TRADE POLICY AND PERFORMANCE OF EXPORT MANUFACTURING INDUSTRIES IN NIGERIA

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DECLARATION A

I declare that this dissertation is my original work and has not been presented to any University or Institution of higher learning for a degree or any other academic award

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DECLARATION B

We confirm that the work reported in this dissertation has been carried out by the candidate under our supervision.

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Signature and date

Name of supervisor 2

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Signature and date

DEDICATION

To God be the glory for things he has done. This dissertation is wholeheartedly dedicated to Almighty God for what he is today and forever more in my life.

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ABSTRACT

This study examines the impact of trade policy and performance of export manufacturing industries in Nigeria. It adopts time series data on a number of policy variables to determine their impacts on the manufacture exports as well as their significance or otherwise in stimulating export in Nigeria. In specific term, it also (a) identify the major determinants of manufacture exports in Nigeria, (b) determine the causal relationship existing between manufacture exports and trade policy (i) Openness, (ii) exchange rate, (iii) average tariff rates and (iv) capacity utilization in Nigeria. (c) determine the effect of trade policies on performance of the manufacturing industries of Nigerian economy pre – structural adjusted programme (SAP) and lastly to determine the effect of trade policies on performance of the manufacturing industries on Nigerian economy post structural adjustment programme (SAP). Empirical analysis of the data from 1970 to 2014 using co-integration analysis, ordinary least square (OLS), Vector autoregressive (VAR) model, unit root tests, cross correlation, Engle Granger co-integration test; Johansen's test for co integration and granger co-integration test, have produced interesting results. Specifically, all the results have ultimately confirmed that there is, indeed a long-run and significant relationship among manufacture exports, trade openness, exchange rate, average tariff rates and capacity utilization. However, in the short-run, manufacture exports in Nigeria respond to current trade openness, current exchange rate and the first and third lags of itself. Finally, the results show that there is a long run co-integrating relationship between the variables. This implies that in the long run, trade policies have impact on manufactured exports in Nigeria. In conclusion it is also recommended that there is urgent need to diversify the economy away from single commodity oil; given the uncertainties in the world oil market, adopt policies that will ensure greater market access for the country's manufacture exports as well as boosting their competitiveness at the international market. These could be achieved through the adoption of trade and exchange rate liberalization policies that are devoid of control and regulations and lastly, policy option to moderate import liberalization in order to reap the benefit of a positively related and significant exchange rate variable with manufacture exports within the framework of market determined exchange rate.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

In order to promote economic growth and development, past and present governments in Nigeria since independence in 1960 have been quite consistent, at least in theory, through an expression in annual budgets in pursuance of industrial based policies. Starting from the Import Substitution Industrialization (ISI) policy of the development of export oriented industries in the 1980s; the momentum has not subsided at the policy of development level. (Adenikinju, 2002).

Various policy measures were adopted to ameliorate the economy situation, such as the stabilization measures of 1982, the restrictive monetary policy and stringent exchange control measure of 1984, all proved abortive. This led to the introduction of the Structural Adjustment Programme (SAP) in 1986 (CBN, 2012). One of the main reasons for the introduction of SAP was to reduce the high dependence of the economy on crude oil as the major foreign earner, by promoting non-oil exports particularly manufactured goods. But the contribution of the manufacturing sub-sector to the GDP has declined steadily, due to a number of factors, from 8.72%, between 1980 – 1990 to 7.62% between 1990–1995 and to 6.12% in 2012 CBN (2014) and Olorunfemi *et al* (2013).

Despite the implementation of four development plans from 1962 - 1985 as well as rolling plans that come with (SAP) in 1986 through the 1990's to propel economic growth and quicken the achievement of structural transformation and diversification, the industrial sector of the Nigerians economy has not been transformed to reflect the objective of the sector. (Adewuyi, 2006). It still requires a radical structural transformation from its current role of mere assembly of imported components to an integral industry with the domestic economy as its base and propeller. The restructuring of the base of an economy is essentially meant to boost gross national output: substantially increase in the economy's capacity for export, promotes small scale industrialization, improve technological skills and capacity, increase value added via greater utilization of local raw materials and intermediate goods, attract foreign investment and reduce its independence on foreign technology; when these challenges are overcome, country is said to join the league of industrialized nations (Adenikinju, 2002).

In the last decade there have been sweeping changes in the attitude of policy makers towards manufacturing in Africa. Policy rhetoric now focuses on the need for firms to compete and the role of industrial policy is seen to promote the effectiveness of firms in such competition. Such a policy stand in stark contrary to the long history in Africa of protection of its manufacturing sector by means of tariffs and non tariff barriers to imports so that domestic industry did not need to compete internationally (Soderbom, 2003).

Also, marginalisation of Africa in world trade has generated a great deal of attention. Early evidence from a World Bank programme of research in the mid-1990s showed that Sub Saharan Africa's (SSA) share of world trade declined dramatically from more than 3 percent in the 1950s to less than 1 percent in the early 1990s (Ng and Yeats, 1996). Africa's share of manufacturing trade and production has also declined dramatically. Estimates from the UNCTAD Trade and Development Report (2006) using different data show a decline in Africa's share of world manufactured exports from 5.4 percent in 1980 to just 2 percent in 2003. Finally, unlike other developing country regions, especially Asia, Africa has been characterised by an inability to diversify into new high value-added, dynamic products (Lall, 2005). As a consequence, many African countries remain highly dependent on a very narrow range of primary products for export earnings, a reality that leaves them highly susceptible to terms-of-trade shocks.

The sources of Africa's decline in world trade are widely debated. These include a comparative advantage in primary products (Wood and Mayer, 2001), high domestic barriers to international trade (Ng and Yeats, 1996), inadequate income growth and poor geography (Rodrik, 1997) and high transport costs associated with poor infrastructure (Venables & Limão, 2001; Elbadawi, 2001; Djankov *et al*., 2004). More recently, the focus has shifted towards the relatively weak institutional policy and regulatory environment in Africa (Clarke, 2005; Eiffert et al., 2005). Collier and Gunning (1999), for example, argue that distorted product and credit markets, high risk, inadequate social capital, inadequate infrastructure and poor public services are key factors inhibiting investment responses by African firms to opportunities.

The critical role of manufacturing sub-sector is predicted on the fact that it acts as an engine of growth by broadening the productive and export base of the economy reducing unemployment and stemming rural-urban drift as well as helping to reduce poverty. This is coming on the hills of declining terms of trade faced by primary products on the world market as trade in non-primary products constitute the most dynamic path of world merchandise trade (Afangideh, 2003).

1.1. Background of the Study

Improvements in export performance following trade liberalization have been limited in most African countries. Indeed, as a proportion of Gross Domestic Product (GDP), exports in Africa increased by only 10 per cent following liberalization. In comparison, non-African developing countries saw their exports as a share of GDP increase by 62 per cent. The increase in exports was also smaller than the increase in imports, leaving the trade balance in Africa in a worse situation after liberalization. (Adewuyi, 2006).

Econometric analysis undertaken to estimate the specific effect of liberalization on exports suggests that, other things being equal, liberalized African countries have export-to-GDP ratios that are 9.5 % higher than those of non-liberalized ones. The effect of trade liberalization on the ratio of exports to GDP in Africa appears to be higher than in other developing countries, where trade liberalization led to a 5 % increase in the ratio of exports to GDP. (Adewuyi, 2006). The difference between this result and the descriptive statistics discussed earlier is due to the fact that the econometric model attempts to attribute causality to different factors determining trade performance. Indeed, weak export momentum and inappropriate domestic policies appear to be the main factors explaining this difference. Africa seems less able to maintain its export market share than its competitors from other developing regions. Out of one percentage point of GDP in exports in a given year, African countries are able to keep 0.78 of a percentage point of GDP the following year, as a result of the lower momentum effect. This is lower than in other developing countries where the ratio is 0.87, other things being equal.

Moreover, domestic policies, proxied by the changes in the real effective exchange rate (which incorporate currency overvaluations), have the highest negative effect on exports in Africa relative to other developing regions. (Adewuyi, 2006). In absolute value terms, exports increased by 12 % per annum on average over the period 1995–2006 in Africa. This increase is slightly larger than that observed for all developing countries over the same period. When the increase in value is disaggregated between volume and price effects, however, it appears that this is mainly due to rising world prices for African exports over the last few years. Indeed, export volumes grew by a yearly average of only 6 % over the period, which is lower than the comparable figures for world and developing-country exports (6.5 % and 9 %, respectively). If export unit prices are considered, however, it appears that African exports have benefited from rising prices to a much higher degree than other regions. This suggests that African exports continue to grow at a lower rate than other regions in volume terms and that it is only the rising prices of fuels, minerals and other primary commodities since 2002 that have maintained African export value growth at a level comparable with other developing regions.

