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IMPACT OF MANUFACTURED GOODS' EXPORTS ON ECONOMIC GROWTH: A DYNAMIC ECONOMETRIC MODEL FOR NIGERIA

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ABSTRACT

The impact of exports on growth has for a long time enmeshed in controversy partly due to both positive and negative effects empirically established in the literature. Still, most studies in developing countries have left detailed examination of exports' components and domestic institutions unexplored in the export-growth nexus. Based on an error correction model, this paper examines the impact of manufactured exports and its components on economic growth in Nigeria, taking cognisance of the country's institutional framework. Few of the components of manufactured exports were found to exert positive influence on growth both in the long and short runs. The paper, however, finds ample evidence in support of the relevance of quality of institutions in the economic growth process. In effect, with the right institutional framework, export-led growth, and specific focus on selected manufacturing subsectors there appears to be a feasible development strategy for Nigeria.

INTRODUCTION AND PROBLEM STATEMENT

In recent years, there has been growing concern over the slow pace of growth of African economies. The reasons for the poor performance have been broadly attributed to the prevailing policy constraint and institutional weaknesses that characterised the region. Specifically, lack of openness to international trade, high-risk environment, low level of social capital, and poor infrastructure have been identified as responsible (Collier and Gunning, 1997). In this regard, many African countries at different times in the past two decades opted for programme of adjusting their economic structure through liberalisation of the economy,

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including the external sector. Thus, there has been an increased openness of African economies to freer movement of goods and services, in addition to access to wider knowledge through technological transfers.

The Nigerian case is representative of most of the characteristics of less developed economies. At independence, when Import Substitution Industrialisation Strategy (ISIS) was adopted, high walls of tariff and non-tariff protection of infant manufacturing industries, and an array of other incentives were put in place. The adoption of ISIS was not only born out of the concern over sustainability of import bills, but also out of the desire for Nigeria to become an exporter, if not net, of industrial goods in the long-term (Bankole *et. al.*, 1999). Despite this, the manufacturing sector's share of total exports remains relatively invariant, though the importation of the same slightly declined. The failure of the inward-looking strategy in Nigeria prompted the switch to outward-looking strategy with the adoption of Structural Adjustment Programme (SAP) in July 1986. One principal aim of which was to liberalise the economy to re-orientate the incentive system towards non-oil exports. The adoption of SAP gave birth to a new industrial policy aimed at stimulating investment and non-oil exports, based on private sector-led development. The liberalisation programme aimed at enhancing a far-reaching policy of import liberalisation and export promotion. On the import side, the removal of import and substantial slash of import tariffs were effected, while various incentives and export expansion schemes were put in place. Given this new policy direction, has the manufactured exports in Nigeria yielded any appreciable dividend to the country's economic growth?

Providing answers to questions posed is the focus of this paper, whose main objective is to examine the impact of manufactured goods' exports on the growth of the Nigerian economy. It therefore specifically develop a framework of analysis to trace the effects of manufactured exports on the economic growth process in Nigeria; determine the contribution of the components of manufactured exports to the economic growth in

Nigeria; and, lastly, determine the complementary role of institutions in the economic growth process.

There are at least three reasons which make this paper relevant. One, related studies are limited to the effect of aggregate exports on growth, leaving impact of manufactured goods' exports on economic growth generally unexplored while those that are related to manufactured goods' exports in Nigeria have only touched on the issue relating to the effect of trade policy on its performance. Two, the value of manufacturing output is considerably substantial (₦162.6billion in 2000), and hence, the potential for revenue and contribution to value-added of manufactured exports is large. Three, having pursued outward-oriented trade policy in the last one and half decades, there are doubts about the extent to which manufactured goods have contributed to growth, especially in the presence of large foreign exchange use by the sector.

Nigeria's Output Performance

Apart from 1990, the real growth rate of the gross domestic product (GDP) did not exceed five per cent. For half of the period between 1990 and 1999, it grew by less than three per cent. On the average, the real GDP grew by only 3.36 per cent per annum, and given the annual growth rate of the population at three per cent, this implies that the annual average growth of per capita was a mere 0.36 per cent.

In terms of sectoral contributions to GDP, both agriculture and service are the dominant sectors. On the average, the two sectors contributed 39 per cent and 41 per cent respectively, while petroleum and mining sector contributed 13 per cent and manufacturing sector, 7 per cent. The contributions of agriculture and service sectors slightly grew over the decade of the 1990s, while the petroleum and mining, and manufacturing sectors on the other hand recorded decline in their contributions to real GDP.

Table 1: Some Macroeconomic Indicators For Nigeria (1990-1999)

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Annual Average
Growth of real GDP (%)	7.6	4.5	2.9	2.2	1.3	2.5	3.2	3.0	2.3	2.6	3.21
Sectoral Outputs as % of GDP											
Agric.	39.0	38.6	38.2	37.9	38.2	38.7	39.0	39.4	40.1	40.6	39.0
Petrol. & Mining	13.2	13.7	13.7	13.0	12.9	12.9	13.4	13.1	12.2	11.5	13.0
Manufacturing	8.2	8.5	7.9	7.4	7.2	6.6	6.5	6.3	5.9	5.9	7.0
Services	39.6	39.2	40.2	41.7	41.7	41.7	41.1	41.2	41.8	42.0	41.0
Non-oil Components											
Agriculture	74.9	73.3	73.3	68.6	72.8	68.5	74.1	69.6	55.8	Na	69.6
Manufacturing	22.7	23.7	24.3	23.3	22.7	31.1	22.3	30.0	44.1	Na	27.4
Others	2.4	3.1	2.5	8.1	4.5	0.4	4.0	0.4	0.1	Na	3.0

