Islamic insurgents and Fulani killer herdsmen which affected faming activities and business, ethnic agitations due to lopsided development policies of government, political imbroglios resulting from the change from one regime of government to another and the influx of criminals and mercenaries from across the country's porous borders.
- Security had significant impact on all the economic development indicators while trade facilitation had no significant impact on any of the economic development indicators.
- Insecurity in Nigeria had increased proportionately with the increase in unemployment rate since 2004 and this had been the part cause of youth restiveness, armed robberies, kidnappings, cultism, ritual killings, drug abuse, political body guarding, assassinations, religious riots and others.

- Primary investment climate determinants and their underlying factors had significant impact on the growth of economic development indicators of gross national income per capita, life expectancy, educational attainment, employment and gross domestic income both positively and negatively.

- Nigeria's investment climate determinants, on the average, had negative significant impact on gross national income per capita and educational attainment while it had positive significant impact on the growth of life expectancy and employment.

- The gross national income per capita was negatively and significantly affected by poor electricity supply, insecurity and poor credit supply to the private sector by commercial banks in Nigeria in that order.

- Educational attainment was significantly hampered by security challenges and dearth of infrastructure. There was a growing wave of cultism among students and sometime staff leading to incessant campus violence, sexual harassment, rape, drug abuse, killings and others. The campus violence caused the destruction of school properties, learning infrastructures, closure of school and expulsion of students out of school.

- Nigeria's investment climate had no positive impact on capital development and efficiency to promoting economic development. The reasons adduced were inadequate credit facilities due to poor savings of Nigerians, poor capital market and financial development, low rate of returns on investment and high cost of borrowing. Others were low domestic and foreign direct investment, insecurity, political uncertainty associated with change of government, corruption and poor infrastructure especially electricity supply and bad roads.

- Employment in Nigeria was positively and significantly influenced by financial development, economic growth, electricity supply and security in that order.

- Most economic reform programmes in Nigeria failed to meet the planned rate of development in real gross domestic product, gross national income per capita, life expectancy, literacy level, employment and capital development. The failure is partly due to

the poor evaluation of the microeconomic foundation of the macroeconomic policies of these programmes and which had led to policy invariance and ineffectiveness.

- There was no articulate and workable infrastructural development plan for Nigeria to address the infrastructural problems of the economy as was the case in comparator's countries like Malaysia, Indonesia, South Africa and Ghana.

5.2 Conclusion

This study examined several factors that affected the investment climate of Nigeria to hamper her level of economic development despite the abundant resources. These determining factors include private sector credit supply, electricity supply, infrastructures, trade facilitation, security, national development plans and their underlying factors which had made the investment climate to be unconducive for investment. The unconducive investment climate had negatively affected capacity utilisation of the manufacturing sector, ease of doing business in Nigeria and capital development and led to the divestment and exodus of investors to other comparator's countries. The low capacity utilisation of the manufacturing sector and the poor capital development had in turn negatively affected the inequality-adjusted human development indices such as gross national income per capita, life expectancy, educational attainment, employment and gross domestic product. Thus the standard of living, longevity of life, literacy level and employment in the country were low to perpetuate poverty and underdevelopment.

The macroeconomic and institutional reform policies of government, such as the structural adjustment programme (SAP), designed to influence the investment climate to bring about rapid economic development failed to meet with the planned developmental objectives of the programmes. The failure of the reforms was due to, among others, poor macroeconomic policy evaluation, lack of committed implementation, discontinuity of programmes especially when there is change in regimes of government, poor project funding, misallocation of capital budgets to finance recurrent budgets, corruption and embezzlement of project funds and lack of committed infrastructural development programme for the country.

5.3 Recommendation

A better and conducive investment climate promotes economic development. For this reason it is imperative for the government and stakeholders of the economy of a country to ensure that the investment environment is conducive for investment. A clement and conducive investment

climate promotes increase in the manufacturing sector's capacity utilisation, encourage investors to stay, encourage inflow of foreign direct investment and capital, and promote capital development and efficiency. These actions will further lead to reduction in the rate of unemployment and poverty; improve standard of living, life expectancy and the literacy level of the nation. Arising from the findings of the study the following recommendations were made:

- The government should seriously tackle the major problems of Nigeria's investment climate which are insecurity, poor electricity supply, poor trade facilitation and decayed infrastructures. This will help to promote rapid development in gross domestic product, gross national income per capita, life expectancy, educational attainment, employment and capital development.

- Insecurity should be addressed through the provision of employment for the youths in labour intensive agro-allied industries and farm settlement businesses which have high labour absorptive capacity. This will stem the tide of youth restiveness to criminal acts of robbery, kidnapping and reduce the negative activities of boko-haran, Fulani herdsmen and Niger-Delta militants' incessant damage to feeder gas pipes to power generating stations as well as theft of important electricity distribution installations and parts such as transformers, conductors, insulators and almond cables.

  Also Community Policing (COPOL) template should be introduced to tackle insecurity challenges at the communal level such as kidnapping dens or hideouts for criminals operating in cities, communal clashes, ritual dens, harassment of farmers and others. COPOL should be a part of the joint security networking committee to be set up in each local government area of the country involving the neighbourhood watch or vigilante group, Police, Military, Civil Defense and Peace Corps.

- The problem of inadequate power supply can be resolved by mounting security surveillance on gas pipelines to ensure uninterrupted gas supply to existing thermal power generating stations. There should be speedy rectification of electrical and distribution faults and the engraftment of the electricity company's name on important and major equipment or cables to discourage theft. More thermal electricity generating stations should be built, in addition to

encouraging private solar power generation and supply by the government, to boost the present generating capacity to meet the required minimum of 20,000 Megawatts needed to drive the economy to rapid development. This will save many collapsing micro and small businesses from extinction to increase the disturbing rate of unemployment.

- Trade facilitation should be improved upon by the government through the provision adequate facilities and security at the sea and air ports to reduce delays in the discharge of cargos to safeguard against the payment of high demurrage and parking fees respectively. Trade policies should be predicated on better foreign policies to attract foreign direct investments and investors to increase the significance of trade facilitation on economic development.

- Government should show serious commitment to infrastructural development policy in the country and mobilise action to implementing the national integrated infrastructural master plan (NIIMP) of 2014. Nigeria's capital budget should be increased to 50% of the annual budget while its misallocation to finance recurrent budget deficit should be avoided to boost infrastructural development.

- Government should seek the support of mega business conglomerates like Aliko Dagote Company, which has large fleet of heavy trucks plying and causing regular damage to the roads, to help build new roads or provide regular maintenance support. This will help to reduce the rate of accidents on the roads, gridlocks or traffic congestions, stress, delays and wastage of man-hours and other economic resources on the roads.

- Development in gross national income per capita and educational attainment can be increased by ensuring high level of security to curtail insurgences, kidnappings robberies, ritualism and cultism. It will also require improving electricity supply and other social and learning infrastructures as well as increasing private sector credit supply to finance economic, educational, and other social welfare programmes to improve the standard of living and education.

- Development in life expectancy and employment can be improved by promoting investment in micro and small businesses, to stimulate more economic growth and seriously check the problem of insecurity. The government should ensure that there is high level of security checks to reduce life threatening violent crimes such as insurgences, kidnappings, robberies, cultism and religious killings that often cause stress and shortens people's life span. Electricity supply should be improved upon to promote electricity-based business activities and health care delivery to boost employment and longevity of life. National development plans should incorporate life supporting social welfare programmes such as health, education, sports, social security benefit and pump priming or employment generating programmes in the nation's economic development plans.

- Capital development and efficiency should be improved upon by the government through the mobilisation of personal, corporate and national savings as well as plough-back business profits. There should be increase in private sector credit supply in addition to resolving the security and political challenges of the country.

- Investment climate assessment studies should be carried out in every 3 years since the ECM average speed of adjustment of 50% per annum takes a 2-year cycle to complete. This would allow for proper policy implementation, analysis, evaluation and simulation of policy effectiveness for sound economic planning.

- Macroeconomic and reform policies of government should be properly evaluated on the basis of their microeconomic foundations to capture the underlying factors that exert significant influence on policy direction and outcome.

5.4 Contribution to Knowledge

The findings of this study, no doubt, will help to fill the knowledge gaps that were not fully covered by previous studies. The study had explicated the characteristics of the primary and underlying factors affecting the conduciveness of Nigeria's investment climate. It explored the impact of the investment climate determinants on the economic development indicators and demonstrated the use of cointegrated regression and discriminant exploratory factor analysis to obtain empirical result. The results of the estimated models provided unique in-depth

information and new knowledge for policy making and economic reform policies as discussed below:

The study used the discriminant factor analysis to disaggregate investment climate to its determinants and economic development indicators to obtain several structural relationship models. This approach provided a comprehensive, integrated and complementary study of the impact of the primary and underlying factors of the investment climate on economic development.

The study adopted the use of the modified neoclassical production function which permits the incorporation of social and institutional factors into the traditional production equation to explore qualitative factor's impact or contribution to the production system. The study demonstrated the use of total factor productivity technique to measure factor efficiency of the investment climate.

The study, unlike previous ones, introduced empirical basis to the use of the inequality-adjusted human development index (IHDI) that has direct impact on human development. It evaluates human development from the basis of benefit or achievement (output) rather than the basis of potential achievement (input) of HDI. The IHDI development indices explored were gross national income per capita with income remittances from abroad and valued at $PPP, educational attainment or level of literacy of adult population that obtain basic primary education, life expectancy or longevity of the number of years actually lived and employment that provides means of livelihood. This metric best measures the economic development level actually achieved by a nation as adjusted to the domestic or local conditions which matters much in matters of human development assessment.

The study identified insecurity, poor electricity supply, poor trade facilitation and decayed infrastructures as the primary factors that made the investment climate not conducive for investment. It projected insecurity as the greatest problem of Nigeria's investment climate and economic development as against the hitherto claim of electricity or power supply. Insecurity is even the bane of electricity supply where militants, vandals destroy and vandalise generating and distribution facilities to cause incessant blackouts. It also identified and focused attention on the underlying factors that caused insecurity such as unemployment which can be resolve by promoting agro-allied investments.

The study computed the capital-output ratios (COR) and the incremental capital-output ratios of Nigeria for 35years to explore the trend of capital development and efficiency. This feat was rare in previous studies, going by the depth of literature reviewed. The primary and underlying factors that led to poor capital development and efficiency were clearly identified for policy makers to apply to promote capital accumulation and development.

The study provided an effective policy implementation tool for policy cycle duration (2yrs) deduced from the ECM result. With the proviso of a one-year period of policy evaluation, simulation and re-launch for another policy cycle, a 3-year scenario cycle of economic development policy plan can be obtained for promoting effective economic development. The study also identified the root cause of why most economic reform programmes and macroeconomic policies of government failed. The reason, among others, was due to the poor evaluation and exploration of the basic underlying microeconomic factors that significantly affect the outcome and efficacy of each programme or policy. Most of the policies have no tap roots that can sustain them. For instance SAP did not explore the potentials and the capability of the Nigerian economy to produce and supply non-oil exports to meet the increased export demand which the tacit devaluation and foreign exchange policies of the programme created. Most agricultural policies do not explore the underlying rural economic factors especially the diverse rural farming cultures which affect their farming practices, output and export orientation. Also there was poor evaluation of the necessary ex-ante basic agricultural supporting infrastructures such as access routes, storage facilities and ancillary agro-allied cottage industries. These have the effect of boosting rural empowerment and employment to reduce rural poverty and improve the standard of living of the rural dwellers.

5.5 Suggestion for Further Studies

A comprehensive study of the effect of insecurity and infrastructure on economic development in Nigeria should be carried out to highlight the state of the problem and the way forward.