The trade structure of African countries did not undergo significant changes in the years following trade liberalization. Most countries in the region remain essentially primary commodity exporters, with only a handful of countries drawing a significant part of their export revenue from manufactured products. In comparative terms, sub-Saharan Africa remains the region with the highest dependence on primary commodity exports. It also appears that export concentration has increased in the years following trade liberalization, strengthening Africa's standing as the region with the highest concentration of exports. (Adenikinju and Olofin, 2000).

Table 1.1: Direction of Nigeria's Exports, 1960 to 2010 in percentage

	1960	1965	1970	1975	1980	1985	1990	1995	1996	2010
America	9.4	9.8	11.47	28.98	47.9	37.5	53.4	49.8	43	50.8
Europe	78.8	76.8	76.82	49.32	49.2	60.7	44.6	36.1	42.8	23.5
Asia	1.5	1.2	0.77	3.49	0.9	0.5	0.8	12.7	8	18.4
Africa	2.6	1.4	3.93	2.57	2	1.2	1.2	1.4	5.7	7.2
Others	7.7	10.8	7.01	15.63	-	-	-	-	0.5	0.1
	100	100	100	100	100	100	100	100	100	100

Source: Ogunkola and Oyejide(2003), updated by the researcher, 2016.

Table 1.2: Direction of Oil and Non-oil Exports of Nigeria, 1980 - 2010 in %

	1980		1995		2010	
	Oil	Non-oil	Oil	Non-oil	Oil	Non-oil
Africa	2.8	3.4	7	14	7.2	Na
Asia	0.4	1.5	8	2	18.4	Na
America	59.5	12.7	55	12	50.8	Na
Europe	37.3	82.2	30	73	23.5	Na
Others	0	0.2	0	0	0.1	Na

Source: CBN (2010), Ogunkola and Oyejide, (2003)

Direction

The increasing diversification of Nigeria's export market is revealed in table 1.1. Gradually, Nigeria's export markets have expanded from its concentration in European to include America and, to a lesser (but increasing) extent, Africa and Asia. Throughout the 1960s and up to the early 1970s, the bulk of the market for Nigeria's exports was provided by Europe, which accounted for about 79 %. However, this figure has dropped since 1975 as Europe has only been providing 45 % of the market. Specifically, the share of Nigeria's exports to America increased gradually from about 9 % in 1960 to about 48 % in 1980. Apart from 1985 when America's share was 37.5 %, America has continued to account for up to 49 % of market for Nigeria's exports except in 1996 when it provided 43 %. The share of Nigeria's exports going to Asia has also increased from about 1.5 % in 1960 to about 8 % in 1995 and to 18.4 % in 2010. In the same vein, the share of Nigeria's exports to the rest of Africa has increased from about 2.6 % in 1960 to about 5.7 % in 1995 and 7.2 % in 2010.

The direction of oil and non-oil exports of Nigeria, 1980 - 1995 is presented in table 1.2. It shows that Africa's share in the market for both Nigeria's oil and non-oil exports have increased. In 1980, America accounted for 59.5 % of Nigeria's oil export while Europe provided the largest market for Nigeria's non-oil export accounting for 82.2 %. The same trend was observed for the two major classes of export up till 2010 although the value for non-oil export was not available. However, from about 2.8 % in 1980, the share of Nigerian oil export destined to African market increase to 7 % in 1995 and to 7.2 % in 2010. In the same manner, African's share in Nigeria's non-oil exports increased from about 3.4 % in 1980 to about 14 % in 1995. The share of Asia in non-oil exports remained virtually constant, at 1.5 % and 2.0 % in 1980 and 1995 respectively, but Asia's share of oil exports increased significantly from about 0.4 % in 1980 to about 8 % in 1995 and 18.4 % in 2010. Similarly, though America's share in Nigeria's non-oil exports market is still high, it however, declined slightly from about 12.7 % in 1980 to about 12%

in 1995. The share of Nigeria's oil exports to European market declined marginally from about 37.3 % in 1980 to about 30 % in 1995 before declining to 23.5 % in 2010. The share of non-oil exports to the same European market declined from about 82.2 % in 1980 to 73 % in 1995.

Finally, America, regardless of the changes noted above, still dominate Nigeria's oil market export (59.5 % in 1980; 55 % in 1995 and 50.8 % in 2010). However, for the non-oil market, Europe is still dominating (82.2 % in l980, 73 % in 1995). The trend observed above could have been accounted for by some factors. The outstanding among these factors could be the relative market access conditions (tariff and non-tariff measures) as guaranteed in the Lome Conventions in which most exports from ACP countries enter EU market duty free and the ACP countries are not under any obligation to reciprocate.

Overall, it appears that the expectations of the advocates of trade liberalization policies have not been met in most African countries. It was expected that by removing the barriers to trade, production for exports would automatically increase in response to new incentives. It is now clear that barriers to trade were only one of the many factors constraining African manufacture exports, and that the issues plaguing the production side and the global market structure will need to be addressed before there can be any large increase in manufacture exports from Africa.

Manufacturing exports represent a negligible proportion of GDP in most African countries. Indeed, in the period 2000–2006, only eight African countries (South Africa, Nigeria, Angola, Algeria, Egypt, Morocco, Libya and Tunisia) had manufacturing exports worth 10 per cent of GDP or more. As a result, Africa is the region in which manufacturing represents the lowest share of total merchandise exports. Furthermore, a handful of middle-income African countries account for the quasi-totality of African manufacturing exports. In global terms, Africa plays a minor role in manufactured exports. (Olorunfemi, 2013)

Above all, the low level of manufacturing exports reflects the small size of the manufacturing sector in most African economies. The level of manufacturing in the economy has not increased noticeably in Africa since trade liberalization. If anything, there has been a slightly downward trend in the ratio of manufacturing value-added to GDP in the years following liberalization.

To explain the poor response of the manufacturing sector to the opportunities created by trade liberalization, it is important to examine the constraints that manufacturing firms in Africa face and that prevent them from expanding and branching into production for exports.

One of the key elements preventing African manufacturing firms from becoming successful exporters is their low level of competitiveness as compared with firms in other regions. Indeed, the costs of production in African countries tend to be considerably higher than those in other regions. Studies by Adenikinju, (1995) suggest that the main determinant of the difference in productivity is the high cost of raw materials and low level of infrastructural development in Africa, although allocate inefficiency also plays a role. Non-labour costs such as the cost of credit, transport and indirect costs are also higher in Africa than in major developing countries exporting manufactured products. Hence, low competitiveness has prevented African firms from moving into exporting. As a result, these firms have not been able to benefit from the "learning from exporting" effect that can lead to productivity gains of up to 50 per cent in the long term.

Before Nigeria's independence in 1960, the predominant economic activities were agricultural production and marketing of imported goods. Early manufacturing activities predating independence were restricted to semi-processing of primary agricultural products as adjuncts to the trading activities of foreign companies in Nigeria. The agro-based manufacturing units that were established included vegetable oil extraction and refining plants, starch making, tobacco processing, pottery, raffia crafts, mat making, wood carving and saw milling. Textiles, breweries, cement, rubber processing, plastic products, brick making and pre-stressed concrete products, followed them. The private indigenous entrepreneurs relied on crude technologies for the production of light consumer goods in the small scale and cottage units that were scattered across the country. At the outset, domestic investment capital was very small and the indigenous private investors interested in large returns were pre-occupied with trading, transport and construction businesses. They lacked the technical know-how required in manufacturing activities. In fact, the share of manufacturing value-added in the Gross Domestic

Products (GDP) was only 3.2 % in 1960 (CBN, 2000). The erstwhile colonial administration besides the construction of roads, generation of electricity in regional capitals and maintenance of law and order to create a conducive environment for trade, did not initiate any particular industrial policy to promote industrial development in the country. (Afangideh, 2003)

However, post independent Nigeria came with it the evolvement of national development plans, later substituted by the three-year national rolling plans within the context of the (SAP), which provided the conceptual framework for the development objectives, strategies for industrialization, government participation in the process of industrialization, and the fiscal and related policies for influencing industrial development. The principal characteristics and set goals of the development plans, as in other developing economies, include among others, the desire to lay an enduring foundation for future expansion of the productive capacity of the economy, achievement of high economic growth through increase in the share of manufacturing value-added (MVA), increase in export of manufactures, diversification of industrial activities and improvement in the standard of living of Nigerians. The plan also sought to re-orientate the Nigerian entrepreneurs away from trading into manufacturing and processing activities as well as promotes even development of the country through industrial dispersal.(Afangideh, 2003)