Sources: Central Bank of Nigeria' Annual Report and Statement of Account (several issues).
Na means not available

In the external sector, both exports and imports substantially grew over the period, with exports exceeding imports for most of the period, implying a favourable trade balance for most of the years. On the average for the decade, annual export was ₦568.4billion, while annual average of imports was ₦400.85billion, with annual trade balance of ₦167.54billion, (CBN, 2002). On the other hand, the current account balance was generally in deficit over the period except in 1990, 1996, and 1997. Considering the two main components of Nigerian non-oil exports, agricultural and manufactured exports, agricultural exports appear to have fallen and lost its contribution to manufactured exports. The performance of manufactured exports in 1997 and 1998 is an indication of its possible assumption of prominence in the export sector.

Review of Nigeria's Export Policies

Efforts at promoting exports in Nigeria during the first two and half decades of independence were not pursued with much vigour, as major reliance was placed on oil exports. The pronouncement of the Federal Government of Nigeria to develop new export markets,

and strengthen the existing ones, while securing stable prices for export commodities, as spelt out in the 1962 budget speech marked the beginning of conscious effort at developing the Nigerian export sector. However, lack of action plan to backup the pronouncement, coupled with the oil boom of the early 1970, worked against achieving these objectives. Another conscious effort to promote exports was the Nigerian Export Promotion Council (NEPC) in 1976. According to Obadan (1993), the council was charged with a three-point responsibility of:

- Spearheading national effort in export development and promotion by generating ideas, suggestions, and measures designed to achieve the course of Nigeria's export trade;
- Advising and assisting the government in identifying export-oriented industries, and help stimulate non-traditional exports from Nigeria; and
- Assisting the government in creating necessary infrastructure, such as export incentives and trade information services.

To achieve these goals, a number of schemes, such as Export Development Fund, Export Price Adjustment Scheme, Export Expansion Grant, and Supplementary Allowance for Pioneering Companies were instituted to enhance Nigerian exports' access to foreign markets.

Further efforts to stimulate exports emanated in 1979 with the Federal Government incentives package, which included directives to banks to streamline credit facilities to exporters, rediscounting facility for short-term trade bills, and the Export Credit Guarantee and Insurance Scheme (Emenuga, 1995). The 1986 budget presented repletion of incentives to promote non-oil exports. Raw materials required for the production of export items were made duty-free and exempted from the 30 per cent import levy introduced in the budget. While granting generous import licences for raw materials needed for export products was promised, excise duty paid on export items were to be refunded. Export licensing procedure was liberalised and simplified, in addition to abolition of export prohibition act. Also contained in

the 1986 budget was a policy that allows for 25 per cent retention of export proceeds by exporters. Accompanying these changes were various support services to entrepreneurs engaged in export marketing activities. The intention to establish an Export Credit Guarantee and Insurance Scheme first conceived in 1979 was declared in 1986, while the enabling decree: Export Credit Guarantee and Insurance Corporation (ECGIC) (Decree No. 15) was promulgated two years later. The ECGIC later transformed into Nigeria Export-Import Bank (NEXIM), which commenced business on January 1, 1991. The functions of NEXIM include the provision of finances and credit guarantees for export production and marketing. These roles have been pursued with vigour since the establishment of the bank (Egwaikhide, 1995).

Mid-way into the year (July 1986) some of the existing policies were reviewed. The 25 per cent export proceed retention allowance was raised to 100 per cent with the full operation of the Domiciliary Account Scheme. The following year witnessed the elimination of export taxes, coupled with the creation of Refinancing and Rediscounting Facilities (RRF) to assist those individuals or group engaged in export marketing activities. In 1988, a Duty Draw Back/Suspension Scheme was introduced, for the purpose of effective development. Given these successive policy measures, importation of raw materials, spare parts and other related inputs for manufactured export commodities became duty free, and such inputs were fully exempted from other charges, including indirect taxes. Between 1990 and 1991 the amount budgeted for this scheme increased from ₦10 million to ₦50 million.

In addition, Manufacturing-in-Bond Scheme, which allowed manufacturers of export items to import basic inputs duty-free, was established along with the Foreign Input Facilities (FIF) operating under the Export Stimulation Loan (ESL) scheme, and providing foreign exchange to producers of export products for the importation of essential inputs. The Nigerian Export Processing Zones (NEPZs), which represent an instrument of export-led industrialisation, was established by decree No. 34 of 1991. It

started off with the construction of the Calabar EPZ which has a total area of 208.849 hectares.

LITERATURE REVIEW

Interest in the relationship between exports and growth was inspired by Robertson's (1938) work, which described export as an engine of growth. Edwards (1992) pointed to the fact that countries with open and less distorted trade policies have experienced higher growth rates than those with more distorted trade policies. These countries tend to accumulate knowledge at higher rate and grow faster. Likewise, Collier and Gunning (1997) emphasised the existence of aggregate level evidence of lack of openness as the single most important cause of slow growth. Salvatore and Hatcher (1992) found partial support for the hypothesis that outward orientation leads to more efficient use of resources and growth.

