Agricultural Sector and Industrial Development in Nigeria: Vector Error Correction Model (VECM) Approach

Eze, Titus Chinweuba (Ph.D)
Department of Economics and Mgt Sciences
Nigeria Police Academy, Wudil- Kano State, Nigeria
ezetituschinweuba@yahoo.com

Abstract
This paper is aimed at examining the long run impact of Agricultural output to the growth of industrial sector in Nigeria between. The methodology adopted for the study is multiple regression analysis employing vector error correction model (VECM) technique, complemented with paire-wise granger causality test to confirm if there is any feedback effect among the series used. The variables included in the model are: Industrial output (INDST) as the dependent variable, and Agricultural output (AGO); exchange rate (EXR) and price of manufacturing output (PMANU) as the explanatory variables. Using time series data spanning from 1970 to 2014, the result of the regression analysis show that: (i) there exist a significant but negative long run relationship between agricultural output and the growth of industrial sector in Nigeria; (ii) an inverse and significant link exists between exchange rate and the growth of industrial sector in Nigeria; (iii) changes in the prices of manufacturing output positively and significantly predicts the growth of industrial sector in Nigeria, and finally, (iv) there is no feedback effect between Agricultural output and industrial sector in Nigeria. Based on the empirical findings, the author proffers the following suggestions: (i) government should encourage the production of more agricultural products that could be used as raw materials by industrial sector in order to achieve balanced growth; (ii) Central bank of Nigeria should vigorously continue to pursue policies that could maintain stable and low exchange rate regime; (iii) finally, Effort should be intensified in providing soft loans for the growth and development of small and medium scale industries (SMEs) to the young school leavers in the country by the three tiers of government.

Keywords: Granger Causality, Vector error correction model, Dependent variable, Explanatory variable, Regression, Predict, Exchange rate, Time series, Raw material.

1.1 Introduction

Agriculture and industrial development are necessary for sustained productivity and growth. Agricultural development alone, if not accompanied by industrial development, can give but temporary relief to the varied problems of underdevelopment.

By far, manufacturing, which can simply be referred to as the process of transforming raw materials from one state to another, constitutes the most dynamic part of the industrial sector. Such activities as food processing and the production of textile and clothing belong not only to the first stage of the manufacturing sector, but also to an out growth of the agricultural sector.

For Adeoti (2010), "efforts concerning industrial development in most developing countries have been varied and the achievement inconsequential for any reckoning". Nigeria being a developing country is not an exception. Industrialization is barely moving in Nigeria relative to other African countries and the following reasons can be responsible for that. For instance, it had been discouraged by the colonial regime, by the merchant, banking and shipping monopolies and later by the operation of the marketing board system, which excluded African merchants and appropriated surplus funds to London. Interestingly however, with the approach of independence, the state provided finance, tax incentives and protection in the early stages of industrialization and agriculture provided the financial resources for this support. This was made possible by the accumulation of reserve of the marketing board.

The place of agriculture in Nigeria's economy has remained critical over the decades since her independence. Prior to the political crises of 1967-1970, agricultural sector's positive contribution to the economy were instrumental in sustaining economic growth and stability. The bulk of foods demanded are satisfied from domestic output, thereby obviating the need to utilize scarce foreign exchange resources on food importation. Stable growth in agricultural exports constituted the backbone of a favorable balance of trade. The primary processing industries obtained regular suppliers of raw materials from the agricultural sector and hence helped to provide some desirable linkages between agriculture and the rest of the economy. Substantial amount of capital were derived from the agricultural sector and accumulation of marketing surpluses, which were used to finance many development projects.

Remarkably, Nigeria is blessed with immense natural and human resources. Statistics show that Nigeria has a total area of about 91.3million hectares. Out of this, only 1 million hectares are arable and another 0.9million hectare under meadows and pastures. The remaining 43.4million hectares are either forest or woodland or unclassified. As submitted by Iyoha (2004), rapid growth and development cannot be possible for any country that gives no serious attention to industrial development. An attempt by a country to reform its agriculture can be construed as another attempt by that country to industrialize its economy. Furthermore, it can be said that industrial enterprises are expected to grow out of agricultural undertakings through the process of raw materials transformation using of course, the aid of human resources and capital goods.

1.2 Statement of the Problem

The discovery of oil in Nigeria in commercial quantity in the middle sixties coupled with the oil boom of 1974 affected adversely the agricultural sector in Nigeria. The country since then became heavily dependent on oil. Production of agricultural products declined leading to scarcity of all classes of foodstuff. Inflation, unemployment, unfavorable balance of payment, youth's restiveness, Kidnapping, insurgency, rape and other vices became a reoccurring decimal, following an increasing level of poverty in the country. Besides, industrial sector which supposed to be developed in line with the submission of several authors such as Iyoha (2004), Oyelaran-Oyeyinka, (2011) remains underdeveloped despite their assertion that Agricultural sector complements industrial sector of any economy by providing forward and backward linkages for overall economic growth. Though some measures had been taken to rectify this, but all to no avail. Hence, the agricultural products continue to decline, thereby calling for an urgent attention with the intent to reviving the sector in Nigeria.

Nevertheless, some previous attempts have been made to conduct econometric studies on the nexus between agricultural sector growth with industrial development in Nigeria, (eg Egwaikhide et al (1994), Ekpo (2004); Akinlo and Odusola (2001)), among others. However, these earlier works were based on single equation regression approach and were analyzed using outdated and unreliable statistical tools, This study deviates from the previous ones in Nigeria by employing a structural multivariate multiple equations modeling approach using vector error correction model (VECM) to derive the parameter estimates of the model specified, which has been acclaimed as the best tool considering its optimal advantages over others.

1.3 Research Questions

To guide this research properly, the following research questions were formulayed:

i. To what extent has agricultural output impacted on the industrial sector of Nigerian economy?
ii. How has changes in exchange rate explained the development of industrial sector in Nigeria?
iii. To what extent has Changes in the prices of manufacturing output predicted changes in the growth of industrial output in Nigeria?
iv. What is the direction of causality between agricultural output and industrial sector in Nigeria?