Specifically, the first National Development Plan (1962 - 68) was prepared and executed with the aid of foreign investments. Actually, import substitution industrialization strategies were adopted with the aim of encouraging technological development, reduction in the volume of imports and encouraging foreign exchange savings by producing locally some of the imported consumer goods. The period saw the establishment of large scale capital intensive and import substituting light industry and assembly-related manufacturing ventures. The Second National Development Plan (1970- 74) witnessed the advent of the oil boom. With huge oil revenue, there was direct government investment in industrial projects, as emphasis shifted to the establishment of import substituting heavy industrial projects such as the steel, petrochemical and petroleum refineries, fertilizer, pulp and paper plants, machine tools and sugar refineries. This was aimed at catalyzing the development of a more diversified and integrated industrial base, essentially to supply basic intermediate and capital goods to the downstream industries.(Afangideh, 2003)

In the Second National Development Plan period, the promotion of indigenous participation in industrial activities became one of the prominent policy instruments designed to encourage industrial development. The implementation of the Nigeria Enterprises Promotion Decree, otherwise called the Indigenization Decree of 1972 and subsequent amendment in 1977, led to divesture of foreign equity holdings and expansion of domestic private investment in the modern sector of the economy through acquisition of existing industrial equity shares. Schedule I of the 1972 Decree listed enterprises exclusively reserved for Nigerians while schedule II listed enterprises in which Nigerians must have at least 40 % share. However, the amendment of the 1972 Decree, the 1977

Decree was more liberal to foreign investors in those activities in which indigenous capability was inadequate.(Afangideh, 2003)

The Third National Development Plan (1975-1980) witnessed increased government role in providing infrastructural facilities and ensuring conducive investment climate while emphasis on heavy industries was upheld. Government contributed N5.3billion or 72.7 % of total investment devoted to industry during the plan period.(Afangideh, 2003).

During the Fourth National Development Plan period (1981- 85), greater emphasis was put on self-sufficiency through increased domestic resource content of industrial production, given the oil burst and the crash of crude oil prices. The fall in crude oil prices resulted in acute shortage of foreign exchange to procure required industrial raw materials and spare parts. The outcome was the fall in the manufacturing capacity utilization, worsened rate of unemployment and deterioration of infrastructure facilities. The consequence of all these was a depressed standard of living of the citizenry.

A response to this state of affairs was the implementation of economic reform programme, including stabilization measures in 1982 and the introduction of (SAP) in July 1986 as well as the adoption of a 3-year National Rolling Plan. The SAP laid emphasis on diversification of the productive base, exports orientation and increased domestic sourcing of inputs through monetary and fiscal incentives. As part of the reforms, the direct involvement of government in productive activities was to be reduced through the privatization and commercialization programmes. Essentially, SAP was designed to boost private sector participation in productive activities with more reliance on market forces and the price mechanism.

As a further step to enhancing the growth and development of the economy and with the advent of globalization, which has resulted in the integration of national economies, Nigeria joined the World Trade Organization (WTO) in 1995 to provide the needed impetus to her export expansion drive by providing a forum for multilateral trade negotiations, and implementing and enforcing trade agreements.

Composition: The manufacturing sub-sector in Nigeria is comprised of a wide range of industrial activities, which include large to medium and small scale manufacturing enterprises as well as cottage and handicraft units in the informal sector, using simple technology. Majority of the large, medium and small-scale enterprises producing consumer goods are owned by the private sector.

A variety of products produced include food, beverages, textiles, wearing apparels, plastics, rubber products, soap and detergents, wooden and metal furniture, chemicals, tyres, tubes and leather products. The consumer goods industries dominate manufacturing activities, accounting for about 70 and 75 % of value-added and employment in the manufacturing sub-sector, respectively. In terms of relative sizes, the bulk (about 65.2 %) are the small scale and micro-industries while the medium and large scale industries represent 31.3 % and 3.5 % of total manufacturing units, respectively. The cottage and handicrafts enterprises engage largely in the production of weaving apparel, light processing of foodstuffs and pottery making. The large-scale capital-intensive manufacturing enterprises include the publicly owned core industrial projects, which produce basic inputs for the downstream industries. The capital goods industries consisting of machinery and electrical equipment are few (CBN, 2000).

Private sector investment remains concentrated in the consumer goods enterprises and has grown faster than the intermediate and capital goods industries because of its relatively simple technology and lower capital investment required for establishment. Large foreign corporations and indigenous firms were involved in the sponsorship of most of the intermediate and consumer goods manufacturing units. The sole proprietorships accounted for 74.5 % of total manufacturing enterprises followed by cooperative (joint venture) and partnerships representing 16.6 % and 7.3 % of total manufacturing units, respectively. (See Table 1.1). A great proportion of the manufacturing enterprises operated by the sole proprietors are micro-enterprises employing between 5 and 10 persons.

Many factors have been identified as influencing Nigeria's manufacturing industry performance and structural changes since independence. Prominent among these factors include government intervention, low technological development, inward-looking strategy and protectionism. Just as what obtains in other developing economies, it has remained the main/objectives of industrial planners in Nigeria to desire to achieve increase in the share of manufacturing contribution to the GDP, replacement of imports with locally produced goods, innovativeness, industrial dispersal and employment generation. The performance of the manufacturing sub-sector is therefore assessed using criteria such as its share (value-added) in GDP, manufacturing production index, which reflects changes in the level of aggregate output relative to a specific base period, and plant capacity utilization rates. Other yardsticks include the growth and diversity of manufactured exports, degree of industrial dispersal, employment generation, level of local raw materials utilization, foreign exchange saving and industrial self-sufficiency. (Adewuyi, 2006)

The pre-structural adjustment programme era, spanning the 1970s to the mid-1980s, witnessed the adoption of various policy measures and strategies designed to promote industrial growth. At the outset, Nigeria, as an inward looking economy adopted the import substitution strategy, which encouraged manufacturing units, but with heavy dependence on imported inputs. Thus, with huge inflow of direct foreign investment capital, massive revenues from oil exports and liberal importation policy, a large quantum of essential raw materials, machinery and equipment were imported to boost manufacturing activities in Nigeria (CBN, 2000). The net import requirement of the manufacturing sub-sector grew rapidly, as more than 60 % of the raw materials consumed in the sector were imported. The high import dependency was more pronounced in the heavy capital-intensive industrial sub-groups. This induced steady output growth averaging 11 % per annum in the manufacturing sub-sector in the 1970s, while its share in GDP also increased from 5.4 % in 1977/78 (1984 constant prices) to a peak of 13 % in 1982. (CBN, 2013)

From the mid-1970s up /to 1981, the manufacturing production reflected the incentive framework, which favoured the supply of locally produced goods to the domestic market. Most investment incentives provided by government were targeted at achieving higher production and greater revenues in the medium to long run. The exchange rate system, as the basic factor affecting the cost-price structure and competitiveness of manufactured products, became a major determinant of the net incentives and the structure of the manufacturing sub-sector producing mainly for the domestic market. The macro-economic policies implemented facilitated Naira appreciation, thus giving protection to the import dependent industries. The overall manufacturing capacity utilization as a result of the over-valued Naira and the substantial supply of imported raw materials, under the protective regime, rose markedly but fluctuated between 75 and 70 % in the period 1975 to 1980. Many manufacturing enterprises including multinationals grew behind high protective fiscal barriers, making huge profits in the 1960s and 1970s. However, foreign exchange supply from oil export declined drastically during 1982 - 85 with the collapse of oil prices in international market. The oil revenue, which accounted for about 90 % of foreign exchange earnings, fell from US $25.4billion in 1980 to less than US $6billion in 1986. Although foreign exchange supply was rationed in favour of industrial raw materials, spare parts and semi-assembled products of selected industries, the quantum of imported raw materials and spare parts fell commensurately with available foreign exchange.

Thus, the performance of the manufacturing sub-sector, deteriorated in the early 1980s. Manufacturing production fell by an average rate of about 1.5 % per annum from 1980 to

1984. The substantial reduction in the sub-sector's gross investment and capacity utilization rate attributed largely to scarcity of foreign exchange; led to low value-added, high production costs and low production for exports. Also, the improvement in manufacturing production, induced largely by output-boosting measures contained in the (SAP) could not be sustained. Thus, average annual growth in manufacturing output fell from 13.0 % in the period 1985 - 1989 to 0.2 % and 0.95 % for the periods 1990 - 1994 and 1995 to 1998, respectively, (Table 1.3). (CBN, 2013).