Studies on Sub-Saharan African (SSA) countries, such as Onafowora and Owoye (1998), found that exports significantly impact real output growth in 10 of the 12 countries covered, and concluded that it is possible to stimulate economic growth in SSA countries through outward looking strategy of export expansion. Other empirical evidence on cross-country and country specific studies on relationship between openness and rapid economic growth are summarised in Balassa (1989), Pack (1989), World Bank (1991) and Dornbusch (1992). However, the assertion that trade policy strongly influence growth has equally been challenged by a number of economists. Whereas, there is a consensus on the contribution of trade reforms to export growth, there are doubts as to whether growth in exports stimulates overall economic development. Modern theory of growth yields an ambiguous answer to the question of whether trade liberalisation promotes growth (Rodrik, 2000). Studies such as Tyler (1981), Feder (1982), Helleiner (1986), Singer and Gray (1988), Ahmad and Kwan (1991), Odedokun (1991) and Buffie (1992), conclude that positive association between exports and economic growth does not exist during periods of decrease in world demand, and that some basic level of income is necessary for lower income countries to benefit

from export expansion and outward-oriented policies leading to growth.

The raging controversy on the impact of exports on economic growth has also been addressed in the new generation of growth models which are based on the roles of economies of scale (Romer, 1986), human capital accumulation and endogenous government expenditure policies for basic education and health (Otani and Villanueva, 1989), dynamic comparative advantage in research and development activities (Grossman and Heipman, 1991) and endogenous technological progress (Solow, 1994). These have brought new elements into the analysis of the way in which trade and other national policies affect long-term economic growth (Edwards, 1992); suggesting that there is a long-term relationship between openness and the rate of growth, rather than the level of output.

Recent concern has been on the need for adequate institutional reforms as a back up to trade reforms, if the development impact of it is to be fully realised (Sheahan, 1994; Rodrik, 2000). According to Rodrik (2001), countries had to satisfy a long list of institutional requirements, so that they can, as the cliché goes, maximise the gains and minimise the risks of participating in the world economy. Continuing, he maintained that global integration remained the key prerequisite for economic development, but there was now a lot to it than just throwing the border open; reaping the gains from openness required a full complement of institutional reforms', such as appropriate regulatory framework, enforcement of business laws, established business customs and culture, infrastructure support, and social insurance. Collier and Gunning (1997) pointed out that Africa's slow growth could be explained in terms of variables measuring the environment and institutions. Rodriguez and Rodrik (1999) emphasised the importance of ensuring complementary policy reforms if trade liberalisation is to be associated with growth.

Also, the literature asserts that firms which engage in exports are more productive than firms that do not. There is a positive correlation between exports and productivity growth

(Sjoholm, 1999), in which case firms that participate in the export market are "superior", extra productive, large, more lasting, and pay higher wages than firms that do not (Aw *et. al.,* 1998; Sjoholm, 1999). The two main sources of performance advantage of exporting firms over non-exporting firms are self-selection and learning-by-exporting. In the case of the former, only the most productive firms are able to survive in the highly competitive export markets. The latter is premised on the acquisition of some elements of productivity improvements that arise from knowledge and expertise, which the firm gains as a direct result of its export market experience.

EMPIRICAL MODEL

This paper's empirical model adapts Feder (1982), which specified the following

$$\dot{Y}/Y = \rho \cdot (\dot{A}/Y) + \delta \cdot (I/Y) + \alpha \cdot (\dot{L}/L) + \beta \cdot (\dot{X}/Y) \quad \ldots\ldots 1$$

Where Y is output, I investment and L is labour force, and the dot represents growth of variables. However, while the export sector has externality and higher productivity advantages over the non-export sector, the outputs from different firms that make up the export sector are not homogenous. Thus, the heterogeneity of the export sector would suggest that the term "β" may be non-constant, but would be a function of the composition of exports (Fosu, 1990), so that the beneficial effect of exports on aggregate output may depend on the nature of the export sector. Aggregate exports are therefore decomposed into manufactured and non-manufactured exports with the export coefficient "β" rewritten as:

$$\beta = \beta_1 M + \beta_2 N \quad \ldots\ldots 2$$

where M and N are the respective shares of manufactured exports and non-manufactured exports in total exports, and their

productivities denoted by β_i. Since M+N=1, equation (2) may be rewritten as:

$$\beta = \beta_2 + (\beta_1 - \beta_2)M \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

Assuming total factor productivity is responsive to the state of the existing institutional framework, and incorporating equation (3) into (1) yields:

$$\dot{Y}/Y = \rho\cdot\dot{A}/Y + \delta\cdot(I/Y) + \alpha\cdot(\dot{L}/L) + \beta_2(\dot{X}/Y) + (\beta_1 - \beta_2)[(\dot{X}^m/\dot{X})\cdot(\dot{X}/Y)] \quad \ldots\ldots\ldots 4$$

where the term $\dot{A}$ becomes a vector of institutional variables, and X^m stands for manufactured goods exports.

According to Rodrik (1999), the reality of growth transformations is that they are instigated by an initial set of policy and institutional initiatives, which he termed "investment strategies", the key enabling elements being adequate human resources development, public infrastructure, social peace and stability and a range of policies that include efficient credit management, tax incentives, investment coordination and increased support and supervision of the financial sector.

Representing the growth rate variables in (4) by lower case letters, equation (4) can be rewritten as equation (5) in log form[2] to include an intercept γ_0 and an error term μ. Thus, real output growth (y) measured by the real gross domestic product (GDP) growth is influenced by changes in institutional variables (a), capital growth or investment (k), labour growth (l), total exports growth (x), and manufactured goods exports growth (x^m). It is common practise in economic growth literature to adopt log form specification, since the coefficients are interpreted as indicative of the percentage change (growth) in the dependent variable in response to percentage change in the explanatory variables.