1.4 Objectives of the Study

The major objective of the study is to assess the contribution of agricultural sector to the growth of industrial development in Nigeria. Specifically however, the study is set out to:

i. Examine if there exist a significant long run impact of agricultural output on the growth of industrial sector in Nigeria

ii. Evaluate whether changes in exchange rate has significantly impacted on the development of industrial sector in Nigeria

ii. Determine how changes in the prices of manufacturing output has significantly predicted changes in the growth of industrial output in Nigeria

iv. Determine the direction of causality between agricultural sector and industrial sector in Nigeria

1.4 Hypothesis

The following hypotheses were formulated to guide this study, namely

H_{01}: Agricultural output has no significant long run impact on the development of industrial sector in Nigeria

H_{02}: Changes in exchange rate has not significantly explained the development of industrial sector in Nigeria.

H_{03}: Changes in the prices of manufacturing output has not significantly predicted changes in the growth of industrial output in Nigeria

H_{04}: Causality does not run from agricultural sector to industrial sector in Nigeria

Review of Related Literature

2.1 Theoretical framework

One of the most dominant framework by which we can conceptualize the development process is termed a two-sector or dualistic model. Its analytic framework is always based on distinguishing the traditional sector (agriculture) and the modern sector (manufacturing). The early model of Lewis (1954) began with the assumption of the existence of an unlimited (or totally elastic) supply of labor originating from the traditional sector. It was assumed that the traditional sector was not rational in the sense of profit maximization. The modern sector of Lewis, which consists of manufacturing and some agricultural production, uses modern technology. The sector is capital intensive and it is rational in the sense of seeking to maximize profit by hiring labor up to the point where the marginal product of the last unit of labor transferred to the modern sector is equal to the wage rate. Savings were reinvested; the demand for labor would increase. This would continue until labor in traditional sector become no longer unlimited. At the point labor became scarce in the traditional sector, it began to be commercialized and subsequently labor would be hired up to the point where the marginal product is equal to the wage rates.

An alternative on Lewis's unlimited labor supply was made by Ranis and Fei (1961), where the marginal product of labor in the traditional sector was assumed to be positive rather than zero. As labor was drawn out of the sector, terms of trade would turn against the modern sector and the wage rate must be raised. As the traditional sector produces, foods were assumed to be consumed by the modern sector. Consequently, profits in the modern sector tended to go down, and investment would also slow down. It is also likely, therefore, that growth will stop priori to the commercialization of the traditional sector.

Jorgensen (1961) extended the two-sector model by dropping the assumption of unlimited supply of labor. His argument was that a necessary condition for the creation and growth of the industrial sector would be that an agricultural surplus must emerge and this can occur only if the rate of technological change in agriculture was high relative to the rate of population growth. Otherwise, the economy is likely to be caught in a low level of equilibrium.

These models commonly tended to concentrate on the role of agricultural sector as the provider of labor, food and savings for the manufacturing sector. Their common emphasis was on the "supply side" role of the traditional sector in the factor market where it contributes factors of

production to the modern sector. On this regard, it should be noted that the assumption of irrationality i.e non-maximizing behavior, on the part of the traditional sector, makes it impossible to extract surplus from the sector for the purpose of overall development without harming production incentives in it (Grbbowski, 2009). They also emphasized on the role of the traditional sector as a source of demand, a market for the outlet of the products from the modern sector,

2.1.1 The Prerequisite Thesis versus the Concurrent Thesis

In this regard, there are two schools of thought, the prerequisite thesis and the concurrence thesis. The former thesis argues that an agricultural revolution and a subsequent rise in agricultural productivity are prerequisite for the initial spur of industrialization, whereas the latter thesis denies the condition for prerequisite and asserts instead that rapid growth in agricultural productivity could occur simultaneously with industrialization. Marx, one of the early growth-stage theorists, presented his stages classification on change in production technology and associated changes in the system of property rights and ideology. Rostow also presented his classification of stages in the transition from a primitive to a modern economy and offered basically an equivalent reason of regarding the agricultural development as the "pre-condition for take-off" (Hayami and Ruthan, 1971).

As mentioned earlier, one reason for supporting the prerequisite thesis is the fact that it is the output of the primary sector, rather than of others that could be increased without costing much of the critically scarce resources of financial capital and foreign exchange. Thus, it is only when agriculture is already growing rapidly that it could and should be squeezed on behalf of the more dynamic sectors of the economy. If on the other hand, the agricultural sector operating at the "immature" stage i.e the quasi-subsistence level, squeezing agriculture would create economic stagnation and not growth.

In contrast, the concurrence thesis argues that the agricultural development and the industrial counterpart could proceed simultaneously. In addition to the effect of agriculture on industrialization put forward by the prerequisite thesis, the industrial development for the part tends to offer a widening market for rural surpluses. It may also contribute to fuller exploitation of the agricultural sector by facilitating improvements in transport, credit and production technique.

Furthermore, the credit and productivity in the primary sector may create a growing market for manufacturing products, especially as incomes rose beyond the level, which afford the minimum essentials. Thus, the prerequisite argued that efforts to increase food supply should receive top priority because of the high demand and great need for additional food because the highest marginal productivity of capital lies in agriculture. Coale and Hoover (2012) conclude that very substantial progress in the requisite to successful development of the economy as a whole limits the growth of the sector; it is more likely to be a case of agricultural growth limiting non-agricultural, then vice versa.

Also, the concurrence group while recognizing the need for raising agricultural productivity concludes that it can be accomplished only by giving a big push to industrialization programme top priority. Higgins (2010) states his position most plainly by arguing that the only means to a cumulative improvement in agricultural productivity is a public policy designed to move labor-scale agriculture and encouraging a rapid rate of industrialization. Elsewhere, he recognized that such a policy requires heavy investment in both the industrial and agricultural sector. Despite this view towards agriculture, however, the logic of Higgins group necessitates emphasis on industrialization since without it; land consolidation and farm mechanization could hardily increase the scarcity of labor.

2.2 Empirical Literature

This section looks at the current empirical works on the relationship between agricultural sector and the sect oral growth, with particular reference to industrial development of a nation. For instance, Hye (2009) carried out a research on the link between agriculture output and industrial output using the data of autoregressive distributed lag model on Pakistan economy. The author found bidirectional long run relationship between agriculture and industrial output in Pakistan. As far as the adjustment term is concerned, the research indicates that agricultural output adjusted more quickly from short run disequilibrium to long run equilibrium when the shock in industrial output is in the short run.