Variations in production level occurred among the manufacturing sub-growth between 1982 and 1996. While the breweries thrived with the highest annual output growth rate, most industries experienced severe difficulties. Cotton, textile, soap and detergents, pharmaceutical and vehicle assembly plants recorded the largest contractions. Generally, manufacturers' inward production orientation and their inability to sustain increasing importation of raw materials, difficulties in replacing obsolete machinery and equipment and the impact of over-valued Naira exchange combined to depress the level of exports.

Table 1.3: Manufacturing Production Index and Capacity Utilization Growth Rates

Year	**Manufacturing N(Million)**	**Annual growth rate (Rate) %**	**Capacity utilization (rate)%**	**Annual growth rate**
1970	24.1	-	85.2	-
1971	27.3	13.28	83.5	-2
1972	29.7	8.79	81.9	-1.92
1973	36.6	23.23	80.2	-2.08
1974	35.5	-3.01	78.6	-2
1975	43.9	23.66	76.6	-2.54
1976	54.1	23.23	77.4	1.04
1977	57.5	6.28	78.7	1.68
1978	65.8	14.43	72.9	-7.37
1979	97.3	47.87	71.5	-1.92
1980	102.4	5.24	70.1	-1.96

1981	117.4	14.65	73.3	4.56
1982	132.8	13.12	63.6	-13.23
1983	94.8	-28.61	49.7	-21.86
1984	83.4	-12.3	43	-13.48
1985	100	19.9	38.8	-10.93
1986	96.1	-3.9	38.3	1.31
1987	128.4	33.61	40.4	4.12
1988	135.2	5.3	42.4	4.95
1989	154.3	14.13	43.8	3.3
1990	102.9	5.57	40.3	-7.99
1991	178.1	9.33	42	4.22
1992	169.5	-4.83	38.1	-9.29
1993	145.5	-14.16	37.2	-2.36
1994	144.2	-0.86	30.4	-18.28
1995	136.2	-5.55	29.3	-3.62
1996	138.7	1.84	32.5	10.92
1997	138.5	-0.14	30.4	-6.46
1998	133.1	-3.9	32.4	6.58
1999	137.7	3.46	34.6	6.79
2000	138.2	0.36	36.1	4.34
2001	136.3	-0.01	39.1	7.7
2002	137.4	0.8	54.9	28.7
2003	137.3	-0.07	56.5	3.5
2004	137	-0.22	55.7	1.44
2005	137.2	0.15	54.9	-1.46
2006	137.6	0.29	53.3	-3.00
2007	137.9	0.21	53.38	0.15
2008	139.6	1.21	53.84	0.85
2009	143.2	2.51	55.14	2.36
2010	144.7	1.04	56.22	1.92
2011	145.8	0.75	57.44	2.12
2012	146.2	0.27	58.63	2.03

Average Manufacturing Growth (%)
1970 – 74 8.5 1985 - 89 13.8
1975 – 79 23.1 1990 – 94 0.99
1980 – 84 -1.5 2000 - 12 0.61

Source: CBN statistical bulletin, Dec, 2013.
Columns 3 & 5 compiled by the researcher (2016).

Table 1.4: **Selected Indicators of Performance in the Nigerian Manufacturing Industries.**

Indicator	1970	1980	1990	1992	1998	2012
Share in GDP (%)	7.2	5.4	8.1	7.9	7.5	6
Share in total exports (%)	7.4	0.3	0.67	0.53	0.6	0.6
Capacity utilization (%)	85.4	70.1	40.3	38.1	32.4	39.6

Share of total imports (%)	68.7	60.3	73.3	65.6	88.8	80.7
Value of Manu. Exports	65.8	39	730.8	1095.5	4134.4	12707.9
Manu. Employment ('000)	102.5	294.2	340.1	n.a	328	
Manu. Value added per capita						
at 1984 constant prices)	3898.	5194.07	7361.4	7657.2	6587.5	6596.7

Source: Adenikinju (2002)

Table 1.4: Using selected indicators, the performance of the manufacturing industries is analyzed. As shown in table 1.4, capacity utilization, which is among the best indicators of performance in manufacturing, performed well in 1970 and 1980 with 85.4 % and 70.1% respectively. The envisaged SAP capacity utilization rate of 55 % and 60 % by 1986 and 1989 respectively was not met. The actual figure for these periods is 38.8 % and 43.8 % respectively. The capacity utilization has actually remained less than 40 % from 1992 till 2012.

Table 1.5: **Selected Indicators of Performance in the Nigerian Manufacturing Industries (Period Averages %)**

Indicator	1980 -90	1990 - 95	1995 – 2001	2001 – 2012
Share in GDP (%)	8.72	7.62	6.18	7.69
Share in total Exports (%)	0.48	0.17	0.26	0.39
Capacity utilization (%)	49.4	36.21	33.56	42.1
Share of total imports (%)	81.1	87.5	80.4	82.9
Value of Manu. Exports (Nm)	773.8	310.1	291.96	557.3
Manu. Employment ('000)	274.49	45.86	40.08	167.27
Manu. Value added per capita (at	65.21	4.84	0.7	35.5
Average Growth Rate of MVA	1.7	0.3	0.5	0.9

Sources: CBN (2013) and Adenikinju (2002).

As shown in Table 1.5, the period 1980 - 2010, only showed a 0.39 % contribution of manufacture to total export. For the same period, manufactures share in GDP, capacity utilization and total imports are 7.6 %, 42.1 % and 82.9 % respectively. The average growth of MVA was 0.9. For the period 1995 - 2012 which coincide with the period that

Nigeria has been with WTO, the indicators are 6.1 %, 0.2 %, 33.56 % and 80.4 % respectively for manufacturing sub-sector's share in GDP, total exports, capacity utilization and total imports. The average growth rate of MVA is 0.5.

Table 1.6: **Growth in Manufacturing Output (%)**

Sector	1970-2001	1970-85	1986-2001	1995-2012
A. Consumer Goods	0.81	3	-0.2	0.2
1 . Sugar	-3.5	-3.9	-3	-1.1
2. Soft Drinks	4	8.3	0.4	1.4
3. Beer and Stout	2.5	5.9	0.86	1.5
4. Cotton	-0.5	0.9	0.09	-0.3
5. Synthetic Fibre	4.8	7.87	-0.8	-1.3
6. Footwear	-3.2	-2.3	-1.7	-0.03
7. Soap Detergents	1.4	4.1	2.7	1.5
B. Intermediate Goods	0.91	2.9	-0.5	-0.4
8. Paints	0.46	3.8	1.2	-0.04
9. Refined Products	1.7	3.4	1.8	0.04
10. Cement	1.9	2.3	-0.06	0.01
1 1 . Roofing Sheets	-0.47	2.2	-4.4	-2
C. Capital Goods	-2.3	7.2	-4.6	-1.5
12. Vehicle Assembly	-0.9	10.1	-1.1	1.7
13. Radio, TV	-3.7	4.3	-8.2	-4.6
Total Manufacturing	2.4	4.7	0.03	0.18

Source: Adenikinju (2002) updated by the researcher.

As shown in Table 1.6 above, growth in manufacturing output was observed across the three major sub-sectors especially the consumer goods sub-sector. The period 1970 - 2001 recorded a growth rate of 0.81 %. An outstanding growth of 3 % however was recorded between 1970 - 1985. But there was output decline of 0.20 during the period 1986 - 2001. The period 1995 - 2010 showed a growth of 0.2 %. However, these growths could be accounted for by the soft drinks, beer and stout as well as soap and detergents sub-sectors as sugar, cotton, synthetic fibre and footwear sub-sector all recorded negative growth.

The intermediate goods sub-sector recorded a positive growth of 0.91 % and 2.90 % respectively during the periods of 1970 - 2001 and 1970 - 85. But the periods 1986 -2001 and 1995 - 2010 showed a negative growth rate of 0.5 % and 0.40 %.

For the capital goods sub-sector, positive growth of 7.20% was only recorded during the 1970 - 1985 period. For the other periods 1970 - 2001, 1986 - 2001 and 1995 -2010, there were negative growth rates of 2.30, 4.60 and 1.5 respectively.

Overall, the table has shown that the period 1970 - 85 marked the golden period of growth of the manufacturing sub-sector as the mean growth recorded over the period was 4.7 %, although this could largely be attributed to factor accumulation rather than efficiency in factor use. The huge inflow of petrodollars largely accounted for it. The table also has confirmed the general recovery in manufacturing growth rate (0.18) in the period 1995 - 2012 from the showdown (0.03) that occasioned the SAP period.