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Appendix 1: Data on Investment Climate and Economic Development, 1981 - 2015

(a) Data on investment climate factors (*independent variables*) 1981-2015

Year	RealGDP (₦bn) 2010 const basic pric (GDPG **(a)**	Com. Bank Credit to private sector (₦bn) (PSCR)**(a)**	Total Cargo Loaded & discharge at Nig. Ports (million tons) (TRDF) **b,c,d**	Net Capital Budget (₦bn) (INFR) **(a)**	Electricity Generation in Nigeria (MW) (ELEC) **(a,b,d)**	Security Dummy Peace=1 War = 0 (SECU)	National Dev.Plan Dummy Plan=1 No plan=0 (NDPL)
1981	15,258	8.3	23.6	5.4	400	1	1
1982	14,985	9.9	22.6	0.6	600	1	1
1983	13,850	10.5	18.7	3.0	750	1	1
1984	13,779	10.9	14.7	2.8	700	1	1
1985	14,954	11.6	16.4	4.9	650	1	1
1986	15,238	15.2	12.3	0.5	750	1	0
1987	15,264	16.9	11.5	1.0	800	1	0
1988	16,215	18.8	11.2	-7.7	850	1	0
1989	17,295	21.2	13.4	-10.4	1,000	1	0
1990	19,306	24.8	16.2	3.8	1,346	1	1
1991	19,199	30.3	86.7	-14.9	1,417	1	1
1992	19,620	75.5	80.0	0.5	1,483	1	1
1993	19,928	88.8	95.2	-63.9	1,450	1	1
1994	19,979	143.5	94.3	1.2	1,553	1	1
1995	20,353	204.1	98.5	244.2	1,585	1	1
1996	21,178	254.9	94.3	489.9	1,624	1	1
1997	21,789	311.4	11.5	529.4	1,612	1	1
1998	22,333	366.5	113.3	351.2	1,511	1	1
1999	22,449	449.1	110.8	425.8	1,609	1	1
2000	23,688	588.0	127.3	271.4	2,000	1	1
2001	25,268	844.5	35.9	435.3	1,900	1	1
2002	28,958	948.5	37.0	40.0	1,800	1	1
2003	31,709	1,203.2	33.8	39.4	2,300	1	1
2004	35,021	1,519.2	36.7	399.5	2,390	0	1
2005	37,476	1,991.2	39.6	795.1	2,800	0	1
2006	39,996	2,609.3	46.2	997.4	2,800	0	1
2007	42,922	4,820.7	57.5	1,386.5	2,928	0	1
2008	46,013	7,799.4	65.2	1989.6	2,663	0	1
2009	49,856	9,667.9	66.9	857.8	2,839	0	1
2010	54,612	9,198.2	74.9	-241.7	3,290	0	1
2011	57,511	9,614.5	83.5	181.8	3,800	0	1
2012	59,930	10,441	76.9	203.5	4,518	0	1
2013	63,219	11,544	76.9	297.7	3,800	0	1
2014	67,153	12,512	86.6	1,160.9	4,038	0	1
2015	69,024	13,569	144.2	1,156.6	4,132	0	1

Source: (**a**) CBN: Statistical Bulletin (2015) **(b**) NBS: Annual Abstracts of Statistics (2008).:
(c) NBS :Annual Abstracts of Statistics (2012) **(d)** NPA Civil and

Environmental Research

(b) Data on Economic Development Indicators (*dependent variables*) 1981-2015

Year	RealGDP (₦bn) 2010 const basic price (GDPG) **(a)**	GNI Per Capita (PPPUS$) at 2011constant price (GNICAP **(d)**	Life Expectancy at birth (Years) (LIFE) **(d)**	Educational Attainment (Total Sch. Leavers from Prim. to Sec schs)(million) (EDUC) (**b,c,d,e)**	Employment rate (%) (EMPL) (**d)**
1981	15,258	3,555	45.9	2.3	95.9
1982	14,985	3,446	46.1	2.8	95.8
1983	13,850	3,196	46.2	3.5	94.7
1984	13,779	3,029	46.3	4.1	92.1
1985	14,954	3,172	46.3	4.3	93.9
1986	15,238	2,742	46.3	3.6	94.7
1987	15,264	2,312	46.3	3.8	93.0
1988	16,215	2,607	46.2	3.6	94.9
1989	17,295	2,510	46.2	3.6	95.9
1990	19,306	2,753	46.1	3.7	96.5
1991	19,199	2,677	46.1	3.7	96.8
1992	19,620	2,584	46.1	4.3	96.5
1993	19,928	2,465	46.1	4.8	96.6
1994	19,979	2,496	46.1	5.3	96.8
1995	20,353	2,539	46.1	5.0	98.1
1996	21,178	2,635	46.2	4.8	97.2
1997	21,789	2,656	46.2	1.9	96.6
1998	22,333	2,626	46.3	1.8	96.5
1999	22,449	2,657	46.4	4.7	82.5
2000	23,688	2,388	46.6	5.0	86.9
2001	25,268	2,618	46.9	5.6	86.4
2002	28,958	2,624	47.2	6.2	87.4
2003	31,709	2,804	47.6	7.7	85.2
2004	35,021	3,632	48.1	7.7	86.6
2005	37,476	3,623	48.7	7.7	88.1
2006	39,996	4,214	49.2	7.9	87.7
2007	42,922	4,215	49.8	7.6	87.3
2008	46,013	4,340	50.3	8.9	85.1
2009	49,856	4,474	50.8	9.5	80.3
2010	54,612	4,862	51.3	10.8	78.9
2011	57,511	4,970	51.7	5.9	76.1
2012	59,930	5,065	52.1	6.3	72.6
2013	63,219	5,205	52.4	6.5	75.3
2014	67,153	5,472	52.8	6.7	87.9
2015	69,024	5,546	53.1	7.1	86.7

Sources. (**a**)CBN: Statistical Bulletin (2015) **(b**) NBS: Annual Abstracts of Statistics (2008).: **(c)** NBS :Annual Abstracts of Statistics (2012) **(d)** World Bank:World Development Indicators (2013 & 2016) (**e**) Index mundi (2015). www.indexmundi.com

(c.): Some Economic Performance Indicators of the Nigerian Economy 1981-2015

Year	GDP Annual Growth rate (%) **a** & **b**	Manufacturing Capacity Utilisation (%) **a** & **b**		Per Capita GDP ($)	Human Development Index (HDI) point **d**	Ease of Doing Business Global Ranking/Position for Nigeria **c**
1981	-13.1	73.3		807	NA	NA
1982	-1.1	63.6		661	NA	NA
1983	-5.1	49.7		445	NA	NA
1984	-2.0	43.0		349	NA	NA
1985	8.3	38.3		344	NA	NA
1986	-8.8	38.8		241	NA	NA
1987	-10.8	40.4		273	NA	NA
1988	7.5	42.4		256	NA	NA
1989	6.5	43.8		260	NA	NA
1990	12.8	40.3		322	NA	NA
1991	-0.6	42.0		279	NA	NA
1992	0.4	38.1		291	NA	NA
1993	2.1	37.2		153	NA	NA
1994	0.9	30.4		171	NA	NA
1995	-0.3	29.3		263	NA	NA
1996	5.0	32.5		315	NA	NA
1997	2.8	30.4		314	NA	NA
1998	2.7	32.4		274	NA	NA
1999	0.5	34.6		299	NA	NA
2000	5.3	36.1		378	NA	NA
2001	4.4	42.7		350	NA	NA
2002	3.8	54.9		457	NA	NA
2003	10.4	56.5		510	NA	NA
2004	6.2	55.7		646	NA	NA
2005	3.4	54.8		804	0.47	91
2006	8.2	53.3		1015	0.48	94
2007	6.8	53.4		1131	0.48	108
2008	6.3	53.8		1377	0.49	108
2009	6.9	55.5		1092	0.49	118
2010	7.8	55.1		2315	0.50	125
2011	4.9	56.2		2514	0.51	137
2012	4.3	56		2740	0.51	133
2013	5.4	52.7		2980	0.52	131
2014	6.3	54.2		3203	0.53	147
2015	2.8	54		2655	0.53	170

Source:

(a) CBN: Statistical Bulletin (2015) **(b**) CBN: Annual Report (2015)

(**c**.)World Bank: World Bank Doing Business Survey (2016). Retrieved from www.doingbusiness.org

(**d**) World Bank: Measuring Index of Economic Performance (2016). Retrieved from www.knoema.com.

Appendix 2: Augmented Dickey-Fuller Unit root Tests Result for the Models

(2a): Model 1

Augmented Dickey-Fuller Unit Root Test on D (LNMCAP)

Null Hypothesis: D(LNMCAP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.517503	0.0137
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

(2b): Model 2

Augmented Dickey-Fuller Unit Root Test on D(LNGDPG)

Null Hypothesis: D(LNGDPG) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.602894	0.0450
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNGDPG,2)
Method: Least Squares
Date: 04/14/16 Time: 11:40
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGDPG(-1))	-0.626954	0.174014	-3.602894	0.0011
C	0.011074	0.013362	0.828807	0.4138
@TREND("1981")	0.001025	0.000773	1.326087	0.1948

R-squared	0.309608	Mean dependent var	0.001380
Adjusted R-squared	0.263582	S.D. dependent var	0.041803
S.E. of regression	0.035873	Akaike info criterion	-3.731153
Sum squared resid	0.038606	Schwarz criterion	-3.595107
Log likelihood	64.56403	Hannan-Quinn criter.	-3.685378
F-statistic	6.726777	Durbin-Watson stat	1.843630
Prob(F-statistic)	0.003859		

(2c): Model 3

Augmented Dickey-Fuller Unit Root Test on D(LNGNICAP)

Null Hypothesis: D(LNGNICAP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.645947	0.0000
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNGNICAP,2)
Method: Least Squares
Date: 07/29/17 Time: 12:01
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGNICAP(-1))	-1.200081	0.180573	-6.645947	0.0000
C	-0.056535	0.029639	-1.907470	0.0661
@TREND("1981")	0.004087	0.001527	2.676594	0.0119

R-squared	0.595694	Mean dependent var	0.001351
Adjusted R-squared	0.568740	S.D. dependent var	0.114994
S.E. of regression	0.075517	Akaike info criterion	-2.242409
Sum squared resid	0.171085	Schwarz criterion	-2.106363
Log likelihood	39.99974	Hannan-Quinn criter.	-2.196633
F-statistic	22.10060	Durbin-Watson stat	1.947528
Prob(F-statistic)	0.000001		

(2d): Model 4

Augmented Dickey-Fuller Unit Root Test on D(LNLIFE)

Null Hypothesis: D(LNLIFE) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 8 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.895248	0.0010
Test critical values:	1% level	-4.374307	
	5% level	-3.603202	
	10% level	-3.238054	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNLIFE,2)
Method: Least Squares
Date: 04/14/16 Time: 11:49
Sample (adjusted): 1991 2015
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNLIFE(-1))	-0.387578	0.204500	-1.895248	0.0789
D(LNLIFE(-1),2)	-0.114738	0.208296	-0.550840	0.5904
D(LNLIFE(-2),2)	0.322950	0.215387	1.499392	0.1560
D(LNLIFE(-3),2)	0.560165	0.221672	2.527000	0.0242
D(LNLIFE(-4),2)	0.529999	0.239561	2.212370	0.0441
D(LNLIFE(-5),2)	0.452663	0.255359	1.772654	0.0980
D(LNLIFE(-6),2)	-0.003112	0.245638	-0.012670	0.9901
D(LNLIFE(-7),2)	-0.138202	0.236176	-0.585167	0.5677
D(LNLIFE(-8),2)	-0.553219	0.218099	-2.536548	0.0237
C	-0.002552	0.001581	-1.614245	0.1288
@TREND("1981")	0.000208	0.000105	1.981384	0.0675

R-squared	0.733767	Mean dependent var	0.000313
Adjusted R-squared	0.543600	S.D. dependent var	0.001654
S.E. of regression	0.001117	Akaike info criterion	-10.45576
Sum squared resid	1.75E-05	Schwarz criterion	-9.919452
Log likelihood	141.6970	Hannan-Quinn criter.	-10.30701
F-statistic	3.858547	Durbin-Watson stat	1.412788
Prob(F-statistic)	0.010929		

(2e): Model 5

Augmented Dickey-Fuller Unit Root Test on D(LNEDUC)

Null Hypothesis: D(LNEDUC) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.306538	0.0007
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test
Equation Dependent Variable:
D(LNEDUC,2) Method: Least Squares
Date: 07/29/17 Time: 12:00
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNEDUC(-1))	-0.965403	0.181927	-5.306538	0.0000
C	0.051460	0.106441	0.483459	0.6323
@TREND("1981")	-0.001355	0.005201	-0.260470	0.7963

R-squared	0.484554	Mean dependent var	-0.004204
Adjusted R-squared	0.450191	S.D. dependent var	0.382191
S.E. of regression	0.283391	Akaike info criterion	0.402532
Sum squared resid	2.409320	Schwarz criterion	0.538578
Log likelihood	-3.641780	Hannan-Quinn criter.	0.448307
F-statistic	14.10101	Durbin-Watson stat	1.986663
Prob(F-statistic)	0.000048		

Augmented Dickey-Fuller Unit Root Test on D(EMPL)