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[2] Attempt was made to estimate another specification form in which the variables' growth series is calculated as "$\mathbf{ga} = (a_t - a_{t-1})/a_{t-1}$". However, the performance of the result of estimated model turned out to be very poor.

$$y_{jt} = \gamma_0 + \gamma_1 a_t + \gamma_2 k_t + \gamma_3 l_t + \gamma_4 x_t + \gamma_5 \log x_{jt}^m + \mu_t \quad \ldots\ldots 5$$

where X_j^m is a vector of exports from manufacturing subsectors, for which separate growth equations were estimated. The theoretical expectation is that the growth rate of real GDP is positively related to investment share of GDP, labour growth, the growth of both the total and manufactured exports' variables and improvement in institutions.

Variable Definitions, Sources of Data and Econometrics Procedure

All variables enter the models in natural log form. Relevant variables are measured as follows: the real output is measured as GDP at 1984 constant prices (RGDP); **a** is a vector of four institutional variables, which are human resources development (HURE) measured as the share of Federal Government expenditure on education and health in GDP; the state of infrastructure (INFR) measured as the share of Federal Government capital expenditure on economic services[3] in GDP. Investment (INVT) is measured as the ratio of gross fixed capital formation to GDP; data on population[4] was used as a proxy for labour force (LAB); total exports (TEXPT) is measured as the share of *fob* values of total exports in GDP, while manufactured exports (x_j^m) are the share of *fob* values of exports of manufacturing subsector j such as food, beverages and tobacco, in GDP. Financial depth was measured as the ratio of real broad money (M2) to real GDP; and the fiscal policy variable was measured as the overall fiscal balance of Federal Government as percentage of GDP. All series were appropriately deflated before they were used for the analysis. The

[3] This includes capital expenditure on such items as provision of electricity, road construction, communication and water supply.

[4] In the absence of data on labour force in most developing countries, population figure is often used as a proxy based on the assumption of a positive association between population and labour growth. Fear is often exercised about data on population exhibiting constant growth, however, the growth of the Nigerian population based on data obtained from the IFS appears not to be constant over the years

nominal GDP obtained was deflated by the GDP deflator, while other variables were appropriately deflated by other indices such as export price index and consumer price index (CPI). The exports' variables were deflated by Nigeria's exports price index proxied by the average of the imports unit value of the major six trading partners of Nigeria namely, United States of America, United Kingdom, France, Germany, Netherlands, and Japan. CPI was used to deflate the rest of the series with the exception of labour.

Data were obtained from the publications of three statistical agencies, IMF's International Financial Statistics CD ROM; CBN's Annual Report and Statement of Accounts, and Statistical Bulletin. Others are the publications of the Federal Office of Statistics, such as Annual Abstract of Statistics, National Accounts of Nigeria, and Nigeria Summary of Trade. Data on the Harmonised System (HS) classification of exports was sourced from the Nigerian Trade Summary, published by FOS, from which exports data for manufacturing subsectors was extracted. Exports data for manufacturing industry were extracted from the FOS' Nigerian summary of trade annual publications for 1965 to 1999. For sectoral analysis, exports from the manufacturing sectors are divided into seven broad subsectors using the HS codes. These subsectors' exports with their sectional codes are Food, Beverages and Tobacco (FBT: 01-04); Mineral, Chemical and Plastic Products (MCPP: 05-07); Leather, Wood and Paper Products (LWPP: 08-10); Textiles and Footwear (TFW: 11 & 12); Ceramic, Precious Stones and Base Metal Products (CPBM: 13-15); Machinery, Electric and Transport Equipment (METE: 16 & 17); and Other Manufactured Products (OMP: 18-20). Details of the components of each subsector are provided in Appendix I. Up to 1995, the Nigerian summary of trade data were published based on the SITC code, while HS code was used for subsequent years from 1996. The SITC codes were mapped into the HS codes for data covering 1965 to 1995, using the HS codes, section and chapter headings' descriptions as a guide.

The econometric analysis in this study is three-fold: test of the existence of static long run equilibrium relationships as

suggested by theory; test of the Granger causality relationship between the growth variable and the export variables; and development of an adequate dynamic model of the short run relationships that could serve as the basis for design and assessment of trade policy. This implies a test of the order of integration of the series and verification of the existence of long run equilibrium relationships via cointegration technique. In order to avoid inappropriate model specification and to reduce the possibility of arriving at misleading results, time series properties of the data were investigated. That is, whether variables of interest were stationary (whether they have a constant mean and a constant finite variance) were tested. A series x_t is said to be integrated of order *d*, denoted as I(*d*), if it must be differenced *d* times before it becomes stationary. Individual series were tested through a unit root test using the Augmented Dickey-Fuller (ADF) statistics applied on the regression:

$$\Delta x_t = \alpha_0 + \lambda x_{t-1} + \alpha t + \sum_{i=2}^{p} \gamma_i \Delta x_{t-i+1} + \varepsilon_t \quad \ldots\ldots 6$$

where *t* is the time trend, *p* is the number of lags, ε_t is a stationary error term. The null hypothesis that x_t is non-stationary is rejected if λ_1 is significantly negative. The number of lags (n) of Δx_t is usually chosen to ensure that regression residual is approximately white noise. What is obtained is DF test when no such lags are required. Table 2 provides unit root test results. All variables are stationary at first difference, that is they are I(1) variables.