Export of Manufactures

Table 1.7: Contribution of Manufacture Exports to GDP and Total Exports

Years Year	GDP at current factor cost N(million)	Total Export N(million)	Manufacturing Export N(million)	ME as % of GDP	MEas% Total Export	Total Export as % of GDP
1970	5205.1	885.4	65.8	1.26	7.43	17.01
1971	6570.7	1293.4	42.2	0.64	3.26	19.68
1972	7208.3	1434.2	37.3	0.62	2.6	19.9
1973	10990.7	2278.4	63.9	0.58	2.8	20.73
1974	18298.3	5794.8	67	0.37	1.16	31.67
1975	20957	4925.5	53.8	0.26	1.09	23.5
1976	26656.3	6751.1	58.9	0.22	0.87	25.33
1977	31520.3	7630.7	84.1	0.27	1.1	24.21
1978	34540.1	6064.4	48.8	0.14	0.8	17.56
1979	41947.7	10836.8	42.6	0.1	0.39	25.83
1980	49632.3	14186.7	42.5	0.09	0.3	28.58
1981	50456.6	11023.3	43.5	0.09	0.39	21.85
1982	51570.3	8206.4	14.5	0.03	0.18	15.91
1983	56709.8	7502.5	9	0.02	0.12	13.23
1984	63006.2	9088	14.3	0.02	0.16	14.42
1985	71368.1	11720	8.5	0.01	0.07	16.42
1986	72128.2	8920.6	3.9	0.005	0.04	12.37
1987	106883.2	30360.6	149.8	0.14	0.49	28.41
1988	142678.3	31192.8	187	0.13	0.6	21.86
1989	222457.6	57971.2	3167	0. 14	0.55	26.06
1990	257873	109886.1	730.8	0.28	0.67	42.61
1991	320247.3	121535.4	1120.8	0.35	0.92	37.95
1992	544330.7	207266	1095.5	0.2	0.53	38.08
1993	691600	218770.1	330.2	0.05	0.15	31.63
1994	911070	206059.2	678.9	0.07	0.33	22.62
1995	1960690	950661.4	3792.7	0.19	0.4	48.49
1996	2740460	1309543.4	772	0.03	0.03	47.79
1997	283500	1241662.7	2010.7	0.07	0.16	43.8
1998	276570	751856.7	4134.4	0.15	0.55	43.8
1999	3225990	1189006.5	3242.5	0.1	0.27	36.86
2000	4842186	2287400.3	3518.5	0.07	0.15	47.24
2001	5487995	2006498.9	12707.9	0.23	0.63	36.56

Source: CBN (2001) and Researcher (2016).

1.2 Problem Statement

Until 1986, Nigeria pursued an industrialization strategy based on import substitution. As the economy benefited from increased foreign exchange earnings from petroleum exports in the early to mid-1970's, Nigeria government embarked upon ambitious and often costly industrial projects. Private sector investment in manufacturing grew too, taking advantage of an array of government incentives.

By the late 1970's, a clear picture of the structure of the manufacturing sub-sector had emerged with the average manufacturing capacity utilization rate between 1975 - 1980 being 76.8 %. At the turn of the early 80s the sub-sector was characterized by high geographical concentration; high production costs; low value-added; serious under-utilization of capacity; high import content of industrial output and low level of foreign investment in manufacturing.   Factors like inadequate infrastructure, lack of executive capacity, poor utilization of available manpower and absence of a sound technological base, have often been adduced for this, (Ojike and Agu, 2012). The early 80's also were associated with significant decline in foreign exchange earnings and the high import dependence of the manufacturing sub-sector became a serious liability on the economy, (Ojike and Agu 2012). Nigeria government had invested heavily in a diversified portfolio of industrial projects including fertilizers, cement, sugar, pulp and paper, iron and steel, salt. However, the poor returns upon these projects could not justify the enormous public funds that had been committed to their execution, the fact, many industrial projects in which huge amounts had been expended remained largely uncompleted and even abandoned. (Adeyemi and Yesufu, 1996).

In order to solve these problems, which had become rather intractable, Nigeria government after several exhaustive studies embarked upon the restructuring of the manufacturing sub sector which was part of the overall structural adjustment programme (SAP) in July 1986? The major features of SAP include increased import liberalization and easier access to foreign exchange market (FEM), where foreign exchange rates are determined by interplay of market forces. Thus, SAP had important implications for government and industry alike. Among other things; it brought about government's re-appraisal of the regulating environment, the structure of protection for local industries and the package of incentives available. For the private sector, and industrialists generally, it demanded a more serious effort to control costs, increase production efficiency and stay competitive. SAP thus marked a watershed in the evolution of the manufacturing sub-sector, just as in other sectors, in Nigeria. (Adeyemi and Yesufu, 1996)

However, whatever rationalization was adopted, one clear and unambiguous conclusion that has been accepted generally was that SAP, as an economic reform, programme did not achieve its set out objectives. Rather, it worsened the economic crises that warranted its adoption (see Adeyemi and Yesufu, 1996).

Just as Nigeria adopted SAP as a major economic reform programme in 1986 with the optimism of economic turn-around, joining WTO in 1995 is predicated on the fact that the global body would help her to open her market and provide access to foreign market. It was thus another important policy package intended to liberalize the external sector and diversify the economy away from the dependence on crude oil exports and imports of both consumer and capital goods.

Consequently, Nigeria export sector remained undiversified despite all efforts including the trade reform policies and export promotional strategies that were aimed at improving the performance of the manufactured exports. The manufactured exports are still very low compared to exports from other sectors in Nigeria.

1.3 Objective of the Study

This major objective of this research was to analyze the impact of trade policy on the performance of export manufacturing industries in the Nigerian economy.

The specific objectives are to:

i. Determine the major determinants of manufactured export performance in Nigeria.
ii. Establish the causal relationship between manufactured exports and trade policy in Nigeria.
iii. Determine the effect of trade policy on performance of the export manufacturing industries in Nigeria pre–structural adjusted programme (SAP) economy
iv. Determine the effect of trade policy on performance of the export manufacturing industries in Nigeria post- structural adjustment programme (SAP) economy.

1.4 Research Hypothesis

Ho_1: Trade policy does not significantly determine the performance of export manufacturing industries in Nigeria.

Ho_2: There is no significant causal relationship between manufactured exports and trade policy in Nigeria.

Ho_3: Trade policy has no significant effect on the performance of the export manufacturing industries in Nigeria pre–structural adjusted programme (SAP) economy.

Ho_4: Trade policy has no significant effect on the performance of the export manufacturing industries in Nigeria pre–structural adjusted programme (SAP) economy.

1.5 Scope of the Study

1.5.1 Geographical Scope

The study make use of data from Nigeria with emphasis on Nigerian manufacture exports, Average tariff rate, Trade Openness, Exchange rates, and manufacturing capacity utilization.

1.5.2 Content Scope

The study looked at the trade policy in Nigeria and the trend of the manufactured exports performance from 1970 to 2014. Being the years that witness various changes in economic policies of the government that was meant to diversify the economy and fluctuations in the World crude oil prices which happen to be the major source of government revenue since the discovery of oil in Nigeria.

1.5.3 Theoretical Scope

The study make use of Hecksher – Ohlin theory which stipulate that country should concentrate in producing for exports, those products for which it has relative abundance and a great deal of relative scarce resources to produced. New trade theory and Lerner's symmetry theorem and country specific tariffs.

1.5.4 Time Scope

The data was collected from 45 years (1970 - 2014) for periods representing pre and post structural adjustment programme policy of Nigerian government.

1.6 Significance of the Study

In the quest for the government to diversify the economy towards achieving economic growth and development, the policy maker will find this study very useful because the researcher investigated the percentage of the manufacture export of Nigeria with the rest of the world with the view of identifying type of the country's balance of payment. Also, it looked at the situation of manufacturing export performance before SAP and the situation after implementation of SAP, so that the policy maker can evaluate some of the instruments and policy that have been implemented so as to determine which one should be strengthen to achieve their purpose.

Many of those who have done research in this area looked only at Nigeria total exports without separating the manufacturing exports. Also, other related researches on manufacturing exports were done in Europe and Asia which necessitate this research work.

1.7 Justification of the Study

The rationale for this study stems from the desire to make an input into the research for economic recovery strategy in Nigeria. Clearly external disequilibria resulting from dwindling foreign exchange earnings, balance of payments deficits and unfavourable terms trade position now confronting the country is due to the declining export that is not complemented by a dynamic export based sub-sector like manufacturing.