Null Hypothesis: D(EMPL) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.852634	0.0002
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EMPL,2)
Method: Least Squares
Date: 04/14/16 Time: 11:28
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EMPL(-1))	-1.067700	0.182431	-5.852634	0.0000
C	-0.550064	1.483497	-0.444186	0.6601
@TREND("1981")	0.019883	0.071752	0.277109	0.7836

R-squared	0.533124	Mean dependent var	-0.033333
Adjusted R-squared	0.501999	S.D. dependent var	5.562346
S.E. of regression	3.918244	Akaike info criterion	5.655672
Sum squared resid	460.5790	Schwarz criterion	5.791718
Log likelihood	-90.31859	Hannan-Quinn criter.	5.701447
F-statistic	17.12847	Durbin-Watson stat	2.004968
Prob(F-statistic)	0.000011		

(2f): Model 6

Augmented Dickey-Fuller Unit Root Test for Explanatory variables of the Models

Model 1 2(1a)

Null Hypothesis: D(LNPSCR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		**-4.230943**	**0.0022**
Test critical values:	**1% level**	**-3.646342**	
	5% level	**-2.954021**	
	10% level	**-2.615817**	

2(1b)

Null Hypothesis: D(LNTRDF) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		**-7.738526**	**0.0000**
Test critical values:	**1% level**	**-3.646342**	
	5% level	**-2.954021**	
	10% level	**-2.615817**	

2(1c)

Null Hypothesis: D(LNINFR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		**-8.697859**	**0.0000**
Test critical values:	**1% level**	**-3.646342**	
	5% level	**-2.954021**	
	10% level	**-2.615817**	

2(1d)

Null Hypothesis: D(LNELEC) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		**-5.960788**	**0.0000**
Test critical values:	**1% level**	**-3.646342**	
	5% level	**-2.954021**	
	10% level	**-2.615817**	

2(1e)

Null Hypothesis: D(LNSECU) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		**-5.744563**	**0.0000**
Test critical values:	**1% level**	**-3.646342**	
	5% level	**-2.954021**	
	10% level	**-2.615817**	

2(1f)

Null Hypothesis: NDPL has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		**-2.298163**	**0.1783**
Test critical values:	**1% level**	**-3.639407**	
	5% level	**-2.951125**	
	10% level	**-2.614300**	

Augmented Dickey-Fuller Unit Root Test for Models 2- 6

2(2-6a)

Augmented Dickey-Fuller Unit Root Test on D(LNPSCR)

Null Hypothesis: D(LNPSCR) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.158821	0.0128
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNPSCR,2)
Method: Least Squares
Date: 04/14/16 Time: 11:52
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNPSCR(-1))	-0.739001	0.177695	-4.158821	0.0002
C	0.172949	0.079594	2.172907	0.0378
@TREND("1981")	-0.000664	0.003438	-0.193113	0.8482

R-squared	0.366851	Mean dependent var	-0.002884
Adjusted R-squared	0.324642	S.D. dependent var	0.228763
S.E. of regression	0.187998	Akaike info criterion	-0.418262
Sum squared resid	1.060298	Schwarz criterion	-0.282216
Log likelihood	9.901327	Hannan-Quinn criter.	-0.372487
F-statistic	8.691123	Durbin-Watson stat	2.065622
Prob(F-statistic)	0.001053		

2(2-6b)

Augmented Dickey-Fuller Unit Root Test on D(LNTRDF)

Null Hypothesis: D(LNTRDF) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.622744	0.0000
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNTRDF,2)
Method: Least Squares
Date: 04/14/16 Time: 11:55
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNTRDF(-1))	-1.325310	0.173863	-7.622744	0.0000
C	0.014716	0.246540	0.059689	0.9528
@TREND("1981")	0.003014	0.012106	0.249008	0.8051

R-squared	0.659612	Mean dependent var	0.016764
Adjusted R-squared	0.636920	S.D. dependent var	1.098861
S.E. of regression	0.662131	Akaike info criterion	2.099801
Sum squared resid	13.15253	Schwarz criterion	2.235848
Log likelihood	-31.64672	Hannan-Quinn criter.	2.145577
F-statistic	29.06740	Durbin-Watson stat	2.014711
Prob(F-statistic)	0.000000		

2(2-6c)

Augmented Dickey-Fuller Unit Root Test on D(LNINFR)

Null Hypothesis: D(LNINFR) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.171528	0.0000
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNINFR,2)
Method: Least Squares
Date: 04/14/16 Time: 11:46
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNINFR(-1))	-1.242475	0.173251	-7.171528	0.0000
C	0.299862	0.745007	0.402495	0.6902
@TREND("1981")	-0.001733	0.036627	-0.047303	0.9626

R-squared	0.632279	Mean dependent var	0.066470
Adjusted R-squared	0.607764	S.D. dependent var	3.195315
S.E. of regression	2.001185	Akaike info criterion	4.311864
Sum squared resid	120.1423	Schwarz criterion	4.447910
Log likelihood	-68.14576	Hannan-Quinn criter.	4.357640
F-statistic	25.79178	Durbin-Watson stat	2.019552
Prob(F-statistic)	0.000000		

2(2-6d)

Augmented Dickey-Fuller Unit Root Test on LNELEC

Null Hypothesis: LNELEC has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.047651	0.0163
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNELEC)
Method: Least Squares
Date: 04/14/16 Time: 11:35
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNELEC(-1)	-0.500566	0.123668	-4.047651	0.0003
C	3.289255	0.784327	4.193728	0.0002
@TREND("1981")	0.027466	0.007674	3.579174	0.0012

R-squared	0.380183	Mean dependent var	0.068678
Adjusted R-squared	0.340194	S.D. dependent var	0.121538
S.E. of regression	0.098723	Akaike info criterion	-1.708899
Sum squared resid	0.302133	Schwarz criterion	-1.574220
Log likelihood	32.05129	Hannan-Quinn criter.	-1.662970
F-statistic	9.507363	Durbin-Watson stat	1.521110
Prob(F-statistic)	0.000603		

Appendix 3: Model 1a Estimation

(3a)

Johasen Cointegration Test for Model 1a

Date: 06/12/18 Time: 22:20
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: LNMCAP LNPSCR LNTRDF LNINFR LNELEC LNSECU NDPL
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.797008	145.5815	125.6154	0.0017
At most 1	0.684742	92.96016	95.75366	0.0767
At most 2	0.424676	54.86619	69.81889	0.4246
At most 3	0.385905	36.62305	47.85613	0.3655
At most 4	0.289364	20.53208	29.79707	0.3875
At most 5	0.191308	9.259448	15.49471	0.3419
At most 6	0.065975	2.252334	3.841466	0.1334

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.797008	52.62136	46.23142	0.0092
At most 1	0.684742	38.09397	40.07757	0.0822
At most 2	0.424676	18.24314	33.87687	0.8651
At most 3	0.385905	16.09098	27.58434	0.6581
At most 4	0.289364	11.27263	21.13162	0.6201
At most 5	0.191308	7.007114	14.26460	0.4883
At most 6	0.065975	2.252334	3.841466	0.1334

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

LNMCAP	LNPSCR	LNTRDF	LNINFR	LNELEC	LNSECU	NDPL
0.010704	-1.049351	2.073500	0.035382	-2.142678	-5.156676	0.931062
0.239134	2.145490	0.394363	-0.284637	-7.913469	0.962048	-1.523706
-4.597079	0.559170	-2.439414	-0.364759	-1.938180	-2.556639	6.125470
8.207999	-0.474197	0.900860	0.108860	2.277411	3.945015	-0.172792

0.802958	0.206609	-0.627240	0.307526	-1.955779	-0.216959	-0.071570
2.620370	-0.640693	-0.427506	-0.133792	2.086639	-0.985085	-1.079676
1.471348	0.036454	0.543764	0.042358	-0.185948	-1.373746	-0.621955

(3b)

Error Correction Model for Model 1a

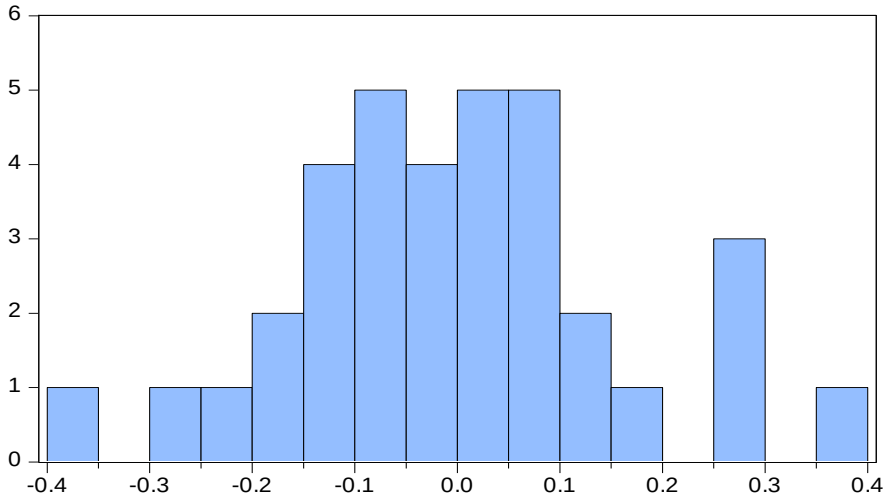
Dependent Variable: D(LNMCAP)
Method: Least Squares
Date: 06/16/18 Time: 00:01
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.393297	1.175928	4.586417	0.0001
D(LNPSCR)	0.061177	0.048541	1.260315	0.2183
D(LNTRDF)	-0.112156	0.051541	-2.176066	0.0385
D(LNINFR)	-0.017882	0.009767	-1.830844	0.0782
D(LNELEC)	-0.184363	0.192867	-0.955910	0.3476
D(SECU)	-0.331348	0.108704	-3.048181	0.0051
D(NDPL)	0.130454	0.104209	1.251849	0.2214
ECM(-1)	0.724884	0.164209	4.414398	0.0024

R-squared	0.607017	Mean dependent var	3.797600
Adjusted R-squared	0.519688	S.D. dependent var	0.222933
S.E. of regression	0.154503	Akaike info criterion	-0.715966
Sum squared resid	0.644522	Schwarz criterion	-0.401715
Log likelihood	19.17142	Hannan-Quinn criter.	-0.608797
F-statistic	6.950889	Durbin-Watson stat	0.972144
Prob(F-statistic)	0.000151		

($3c_1$)

Normality Test for Model 1a



Series: Residuals	
Sample 1981 2015	
Observations 35	
Mean	1.36e-15
Median	-0.000340
Maximum	0.375063
Minimum	-0.373934
Std. Dev.	0.157900
Skewness	0.144645
Kurtosis	3.230161
Jarque-Bera	0.199300
Probability	0.905154

($3c_2$)

Correlation Test for Model 1a

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	12.19232	Prob. F(2,27)	0.0002
Obs*R-squared	16.60929	Prob. Chi-Square(2)	0.0002

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 06/12/18 Time: 22:12
Sample: 1981 2015
Included observations: 35
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNPSCR	0.068539	0.040851	1.677789	0.1049
LNTRDF	0.073247	0.043943	1.666848	0.1071
LNELEC	-0.229612	0.139505	-1.645898	0.1114
LNSECU	0.117791	0.103532	1.137721	0.2652
NDPL	-0.201733	0.100100	-2.015305	0.0539
C	1.129923	0.811015	1.393222	0.1749
RESID(-1)	0.809227	0.181517	4.458137	0.0001
RESID(-2)	0.037709	0.208874	0.180536	0.8581

R-squared	0.474551	Mean dependent var	1.36E-15
Adjusted R-squared	0.338324	S.D. dependent var	0.157900
S.E. of regression	0.128442	Akaike info criterion	-1.069053
Sum squared resid	0.445426	Schwarz criterion	-0.713545
Log likelihood	26.70843	Hannan-Quinn criter.	-0.946332
F-statistic	3.483521	Durbin-Watson stat	1.744482
Prob(F-statistic)	0.008649		

($3c_3$)

Heteroscedasticity Test for Model 1a

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	5.885577	Prob. F(5,29)	0.0007
Obs*R-squared	17.62816	Prob. Chi-Square(5)	0.0035
Scaled explained SS	13.49501	Prob. Chi-Square(5)	0.0192

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/12/18 Time: 22:12
Sample: 1981 2015
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.148874	0.166747	0.892811	0.3793
LNPSCR	0.018983	0.007416	2.559822	0.0159
LNTRDF	-0.028993	0.009015	-3.216034	0.0032
LNELEC	-0.029615	0.027723	-1.068234	0.2942
LNSECU	0.074518	0.018931	3.936304	0.0005
NDPL	0.050683	0.018345	2.762733	0.0098