Second, the analysis attempts to establish bi-directional relationship among the trade variables, in accordance with concept of causality which enhances the investigation and results. Standard Granger (1986) causality test was employed, which examines the role of past changes in X, in explaining the current variations in Y. A reversed causality direction is determined by experimenting with variables X and Y interchanged, using the following equations:

$$y_i = \sum_{i=1} \alpha_i y_{t-1} + \sum_{i=1} \beta_i x_{t-1} + U_t \quad \ldots\ldots 6a$$

$$x_t = \sum_{i=1} \beta_i x_{t-1} + \sum_{i=1} \alpha_i y_{t-1} + V_t \quad \ldots\ldots 6b$$

to determine whether or not x_t do not Granger cause y_t and vice versa, respectively. The results generally reveal a weak causality from the manufacturing exports' growth variable to GDP growth. Only two out of the seven manufacturing subsectors' exports granger cause economic growth while the total export variable was found to Granger cause GDP growth (Odusola and Akinlo, 1995). On the other hand, economic growth was found to Granger cause growth in five of the manufacturing subsectors' exports growth, in addition to Granger causing growth of the total exports.

Equilibrium Relationships and Cointegration

It should be acknowledged that the long run properties of the variables are lost when the variables are differenced. To test for the long run relationship between the variables we apply the Engle-Granger (1987) two-step cointegration test, which uses the residuals from the long run equation estimated with the non-stationary variables, and then test for the existence of a unit root in the residual using the ADF. The series are cointegrated, if the residual is stationary. The core model which expresses growth as a function of infrastructural facilities, human resources, total exports, investment and labour variables is separately augmented with total manufactured exports and seven manufacturing subsectors' exports variables so as to test for the impact of these on long run growth[5], and cointegration tests applied. The results revealed that long run equilibrium relationships exist between real GDP, the institutional variables, total exports, investment, labour and each of the manufactured exports' subsectors and total manufactured exports in all the growth equations. Also, reported diagnostic tests show

[5] In an earlier estimation, the institutional variables were extended to include measures of state of infrastructural facilities and the level of financial depth. These two variables performed poorly, both in the long run and short run estimates with respect to statistical significance and sign outcomes. Thus, they were dropped in the final analysis

that the estimates generally do not suffer from serial correlation and heteroskedasticity.

There are eight growth equations in all; the first includes total manufactured exports as one of the explanatory variables, while the remaining feature each manufactured exports subsector. The average value of adjusted R^2 around 0.88 is robust. Interpreting Table 2 along the rows, the two institutional variables, infrastructure and human resources have the expected positive sign. The former variable is generally significant at five per cent level, with an average coefficient of 0.15. On the other hand, human resources variable is only significant in three of the growth equations, namely those with Mineral, Chemical and Plastic Products exports; Textiles and Footwear exports; and Other Manufactured Products exports. The non-significance of human resources in many of the equations may be an indication of disproportionate ratio of unskilled labour to skilled labour in the manufacturing sector in the Nigerian economy.

The sign and magnitude of the investment coefficient are within the expected range and conform to a *priori* positive sign in all the growth equations in accordance with neoclassical growth theory. It is statistically significant also, while the coefficients range between 0.44 and 0.52. The labour coefficients are generally greater than unity, except for growth equation augmented by; Ceramic, Precious Stones and Base Metal Products' exports. The signs and statistical significance of the coefficients on the growth of total exports and especially total manufactured goods' exports and its subsectors' components are of particular importance in this paper. The coefficients of the total exports growth are positive and significantly different from zero in all of the growth equations. The total exports elasticities of growth are between the range of 0.23 and 0.31. The finding that exports exert significant positive influence on growth suggests that export-led growth is a feasible strategy for Nigeria, and further lends credence to the existing finding in the literature in this regard.

Table 2: Cointegration Regressions (Dependent variable is log of Real GDP)

	Growth Equation 1	Growth Equation 2	Growth Equation 3	Growth Equation 4	Growth Equation 5	Growth Equation 6	Growth Equation 7	Growth Equation 8
CONSTANT	7.1134* (4.76)	7.1295* (4.63)	6.9255** (4.67)	0.9411* (1.4022)	6.9269* (4.19)	7.7283* (3.55)	6.0777* (3.31)	6.9740* (4.65)
LogINFR	0.1532* (3.30)	0.1530* (3.31)	0.1582* (3.53)	0.1564* (3.27)	0.1499* (3.31)	0.1418* (2.78)	0.1478 (3.35)	0.1622* (3.20)
LogHURE	0.0285 (0.428)	0.0281 (0.425)	0.0509** (2.106)	0.0309 (0.469)	0.0228** (2.048)	0.0141 (0.198)	0.0239 (0.381)	0.036** (1.9.534)
LogINVT	0.4921* (4.58)	0.4910* (4.67)	0.4666* (4.65)	0.4860* (4.99)	0.4771* (4.43)	0.4833 (4.95)	0.4403* (4.04)	0.5195* (4.22)
LogLAB	1.0.235* (3.09)	1.0206* (3.08)	1.0251* (3.12)	1.0566* (2.96)	1.0287* (3.10)	0.9034** (2.03)	1.19564 (3.16)	1.0704* (3.06)
LogTEXPT	0.2465* (2.42)	0.2477* (2.48)	0.2836* (3.80)	0.2496** (1.72)	0.2722* (2.68)	0.2662* (3.77)	0.3056* (3.61)	0.2257* (2.41)
LogTMANX	0.0040 (1.402)							
LogFBT		0.0032** (1.892)						
LogMCPP			-0.0240 (-0.744)					
LogLWPP				0.0095* (1.901)				
LogTFW					-0.0060* (-2.224)			
LogCPBM						-0.0201 (-0.397)		
LogMETE							-0.0201 (-0.907)	
LogOMP								0.0107** (1.993)
A	1.7868 (0.1875)	1.7834 (0.1880)	1.5414 (0.2330)	1.8778 (0.1731)	1.8074 (0.1841)	1.9412 (0.1638)	1.3587 (0.2746)	2.0483 (0.1493)
B	0.7336 (0.3996)	0.7473 (0.3952)	0.8757 (0.3580)	0.6036 (0.4442)	0.8124 (0.3757)	1.0556 (0.3137)	1.6154 (0.2130)	0.6527 (0.4265)
Adj. R^2	0.8802	0.8801	0.8825	0.8805	0.8804	0.8808	0.8836	0.8809
σ	0.1530	0.1530	0.1516	0.1529	0.1529	0.1526	0.1508	0.1526
LL	19.9451	19.94358	20.2811	19.9806	19.97	20..367	20.4458	20.0504
CRDW-stat.	1.7457	1.6406	1.7137	1.6122	1.9283	1.9089	1.9681	1.7522
ADF(1)	-3.947 (2.9528)	-3.949 (-2.9528)	-3.980 (-2.9528)	-3.937 (-2.9228)	-3.951 (-2.9528)	-3.904 (-2.9528)	-4.187 (-2.9528)	-3.865 (-2.9528)