In a similar study using causality test, Katircioglu (2006) examines the impact of agricultural sector growth on the overall economic growth for North Cyprus using time series data ranging from 1975 to 2002. He found bidirectional relationship between agricultural output growth and economic growth in the case of North Cyprus. Craigwell et al (2008) described in their research on Barbados economy that, state industrial output promoted agricultural output.

Moreover, Katircioglu (2004) investigated the link between economic growth and sect oral growth in a case study of North Cyprus. He formed a long run relationship between economic growth and sect oral growth in the country. The causality result of his study indicates unidirectional causality from GDP growth to agricultural sector growth and concludes that GDP growth gives unidirectional causation to industry and services sector growth.

Chebbi (2010) studied the link between agricultural growth and other sect oral growth in Tunisian economy (ie manufacturing, industrial, transportation, tourism and telecommunication, commerce and service sector), using the Johansen co integrations and Granger causality tests. The author confirms the existence of a long run positive relationship between agriculture growth and other sectors of the economy. In addition, he rejected the weak exogeneity for agricultural sector and suggests possible long run linkages between agriculture and other sectors of the country.

2.3. Contributions of Agriculture to industrial and Economic Development in Nigeria

Notwithstanding Nigeria's rich endowment in black oil and other mineral resources, the wellbeing of her economy still largely depends on agricultural sector. The Nigerian economy is essentially agriculture in terms of national output and employment generation. It is the largest contributor to Gross Domestic Production (GDP) (average 38% in the last 8 years) with crops accounting for 80%, forestry 3% and fishery 4%. It provides employment for about 65% of the adult labor force and the food and fiber needs of a large and increasing population. The agro-industrial enterprises depend on the sector for raw materials whilst 88% of the non-oil exports earning come from the sector. The sector contributes a great deal to the development of the economy in various ways:

Agriculture contributes significantly to national food self–sufficiency by accounting for over 90% of total food consumption requirements, its helps to maintain a healthy and peaceful population and also a source of food and nutrition for households. Furthermore the ultimate objective of interest of economists in productivity should be to find ways of increasing output per unit of input and attaining desirable inter-firm, intra-firm and inter sector transfers of population resources thereby providing the means of raising the standard of living.

In Nigeria, agriculture export has played an important role in economic development by providing the needed foreign exchange earnings for other capital development project. Ekpo and Egwaikhide (1994) observed that Nigeria agricultural export has enlarged to include cocoa beans and palm kernel. Statistics indicate that in 1960 agricultural export commodities contributed well over 75% of total annual merchandise exports. In 1940"s and 50"s Nigeria was ranked very high in the production and exportation of major crops in the world. For instance, Nigeria was the largest exporter of palm oil and palm kernel, second to Ghana in cocoa and third position in the exportation of groundnut. Olayide and Essang (2012) report that Nigeria export earnings from major agricultural crops contributed significantly to the Gross Domestic Product (GDP).

In terms of employment, the sector is still leading in economic activities, while accounting for one-third of the Gross Domestic Product (GDP). It remains the leading employment sector of the vast majority of the Nigerian population as it employs two- third of the labor force Bola (2007). Olatunji (2002) observed that in Nigeria today, farming still remains the sources of employment of majority of the adult population.

Overview of Nigerian Economy

The structure of the Nigerian economy is typical of an underdeveloped country. Over half of the gross domestic product (GDP) is accounted for by the primary sector with agriculture continuing to play an important role. The oil and gas sector, in particular, continues to be a major driver of the economy, accounting for over 95 per cent of export earnings and about 85 per cent of government revenue between 2011 and 2012. The sector contributed 14.8 and 13.8 per cent to GDP in 2011 and 2012, respectively. It also recorded an increase in reserves from 37.119 billion barrels (bbs) in 2012 from 36.042 bbs in 2011. In contrast, the industrial sector in Nigeria (comprising manufacturing, mining, and utilities) accounts for a tiny proportion of economic activity (6 per cent) while the manufacturing sector contributed only 4 per cent to GDP in 2011. This is despite policy efforts, over the last 50 years, and, in particular, more recently, that have attempted to facilitate the industrialization process. In this paper we explore the evolution of the industrial sector in Nigeria over the last 50 years. To set the context we begin by providing an overview of the policy framework for industrial development from the 1960s to the present day.

At independence in 1960 and for much of that decade, agriculture was the mainstay of the Nigerian economy providing food and employment for the populace, raw materials for the nascent industrial sector, and generating the bulk of government revenue and foreign exchange earnings. Following the discovery of oil and its exploration and exportation in commercial quantities, the fortunes of agriculture gradually diminished while crude petroleum replaced it as the dominant source of revenue and export earnings. This is despite a drive for industrial development in Nigeria dating back to the early 1960s with the first National Development Plan for the period 1962-68. Under the First Plan the country embraced import-substituting industrialization (ISI) with the objective of mobilizing national economic resources and deploying them on a cost/benefit basis among contending projects as a systematic attempt at industrial development. The period of this plan witnessed the commissioning of energy projects such as the Kanji dam and the Ughelli thermal plants, which provided a vital infrastructural backbone for the nascent industrial sector. Other important industrial infrastructure developed during this period, which was considered crucial for catalyzing industrial take-off in Nigeria; included an oil refinery, a development bank, and a mint and security company. Even though, the main objective of the ISI strategy was to stimulate the start-up and growth of industries as well as enhance indigenous participation by altering the ownership structure and management of industries, it was characterized by a high degree of technological dependence on foreign know-how to the extent that the domestic factor endowments of the country were grossly neglected. The focus on an ISI strategy as the cornerstone of industrial development efforts during the period of the First Plan therefore seemed to have neglected many of the factors required for managing the emerging industrial sector and in particular, the management of technologies transferred or acquired.

The Second National Development Plan (1970-74), attempted to address the limitations of the ISI strategy, and placed emphasis on 'the upgrading of local production of intermediate and capital goods for sale to other industries'. This was the first systematic effort to create an industrial structure linked to agriculture, transport, mining, and quarrying. The Second Plan coincided with Nigeria's newly acquired status as a major petroleum producing country. As the economy benefited heavily from enormous foreign exchange inflows, the government embraced ambitious and costly industrial projects in sectors such as iron and steel, cement, salt, sugar,

fertilizer, pulp and paper, among others. According to the plan, the establishment of industrial projects during this period was inspired by the need to increase the earning power of the populace; to minimize social tension by generating more employment; to make essential goods easily available; and to lay the foundation for a self-sustaining economy. The shallow nature of Nigeria's technological capacity, however, prevented the economy from moving beyond the elementary phases of these projects, and indeed, virtually all of these projects have today either been shut down or operate at very low capacity.