R-squared	0.503662	Mean dependent var	0.024220
Adjusted R-squared	0.418086	S.D. dependent var	0.036698
S.E. of regression	0.027994	Akaike info criterion	-4.158831
Sum squared resid	0.022727	Schwarz criterion	-3.892200
Log likelihood	78.77954	Hannan-Quinn criter.	-4.066790
F-statistic	5.885577	Durbin-Watson stat	1.948582
Prob(F-statistic)	0.000716		

($3c_4$)

Ramsey RESET Test for Model 1a

Ramsey RESET Test
Equation: UNTITLED
Specification: LNMCAP LNPSCR LNTRDF LNELEC LNSECU NDPL C
Omitted Variables: Powers of fitted values from 2 to 3

	Value	df	Probability
F-statistic	0.601125	(2, 27)	0.5554
Likelihood ratio	1.524771	2	0.4666

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.036137	2	0.018069
Restricted SSR	0.847705	29	0.029231
Unrestricted SSR	0.811568	27	0.030058

Appendix 4: Model 2 Estimation

(4a)

Johasen Cointegration Test for Model 2

Johansen Cointegration Test for model 1

Date: 04/14/16 Time: 13:34
Sample (adjusted): 1984 2015
Included observations: 32 after adjustments
Trend assumption: Linear deterministic trend
Series: LNGDPG LNPSCR LNTRDF LNINFR LNELEC SECU NDPL
Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.964972	261.0645	125.6154	0.0000
At most 1 *	0.808353	153.8135	95.75366	0.0000
At most 2 *	0.666351	100.9463	69.81889	0.0000
At most 3 *	0.577986	65.82097	47.85613	0.0005
At most 4 *	0.459915	38.21404	29.79707	0.0043
At most 5 *	0.280371	18.50114	15.49471	0.0171
At most 6 *	0.220530	7.972523	3.841466	0.0047

Trace test indicates 7 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.964972	107.2511	46.23142	0.0000
At most 1 *	0.808353	52.86715	40.07757	0.0011
At most 2 *	0.666351	35.12534	33.87687	0.0353
At most 3 *	0.577986	27.60694	27.58434	0.0497
At most 4	0.459915	19.71289	21.13162	0.0780
At most 5	0.280371	10.52862	14.26460	0.1795
At most 6 *	0.220530	7.972523	3.841466	0.0047

Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

LNGDPG	LNPSCR	LNTRDF	LNINFR	LNELEC	SECU	NDPL
-4.530625	-2.635035	-3.014707	0.432456	16.11678	-0.535385	1.420633
3.663971	-3.457644	3.601473	0.645105	4.498540	-4.017449	-1.002116
3.252061	0.703172	-3.861630	-0.144758	3.995965	4.884010	1.333282
-10.79476	1.606098	0.040490	-0.224778	3.235186	-2.815590	-5.202762
-15.72031	1.866425	-1.891969	-0.921002	7.819977	-2.699611	3.092335
-1.063676	-0.122510	-0.495001	0.178260	4.720282	4.247307	-0.148097
-19.77503	2.091475	-1.985519	-0.119514	6.308154	-5.447648	2.194024

Unrestricted Adjustment Coefficients (alpha):

D(LNGDPG)	-0.006145	-0.009543	0.006155	0.007799	-0.005317	0.007566	0.005258
D(LNPSCR)	0.067450	0.020162	-0.052795	-0.000973	0.029991	0.019566	0.032719
D(LNTRDF)	0.278640	-0.106365	0.111199	0.104481	0.023852	-0.162984	0.006121
D(LNINFR)	-0.171248	0.259940	0.117259	0.380741	1.061397	0.272352	-0.135051
D(LNELEC)	-0.000566	-0.026490	-0.030324	0.027271	-0.004359	0.000795	-0.010573
D(SECU)	-0.002440	0.071124	-0.036015	0.053144	-0.026133	-0.044316	-0.004023
D(NDPL)	0.027650	-0.023387	0.043673	0.141670	-0.026271	0.039620	-0.035565

(4b)

Error Correction for model 2

Error Correction Model 1

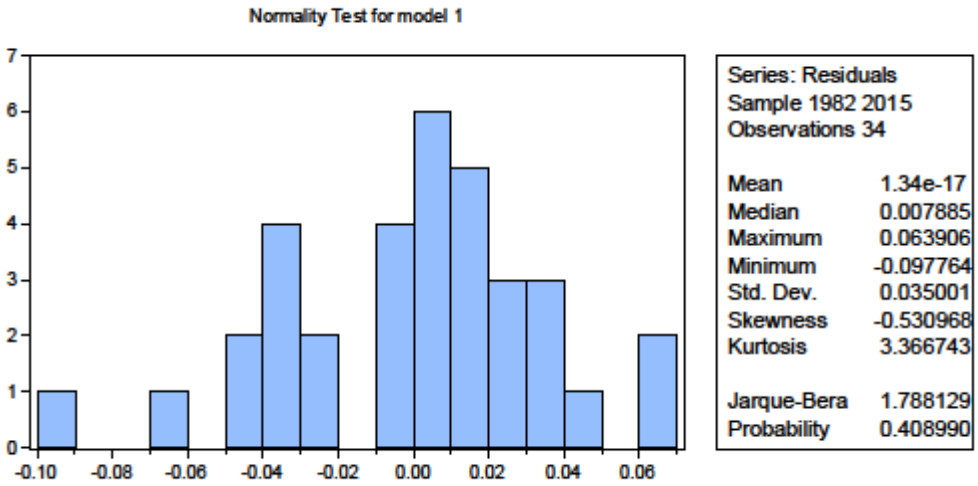
Dependent Variable: D(LNGDPG)
Method: Least Squares
Date: 04/14/16 Time: 13:48
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.045937	0.011745	3.911316	0.0006
D(LNPSCR)	0.005709	0.037596	0.151855	0.8805
D(LNTRDF)	0.003751	0.010481	0.357871	0.7233
D(LNINFR)	-0.007509	0.003722	-2.017511	0.0541
D(LNELEC)	0.037867	0.060660	0.624245	0.5379
D(SECU)	0.085997	0.041923	2.051299	0.0504
D(NDPL)	0.062454	0.029388	2.125145	0.0432
ECM(-1)	-0.183521	0.096044	-1.996080	0.0571

R-squared	0.619221	Mean dependent var	0.044393
Adjusted R-squared	0.535934	S.D. dependent var	0.042421
S.E. of regression	0.039432	Akaike info criterion	-3.426137
Sum squared resid	0.040428	Schwarz criterion	-3.066993
Log likelihood	66.24432	Hannan-Quinn criter.	-3.303658
F-statistic	11.74165	Durbin-Watson stat	1.685551
Prob(F-statistic)	0.002148		

($4c_1$)

Normality Test for Model 2



($4c_2$)

Serial Correlation Test for model 1

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.791365	Prob. F(2,24)	0.2177
Obs*R-squared	2.701796	Prob. Chi-Square(2)	0.1178

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 04/14/16 Time: 13:51
Sample: 1982 2015
Included observations: 34
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000368	0.010609	0.034667	0.9726
D(LNPSCR)	0.006006	0.033647	0.178502	0.8598
D(LNTRDF)	0.000938	0.009339	0.100443	0.9208
D(LNINFR)	0.001265	0.003312	0.382051	0.7058
D(LNELEC)	-0.023418	0.054070	-0.433106	0.6688
D(SECU)	0.026875	0.040340	0.666201	0.5116
D(NDPL)	0.007532	0.027188	0.277039	0.7841
ECM1(-1)	-0.072364	0.087808	-0.824110	0.4180
RESID(-1)	0.664541	0.215113	3.089270	0.0050
RESID(-2)	-0.201912	0.222147	-0.908910	0.3724

R-squared	0.285347	Mean dependent var	1.34E-17
Adjusted R-squared	0.017352	S.D. dependent var	0.035001
S.E. of regression	0.034696	Akaike info criterion	-3.644448
Sum squared resid	0.028892	Schwarz criterion	-3.195518
Log likelihood	71.95561	Hannan-Quinn criter.	-3.491350
F-statistic	1.064748	Durbin-Watson stat	2.087574
Prob(F-statistic)	0.422041		

$(4c_3)$

Heteroskedasticity Test for model 1

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.638005	Prob. F(7,26)	0.7205
Obs*R-squared	4.984083	Prob. Chi-Square(7)	0.6619
Scaled explained SS	3.449015	Prob. Chi-Square(7)	0.8406

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/14/16 Time: 13:51
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001645	0.000576	2.858573	0.0083
D(LNPSCR)	-0.002516	0.001842	-1.365529	0.1838
D(LNTRDF)	-0.000246	0.000514	-0.479119	0.6359
D(LNINFR)	0.000140	0.000182	0.765919	0.4506
D(LNELEC)	0.002219	0.002973	0.746352	0.4622
D(SECU)	0.001667	0.002055	0.811585	0.4244
D(NDPL)	-0.000504	0.001440	-0.349773	0.7293
ECM1(-1)	0.003341	0.004707	0.709930	0.4841

R-squared	0.146591	Mean dependent var	0.001189
Adjusted R-squared	-0.083173	S.D. dependent var	0.001857
S.E. of regression	0.001932	Akaike info criterion	-9.457740
Sum squared resid	9.71E-05	Schwarz criterion	-9.098596
Log likelihood	168.7816	Hannan-Quinn criter.	-9.335261
F-statistic	0.638005	Durbin-Watson stat	1.528301
Prob(F-statistic)	0.720474		

($4c_4$): model 2

Ramsey RESET Test for model 1

Ramsey RESET Test
Equation: EQ01
Specification: D(LNGDPG) C D(LNPSCR) D(LNTRDF) D(LNINFR) D(LNELEC) D(SECU) D(NDPL) ECM1(-1)
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.447221	25	0.1603
F-statistic	2.094447	(1, 25)	0.1603
Likelihood ratio	2.735401	1	0.0981

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.003125	1	0.003125
Restricted SSR	0.040428	26	0.001555
Unrestricted SSR	0.037303	25	0.001492

LR test summary:

	Value	df
Restricted LogL	66.24432	26
Unrestricted LogL	67.61202	25

Unrestricted Test Equation:
Dependent Variable: D(LNGDPG)
Method: Least Squares
Date: 04/14/16 Time: 13:52
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001340	0.032893	0.040747	0.9678
D(LNPSCR)	0.016471	0.039891	0.412902	0.6832
D(LNTRDF)	0.002259	0.011075	0.203995	0.8400
D(LNINFR)	0.005764	0.009870	0.584031	0.5644
D(LNELEC)	-0.009141	0.062650	-0.145898	0.8852
D(SECU)	0.088086	0.127105	0.693018	0.4947
D(NDPL)	-0.012049	0.058983	-0.204276	0.8398
ECM1(-1)	0.071245	0.199602	0.356932	0.7241
FITTED^2	16.65346	11.50720	1.447221	0.1603

R-squared	0.371846	Mean dependent var	0.044393
Adjusted R-squared	0.170837	S.D. dependent var	0.042421
S.E. of regression	0.038628	Akaike info criterion	-3.447766
Sum squared resid	0.037303	Schwarz criterion	-3.043729
Log likelihood	67.61202	Hannan-Quinn criter.	-3.309978
F-statistic	1.849898	Durbin-Watson stat	1.171313
Prob(F-statistic)	0.114504		

Appendix 4: Model 3 Estimation

Date: 07/29/17 Time: 12:49
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: LNGNICAP LNGDPG LNPSCR LNTRDF LNINFR LNELEC SECU NDPL Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
None *	0.839923	212.4190	159.5297	0.0000
At most 1 *	0.800661	151.9598	125.6154	0.0005
At most 2 *	0.664440	98.73907	95.75366	0.0307
At most 3	0.569416	62.70455	69.81889	0.1619
At most 4	0.332472	34.89835	47.85613	0.4534

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
*** denotes rejection of the hypothesis at the 0.05 level**
****MacKinnon-Haug-Michelis (1999) p-values**

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.839923	60.45923	52.36261	0.0061
At most 1 *	0.800661	53.22072	46.23142	0.0077
At most 2	0.664440	36.03452	40.07757	0.1331
At most 3	0.569416	27.80620	33.87687	0.2226
At most 4	0.332472	13.33775	27.58434	0.8655
At most 5	0.288218	11.21945	21.13162	0.6254
At most 6	0.191177	7.001763	14.26460	0.4889
At most 7	0.096242	3.339391	3.841466	0.0676

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
*** denotes rejection of the hypothesis at the 0.05 level**
****MacKinnon-Haug-Michelis (1999) p-values**