Note: a) t-values are in parentheses. b) * and ** denotes 5 per cent and 10 per cent levels of significance respectively.

σ = Standard error of regression LL= Maximum of Log-likelihood;

A = Lagrange multiplier test of residual serial correlation B = Heteroscedasticity test

Food, Beverages and Tobacco exports; Leather, Wood and Paper Products exports; and Other Manufactured Products exports indicate positive influence on economic growth, their coefficients are significant at five per cent and ten per cent levels. The coefficients of the other manufacturing subsectors are negative and insignificant, except for Textiles and Footwear exports.

Short Run Dynamic Relationships: The Error-Correction Model (ECM)

Given the strong evidence of cointegration among the variables in all the reported cointegration regressions in Table 2, we present the corresponding short run dynamic models to each of these static long run equations. The general over-parameterised short run dynamic growth equation is of the form:

$$\Delta y_{jt} = \alpha_0 + \sum_{i=1}^{2} \alpha_{1i} \Delta y_{t-i} + \sum_{i=0}^{2} \alpha_{2i} \Delta a_{t-i} + \sum_{i=0}^{2} \alpha_{3i} \Delta k_{t-i} + \sum_{i=0}^{2} \alpha_{4i} \Delta x_{t-i} + \sum_{i=0}^{2} \alpha_{5i} \Delta x_{t-i}^{mj} + \alpha_6 EC_{t-1} + \mu_t \ldots 7$$

where the lower case letters represent the growth of the variables[6], with the inclusion of two-period lags, y_t is the rate of growth of real GDP, "*a*" represents the two institutional variables (infrastructural facilities and human resources), *k* stands for real investment share of real GDP, "x" denotes total real exports share of real GDP, while x^{mj} is the proportion of j^{th} manufactured exports in real terms to real GDP. EC_{t-1} is the error correction term (lagged one period); μ_t is zero mean white noise error term.

The results of the parsimonious short run dynamic growth equations are presented in Table 3. The diagnostic statistics show that the models generally explain large proportion of the variations in economic growth in Nigeria. The adjusted R^2 values range from 0.94 to 0.97. The adjusted-R^2 values, coupled with the small values of standard errors (ranging between 0.05 and 0.11, suggest that the models fit the data quite well. The statistical fit of the short run dynamic reduced form equations for economic growth appears to be good as indicated by the F-values. As expected, the coefficients

[6] Note that the variables are scaled by output (Y), i.e. the variables are expressed as share of GDP.

of the error correction term (EC_{t-1}) have negative signs, and more importantly, they are statistically significant at five per cent level. This confirms the appropriateness of the error correction approach framework and that ignoring the long run equilibrium relationship is detrimental. All the growth equations were tested for serial correlation, mis-specification errors and heteroscedasticity using the Breusch-Godfrey Serial Correlation, Ramsey's RESET functional form mis-specification, and the Auto Regressive Conditional Heteroskedasticity (ARCH) LM tests. The probability values reported along with the results in Table 3 showed the absence of autocorrelation and heteroskedasticity.

The role of institutional framework in attainment of economic growth, as represented by the infrastructural facilities and human resources variables appears to be crucial for Nigeria. The two variables are generally statistically significant either at five per cent or ten per cent confidence level, though with mixed signs of the coefficient. The *a priori* positive influence of current investment on growth in the short run is confirmed in all the growth equations, with strong statistical significance and positive coefficient of over 0.40 in general. The positive relationship between labour force and economic growth was also confirmed by our short run estimates. The labour force variable up to one lag has positive coefficient and significantly different from zero, except for the growth equation augmented by other manufacturing subsectors' exports.

The export-led growth assertion obtained in the long run analysis is further confirmed by the short run analysis, howbeit limited to only the current period series. The coefficients of the export variable at zero lag has positive *a priori* sign, and are significantly different from zero at five per cent level. The coefficient ranged from 0.25 to 0.35. Traces of positive influence of the manufacturing subsector's exports on growth of output in the short run is found in four of the growth equations augmented

Table 3: Short-run Dynamic Models of Manufactured Exports and Growth (Dependent variable is Δ^2LogRGDP)