The period of the 1970-74 Plan also witnessed a dramatic shift in policy from private to public sector-led industrialization. Industrial planning took place in the public sector which also executed most of the industrial projects as the government invested directly in productive activities. It was clear at this time that Nigerian entrepreneurs did not have the money or the techno-managerial capacity to establish and manage such enterprises and so the government had to lead the way. On balance, a critical appraisal of the nature of the industrial development challenge of the 1970s reveals that the limitation was not so much that of finance but dearth of human capital including techno-managerial capabilities and skills required for initiating, implementing, and managing industrial projects. This was all the more evident by the fact that project preparation, feasibility studies, engineering drawings and designs including construction, erection, and commissioning, relied greatly on foreign technical skills and services. The 1972 Act on Indigenization of Enterprises Operating in Nigeria resulted in an indigenization policy which was subsequently amended, repealed, and replaced by the Nigerian Enterprises Promotion Act of 1977.

The objectives of the policy were to:

• Transfer ownership and control to Nigerians in respect of those enterprises formerly owned (wholly or partly) and controlled by foreigners;
• Foster widespread ownership of enterprises among Nigerian citizens;
• Create opportunities for Nigerian indigenous businessmen;
• Encourage foreign businessmen and investors to move from the unsophisticated spheres of the economy to domains where large investments are required.

The Third National Development Plan (1975-80) was launched at the height of the oil boom. Despite a lack of executive capacity in the country, the plan envisaged an investment outlay of 42 billion NGN (up from 3.2 billion NGN of the Second Plan).Emphasis remained on public sector investment in industry, especially heavy industries. With easy access to foreign exchange, private firms opted for investments in the light, low technology consumer industries which were heavily dependent on imported machinery and raw materials. It became apparent that the country had entered into industrial project agreements with very little concern for the country's capabilities for technology acquisition. While by their nature each of these projects required the acquisition of key sector-specific skills, the agreements made by the Nigerian planners were for the turnkey transplantation of technology. Attendant to the fact that during the same period, the nation's oil sector had become vibrant and prosperous, and the gates of the economy had been opened up to all sorts of imports. This had a debilitating effect on real industrial growth. In effect, the period of the Third National Development Plan failed to advance the course of industrial development in Nigeria in a significantly positive way.

The Fourth National Development Plan (1981-85) coincided with the inception of a global economic recession which sparked declining foreign exchange earnings, balance of payment disequilibrium and unemployment in the Nigerian economy. As a result, the hugely import-based manufacturing sector was severely hit. Plummeting world oil prices and dwindling foreign exchange earnings left industries in need of foreign exchange to import new materials and parts. Indeed, this global recession exposed profound weaknesses in Nigeria's industrial structure and planning. It was evident at the end of the fourth development decade in Nigeria that existing strategies targeted at industrial development could neither solve the problem of economic

underdevelopment nor the social ones created by mass poverty, unemployment, and insecurity of life and property. As a result, the pressure to seek alternative development paradigms had been triggered, not just by technical and economic imperatives, but also by social considerations.

The structural adjustment programme (SAP) was adopted in 1986, as an alternative framework for addressing the weaknesses and ineffectiveness of previous development planning efforts. The objectives of SAP included promoting investment, stimulating non-oil exports and providing a base for private sector-led development; promoting the efficiency of Nigeria's industrial sector; privatizing and commercializing state-owned enterprises to promote industrial efficiency; developing and utilizing domestic technology by encouraging accelerated development and use of local raw materials and intermediate inputs rather than imported ones.

A national science and technology (S&T) policy was formulated and launched in 1986.The objectives of this policy were to increase public awareness in S&T and their vital role in national development and well-being; direct S&T efforts along identified national goals; promote the translation of S&T results into actual goods and services, and to create, increase and motivate output in the S&T community. The S&T policy marked the beginning of the recognition of S&T efforts as a vehicle for successful industrial development in Nigeria. To facilitate the achievement of the 'self-reliance' aspiration of the S&T policy, the Raw Materials Research and Development Council, was established by Decree No. 39 in 1987. The Standards Organisation of Nigeria (SON) was also established for the purpose of ensuring standardization and adequate quality control in industrial production. The S&T policy emphasized the transfer of foreign technology to local firms, via the licensing and registration of patents, trademarks, technical assistance arrangements, research and development, training, and operations. There is little evidence that the S&T policy was successful. Bamiro (1994) and Oyeyinka (1997) among other authors identified some of the plausible reasons for the non-performance of the S&T policy to include the fact that:

►S&T Institutions were operating independently of each other, with little or no interactions, leading to duplication of efforts and wastages;
►Narrow base of S&T research which concentrated on R&D;
►Isolation of the manufacturing sector from R&D activities and therefore non-commercialization of ideas; and
►Insufficient funding for the S & T sectors

It could therefore be argued that innovation was absent in this era of industrial development, to the extent that although the role of S&T was temporary acknowledged, its deeper implications were not grasped and fully appreciated. The important issues which the era of S&T policy in Nigeria missed were how S&T translates or influences the broad process of industrial development and how such influences may be improved upon, i.e., a recognition of the need to transit from S&T to science, technology, and innovation (STI). In 1989, the trade and financial liberalization policy was enacted. A key aim was to stimulate competition among domestic firms and between domestic import-competing firms and foreign firms with the objective of promoting efficiency. The aim was to achieve this through a reduction in both tariff and non-tariff barriers, scrapping the commodity marketing boards and market determination of the exchange rate as well as the deregulation of interest rates, meant to foster financial efficiency and industrial productivity.