LNGNICAP	LNGDPG	LNPSCR	LNTRDF	LNINFR	LNELEC	SECU	NDPL
-23.27210	24.98029	-0.994248	0.935899	-0.018694	-15.19860	-6.556400	3.626987
18.24625	-13.43150	1.342793	1.581993	-0.090783	1.629765	5.687115	-3.746481
1.457687	0.917473	1.862808	-2.422202	-0.395721	-2.038364	5.024200	0.231007
8.566394	-16.66840	2.639589	0.344398	-0.344835	1.724261	-1.113796	-3.810645
-7.328652	5.130521	-0.655935	0.910391	-0.052242	-0.319250	-0.982568	-1.794208
-5.694674	15.42824	-1.909031	0.447491	0.698459	-4.703170	0.595966	-2.213531
1.750648	-0.569095	0.681389	0.519280	0.176621	-0.804419	3.077674	-0.408565
5.428254	-17.98123	2.287999	-1.162946	-0.095265	3.350093	-0.855553	-0.154266

Unrestricted Adjustment Coefficients (alpha):

D(LNGNICAP)	0.007061	-0.038577	0.019537	0.014669	0.008047	-0.005581	0.018840
D(LNGDPG)	-0.004262	-0.008268	0.004897	0.010672	0.006352	0.002352	0.004132
D(LNPSCR)	-0.009159	-0.066516	-0.057555	-0.060989	0.037791	-0.019062	-0.014707
D(LNTRDF)	-0.081478	-0.207167	0.221161	-0.056830	-0.044923	0.066956	-0.174545
D(LNINFR)	-0.278308	-0.022554	0.312781	0.285435	0.446469	-0.727005	-0.009601

(4a) **Johansen Cointegration Test for Model 3**

(4b)

Error Correction Model 3

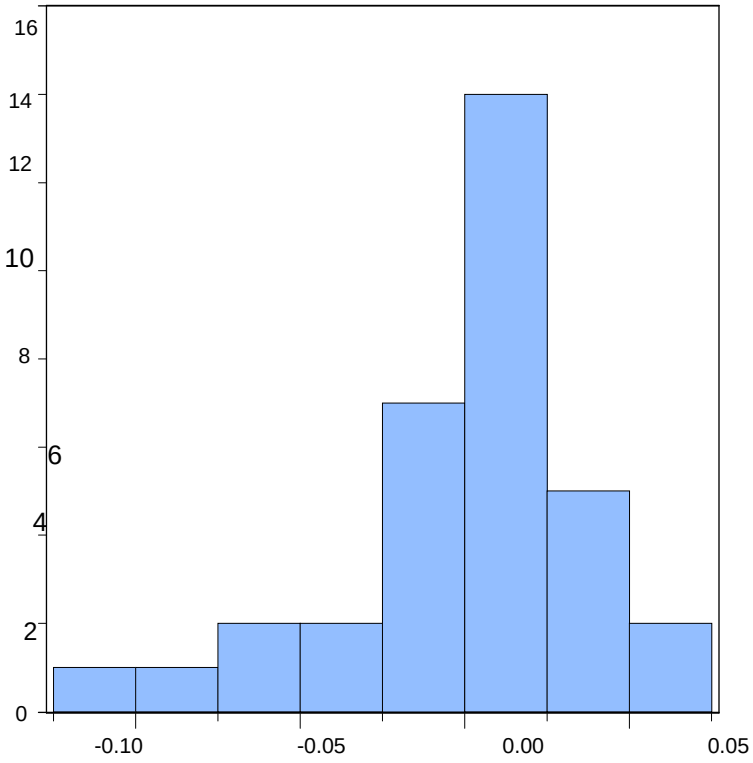
Dependent Variable: D(LNGNICAP) Method: Least Squares
Date: 07/29/17 Time: 12:52
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.029200	0.019285	1.514124	0.1425
D(LNGDPG)	0.470469	0.213628	2.202277	0.0371
D(LNPSCR)	-0.115512	0.047888	-2.412136	0.0235
D(LNTRDF)	-0.018319	0.012000	-1.526608	0.1394
D(LNINFR)	0.003770	0.004321	0.872439	0.3913
D(LNELEC)	-0.257231	0.077351	-3.325509	0.0027
D(SECU)	-0.190525	0.048277	-3.946521	0.0006
D(NDPL)	0.097686	0.035636	2.741197	0.0111
ECM(-1)	-0.788181	0.174604	-4.514118	0.0001

R-squared	0.769182	Mean dependent var	0.013080
Adjusted R-squared	0.695320	S.D. dependent var	0.080522
S.E. of regression	0.044446	Akaike info criterion	-3.167142
Sum squared resid	0.049387	Schwarz criterion	-2.763105
Log likelihood	62.84141	Hannan-Quinn criter.	-3.029354
F-statistic	10.41378	Durbin-Watson stat	2.200612
Prob(F-statistic)	0.000003		

($4c_1$)

Normality test for Model 3



Series: Residuals

Sample 1982 2015
Observations 34

Mean	8.21e-18
Median	0.007856
Maximum	0.056213
Minimum	-0.119385
Std. Dev	0.038686
Skewness	-1.246297
Kurtosis	4.465432
Jarque-Bera	11.84407
Probability	0.002680

($4c_2$)

Serial Correlation Test for Model 3

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.541847	Prob. F(2,23)	0.5889
Obs*R-squared	1.529899	Prob. Chi-Square(2)	0.4654

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 07/29/17 Time: 12:53
Sample: 1982 2015
Included observations: 34
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004184	0.020323	-0.205862	0.8387
D(LNGDPG)	0.024168	0.222654	0.108543	0.9145
D(LNPSCR)	0.008222	0.049449	0.166278	0.8694
D(LNTRDF)	0.001144	0.012277	0.093187	0.9266
D(LNINFR)	0.000656	0.004463	0.147032	0.8844
D(LNELEC)	0.014951	0.082125	0.182049	0.8571
D(SECU)	-0.010438	0.050771	-0.205596	0.8389
D(NDPL)	-0.007613	0.037260	-0.204322	0.8399
ECM2(-1)	0.077945	0.245255	0.317814	0.7535
RESID(-1)	-0.154691	0.300433	-0.514892	0.6115
RESID(-2)	0.171917	0.229671	0.748536	0.4617

R-squared	0.044997	Mean dependent var	8.21E-18
Adjusted R-squared	-0.370222	S.D. dependent var	0.038686
S.E. of regression	0.045284	Akaike info criterion	-3.095535
Sum squared resid	0.047165	Schwarz criterion	-2.601713
Log likelihood	63.62410	Hannan-Quinn criter.	-2.927128
F-statistic	0.108369	Durbin-Watson stat	1.962915
Prob(F-statistic)	0.999550		

($4c_3$)

Heteroskedasticity Test for Model 3

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.163235	Prob. F(8,25)	0.9940
Obs*R-squared	1.687833	Prob. Chi-Square(8)	0.9891
Scaled explained SS	1.581172	Prob. Chi-Square(8)	0.9913

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 07/29/17 Time: 12:54
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002438	0.001334	1.827858	0.0795
D(LNGDPG)	-0.005242	0.014776	-0.354776	0.7257
D(LNPSCR)	-0.002812	0.003312	-0.849118	0.4039
D(LNTRDF)	-2.01E-05	0.000830	-0.024217	0.9809
D(LNINFR)	-7.49E-05	0.000299	-0.250549	0.8042
D(LNELEC)	-0.001419	0.005350	-0.265279	0.7930
D(SECU)	0.001053	0.003339	0.315328	0.7551
D(NDPL)	0.000319	0.002465	0.129296	0.8982
ECM2(-1)	-0.000758	0.012077	-0.062777	0.9504

R-squared	0.049642	Mean dependent var	0.001453
Adjusted R-squared	-0.254472	S.D. dependent var	0.002745
S.E. of regression	0.003074	Akaike info criterion	-8.509651
Sum squared resid	0.000236	Schwarz criterion	-8.105615
Log likelihood	153.6641	Hannan-Quinn criter.	-8.371863
F-statistic	0.163235	Durbin-Watson stat	2.050479
Prob(F-statistic)	0.993951		

($4c_4$)

Ramsey RESET Test for Model 3

Ramsey RESET Test
Equation: UNTITLED
Specification: D(LNGNICAP) C D(LNGDPG) D(LNPSCR) D(LNTRDF) D(LNINFR) D(LNELEC) D(SECU) D(NDPL) ECM2(-1)

	Value	df	Probability
t-statistic	0.055705	24	0.9560
F-statistic	0.003103	(1, 24)	0.9560
Likelihood ratio	0.004396	1	0.9471

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	6.38E-06	1	6.38E-06
Restricted SSR	0.049387	25	0.001975
Unrestricted SSR	0.049381	24	0.002058

LR test summary:

	Value	df
Restricted LogL	62.84141	25
Unrestricted LogL	62.84360	24

Unrestricted Test Equation:
Dependent Variable: D(LNGNICAP)
Method: Least Squares
Date: 07/29/17 Time: 12:54
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.028946	0.020203	1.432779	0.1648
D(LNGDPG)	0.469365	0.218918	2.144028	0.0424
D(LNPSCR)	-0.115373	0.048936	-2.357642	0.0269
D(LNTRDF)	-0.018236	0.012335	-1.478390	0.1523
D(LNINFR)	0.003769	0.004410	0.854621	0.4012
D(LNELEC)	-0.258622	0.082800	-3.123468	0.0046
D(SECU)	-0.183149	0.141283	-1.296329	0.2072
D(NDPL)	0.098382	0.038458	2.558152	0.0173
ECM2(-1)	-0.787902	0.178263	-4.419881	0.0002
FITTED^2	0.115978	2.082011	0.055705	0.9560

R-squared	0.769211	Mean dependent var	0.013080
Adjusted R-squared	0.682666	S.D. dependent var	0.080522
S.E. of regression	0.045360	Akaike info criterion	-3.108447
Sum squared resid	0.049381	Schwarz criterion	-2.659518
Log likelihood	62.84360	Hannan-Quinn criter.	-2.955349
F-statistic	8.887918	Durbin-Watson stat	2.184449
Prob(F-statistic)	0.000009		

Appendix 5: Model 4 Estimation. (5a)

Johansen Cointegration Test for model 3

Date: 04/14/16 Time: 13:37
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: LNLIFE LNGDPG LNPSCR LNTRDF LNINFR LNELEC SECU NDPL
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.954628	267.8447	159.5297	0.0000
At most 1 *	0.790195	165.7805	125.6154	0.0000
At most 2 *	0.686562	114.2485	95.75366	0.0015
At most 3 *	0.600793	75.96347	69.81889	0.0149
At most 4	0.437477	45.66040	47.85613	0.0792
At most 5	0.326005	26.67475	29.79707	0.1098
At most 6	0.270066	13.65517	15.49471	0.0929
At most 7	0.094250	3.266747	3.841466	0.0707

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.954628	102.0642	52.36261	0.0000
At most 1 *	0.790195	51.53201	46.23142	0.0124
At most 2	0.686562	38.28504	40.07757	0.0785
At most 3	0.600793	30.30308	33.87687	0.1260
At most 4	0.437477	18.98565	27.58434	0.4156
At most 5	0.326005	13.01958	21.13162	0.4504
At most 6	0.270066	10.38842	14.26460	0.1877
At most 7	0.094250	3.266747	3.841466	0.0707

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

LNLIFE	LNGDPG	LNPSCR	LNTRDF	LNINFR	LNELEC	SECU	NDPL
-149.8262	28.39015	-0.352038	0.195854	-0.086715	-11.97584	-2.024597	1.195594
9.958556	0.775048	-0.778499	3.222488	0.016222	-3.269199	-0.002046	-3.235080
122.9311	-21.23820	3.339227	-1.398938	-0.269434	-1.280356	1.128055	1.569745
61.34931	-11.80440	-0.347548	0.626886	0.346340	2.966799	-4.404056	2.719471
33.69480	-1.320632	-0.142235	-0.111120	0.110171	0.787363	4.486056	2.403722
-15.90688	1.721385	0.696004	0.805310	0.285528	-2.257202	-0.518641	-1.976840
-11.62887	-8.886930	1.780257	-0.130613	-0.659368	1.650467	-3.326229	1.966667
30.69998	10.28127	-2.372470	1.377438	0.154377	0.442956	4.348466	-1.348165

Unrestricted Adjustment Coefficients (alpha):