Δ^2LogRGDP$_t$	Equation 1.	Equation 2.	Equation 3.	Equation 4.	Equation 5 ****	Equation 6.	Equation 7.	Equation 8.
Const	0 02353 (1 10)	-0 0105 (-0.415)	0 0176 (0 746)	0.0066(0.401)	0 0235 (0.967)	0 0196 (-0 967)	0.0779*(3.66)	-0 0041 (-0 186)
ΔlogRGDP$_{t-1}$		0 4221*(2.54)	0.4999*(2 53)	0 3818*(2 49)	0 5053*(2 47)	0.2453**(-1 86)	0.3223*(2.81)	0 3828*(2 90)
ΔlogRGDP$_{t-2}$		0.4351* (2 52)						
ΔlogINFR	0 1133*(2 98)	-0 0807**(-1 97)	0 0871** (2 03)	-0.1200* (-3.74)	0 0938* (2 15)	-0.1348* (-3 48)	-0 0848* (-2 96)	-0 1712*(-4 23)
ΔlogINFR$_{t-1}$		0 2702*(-3.6476)	0 0941** (1 75)	0 0926*(2 12)	0.0949 (1 70)		0.1171*(3.36)	
ΔlogINFR$_{t-2}$	-0 1125*(-2 96)		-0.0679** (-1 81)	-0 0994* (-3 22)	-0 0610 (-1 67)	0 1021* (2 64)	-0.0941* (-2.90)	
ΔlogHURE	0 0895** (2.00)		0.1492* (2 65)	0 0631 (1.60)	0 1351 *(2.53)	0.1439*(2.87)	0.1567*(4.26)	0 1781*(4 08)
ΔlogHURE$_{t-1}$		-0.0944 (-1 47)						
ΔlogHURE$_{t-2}$							-0 0580 (-1 51)	
ΔlogINVT	0 4062* (5 15)	0 4616* (5.33)	0.2884*(3.4830)	0 4564* (7 06)	0 4215* (4 46)	0 4848* (6.24)	0 4026*(6 51)	0 4590*(6 48)
ΔlogINVT$_{t-1}$		-0 2772*(-2 26)	-0.2809*(-3.8938)	-0.1745**(1 72)	-0 1767 (-1.28)			
ΔlogINVT$_{t-2}$	0.1977* (2 26)		-0.0996**(-1.8844)	0.2811*(3.32)		0.1499**(1.81)		
ΔlogLAB$_t$		1.1982**(1.82)					-0.7605**(-1 80)	1 2931*(2.53)
ΔlogLAB$_{t-1}$	0.8103** (1.72)		1.0373**(1.92)	1 3268* (3 44)	0.8838 (1 66)	0.7409 (1.47)		
ΔlogLAB$_{t-2}$			-0 7714 (-1.45)		-0.7564 (-1 41)		-0.9394*(-2 31)	
ΔlogTEXPT	0.3529* (6.70)	0.3190*(4 88)	0 3520*(5.52)	0.3170* (6 86)	0.3481* (5.04)	0.2839* (4.98)	0.3156*(7 16)	0.2585* (5.14)
ΔlogTEXPT$_{t-1}$			-0.2129* (-2 60)	-0 1026*(-1 70)	-0 2039* (-2.28)	-0.1851* (-2 64)	-0 3199* (-4 51)	0 2224*(3 21)
ΔlogTEXPT$_{t-2}$	-0 4134** (-2 08)	-0.1393**(-1.77)	-0 1406** (-2.09)	0.2200* (4 26)	-0 1530*(-2 28)	-0.1217**(-2 01)	0.0960 (-1 63)	-0.1119** (-1.98)
ΔlogTMANX$_{t-1}$	-0.0857 **(-1 98)							
ΔlogFBT		0.1258*(2.43)						
ΔlogFBT$_{t-1}$		-0.0823 (-1 42)						
ΔlogMCPP$_{t-1}$			-0 03417 (-0 899)					
ΔlogLWPP$_{t-1}$				0.0995*(4 24)				
ΔlogTFW$_{t-1}$					-0.0242 (-0 653)			
ΔlogCPBM$_{t-2}$						-0.0882**(-1 86)		
ΔlogMETE							0.0652* (2.90)	
ΔlogMETE$_{t-1}$							0.0680*(2.61)	
ΔlogMETE$_{t-2}$							-0.0732* (-3.66)	
ΔlogOMP								0 0984*(3.49)
ECM$_{t-1}$	-0.5565*(-3.89)	-0.9408*(-4 51)	-0.8678*(-4 05)	-0.8884*(-5 29)	-0 8778* (-4 16)	-0.6947*(-4 57)	-0 6756*(-5.24)	-0.6073*(-4 24)
Adj R^2	0.9462	0.9504	0.9553	0.9749	0.9528	0.9544	0.9794	0 9501
σ	0.1050	0.1089	0.1063	0.0797	0.1093	0.1017	0.0769	0 1011
DW	1.61	1.64	1.72	1.57	1.68	1.6759	2.13	2.07
AIC	-4.2407	-4.1358	-4.9494	-4.7534	-4 1220	-4.2807	-4.8264	-4 3162
A	2 3602(0.12150)	1.0246(0.3813)	1 6199(0.2307)	1.8365(0.1934)	1 9606 (0.1752)	1.9078(0.1789)	0.2972(0.7478)	1.0759(0.3609)
B	0.7999 (0.3818)	0.1884(0.6697)	0.3519(0.5613)	0.4025(0 5348)	0 1991(0.6614)	0.1438(0.7089)	0.0724(0.7918)	0.8361(0 3714)
C	0.0840(0.7751)	0.1884(0.6697)	0.0611(0.8081)	0 02127(0.9118)	0 0029(0.9579)	1 6693(0.2136)	1.0010(0 3353)	0 0753(0 7868)

Note: a) t-values are in parentheses; b) * and ** denotes 5% and 10% levels of significance respectively. σ = Standard error of regression