The National Economic Reconstruction Fund (NERFUND) was set up in the same year as a complement to industrial policy. The objective of the industrial policy was to reverse some of the provisions of the Nigerian indigenization policy, and open up the economy for foreign investors. NERFUND sought to address the medium- and long-term financial constraints experienced by small- and medium-scale entrepreneurs, provide the required financial resources to participating merchant and commercial banks to lend to small- and medium-scale firms and provide naira or foreign denominated loans to participating firms for a period of five to ten years

with a grace period of one to three years. In 1990, the need to link the science, engineering and technology sectors to fit within industrial and economic development endeavors became a key issue among the S&T community in Nigeria. As would be expected, the undue pampering of the manufacturing sector in the import substitution era through liberal and anti-competitive policies in the form of low interest rates, low wages, tariffs on imported inputs, an overvalued exchange rate, and high tariffs on imported substitutes, led to the sector's inability to evolve a consistent growth dynamic or chart an autonomous growth trajectory in such a way as to rival the industrialization rate of some other developing countries. The S&T policy document was consequently revised in 1992 and incorporated the broad objective of vigorously pursuing an S&T infrastructure development programme targeted at accelerating the emergence of endogenous capacity.

The role of S&T and its translation to "innovation as an engine of development" started to feature prominently in the economic reform agenda between 1999 and 2007, especially within the rubric of the National Economic Empowerment and Development Strategy (NEEDS). The NEEDS framework identified STI as a cross-cutting issue that should be promoted in order to achieve economic development objectives (NPC 2007). Similarly, the current economic policy blueprint – Nigeria Vision 20: 2020 embraces elements of STI aimed at addressing challenges in critical areas such as biotechnology, nanotechnology, institutional linkages, capacity building, renewable energy, ventures capital, space research, small- and medium-scale industry targeted research, knowledge-intensive new and advanced materials, STI information management, information and communication technology6; intellectual property rights, traditional medicine, and indigenous knowledge. The Bank of Industry (BOI) established in 2000, was introduced as a development institution to accelerate industrial development through the provision of long-term loans, equity finances and technical assistance to industrial enterprises. The bank combined the following institutions: the Nigerian Industrial Development Bank (NIDB), the Nigerian Bank for Commerce and Industry, Industrial and Insurance Brokers, and the Leasing Company of Nigeria Limited.

The objectives of this bank included providing long- term loans, assisting in employment generation and promoting industrial dispersal of indigenous entrepreneurship. As a complement to the BOI, small and medium industries equity investment scheme (SMIEIS) was also set up in 2000. The objective was to assist in the co-ordination of the scheme with a guideline that 60 per cent of the SMIEIS fund should go to the core real sector.

3.1 Methodology

In the theoretical analysis highlighted earlier, the researchers identified a number of variables that influences industrial development in Nigeria. It was shown that industrial development (INDUST) is a function of agricultural output (AGQ), exchange rate (EXR), and price of manufacturing output (PMANU).

Thus, the model for this study is specified in line with the above analysis as shown below:

$$INDUST = (AGQ, EXR, PMANU) \quad (1)$$

Given the fact that independent variables determine the changes in the dependent variable, the functional relationship between the dependent and explanatory variables in linear equation is specified as shown below:

$$INDUST_t = b_{0t} + b_1AGQ_t + b_2PMANU_t + b_3EXR_t + \varepsilon_t \quad (2)$$

Following the Reynold (1985) and Ajayi (1978), the data of the variables in equation (2) above is transformed into logarithm form, so as to remove lags, which could have resulted from bureaucratic bottlenecks. This is because using the raw data as they are may lead to bias resulting to violation of the ordinary least squares and vector error correction model (VECM) assumptions. As a result, the log specification becomes:

$\text{Log INDUST}_t = b_{0t} + b_1 \text{LogAGQ}_t + b_2 \text{LogPMANU}_t + b_3 \text{LogEXR}_t + \varepsilon_t$ (3)

Where,

Log INDUST	=	logarithm of industrial output
LogAGQ	=	" " agricultural output
Log EXR	=	logarithm of exchange rate
Log PMANU	=	logarithm of price of manufacturing output
ε_t	=	stochastic error term
b_0, b_1, b_2, b_3	=	represent the coefficients to be estimated

A prior expectation $(b_1, b_3 > 0; b_2 \infty 0)$

3.2 Estimation Techniques

The first step taken to estimate the specified model was to determine the stationarity of the data used. This was to make sure that the variables have stable mean and variance so that the resultant regression results are meaningful. Otherwise, if stationarity of the variable is present and not checked, the existence of drift in the data sequence will signify that the regression outcome was false. Thus, Augumented Dicker-fuller (ADF) test was used to determine the stationarity or not stationary of the series.

The second step required testing for co-integration among the series used. Co-integration refers to a long run equilibrium link among the series. The idea of long run stability implies that two or more series may drift away from one variable to the other in the short run but drift collectively in the long run (Enders, 1995). When variables wander away from each other, the process is known as a random walk. In the long run however, it may be possible that these variables shift in a similar path, that is, have a long run link. This is co-integration.

If variables are co-integrated and the error correction terms confirms the speed of adjustment of the short run relation to the unexpected shocks , then Vector error correction model (VECM) which incorporates both the long run and short run effects simultaneously was used to estimate the parameter of the model. The beauty of VECM over OLS is because it saves one from the agony of endogeniety crisis.

Finally, Pairewise granger causality test was used to check the presence or absence of feedback effect among the series used.

4.1 Results and Discussion

The result of the Augmented Dickey-Fuller Unit Root test showed that all the variables were all confirmed to be stationary only after their first differencing. The result conducted at both 1% and 5% levels of significant is presented in table 4.1 below:

Table 4. 1: RESULT OF THE ADF UNIT ROOTS FOR STATIONARITY

	LEVELS			**1st DIFFERENCE**			
VARIABLES	**ADF Statistic**	**1% Critical**	**5% Critical Value**	**ADF Statistic Value**	**1% Critical Value**	**5% Critical Value**	**REMARKS**
INDUST	-2.696954	-4.198503	-3.523623	-10.00021	-4.205004	-3.529758	1(1)
AGO	-5.530984	-4.198503	-3.523623	-8.561719	-4.205004	-3.529758	1(1)
EXR	-1.628896	-4.198503	-3.523623	-10.62888	-4.205004	-3.529758	1(1)
PMANU	-2.552891	-4.198503	-3.523623	-6.597302	-4.205004	-3.529758	1(1)

Source: Author's computation using E-View 7 computer software

As shown in table 4.1 above, the unit root tests result indicated that all the series namely; Industrial output (INDUST); Agricultural output (AGO); Exchange rate (EXR); and Price of manufacturing output (PMANU) contained unit root and are stationary only after first differencing, at 1% and 5% significant levels. This follows the decision rule which states that when the computed ADF absolute value exceeds the absolute critical value, we reject the null hypothesis and conclude that the series are stationary and vice-versa.