D(LNLIFE)	0.000281	-0.000371	-9.38E-05	-0.000136	0.000439	0.000345	0.000167
D(LNGDPG)	-0.019704	0.005687	-0.000197	-0.014055	-0.002221	0.000628	-0.002898
D(LNPSCR)	-0.016389	-0.010402	-0.114054	0.010719	0.012504	-0.024098	0.017638
D(LNTRDF)	0.166985	-0.415230	0.008551	-0.061449	-0.160487	-0.044587	-0.014660
D(LNINFR)	-0.160553	-0.117817	-0.042828	-0.426748	-0.061367	-0.029005	0.828406

(5b)

Model 4

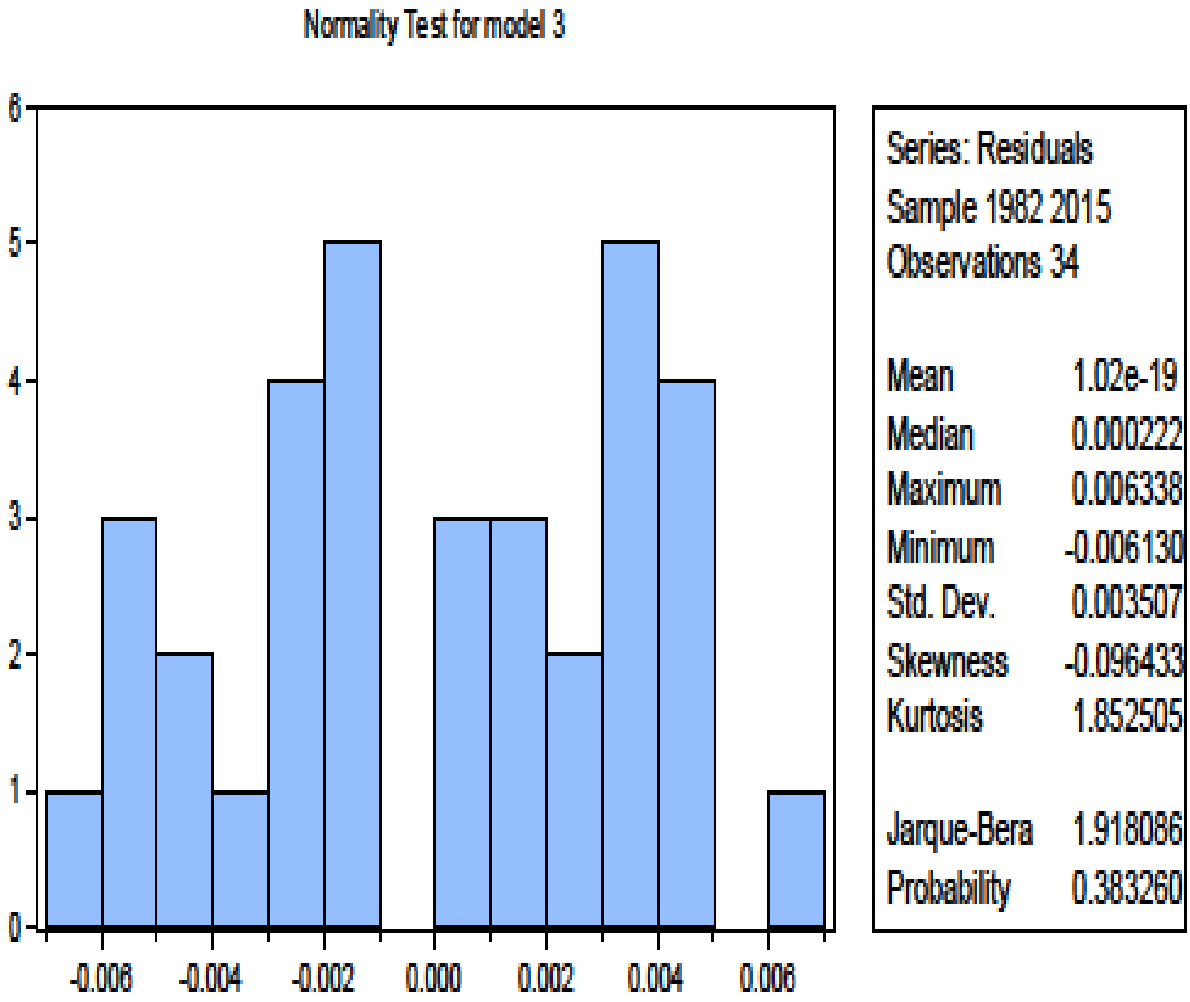
Error Correction Model 3

Dependent Variable: D(LNLIFE)
Method: Least Squares
Date: 04/14/16 Time: 13:58
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003488	0.001778	1.961718	0.0610
D(LNGDPG)	0.051324	0.018770	2.734382	0.0113
D(LNPSCR)	0.008860	0.002751	3.220641	0.0018
D(LNTRDF)	-0.000392	0.001116	-0.351287	0.7283
D(LNINFR)	0.013184	0.007880	0.185130	0.8546
D(LNELEC)	0.017364	0.007894	2.199646	0.0398
D(SECU)	0.011079	0.004511	2.455996	0.0213
D(NDPL)	-0.005272	0.003315	-1.590502	0.1243
ECM(-1)	-0.262985	0.122740	-2.142628	0.0421

R-squared	0.674799	Mean dependent var	0.004286
Adjusted R-squared	0.574734	S.D. dependent var	0.004435
S.E. of regression	0.004029	Akaike info criterion	-7.968706
Sum squared resid	0.000406	Schwarz criterion	-7.564670
Log likelihood	144.4680	Hannan-Quinn criter.	-7.830918
F-statistic	3.873391	Durbin-Watson stat	1.528301
Prob(F-statistic)	0.010004		

($5c_1$) **Model 4**


Normality Test for model 3
6
5
4
3
2
1
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-0.006
-0.004
-0.002
0.000
0.002
0.004
0.006
Series: Residuals
Sample 1982 2015
Observations 34
Mean 1.02e-19
Median 0.000222
Maximum 0.006338
Minimum -0.006130
Std. Dev. 0.003507
Skewness -0.096433
Kurtosis 1.852505
Jarque-Bera 1.918086
Probability 0.383260

($5c_2$) : Model 4

Serial Correlation Test for model 3

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.048843	Prob. F(2,23)	0.3348
Obs*R-squared	2.748885	Prob. Chi-Square(2)	0.2277

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 04/14/16 Time: 13:59
Sample: 1982 2015
Included observations: 34
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000542	0.000862	0.628338	0.5360
D(LNGDPG)	-0.034030	0.009887	-3.441958	0.0022
D(LNPSCR)	0.004469	0.002170	2.059931	0.0509
D(LNTRDF)	0.000475	0.000530	0.896245	0.3794
D(LNINFR)	-8.02E-06	0.000174	-0.046012	0.9637
D(LNELEC)	0.000677	0.004131	0.163876	0.8713
D(SECU)	-0.002538	0.002137	-1.187452	0.2472
D(NDPL)	0.005268	0.001851	2.845459	0.0092
ECM3(-1)	-0.079620	0.056407	-1.411529	0.1715
RESID(-1)	0.567881	0.169216	3.355955	0.0027
RESID(-2)	0.648104	0.195610	3.313238	0.0030

R-squared	0.816144	Mean dependent var	1.02E-19
Adjusted R-squared	0.736206	S.D. dependent var	0.003507
S.E. of regression	0.001801	Akaike info criterion	-9.544660
Sum squared resid	7.46E-05	Schwarz criterion	-9.050837
Log likelihood	173.2592	Hannan-Quinn criter.	-9.376252
F-statistic	10.20977	Durbin-Watson stat	1.888229
Prob(F-statistic)	0.000003		

($5c_3$): Model 4

Heteroskedasticity Test for model 3

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.281523	Prob. F(8,25)	0.9660
Obs*R-squared	2.809842	Prob. Chi-Square(8)	0.9457
Scaled explained SS	0.647546	Prob. Chi-Square(8)	0.9996

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/14/16 Time: 13:59
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.16E-06	5.43E-06	1.501741	0.1457
D(LNGDPG)	3.02E-05	5.73E-05	0.525875	0.6036
D(LNPSCR)	6.41E-06	1.45E-05	0.441673	0.6625
D(LNTRDF)	-6.13E-07	3.41E-06	-0.179699	0.8588
D(LNINFR)	-1.12E-07	1.19E-06	-0.094531	0.9254
D(LNELEC)	2.16E-05	2.41E-05	0.894785	0.3794
D(SECU)	1.12E-05	1.38E-05	0.812207	0.4243
D(NDPL)	-3.15E-07	1.01E-05	-0.031057	0.9755
ECM3(-1)	0.000251	0.000375	0.669988	0.5090

R-squared	0.082642	Mean dependent var	1.19E-05
Adjusted R-squared	-0.210912	S.D. dependent var	1.12E-05
S.E. of regression	1.23E-05	Akaike info criterion	-19.55054
Sum squared resid	3.79E-09	Schwarz criterion	-19.14650
Log likelihood	341.3591	Hannan-Quinn criter.	-19.41275
F-statistic	0.281523	Durbin-Watson stat	1.721783
Prob(F-statistic)	0.965986		

($5c_4$): Model 4

Ramsey RESET Test for model 3

Ramsey RESET Test
Equation: UNTITLED
Specification: D(LNLIFE) C D(LNGDPG) D(LNPSCR) D(LNTRDF) D(LNINFR) D(LNELEC) D(SECU) D(NDPL) ECM3(-1)
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.710746	24	0.1300
F-statistic	2.926653	(1, 24)	0.1100
Likelihood ratio	3.912135	1	0.1479

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	4.41E-05	1	4.41E-05
Restricted SSR	0.000406	25	1.62E-05
Unrestricted SSR	0.000362	24	1.51E-05

LR test summary:

	Value	df
Restricted LogL	144.4680	25
Unrestricted LogL	146.4241	24

Unrestricted Test Equation:
Dependent Variable: D(LNLIFE)
Method: Least Squares
Date: 04/14/16 Time: 13:59
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000772	0.002336	0.330454	0.7439
D(LNGDPG)	0.008147	0.031050	0.262390	0.7953
D(LNPSCR)	0.001183	0.005782	0.204585	0.8396
D(LNTRDF)	0.000234	0.001136	0.206250	0.8383
D(LNINFR)	2.88E-05	0.000375	0.076829	0.9394
D(LNELEC)	0.000311	0.008831	0.035258	0.9722
D(SECU)	0.004219	0.005337	0.790586	0.4369
D(NDPL)	-0.000455	0.004258	-0.106974	0.9157
ECM3(-1)	0.005494	0.196510	0.027956	0.9779
FITTED^2	116.8290	68.29126	1.710746	0.1000

R-squared	0.442752	Mean dependent var	0.004286
Adjusted R-squared	0.233784	S.D. dependent var	0.004435
S.E. of regression	0.003882	Akaike info criterion	-8.024945
Sum squared resid	0.000362	Schwarz criterion	-7.576016
Log likelihood	146.4241	Hannan-Quinn criter.	-7.871848
F-statistic	2.118754	Durbin-Watson stat	0.529679
Prob(F-statistic)	0.068728		

Appendix 6: Model 5 Estimation (6a)

Johansen Cointegration Test for Model 5

Date: 07/29/17 Time: 12:59
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: LNEDUC LNGDPG LNPSCR LNTRDF LNINFR LNELEC SECU NDPL Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

None *	0.909653	215.0822	159.5297	0.0000
At most 1 *	0.796848	135.7469	125.6154	0.0104
At most 2	0.588821	83.15150	95.75366	0.2672
At most 3	0.526319	53.82349	69.81889	0.4692
At most 4	0.302644	29.16518	47.85613	0.7604
At most 5	0.233460	17.27002	29.79707	0.6201
At most 6	0.136321	8.496383	15.49471	0.4139
At most 7	0.104983	3.660106	3.841466	0.0557

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
*** denotes rejection of the hypothesis at the 0.05 level**
****MacKinnon-Haug-Michelis (1999) p-values**

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.909653	79.33529	52.36261	0.0000
At most 1 *	0.796848	52.59542	46.23142	0.0092
At most 2	0.588821	29.32801	40.07757	0.4688
At most 3	0.526319	24.65831	33.87687	0.4085
At most 4	0.302644	11.89515	27.58434	0.9368
At most 5	0.233460	8.773640	21.13162	0.8503
At most 6	0.136321	4.836277	14.26460	0.7624
At most 7	0.104983	3.660106	3.841466	0.0557

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
*** denotes rejection of the hypothesis at the 0.05 level**