Oyejide (1975) looked at trade policy and industrialization, Oyelabi (1973), Thomas etal 1991, Sveelberg 2003, Santos-pan-lino, 2003, Ahmed 2000, Michoely et al (1991), Green and Sapsford, 1994, Jenkus, 1996, Agosin 1991, Cleance and Kiri Patrick 1991, Afangideh (2007), Pantano and Posadas (2002). Amphonosah (2002) Ajayi (2005) and Babatunde (2006) examined impact of trade or tariff policy on export or on industrialization and not on manufacture export performance which the study addressed. The methodology used to analyze the above issue varies from well-specified theoretical models to using a simple one to one relationship between tariff policy and export performance which most of the scholars who have done similar work failed to address. Empirically, most of the related work make use of gravity model except Afangideh (2007) that worked on impact of world trade organization on manufacture exports performance that make use of multivariate co-integration which this study adopted. Also, most of the related studies were made for developed countries only few studies have been made for Nigeria.

1.8 Operational Definitions.

Manufactured Exports

UNCTAD: Define manufactured goods as the sum of Standard International Trade Classification (SITC) 5 (Chemicals), SITC (6) manufactured goods, SITC 7 (machinery and transport equipment) and SITC 8 (miscellaneous manufactured articles), the value of exports for which are obtained from the UN year books for International Trade Statistics.

This is the total monetary value of all industrial products produce or manufactured and exported out of a country within a particular period or the real dollar value of manufacturing or other prominent industry exports from a particular country. E.g, food manufacturing, chemical manufacturing, plastics and rubber products, fabricated metal products, cements and textiles. CBN financial standard.

Trade Policy

Average Tariff rate

Brief Definition:

The indicator can be defined as the simple average tariff imposed on all exports from developing countries and LDCs. The Simple average tariff is the unweighted average of the effectively applied rates for all products subject to tariffs. (UNCTAD, 2016)

Unit of Measurement:

Percentage point

Placement in the CSD Indicator Set:

Global economic partnership/ Trade

POLICY RELEVANCE

(a) Purpose:

Evaluate the restrictiveness of trade policy, especially in developed countries, toward developing countries and least developed countries (LDCs) measured by the average tariffs rates.

(b)

Relevance to Sustainable/Unsustainable Development (theme/sub-theme)

Tariffs raise the price of imports from developing countries and therefore reduce demand for their products and limiting their growth opportunities. This can result in a suboptimal mix of outputs, limiting growth and encouraging production of less sustainable outputs.

(c)

International Conventions and Agreements: The Marrakesh Protocol to the General Agreement on Tariffs and Trade 1994is the legally binding agreement for the reduced tariff rates. GATT is now the WTO's principal rule-book for trade in goods. It has annexes dealing with specific sectors such as agriculture and textiles, and with specific issues such as state trading, product standards, subsidies and actions taken against dumping. The WTO's rules — the agreements — are the result of negotiations between the members.

(d) International Targets/Recommended Standards:

According to WTO, there is no legally binding agreement that sets out the targets for tariff reductions (e.g. by what percentage they were to be cut). However, within the Doha Development Agenda, which launched the current round of multilateral trade negotiations in 2001, countries committed themselves to the objective of duty-free and quota-free market access for products originating from LDCs.

Some countries have programs to voluntarily reduce or remove tariffs on the exports of developing countries, in addition to trade preferences given to developing countries under the Generalized System of Preferences (GSP) or the Global System of Trade Preferences Among Developing Countries (GSTP). For example, the European Union has launched a program to eliminate tariffs on developing country exports of "everything but arms," and the United States offers special concessions to exports form Sub-Saharan Africa.

However there are many restrictions built into these programs. Millennium Development Goal (MDG) 8, target 12 is "Develop further an open, rule-based, predictable, non-discriminatory trading and financial system", and target 13 is "Address the special needs of the least developed countries, landlocked countries and small island developing states (SIDS).

(e)

Linkages to Other Indicators:

This indicator is closely linked with other measures of economic development. Subsidies to agricultural producers and exporters in OECD countries are another form of barrier to developing economies' exports.

METHODOLOGICAL DESCRIPTION

(a)

Underlying Definitions and Concepts:

Simple averages are the unweighted average of all tariff lines as contained in a country's tariff schedule. Averages across groups of products, such as agricultural commodities, textiles, and clothing may be based on the Standard International Trade Classification or the Harmonized System.

Tariff averages include ad valorem duties and ad valorem equivalents of non-ad valorem duties, where available.

The list of least-developed countries is determined by the Economic and Social Council of the United Nations. As of 2006, 50 countries are on this list. There is no commonly agreed definition of developing countries.

(b) Measurement Methods:

Tariff rates are averaged at the most detailed tariff line or trade classification level available. Lines with no published tariff are not included. Ad-valorem equivalents to special rates may be used where available. When effectively applied rates are not known, most favored nations rates may be used.

(c)

Limitations of the Indicator: Average tariff rates may disguise high tariffs targeted at specific goods. Other barriers to trade, such as quantitative restrictions, phyto-sanitary Standards, anti-dumping measures, and subsidies paid to domestic producers may further restrict developing country exports.

(d)

Status of Methodology:

The methodology is well developed.

(e) Alternative Definitions/Indicators:

Average tariffs can also be computed as trade- weighted averages of effectively applied tariff rates or as simple or weighted averages of bound rates. The MDG indicator # 39 on tariff averages is calculated using effectively applied tariff rates and standardized trade weights, based on multi-year averages of import patterns of major developed countries (United States of America, European Union, Japan, Canada, Australia and Switzerland).

Trade Openness

This is taken to imply that there is minimal or no restrictions to trade and defined as the sum of export and import relative to the gross domestic product.

Trade openness provides significant information about foreign market thereby enabling local firms to serve foreign markets efficiently. (World development indicators)/ UNCTAD

Exchange rate

This is the ratio at which a unit of currency of one country can be exchanged for that of another country or rate at which one currency may be converted into another. The exchange rate is used when simply converting one currency to another or for engaging in speculation or trading in the foreign exchange market. It is a necessity in trade across boundaries. (World development indicators)

Capacity Utilization

This is the extent to which an enterprise or a nation actually uses its installed productive capacity. It is the relationship between output that is actually produced with the installed equipment and the potential output which could be produced with it, if capacity was fully used. Its measure as a ratio of the capacity put to use to the total available capacity in a unit of time.

CU = capacity put in use\ total capacity available.

Mahadevan (2010)

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter was concerned with review of theories, concepts and empirical finding on the linkage between trade policy and manufactured export.

2.1. Theoretical Review of Trade policy and Manufacture Export Performance

The following theories of trade policy were reviewed:

-The theory of regional trade agreements RTA),

- Absolute cost advantage theory,

- Neo classical trade theory of external trade,

-Classical trade theory,

- Modern theory of trade,

-Political Asymmetry and common external tariff,

-The factor proportion theory,

- New trade theory,

- Lemmer's symmetry theories and country tariffs .

Balass (1982) opines that trade liberalization reduces anti- export bias and that there is incentive effect of protection on production for export via-a-viz production for market which is sometimes referred to as relative anti export bias (Jenkins, 1996) The existence of large profits to be made in protected import substituting industries will make firms to be unwilling to invest production for export. Also, protections can also adversely affect the competitiveness of exports in relation to the production of other countries. Since the cost of inputs may be higher than world market prices protection; protection allows exporter to be at a competitive disadvantage in international markets. As a result, local exporters will likely suffer a cost penalty unless they are granted exemptions from duties on imported inputs and are free to substitute imports to domestically produced inputs. (Jenkins, 1996).

In addition, trade liberalization encourages the availability of imported inputs that may be critical to the export production. Under very restrictive trade regimes, local exporters may not be able to acquire certain key imported intermediate input which they require in order to produce for exports. According to Morrinsson (1996) protectionist policies not only discourage exports directly through their effects on the cost and availability of imported inputs, but also indirectly through their impact on the exchange rate Protection reduces the demand for foreign exchange below the level that would exist under free trade, leading to a higher exchange rate that would apply in the absence of protectionist measures. The consequent over valuation of the currency is therefore a disincentive to exporters. (Jenkins, 1996).

Nevertheless, the theory of regional trade agreements (RTAs) dates from Vines (1950), who drew the distinction between trades creating and trade-diverting, extents resuming from RTA formation. Viner's contribution showed that even though on RTA liberalizes trade by reducing at least some barriers; it does not necessarily follow that this will generate net gains from trade. Net gains would be expected if all barriers to trade are reduced on a non-discriminatory basis, but RTAs by their nature discriminate against non-members. In RTAs distortions between sources of supply are not eliminated but are shifted. If partner country production displaces higher cost domestic production then there will be gains, or trade creation. However, if partner country production displaces lower cost imports from the rest of the world, this is trade diversion (Geloso-Grosso, 2001) since distortions may likely remain in some activities in the economy, It may not be necessarily true that removing part of the distortion for example. However, it has been argued that for any proposed customs union of free trade area there could be a set of common external tariffs that would precisely leave the new trading bloc's trade with non-member countries unchanged, so preventing trade diversion from taking place.