The stationarities of all the series in the same order was thus a motivation to run for co-integration tests so as to find out the presence or absent of any long run relationship between the series. In view of the above therefore, since the variables are stationary at difference orders, there was the need for a test for co- integration test using the Johansen (1991) co- integration technique. The result is presented in table 4.2 and table 4.3 as shown below:

Table 4.2 Co-integration Rank Test (Trace)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.883130	120.4273	63.87610	0.0000
At most 1	0.326854	32.41293	42.91525	0.3664
At most 2	0.220822	16.18540	25.87211	0.4778
At most 3	0.135194	5.955272	12.51798	0.4660

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

Source: Author's computations using Eviews 7 computer software

Table 4.3 Co-integration Rank Test (Maximun Eigenvalue)

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.883130	88.01438	32.11832	0.0000
At most 1	0.326854	16.22752	25.82321	0.5245
At most 2	0.220822	10.23013	19.38704	0.5942
At most 3	0.135194	5.955272	12.51798	0.4660

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

Source: Author's computations using Eviews 7 computer software

Series: INDUST, AGO, EXR, PMANU
Lag intervals:No lags

Table 4.2 and table 4.3 above indicated the presence of (1) co-integrating equation for trace statistics and 1 co-integrating equation for maximum Eigenvale at 1% and 5% level of significance. Co-integration exists at those ranks where the value of the trace statistic exceeds the 1% and 5% critical value. Again, the eigenvalues all lie below 1, indicating the presence of co-integration.

Having established the presence of co-integration, the researcher moved on to calculate the speed of adjustment of the model to shocks. To do this, the researcher computed the Vector Error correction model. The result is presented in Table 4.4 below:

Table 4.4 VECTOR ERROR CORRECTION MODEL

Vector Error Correction Estimates
Date: 01/16/16 Time: 03:27
Sample (adjusted): 1973 2011
Included observations: 39 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
INDUST(-1)	1.000000
AGO(-1)	-0.604644 (0.12638) [-4.78420]
EXR(-1)	12837.10 (3154.75) [-4.06913]
PMANU(-1)	12.59411 (2.07594) [6.06669]
C	-1395389.

Error Correction:	D(INDUST)	D(AGO)	D(EXR)	D(PMANU)
CointEq1	-0.008762 (0.00244) [-3.36028]	0.566114 (0.09667) [5.85637]	1.79E-05 (5.1E-06) [3.55129]	0.001313 (0.00459) [0.28645]
D(INDUST(-1))	-0.128902 (0.17991) [-0.71647]	0.628830 (2.69997) [0.23290]	-3.74E-05 (0.00014) [-0.26467]	0.007819 (0.12807) [0.06105]

D(INDUST(-2))	-0.168180	-0.267716	-0.000101	0.055909
	(0.17649)	(2.64863)	(0.00014)	(0.12564)
	[-0.95291]	[-0.10108]	[-0.72924]	[0.44500]
D(AGO(-1))	0.011514	0.010073	-1.65E-06	2.33E-05
	(0.00931)	(0.13973)	(7.3E-06)	(0.00663)
	[1.23669]	[0.07209]	[-0.22615]	[0.00352]
D(AGO(-2))	0.003735	-0.234807	-6.76E-06	0.007413
	(0.00937)	(0.14068)	(7.4E-06)	(0.00667)
	[0.39846]	[-1.66913]	[-0.91870]	[1.11085]
D(EXR(-1))	339.8373	-14386.23	-0.486003	132.0365
	(267.518)	(4014.71)	(0.20990)	(190.436)
	[1.27033]	[-3.58338]	[-2.31538]	[0.69334]
D(EXR(-2))	232.7067	-9520.013	-0.427430	344.6662
	(266.620)	(4001.23)	(0.20920)	(189.797)
	[-0.87280]	[-2.37927]	[-2.04320]	[1.81598]
D(PMANU(-1))	0.208560	-6.459091	-0.000425	0.634599
	(0.28203)	(4.23243)	(0.00022)	(0.20076)
	[0.73951]	[-1.52609]	[-1.91997]	[3.16093]
D(PMANU(-2))	0.078781	-11.40989	-0.000694	0.060757
	(0.34454)	(5.17057)	(0.00027)	(0.24526)
	[0.22866]	[-2.20670]	[-2.56748]	[0.24772]
C	-5526.415	725039.8	27.87140	2577.414
	(9068.83)	(136098.)	(7.11564)	(6455.76)
	[-0.60939]	[5.32733]	[3.91692]	[0.39924]

R-squared	0.155809	0.836750	0.331863	0.829816
Adj. R-squared	-0.106182	0.786086	0.124510	0.777000
Sum sq. resides	6.37E+09	1.43E+12	3922.422	3.23E+09
S.E. equation	14822.30	222441.9	11.62996	10551.43
F-statistic	0.594712	16.51571	1.600475	15.71150
Log likelihood	-424.1130	-529.7458	-145.2512	-410.8581
Akaike AIC	22.26221	27.67927	7.961601	21.58247
Schwarz SC	22.68876	28.10583	8.388155	22.00902
Mean dependent	4096.388	297103.3	3.928300	17800.28
S.D. dependent	14092.96	480946.5	12.42947	22343.90

Determinant resid covariance (dof adj.)	9.62E+28
Determinant resid covariance	2.94E+28
Log likelihood	-1499.604
Akaike information criterion	79.15920

Schwarz criterion	81.03604

Source: Author's computations using Eviews 7 computer software

As shown in the upper region of the vector error correction model (VECM) for equation 1 above, the long run relationship which relates industrial output as a function of Agricultural output, exchange rate, and price of manufacturing output shows that the co-integrating equation 1 is well behaved having possessed the expected negative sign, fractional and significant as shown in the VECM results. Also, the value of the error correction coefficient is -0.008762. This indicates that about 08% of the disequilibrium between the short run and long run relationship is corrected annually. The R-squared value of 0.155809 indicates that about sixteen percent (16%) of the variability in industrial output in Nigeria within the period under review was determined or influenced by Agricultural output, exchange rate and prices of manufacturing output.

At five percent (5%) level of significance and relevant degrees of freedom, Agricultural output, exchange rate and prices of manufacturing output as shown by their computed t-values of -4.78420, -4.06913 and 6.06669 respectively appeared to be highly significant determinants of industrial output in Nigeria within the sampled period.