A = Lagrange multiplier test of residual serial correlation; B = Ramsey's RESET test for functional form misspecification;

C = Langrage Multiplier Autoregressive Conditional Heteroscedasticity (ARCH) tests

by Food, Beverages and Tobacco exports; Leather, Wood and Paper Products exports; Machinery, Electric and Transport Equipment exports; and Other Manufactured Products exports; and significant at five per cent level. The existence of positive relationship may be an indication of possibility of some manufacturing goods' exports being used as a strategy to support growth policies. While the remaining four growth equations have negative coefficients, and are generally not significantly different from zero, two of the growth equations with positive coefficients coexist with negative signs at different lags. The negative signs in some of the growth equations may not be unexpected, considering the non-causal relationship between these variables and economic growth variables. More so, the result may primarily be due to the very small share of manufactured goods exports in total exports or the high dependence of manufacturing sector on imported raw materials, intermediate inputs, and capital goods.

CONCLUSION

This paper examined the impact of total and subsectoral manufacturing exports on economic growth in Nigeria, using annual data from the period 1965 to 1999. The export-led growth hypothesis with emphasis on manufactured goods exports is tested by developing and estimating long run and short run dynamic models. The findings generally uphold the theoretical assertion of positive association between economic growth and investment and labour as well as aggregate exports as engine of growth. Generally, both investment and labour were found to stimulate economic growth in the long and short runs.

The import of high quality institutions in shaping economic performance appears to be applicable to the growth process in Nigeria as the two measures of institutional variables, infrastructural facilities and human resources, turn out with robust results. The former appear to have a stronger impact on economic growth in Nigeria, as it was found to be consistently positive and statistically significant in the long run and as well in most of the short run equations. The human resources variable, to a great

extent, exhibits long-term impact on growth, though not significant in some growth equations.

Manufactured goods' exports and its components, which are the focus of this paper, have positive and statistically significant coefficients in three of the sub-manufactured exports augmented equations, namely; Food, Beverages and Tobacco; Leather, Wood and Paper Products; and Other Manufactured Products. The remaining five growth equations have negative coefficients, with most not being significant. This outcome is suggestive of a reflection of the rather very small share of manufactured goods' exports in the Nigeria's total exports, and a further confirmation of non-existence of causality relationship between these manufacturing exports' subsector variables with the growth variables.

The empirical evidence from the short run dynamic models reveals that both infrastructural facilities and human resources variables consistently have positive effects on economic growth, though not significant in some cases for human resources variable. Investment and labour force also have positive and significant influence on short run growth. The influence of three manufactured goods' subsectors exports turned out to be negative, and significant perhaps because of import dependence which constitutes a leakage form the economy. Generally however, the result of the effect of manufactured exports and institutional reforms on real economic growth are consistent with the predictions of exports promotion hypothesis. Hence, it needs be noted, that one of the mechanisms through which manufactured exports influence growth is via its multiplier effects, namely its extended backward and forward linkages with other sectors of the economy. Policy measures that enhance the growth of these categories of exports over time have the potential of significantly stimulating economic growth in Nigeria.

The observed close relationships among growth rates of real output, aggregate and manufactured exports, investment and institutional changes imply that economic growth in Nigeria can be enhanced through trade policy that supports export expansion, with

increased emphasis on manufactured exports since the country stands to gain from this policy stance. Similarly, appropriate institutional reforms are crucial to provide the required support for trade policy reforms to be beneficial to the growth of the economy. One policy issue here is that placing trade policy in its right perspective requires giving consideration to appropriate institutional settings as a prerequisite export expansion for better economic performance.

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Appendix 1: Variable Definitions

- FBT: Manufactured exports from Food, Beverages and Tobacco Subsector (Manufactured exports within 01-04 sections, and 01-24 Chapters of Exports Classified by Harmonised System).
- MCPP: Manufactured exports from Mineral, Chemical and Plastic Products Subsector (Manufactured exports within 05-07 sections, and 25-40 Chapters of Exports Classified by Harmonised System).
- LWPP: Manufactured exports from Leather, Wood and Paper Products Subsector (Manufactured exports within 08-10 sections, and 41-49 Chapters of Exports Classified by Harmonised System).
- TFW: Manufactured exports from Textiles and Footwear Subsector (Manufactured exports within 11-12 sections, and 50-67 Chapters of Exports Classified by Harmonised System).
- CPBM: Manufactured exports from Ceramic, Precious Stones and Base Metal Products Subsector (Manufactured exports within 13-15 sections, and 68-83 Chapters of Exports Classified by Harmonised System).
- METE: Manufactured exports from Machinery, Electric and Transport Equipment Subsector (Manufactured exports within 16-17 sections, and 84-89 Chapters of Exports Classified by Harmonised System).
- OMP: Exports from Other Manufactured Products Subsectors (Manufactured exports within 18-20 sections, and 90-96 Chapters of Exports Classified by Harmonised System).
- RPCGDP: Real per capita GDP
- FISC: Fiscal Balance (Fiscal balance as percentage of GDP)
- FIND: Financial Depth (Broad money (M2) as percentage of GDP)
- INFR: Infrastructure (Federal Government Capital Expenditure on social services as percentage of GDP)
- HURE: Human Resources (Federal Government expenditure on education and health as percentage of GDP).
- TEXPT: Total Exports (Real total exports of goods as percentage of real GDP)
- INVT: Investment (Real gross capital formation as percentage of real GDP).
- TMANX: Total Manufactured Exports (Total manufactured exports as percentage of GDP).
- Note: Data for all the manufacturing subsectors' exports were expressed as percentage of GDP).