LNEDUC	LNGDPG	LNPSCR	LNTRDF	LNINFR	LNELEC	SECU	NDPL
-3.121613	0.690703	1.963205	-0.386334	-0.514336	-6.319608	0.137208	1.381298
-0.582175	2.776245	-1.154065	3.341930	0.207050	-4.005593	-3.571814	-1.349442
3.562735	7.698750	-1.001986	0.072197	0.457260	-2.457974	5.547936	1.535033
3.958465	-2.345179	1.636456	0.250658	-0.122191	-4.343292	2.236268	-2.756962
-0.807742	-10.83000	1.160292	-0.898947	-0.670948	3.374171	-4.401224	3.891618
-1.490946	1.404564	-0.369458	1.052381	-0.298894	2.328846	1.399030	-0.569780
-2.616842	-13.66618	2.074826	0.316908	-0.229163	1.771412	-4.273860	0.586065
1.454073	7.781377	-0.287069	0.516232	0.109329	-3.664795	2.144346	0.041447

Unrestricted Adjustment Coefficients (alpha):

D(LNEDUC)	0.123458	-0.095403	-0.023394	-0.069750	-0.028626	-0.027098	0.032757
D(LNGDPG)	-0.010956	-0.015078	-0.003669	0.011801	-0.003663	-0.003295	0.002797
D(LNPSCR)	-0.088140	-0.005342	0.039047	-0.021438	0.028967	0.012644	0.002061
D(LNTRDF)	0.129844	-0.213080	-0.215021	-0.196003	0.027023	-0.016931	-0.067664
D(LNINFR)	-0.002199	-0.297114	-0.260781	0.294639	0.468773	0.690702	0.079080

(6b)

Error Correction Model 5

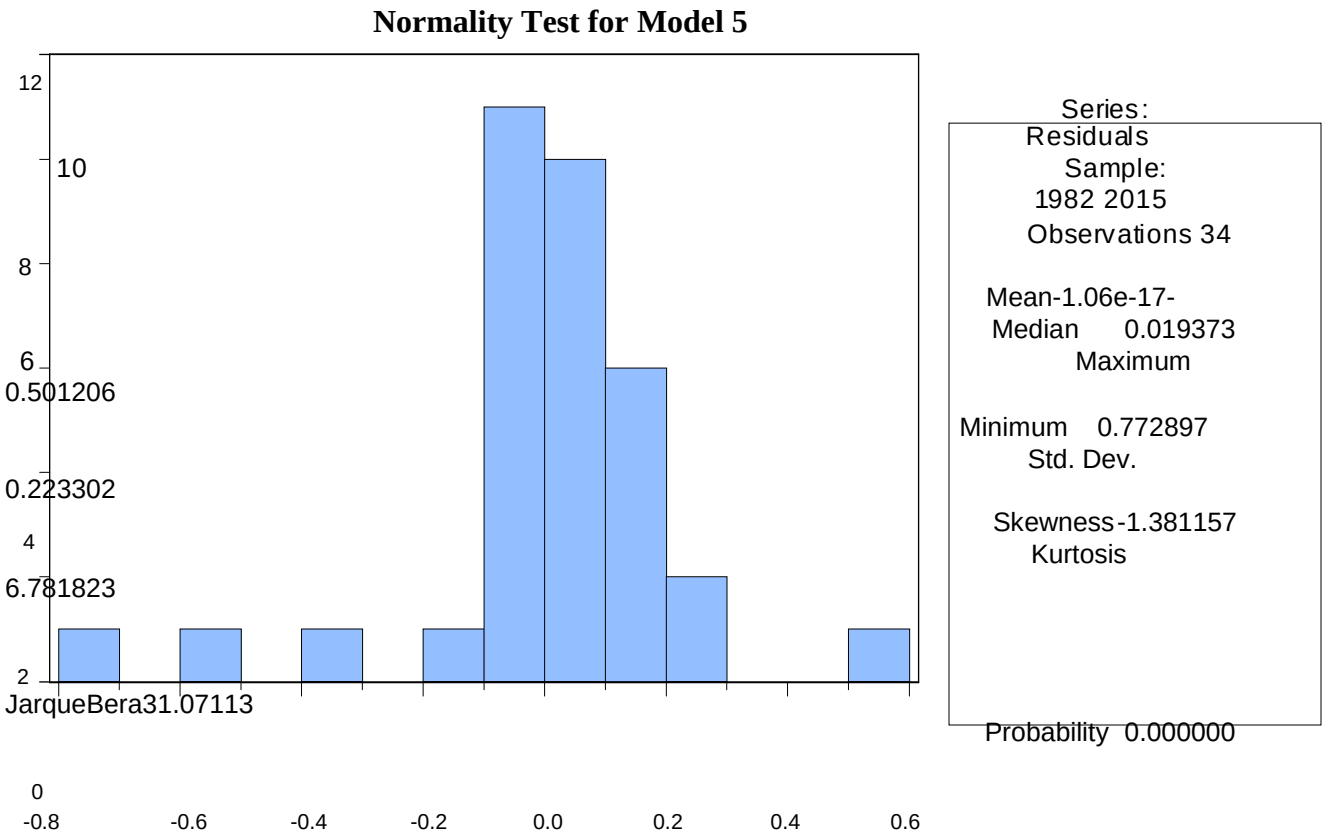
Dependent Variable:D (LNEDUC)

Method: Least Squares
Date: 07/29/17 Time: 13:01
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.039116	0.103095	-0.379419	0.7076
D(LNGDPG)	-0.042132	1.327120	-0.031747	0.9749
D(LNPSCR)	0.256885	0.245635	1.045798	0.3057
D(LNTRDF)	0.021014	0.074378	0.282529	0.7799
D(LNINFR)	-0.047371	0.024748	-1.914124	0.0671
D(LNELEC)	0.195349	0.395009	0.494543	0.6252
D(SECU)	-0.323265	0.289439	-1.116866	0.2747
D(NDPL)	0.100827	0.212942	0.473495	0.6400
ECM(-1)	-0.544827	0.234071	-2.327619	0.0283

R-squared	0.327266	Mean dependent var	0.033153
Adjusted R-squared	0.111991	S.D. dependent var	0.272252
S.E. of regression	0.256555	Akaike info criterion	0.338979
Sum squared resid	1.645511	Schwarz criterion	0.743016
Log likelihood	3.237357	Hannan-Quinn criter.	0.476767
F-statistic	1.520223	Durbin-Watson stat	1.662935
Prob(F-statistic)	0.200307		

($6c_1$)


Normality Test for Model 5
12
10
8
6
4
2
0
-0.8
-0.6
-0.4
-0.2
0.0
0.2
0.4
0.6
Series: Residuals
Sample: 1982 2015
Observations 34
Mean -1.06e-17
Median 0.019373
Maximum
Minimum 0.772897
Std. Dev.
Skewness -1.381157
Kurtosis
0.501206
0.223302
6.781823
JarqueBera 31.07113
Probability 0.000000

($6c_2$)

Serial Correlation Test for Model 5

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.833045	Prob. F(2,23)	0.1825
Obs*R-squared	4.674367	Prob. Chi-Square(2)	0.0966

Test Equation:
Dependent Variable:
RESID Method: Least Squares
Date: 07/29/17 Time: 13:02
Sample: 1982 2015
Included observations: 34
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.022133	0.102422	-0.216094	0.8308
D(LNGDPG)	0.291912	1.304233	0.223818	0.8249
D(LNPSCR)	0.049616	0.246515	0.201268	0.8423
D(LNTRDF)	0.020275	0.073168	0.277099	0.7842
D(LNINFR)	-0.000231	0.024569	-0.009414	0.9926
D(LNELEC)	-0.050774	0.383777	-0.132302	0.8959
D(SECU)	-0.018866	0.286943	-0.065750	0.9481
D(NDPL)	-0.023604	0.207065	-0.113993	0.9102
ECM4(-1)	-0.487328	0.605383	-0.804991	0.4291
RESID(-1)	0.674642	0.574215	1.174895	0.2521
RESID(-2)	-0.101978	0.303316	-0.336209	0.7398

R-squared	0.137481	Mean dependent var	-1.06E-17
Adjusted R-squared	-0.237527	S.D. dependent var	0.223302
S.E. of regression	0.248411	Akaike info criterion	0.308728
Sum squared resid	1.419283	Schwarz criterion	0.802550
Log likelihood	5.751632	Hannan-Quinn criter.	0.477135
F-statistic	0.366609	Durbin-Watson stat	2.190969
Prob(F-statistic)	0.948960		

($6c_3$)

Heteroskedasticity Test for Model 5

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.228939	Prob. F(8,25)	0.3234
Obs*R-squared	9.596813	Prob. Chi-Square(8)	0.2945
Scaled explained SS	14.99975	Prob. Chi-Square(8)	0.0592

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 07/29/17 Time: 13:03
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.072252	0.046202	1.563817	0.1304
D(LNGDPG)	-0.021318	0.594754	-0.035843	0.9717
D(LNPSCR)	-0.050829	0.110082	-0.461741	0.6483
D(LNTRDF)	-0.081954	0.033333	-2.458651	0.0212
D(LNINFR)	-0.001530	0.011091	-0.137961	0.8914
D(LNELEC)	-0.137813	0.177025	-0.778494	0.4436
D(SECU)	-0.052903	0.129713	-0.407847	0.6869
D(NDPL)	-0.002446	0.095431	-0.025629	0.9798
ECM4(-1)	-0.217609	0.104900	-2.074444	0.0485

R-squared	0.282259	Mean dependent var	0.048397
Adjusted R-squared	0.052582	S.D. dependent var	0.118124
S.E. of regression	0.114976	Akaike info criterion	-1.266259
Sum squared resid	0.330487	Schwarz criterion	-0.862222
Log likelihood	30.52640	Hannan-Quinn criter.	-1.128471
F-statistic	1.228939	Durbin-Watson stat	1.237706
Prob(F-statistic)	0.323352		

($6c_4$)

Ramsey RESET Test for Model 5

Ramsey RESET Test
Equation: UNTITLED
Specification: D(LNEDUC) C D(LNGDPG) D(LNPSCR) D(LNTRDF) D(LNINFR) D(LNELEC) D(SECU) D(NDPL) ECM4(-1)
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.422740	24	0.1677
F-statistic	2.024189	(1, 24)	0.1677
Likelihood ratio	2.753069	1	0.0971

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.127990	1	0.127990
Restricted SSR	1.645511	25	0.065820
Unrestricted SSR	1.517521	24	0.063230

LR test summary:

	Value	df
Restricted LogL	3.237357	25
Unrestricted LogL	4.613892	24

Unrestricted Test Equation:
Dependent Variable: D(LNEDUC)
Method: Least Squares
Date: 07/29/17 Time: 13:03
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.031601	0.101184	-0.312315	0.7575
D(LNGDPG)	0.370209	1.332640	0.277801	0.7835
D(LNPSCR)	0.345075	0.248605	1.388047	0.1779
D(LNTRDF)	0.027125	0.073026	0.371438	0.7136
D(LNINFR)	-0.056235	0.025044	-2.245478	0.0342
D(LNELEC)	0.268267	0.390536	0.686921	0.4987
D(SECU)	-0.465773	0.300850	-1.548188	0.1347
D(NDPL)	0.022980	0.215763	0.106506	0.9161
ECM4(-1)	-0.987138	0.386372	-2.554890	0.0174
FITTED^2	-2.211291	1.554248	-1.422740	0.1677

R-squared	0.379592	Mean dependent var	0.033153
Adjusted R-squared	0.146939	S.D. dependent var	0.272252
S.E. of regression	0.251456	Akaike info criterion	0.316830
Sum squared resid	1.517521	Schwarz criterion	0.765759
Log likelihood	4.613892	Hannan-Quinn criter.	0.469928
F-statistic	1.631579	Durbin-Watson stat	1.766317
Prob(F-statistic)	0.162350		

Appendix 7: Model 6 Estimation (7a)

Johansen Cointegration Test for model 5

Date: 04/14/16 Time: 13:39
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: EMPL LNGDPG LNPSCR LNTRDF LNINFR LNELEC SECU NDPL
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.885067	228.1844	159.5297	0.0000
At most 1 *	0.813755	156.7920	125.6154	0.0002
At most 2 *	0.644643	101.3292	95.75366	0.0195
At most 3	0.570293	67.18628	69.81889	0.0796
At most 4	0.404851	39.31274	47.85613	0.2480
At most 5	0.276295	22.18761	29.79707	0.2882
At most 6	0.212786	11.51635	15.49471	0.1816
At most 7	0.103920	3.620945	3.841466	0.0571