Member countries in a RTA can be affected through difference in mechanism. One of such mechanism is when the external barrier of a regional arrangement are low the potential for trade diversion is low because lower external tariffs offer less scope for the displacement of imports from non-member countries. Also, market enlargement allows firms to exploit economies of scale more fully within a RTA. The possibilities are that firms in member countries will likely produce greater quantities of products after formation of an RTA. This therefore occurs as trade preferences which results in demand shift in favour of intra-regional trade to enable these firms achieve greater economies of scale and lower output prices as they capture (and create) large markets for their outputs at home and abroad. Finally, according to smith and Venables (1988) RTAs may successfully erode market power of dominant firms in participating countries through encouraging market entry of competing firms from other member countries, bringing lower prices.

Thus, the potential advantages of trade liberalization and integration of African countries are firmly rooted in a theory of economies of scale. The small size of most SSA economies points to unification as useful means of expanding markets and increasing participation in the global economy. Consequently, a relaxation of trade restrictions within a given region could reduce internal transport cost, stimulate intra-regional trade, and ultimately increase the growth and productivity of member state. Moreover intraregional liberalization could encourage African countries to adopt a more out ward oriented attitude towards trade instead of the protectionist, inward-oriented mentality which frequently exists. (Ajayi, 2005).

Okon (2004) argue that free trade is couched on the law of absolute advantage developed by Adam Smith later fine-tuned by David Ricardo (in the 19th century) into the law of comparative advantage. According to Adam Smith (1776), each country should specialize in those goods or services in which it has absolute advantage. David Ricardo further argue that even when one country has absolute advantage in the production of two goods and against another country, it may still be more beneficial to both countries if each of them specialize the production of only one of the goods.

With this, both countries can enjoy the benefit of comparative advantage and enhance the process of exchange between the two. Thus, the underlining tenets of the Classical theory is that a country will tend to export the commodity whose comparative cost is lower in autarky and import the goods of which the comparative cost is higher in pre-trade isolation (lyoha, 1995). The classical theory assumes, among others, constant costs, only one factor of production and perfect competition in both factor and product market.

The neoclassical theory of external trade was developed out of the need to modify some of the assumptions of the classical theory to provide more realistic existence of differences in comparative costs between countries, introduce capital as a second factor of production, and allowed for international differences in the pattern of demand. According to Agiebenebo, (1995) the policy conclusion of the modern theory of trade is exactly the same as that of classical trade theory. Free trade internationally and in the domestic economy will maximize national and world production efficiency output, consumption and hence, welfare. The interferences with trade such as tariffs, quotas or subsides will lower world and national output and keep the nations of the World on lower indifference curves.

Iyoha (1995) also opined that a number of theories have been propounded to modify some aspect of the modern theory of trade. These includes the Linder theory of external trade, the size and distance theory of external trade postulated by Lineman and Adam Smith but it was modified and applied to third world markets to remove agrarian societies, creates opportunities not to reallocate fully employed resources as in the traditional modes but rather to make use of formally underemployed land and labour resources to produce greater output for export to foreign markets.

Oyelabi (1973) in his article titled tariffs, domestic prices and industrial growth in Nigeria posited that tariff will cause a shift in relative factor prices in favour of the tariff-imposing country's scarce factor of production which is used intensively in the import-competing sector. He is also of the opinion that most of the developing countries, will have to redistribute their income in favour of urban industrial capitalists, a good percentage of whom are likely to be foreigners. Furthermore, an unfailing by-product of high tariffs is the encouragement of smuggling and black marketing.

Afangideh (2003) on the impact of WTO on Nigerian manufacture performance make use of three different theories vis-a-vis the classical theories of trade, absolute advantage theory and the theory of comparative advantage. In the absolute advantage theory, Adam Smith submit that countries should specialize in and export those commodities in which they have an absolute advantage and should import those commodities in which the trading partner has an absolute advantage. Also, the David Ricardo (1817) theory of comparative advantage has it that, a country has a comparative advantage in producing a good if the opportunity cost of producing the good is lower at home than in the other country (Sodersten and Reed, 1994).

The factor proportion theory by Heckscher (1919) and Bertil Ohlin (1933) and Samuelson (1948) concluded that if a country that has labour in abundance but lack capital, labour will relatively cheap, and they will have relative cost advantage over other countries in the production of goods and services that require abundant labour. Such countries should therefore concentrate on the production of labour intensive products, which will give them surpluses of export to pay for import from other countries (Akpakpan, 1999). In the same way countries that have capital in abundant will have a relative cost advantage in the production of goods and services that require abundant capital. Such country should therefore concentrate on the production of capital- intensive goods and services that will give them surpluses to export. Like Ricardo's comparative advantage, this theory shows that both countries will benefit from specialization through increased output while free trade will help to spread these benefits.

In Subhayn and Suryadipta Roy (2008) on the effect of political Asymmetry and common external tariff of customs union., custom union was considered with two members labeled A and B while the rest of world is labeled C. They assume a one good situation custom union (CU) - importable that is imported from C by A and B is subject to a CET, which decided by the CU jointly. This decision is influenced by lobbying from the producers of this good A and B. It was first assumed that the producer in the two countries co-operate with each other and lobby government in both A and B jointly. They also concluded in their theory that since the lobbying is socially unproductive, it entails a social welfare loss of the amount in country (i=A,B). Consumers' surplus, domestic profits plus tariff revenue, in country is denoted by Si(t) with Si<0 . It is also assumed that country is what government cares about not social welfare, given bu Si(t) - hi, but also the net total income of the lobby group.

Osinusi, *et al* (2008)- the impact of trade policy on Nigeria manufacture exports performance make use of the New trade theory and Lerner's symmetry theorem and country specific tariffs. The new trade theory is associated with the names of Brander and Spencer (1983), and Grossman (1992). New trade theory relaxes the restrictive assumption of perfect competition and absence of market failures, which are keys in the tradition trade. New trade theory concluded that under conditions of imperfect competition (eventually due to economics of scale and the existence of externalities (spillover) restriction to trade might be welfare improving. As far as imperfect competition is concerned, trade restrictions in the international arena are then used to win market power (monopoly) power, oligopoly power or become the winner in monopolist competition) also Lerner's symmetry theorem and country specific tariff was based on the equivalent between a uniform tariff and a uniform export tax. This has proved useful in furthering the understanding of policy and integration.

Gernt (1999) on free trade areas as a model for EU-ACP relations, the economic theory of preferential treatment is narrowly related to the theory of economic integration as trade preferences use reductions of trade barrier in a discriminating way as is the case in FTAs and Customs Unions (CUs). Pelkmans (1997) opined that a country gains from participating in a free trade area if the trade consumption effects outweigh trade diversion and indirect trade deflection.

The research considered three theories; The Factor Proportion Theory, New Trade Theory and Lerner's Symmetry Theorem and Country Specific tariffs which is disclosed as follows:

2.1.1 The Factor Proportion Theory

Arising from the weakness of David Ricardo's Comparative Advantage Theory, modern economists had to search for better explanations of the basis of international trade. One explanation that has remained popular till today is the factor proportion theory.

The factor proportion theory was first developed by two Swedish economists, Eli Heckscher (1919) and Bertil Ohlin (1933), and later modified by Paul Samuelson in 1948. For this reason, it is commonly referred to as the Heckscher-Ohlin-Samuelson theory, or simply the H-O-S theory.

The theory overcomes the shortcomings of Ricardo's comparative advantage theory by recognizing that production involves more factors than just labour, and that the various countries of the world are endowed with different proportions of these factors. It accepts the point about differences in comparative costs, but points out that it is the international differences in relative factor endowments that explain differences in comparative costs and constitute the basis for international trade. (Afangideh, 2003)

Given differences in factor proportions (i.e. factor supplies) relative factor prices will differ, and for this reason, factor combinations and commodity price ratios will differ. For instance, in countries that have labour in abundance but lack capital, labour will be relatively cheap, and they will have relative cost advantage over other countries in the production of goods and services that require abundant labour. Such countries should therefore concentrate on the production of labour-intensive products, which will give them surpluses to export to pay for imports from other countries (Akpakpan, 1999). In the same way, countries that have capital in abundance will have a relative cost advantage in the production of goods and services that require abundant capital. Such countries should therefore concentrate on the production of capital-intensive goods and services that will give them surpluses to export. Like Ricardo's comparative advantage, this theory shows that both sets of countries will benefit from specialization through increased output while free trade will help to spread these benefits.