As regards the expected signs, the result reveals that both the coefficients of Agricultural output and exchange rate showed a negative link with industrial output in Nigeria contrary to a priori expectation. However, price of manufacturing output and industrial output revealed a positive relationship in the long run in conformity with a priori criterion as can be seen in the upper region of the vector error correction model (VECM) in table 4.4 above.

As also indicated by the Granger causality test, there is no causality between industrial output and Agricultural output within the period under review in Nigeria as shown in table 4.5 below.

Table 4.5 **GRANGER CAUSALITY TEST RESULT**

Pairwise Granger Causality Tests
Date: 01/16/16 Time: 03:48
Sample: 1970 2013
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
AGO does not Granger Cause INDUST	40	0.81686	0.4501
INDUST does not Granger Cause AGO		1.25841	0.2966
EXR does not Granger Cause INDUST	40	0.78995	0.4618
INDUST does not Granger Cause EXR		0.93455	0.4023
PMANU does not Granger Cause INDUST	40	0.15446	0.8575
INDUST does not Granger Cause PMANU		1.34230	0.2744
EXR does not Granger Cause AGO	41	7.24113	0.0023
AGO does not Granger Cause EXR		0.04692	0.9542

PMANU does not Granger Cause AGO	41	4.25302	0.0220
AGO does not Granger Cause PMANU		0.08745	0.9165
PMANU does not Granger Cause EXR	41	0.78461	0.4639
EXR does not Granger Cause PMANU		11.6421	0.0001

Source: Author's computations using Eviews 7 computer software

Test of Hypotheses

The hypotheses are re-stated below so as to subject them to an empirical test:

H_{01}: *Agricultural output has no significant long run impact on the development of industrial sector in Nigeria*

The statistical tool used to test for the first hypothesis is the result of VECM which is [-4.78420] at the upper region. Since this value is greater than the 0.05 critical values, we conclude that Agricultural output has significant long run impact on the development of industrial sector in Nigeria within the period under study as show in the VECM result below:

Table 4.6 Test of Hypotheses Using VECM Result

Vector Error Correction Estimates
Date: 01/16/16 Time: 03:27
Sample (adjusted): 1973 2011
Included observations: 39 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
INDUST(-1)	1.000000
AGO(-1)	-0.604644 (0.12638) [-4.78420]
EXR(-1)	12837.10 (3154.75) [-4.06913]
PMANU(-1)	12.59411 (2.07594) [6.06669]
C	-1395389.

H_{02}: *Changes in exchange rate has not significantly impacted on the development of industrial sector in Nigeria.*

Using the above VECM result as shown in table 4.6, the coefficient of exchange rate is -4.06913 which is more than the alfa level of 0.05; the conclusion is that exchange rate exerts a

significant long run impact on the development of industrial sector in Nigeria. As a result, increase in exchange rate in Nigeria inhibits the development of industrial sector within the sampled period.

$H_{03:}$ Changes in the prices of manufacturing output has not significantly predicted changes in the growth of industrial output in Nigeria

Using the same VECM coefficient in table 4.6 for PMANU, it can be seen from the upper- region that the coefficient of the value [6.06669] is more than the theoretical alfa value of 0.05. Hence, the deduction is that PMANU is not only positively related to industrial output but also highly significant in predicting the growth of industrial sector in Nigeria.

Ho_4 Causality does not run from agricultural sector to industrial sector in Nigeria

The result of the paire-wise Granger Causality was used to test the above hypotheses as shown in table 4/7 below:

Table 4.7 PAIREWISE GRANGER CAUSALITY TEST RESULT

Null Hypothesis:	Obs	F-Statistic	Prob.
AGO does not Granger Cause INDUST	40	0.81686	0.4501
INDUST does not Granger Cause AGO		1.25841	0.2966

The causality between AGO and INDUST is not significant as confirmed by the P-value of the F-statistics [0.4501 and 0.2966]. Thus, since the P-value of the causality between AGO and INDUST is greater than the Alfa level (0.05), we accept the null hypothesis and reject the alternative. And therefore conclude that there is no causal relationship existing between Agricultural output and industrial sector in Nigeria.

Summary of Findings

Based on the above empirical results, the following findings are deducible:

(i) Agricultural output is shown to be negatively and significantly related to industrial output, implying that agricultural output though negatively related, is a major proximate determinant of the growth of industrial output in Nigeria. An increase in Agricultural output leads to a fall in industrial output.

(ii) The negative sign of exchange rate is a pointer to the fact that it has an inverse impact on industrial output. Thus, as foreign exchange rate falls, industrial output is stimulated and increased. In other words, an increase in exchange rates of the domestic currency vis-à-vis other currencies retards economic growth. This is because it leads to a fall in the value of money and exacerbates inflation rate in the country. Hence, the need to pursue policies that would maintain stable and low exchange rate.

(iii) Changes in the price of manufacturing output is positively and significantly a major predictor of the growth of industrial output in Nigeria. The policy option is for the government to strive to remove any obstacle that could inhibit the growth of infant industries in Nigeria.

(iv) The findings also reveal that there is no feedback effect between Agricultural output and industrial output in Nigeria. This confirms the non-complimentary nature of the two sectors in terms of both forward and backward linkages. Policies that should ensure a simultaneous and balanced growth of the two sectors should be vigorously pursued.

Recommendations

Drawing from the findings above, the author makes the following prescriptions:

(i) Government should encourage the production of more agricultural products that could be used as raw materials by industries in order to achieve balanced growth between agricultural and industrial sectors of Nigerian economy.

(ii) The apex financial institution in the country (CBN) should vigorously pursue policies that could maintain stable and low exchange rate regime.
(iii) Effort should be intensified in providing soft loans for the growth and development of small and medium scale industries (SMEs) to the young school leavers in the country by the three tiers of government. This will no doubt enhance the development and growth of infant industries in the country.
(iv) Finally, policies that should ensure a balanced growth of both Agricultural sector and industrial sector should be pursued in order to ensure both forward and backward linkages between the two sectors for the overall development of Nigerian economy.

References

Adeoti, J. O. (2010). Investment in technology and export potential of firms in southwest Nigeria: *AERC Research Paper 231*. Nairobi: African Economic Research Consortium.