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.885067	71.39239	52.36261	0.0002
At most 1 *	0.813755	55.46279	46.23142	0.0040
At most 2	0.644643	34.14291	40.07757	0.2001
At most 3	0.570293	27.87354	33.87687	0.2194
At most 4	0.404851	17.12512	27.58434	0.5692
At most 5	0.276295	10.67126	21.13162	0.6800
At most 6	0.212786	7.895405	14.26460	0.3894
At most 7	0.103920	3.620945	3.841466	0.0571

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

EMPL	LNGDPG	LNPSCR	LNTRDF	LNINFR	LNELEC	SECU	NDPL
0.230648	4.075865	1.755717	-1.204676	-0.317345	-4.983349	3.187860	1.341432
-0.053998	4.783872	-0.239889	2.387835	0.045562	-7.195262	-0.801244	-1.166015
-0.183078	-17.70611	3.531035	-1.215846	-0.498215	-0.756037	-2.914829	0.227286
-0.071858	8.182631	-0.116904	-0.993293	-0.078512	-2.492855	3.710036	-1.733356
-0.164937	2.165426	-0.693469	-1.317937	0.115247	0.085901	1.419570	3.850444
-0.021456	-1.725809	0.300448	0.252093	-0.527484	1.926867	0.872434	1.445006
-0.099758	3.316589	-0.309241	0.566512	0.370961	-0.682892	4.155116	-1.445777
-0.089785	-5.288017	-0.125295	-0.612925	-0.045851	3.092885	-0.152303	-0.276123

Unrestricted Adjustment Coefficients (alpha):

D(EMPL)	-1.893974	0.523484	-0.912463	1.008137	0.229494	0.806362	0.237625
D(LNGDPG)	-0.009113	-0.008078	0.012829	0.006333	-0.003419	-0.002257	0.006288
D(LNPSCR)	-0.033160	-0.053181	-0.039260	-0.064795	0.002909	0.019108	-0.007806
D(LNTRDF)	0.146841	-0.259283	-0.119045	0.186241	0.013434	-0.052374	-0.170638
D(LNINFR)	0.129207	-0.295274	0.379969	0.060174	-0.386301	0.812545	-0.102769

(7b): **Model 6**

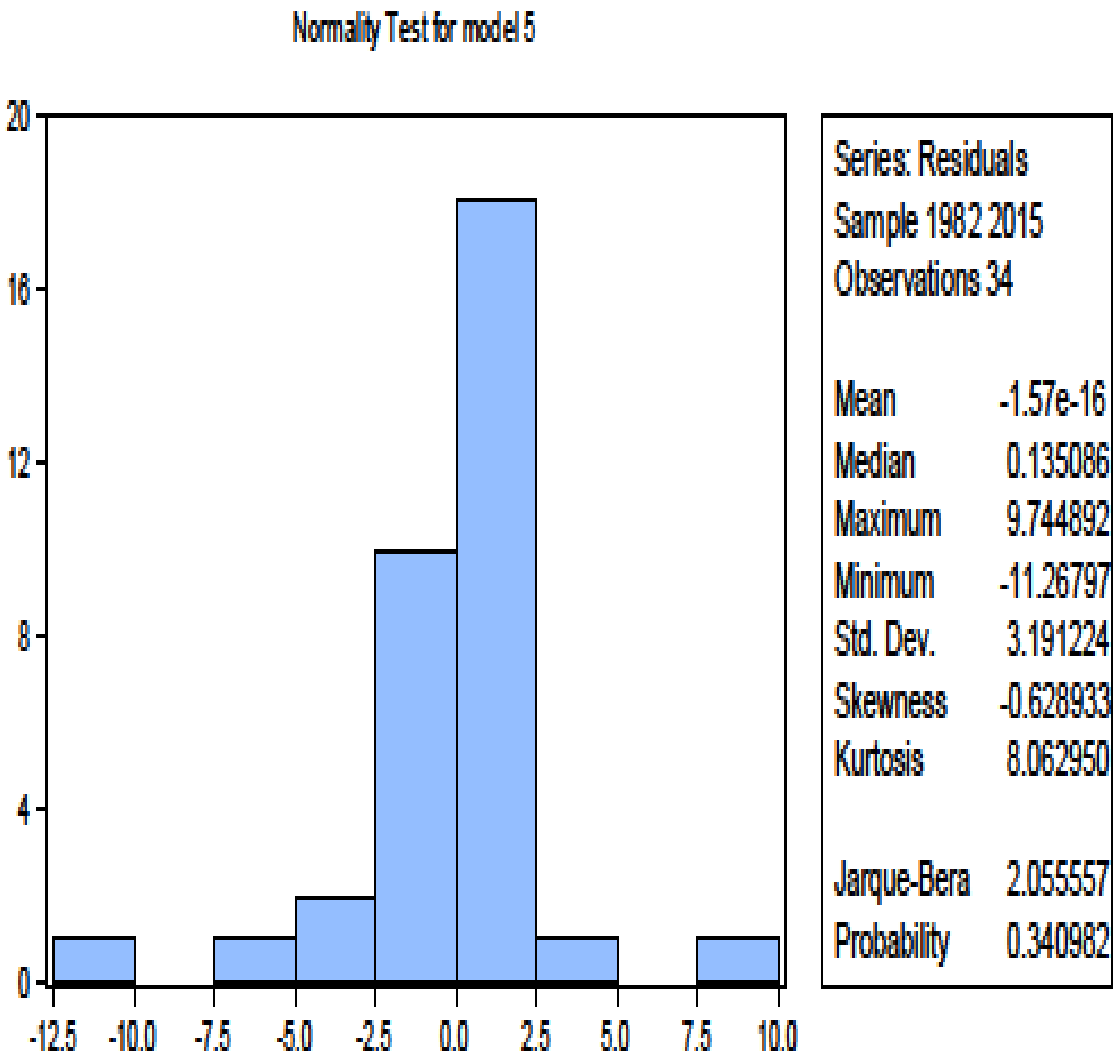
Error Correction Model 5

Dependent Variable: D(EMPL)
Method: Least Squares
Date: 04/14/16 Time: 14:11
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.322980	1.364581	-0.969514	0.3416
D(LNGDPG)	13.19357	4.469836	2.951689	0.0272
D(LNPSCR)	0.817403	0.203035	4.025921	0.0002
D(LNTRDF)	1.211883	1.005259	1.205543	0.2393
D(LNINFR)	0.364522	0.354010	1.029695	0.3130
D(LNELEC)	1.548581	0.536283	2.887619	0.0140
D(SECU)	0.161662	0.056798	2.846262	0.0158
D(NDPL)	-0.975009	2.959136	-0.329491	0.7445
ECM(-1)	-0.484959	0.181899	-2.666080	0.0133

R-squared	0.575293	Mean dependent var	-0.270588
Adjusted R-squared	0.444339	S.D. dependent var	3.748659
S.E. of regression	3.666437	Akaike info criterion	5.658245
Sum squared resid	336.0690	Schwarz criterion	6.062281
Log likelihood	-87.19016	Hannan-Quinn criter.	5.796033
F-statistic	3.187085	Durbin-Watson stat	1.685990
Prob(F-statistic)	0.045604		

($7c_1$) : **Model 6**


Normality Test for model 5
20
16
12
8
4
0
-12.5
-10.0
-7.5
-5.0
-2.5
0.0
2.5
5.0
7.5
10.0
Series: Residuals
Sample 1982 2015
Observations 34
Mean -1.57e-16
Median 0.135086
Maximum 9.744892
Minimum -11.26797
Std. Dev. 3.191224
Skewness -0.628933
Kurtosis 8.062950
Jarque-Bera 2.055557
Probability 0.340982

($7c_2$): **Model 6**

Serial Correlation Test for model 5

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.137336	Prob. F(2,23)	0.3381
Obs*R-squared	3.059934	Prob. Chi-Square(2)	0.2165

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 04/14/16 Time: 14:12
Sample: 1982 2015
Included observations: 34
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.392373	1.445411	-0.271461	0.7885
D(LNGDPG)	0.793258	18.95305	0.041854	0.9670
D(LNPSCR)	0.774432	3.575026	0.216623	0.8304
D(LNTRDF)	0.165119	1.007324	0.163918	0.8712
D(LNINFR)	-0.084682	0.357904	-0.236606	0.8151
D(LNELEC)	1.385273	5.699737	0.243042	0.8101
D(SECU)	-0.837688	3.989052	-0.209997	0.8355
D(NDPL)	0.409307	3.050208	0.134190	0.8944
ECM5(-1)	-0.211625	0.372761	-0.567723	0.5757
RESID(-1)	0.385330	0.428270	0.899736	0.3776
RESID(-2)	-0.197545	0.316120	-0.624906	0.5382

R-squared	0.089998	Mean dependent var	-1.57E-16
Adjusted R-squared	-0.305655	S.D. dependent var	3.191224
S.E. of regression	3.646460	Akaike info criterion	5.681583
Sum squared resid	305.8235	Schwarz criterion	6.175406
Log likelihood	-85.58692	Hannan-Quinn criter.	5.849991
F-statistic	0.227467	Durbin-Watson stat	2.018409
Prob(F-statistic)	0.990442		

($7c_3$): **Model 6**

Heteroskedasticity Test for model 5

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.165935	Prob. F(8,25)	0.9936
Obs*R-squared	1.714343	Prob. Chi-Square(8)	0.9886
Scaled explained SS	3.273227	Prob. Chi-Square(8)	0.9161

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/14/16 Time: 14:12
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.15817	11.11047	1.544324	0.1351
D(LNGDPG)	-54.02030	142.2401	-0.379783	0.7073
D(LNPSCR)	-21.13891	28.74426	-0.735413	0.4689
D(LNTRDF)	-3.000907	8.184859	-0.366641	0.7170
D(LNINFR)	1.538684	2.882364	0.533827	0.5982
D(LNELEC)	-0.919746	45.07664	-0.020404	0.9839
D(SECU)	10.16543	32.30749	0.314646	0.7556
D(NDPL)	-0.689282	24.09340	-0.028609	0.9774
ECM5(-1)	-0.027665	1.481033	-0.018680	0.9852

R-squared	0.050422	Mean dependent var	9.884383
Adjusted R-squared	-0.253443	S.D. dependent var	26.66399
S.E. of regression	29.85228	Akaike info criterion	9.852326
Sum squared resid	22278.96	Schwarz criterion	10.25636
Log likelihood	-158.4895	Hannan-Quinn criter.	9.990114
F-statistic	0.165935	Durbin-Watson stat	2.145504
Prob(F-statistic)	0.993609		

(7c_4): **Model 6**

Ramsey RESET Test for model 5

Ramsey RESET Test
Equation: UNTITLED
Specification: D(EMPL) C D(LNGDPG) D(LNPSCR) D(LNTRDF) D(LNINFR) D(LNELEC) D(SECU) D(NDPL) ECM5(-1)
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.666912	24	0.5112
F-statistic	0.444771	(1, 24)	0.5112
Likelihood ratio	0.624326	1	0.4294

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	6.114760	1	6.114760
Restricted SSR	336.0690	25	13.44276
Unrestricted SSR	329.9543	24	13.74809

LR test summary:

	Value	df
Restricted LogL	-87.19016	25
Unrestricted LogL	-86.87800	24

Unrestricted Test Equation:
Dependent Variable: D(EMPL)
Method: Least Squares
Date: 04/14/16 Time: 14:13
Sample: 1982 2015
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.908800	1.635840	-1.166862	0.2547
D(LNGDPG)	16.09399	18.19454	0.884551	0.3852
D(LNPSCR)	1.168045	3.608726	0.323672	0.7490
D(LNTRDF)	1.412781	1.060303	1.332431	0.1952
D(LNINFR)	0.387798	0.359705	1.078100	0.2917
D(LNELEC)	2.128766	5.665990	0.375709	0.7104
D(SECU)	0.178702	4.012877	0.044532	0.9648
D(NDPL)	-1.279433	3.027167	-0.422650	0.6763
ECM5(-1)	-0.446822	0.192637	-2.319506	0.0292
FITTED^2	0.086773	0.130112	0.666912	0.5112

R-squared	0.288479	Mean dependent var	-0.270588
Adjusted R-squared	0.021658	S.D. dependent var	3.748659
S.E. of regression	3.707842	Akaike info criterion	5.698706
Sum squared resid	329.9543	Schwarz criterion	6.147635
Log likelihood	-86.87800	Hannan-Quinn criter.	5.851804
F-statistic	1.081171	Durbin-Watson stat	1.637888
Prob(F-statistic)	0.411305		