Adenikinju, A. F. (2005). African imperatives in the new world order: Country case study of the manufacturing sector in Nigeria: in O.E. Ogunkola A. and Bankole (eds.), Nigeria's imperatives in the new world trade order. Nairobi. *African Economic Research Consortium and Ibadan: Trade Policy Research and Training Programme.*

Bamiro, O. A. (1994). National technology policy for development: The role of research and development institutions: *Paper presented at the National Workshop on Technology Management, Policy and Planning in Nigeria,* 18-21 October.

Bashir B, (2007). Sustaining Nigeria's manufacturing sector in the face of the current global economic recession: *International Journal of Economics, Ibadan, Nigeria*

Bevan, D., P. Collier, and J. W. Gunning (1999). *The political economy of poverty, equity, and growth: Nigeria and Indonesia. Oxford*: Oxford University Press and World Bank.

Biersteker, T. J. (1987). *Multinationals, the state, and control of the Nigerian economy:* Princeton: Princeton University Press.

Craigwell, R; D. Downes; K. Greenidge; and K. Steadman (2008). Sect oral output, growth and economic linkages in the Barbados economy over the past five decades: *Applied Economic International Development :* 8: 123-136.

Chebbi, H.E (2010). Agriculture and economic growth in Tunisia: *China Agric-Economics Rev.* 2: 63-78.

Duckham, A.N; and Peace, K (1980). *Agricultural administration:* Vol. 7

Fashoyin, T., S. Matanmi, and A. Tawose (1994). Reform measures, employment and labour market processes in the Nigerian economy: Empirical Findings: in T. Fashoyin (ed.), Economic reform policies and the labour market in Nigeria: Lagos: *Friedrich Ebert Foundation.*

Fei, J.C.H; and G.Ranis (1964). *Development of the labor surplus economy*: Theory and policy. Irwing Publishing company: Homewood, Il.

Forrest, T. (1993). *Politics and economic development in Nigeria:* Oxford: Westview Press, Inc.

George, A. and Milward, A (1980). *The development of the economics of continental Europe:* 1854-1914. Unwin and saul ltd, Britain

Hemeberry, S.R; M.E. Khan and K. Piewthongngam (2000). An analysis of industrial-agricultural interactions: A case study in Pakistan. *International Journal of Agric Economics:* 22: 17-27.

Hye, Q.M.A (2009). Agriculture on the road to industrialization and sustainable economics growth: An empirical investigation for Pakistan. *International Journal of Agricultural Economics and Rural Development:* 2: 1-6.

Hirschman, A.O. (1958). *The strategy of economic development:* Yale University Press, New York

Ihonvbere, J. O. (1993). *Nigeria: The politics of adjustment and democracy*. New Brunswick, NJ: Transaction Publishers.

Jalilian, H., M. Tribe, and J. Weiss (eds) (2000). Industrial development and policy in Africa: Issues of de-industrialisation and development strategy. Cheltenham: Edward Elgar. *Manufacturers Association of Nigeria* (2009).

Katircioglu, S.T. (2006). Causality between agriculture and economic growth in a small nation under political isolation: A case from North Cyprus. *International Journal of Social Economics:* 33: 331-343.

Katircioglu, S. (2004). Co integration and causality between GDP, agriculture, industry and services growth in north Cyprus: Evidence from time-series data: *Rev. Social Econ. And Bus. Stud.:* 5/6: 173-187.

Ken, R (1986).

Lewis, W.A. (1954). Economic development with unlimited surpluses of labor: *The Manchester School*: 22: 139-191.

Nachane, D.M; S.D. Sawant and C.V. Achuthan (1989). Agriculture and industry: A study of selected linkages. *Indian Journal of Agric-Economics:* 44: 140-149.

National Bureau of Statistics (NBS) (2012). National Accounts Statistics of Nigeria. Abuja: *National Bureau of Statistics.*

Nigeria Export Processing Zones Authority (NEPZA) (2013). Available at: http://www.nepza.gov.ng National Planning Commission (NPC) (2004). Nigeria: National Economic Empowerment and Development Strategy. NPC: Abuja. 32

NPC (2007) Nigeria: National economic empowerment development strategy (NEEDS2). NPC: Abuja.

NPC (2009) Nigeria vision 20:2020: Economic transformation blueprint: *National Planning Commission, Abuja.*

Ogun, O. (1995). Country studies: Nigeria; in S. M. Wangwe (ed.) exporting Africa: Technology, trade and industrialisation in Sub-Saharan Africa, *UNU/INTECH Studies in New Technology and Development*. Milton Park: Routledge.

Oyelaran-Oyeyinka, B (2012). Industrial technology policy - making and implementation in Nigeria: An Assessment: *NISER Occasional Paper. Ibadan: NISER.*

Oyelaran-Oyeyinka, B. (2004). Networking technical change and industrialization: The case of small and medium firms in Nigeria: *ATPS Special Paper Series 20. Nairobi: African Technology Policy Studies Network*.

Oyelaran-Oyeyinka, B. (2011). Nigeria yesterday and tomorrow: An economic perspective of industrial regress, dreams and visions: *Invited Paper at Lead City University Ibadan.*

Perez, C.,and Soete, L. (1988). *Catching up in technology: Entry barriers and windows of opportunity: in G. Dosi et al. (eds) Technical change and economic theory*. London. Pinter.

Ranis, G. and J.C.H. Fei (1961). A theory of economic development: *American Economic Review;* 51: 533-565.

Rattso, J. (1988). Macroeconomic adjustments in a dual economy under policy controlled domestic terms of trade: *Indian Economic Review:* 23: 45-59.

Sah, R.K. and J.E.Stiglitz (1984). The economics of price scissors: *American Economic Review:* 74: 125-138.

Taylor, L. (1989). *Theories of sect oral balance: In: The balance between agriculture and industry in economic development*: Willianson, J. and V.P. Amukhi (Eds.). St. Martin's press//EA, New York.

Todaro, M (1985). *Economics developmentof third world countries:* Longman Inc. New York

Sandrey R., H. Grinsted Jensen, and Oyewumi, O (2007). Trade policy options for Nigeria: A GTAP simulation analysis: *Tralac Working Paper* No 10. Stellenbosch: Tralac.

Subrata, G (1984). *Development economics:* Longman Inc. USA

World Bank (2006). *Investment climate survey data*: Washington, DC: World Bank.

World Bank (2012). *World development indicators*: Washington, DC: World Bank.