In line with this reasoning, the less-developed countries (LDCs) embarked upon the production of labour-intensive (primary) products for export, and to rely on the more-developed countries (MDCs) for the supply of manufactured goods (which are generally more capital-intensive). However, the proponents pay little attention to the question of the terms of exchange that is the critical factor in the transmission of the benefits of trade to the participating countries. The controversy in trade between the developed and less developed countries have been predicated on this transmission of benefits.

According to Akpakpan (1999), while the factor proportions theory provides a useful explanation of the basis of international trade, its conclusions about the benefits or gains for individual partners are questionable. The current mainstream thinking in economics is to focus on trade liberalization, which the literature and several studies have supported as being beneficial to all trading partners.

2.1.2 The New Trade Theory

New trade theory is associated with the names of Brander and Spencer (1983), new trade theory relaxes the restrictive assumption of perfect competition and the absence of market failures, which are keys in the traditional trade theory. New trade theory concludes that under conditions of imperfect competition (eventually due to economies to scale and the existence of externalities (spillovers) restrictions to trade might be welfare improving). As far as imperfect competition is concerned, trade restrictions in the international arena are then used to win market power (monopoly power, oligopoly power or become the winner in monopolistic competition). Market power can be used to get rid of foreign competitors in various ways, e.g. products can be temporarily under priced (sold below marginal cost) until competitors will have left the market (predatory, pricing). After that, producers with market power will switch to make up pricing. Having market power (in international terms) is equivalent to be able to increase output and the market share. As it is well known, these strategies will allow production at decreasing average cost in industries characterized by economies of scale.

In such an environment smaller foreign competitions have no chance because they cannot produce under economies of scale. Even though national welfare will rise in the economy that has relatively more market power, the gains are static since average costs do not fall indefinitely, but stop decreasing at a certain point, dynamic gains are possible if high entry costs, high learning effects and externalities (spillovers) prevail in the protected industries.

2.1.3 Lerner's Symmetry Theorem and Country Specific Tariffs

Lerner's symmetry theorem, which illustrates the equivalence between a uniform tariff and a uniform export tax, has proved useful in furthering the understanding of commercial policy. It is therefore of interest to ask whether or not a similar result characteristics country – specific commercial policies. That is, are country-specific tariffs and export taxes equivalent policies.

It is easy to see that Lerner's symmetry theorem does not extend to country specific tariffs and export taxes. This fact follows from the reasoning that was used to establish the key qualitative features of a country-specific tariff. When country-specific, tax on exports to country A is exacted, home exporters will be shifting their exports to country B to avoid paying the tax on exports to country A. In response to the reduced supply of goods from the home country, country A will begin importing good X from country B. What is crucial for the effectiveness of a country-specific export tax is whether or not country B can supply enough of good X to satisfy country as import demand at free trade relative prices.

To take the simplest case, suppose that goods are inelastically supplied in country B and that they are endowed with a very large quantity of good M, M^{-b}, and no good X (i.e. $X^{-b} = 0$). In this case, a country-specific export tax will have impact, but it is entirely possible that country B's endowment of good M is large enough to satisfy the home country's demand for imports at free trade prices so that a country-specific tariff has no impact on relative prices or utilities.

2.2 Empirical Work on Trade Policy and Industrialization in Nigeria

Oyejide (1975) concluded that Tariff protection would be helpful only if there is a market which is worthwhile to be protected and that tariff imposition tend to reduce the size of the market. It was observed that, in spite of the acceptance of tariff protection as a legitimate and effective instrument of industrial policy, it must also be noted that there were a number of serious problems which are inherently associated with its practical application. The findings include; imposition of high tariff rates as a means of encouraging the growth of local manufacturing industries which led to three fundamental problems. First, it forces on the consumers to subsidize new industries by paying higher prices for poor quality products. This constitutes a serious hardship to the consumers and their sacrifice would not be worthwhile unless the industries are able to improve the quality of their products and reduce their production costs within a relatively short time. Secondly, the imposition of high tariff rates tends to reduce the size of the local market. He concluded that the effect or the manipulation of the tariff structure is to aid or speed up the process of industrialization in Nigeria from 1957 to 1967. Also, tariff protection was not the only instrument of industrial policy used in an attempt to achieve some measures of industrial development. In particular, a system of industrial incentives was also used to induce and encourage the establishment of domestic manufacturing industries Hence, Oyelabi conclude that the impact and effectiveness of tariff protection as an instrument of industrial policy cannot be analyzed in isolation from that of other collaborate measures, the effect of the system of industrial incentives must also be taken care of.

Oyelabi (1973) in tariff, domestic prices and industrial growth in Nigeria using econometric analysis model concluded that in the past twelve years, the Nigerian tariff system has undergone enormous changes. From a low-rate limited objective, relatively simple schedule, it has evolved into a relatively high rate wide-ranging and ever-changing complex structure. The Federal executive council is vested with the responsibility of making tariff policy. The council acts on the responsibility of making tariff policy. The council act on the advice of the ministry of finance which in turn seeks advice, more or less informally from a variety of sources, including the Tariff Advisory Committee and the Central Bank on the whole. Nigerian tariff rates are now much higher than before, and they change too often. He also concluded that on the role of tariffs in stimulating industrial growth, the analysis showed that effective rates were generally higher than nominal rates, and that the imposition of excise (or other indirect) taxes on domestically produced goods reduced (substantially in some case) the effective protection enjoyed by the relevant industries Nominal rates of tariff indicated a different industrial resource allocation from the computed elective rates. Oyelabi also found that effective rates did not appear to be significantly correlated with certain possible policy criteria like productivity, labour intensiveness and industrialization. He finally concluded that the structure of effective rates did not indicate that a high premium was placed on foreign exchange earning industries and indicated that more effective protection could have been accorded the foreign saving ones.

Juthathip and Archanum (2008) find out that multinational corporations tend to be more export – oriented than indigenous firms and that the trade policy of the government will be an encouraging factors for the indigenous firms to engage in exportation of manufacturing goods. The conclude that policy aiming to attract investment from other countries enhance overall export activity and benefit domestically owned firms in terms of export spillover.

Ukoha (2000) explores the determinants of capacity utilization in Nigerian manufacturing industry and found out that the exchange rate, federal government capital expenditure on manufacturing, and per capita real income, have positive effects on manufacturing capacity utilization. On the contrary, inflation, loans and advances to manufacturing have negative effect. It recommended the adoption of economic policies that ensure price stability and at the same time achieve target objectives. It maintained that exchange rate deregulation policy promotes manufacturing capacity utilization and therefore, advocated fiscal policy measures involving increased government capital expenditure to the manufacturing sub-sector as well as those that raise the level of aggregate demand in the economy.

Shouvik (2012) on manufacture exports of the developing countries and their terms of trade vis-à-vis the developed countries find out that developing countries were able to increase their share of manufacturing exports in the global market which is concentrated mainly in the hands of the South East Asian Tigers and few other countries like China and India. It was concluded that a blind pursuit of the East Asian country's strategy of development by the other developing countries may not be beneficial for the developing countries as a whole, therefore the developing countries have to occupy the seat of innovators in the production of manufactured goods.

2.3 Empirical Work on Trade policy and Manufacture Export Performance

Many studies have been carried out on the relationship between trade policy and performance of the manufacturing sub-sector in Nigeria. The literature is quite clear in its agreement of the role of trade policy on the manufacture export performance.

The argument is based on whether tariff policy has led to positive or negative performance. Some studies have found a positive link between trade policies and export performance (Thomas *el at* , 1991, Svedberg , 2000, Santos-Paulino, 2003, Ahmed, 2000 and Michaely *et al*, 1991 found some empirical evidence to support a link between trade policies and export performance.

Xinxin (2013) on determinants of textile and apparel export performance in Asian countries concluded that tariff and exchange rate has a negative impact on textile and apparel export performance in Asian developing countries especially after the elimination of the quota system.

Singer and Gray (1988) queries if trade policy influences export performance, using empirical data (67-73, 77-83) they show that changes in world demand carried greater weight in determining export performance than changes in trade policy. The (Spearman) rank correlation between export orientation and growth is high and significant when world market conditions are favorable, also the correlation is stronger (and significant) for higher - income countries for both sub-periods than for lower-income countries. More recently, Ahmed (2000) investigated the response of Bangladesh's aggregate merchandise exports to a real exchange rate-based trade liberalization programme during the period 1974-1996. Empirical results suggest that there exists a unique long-run or equilibrium relationship among real quantities of export relative export price and export weighted real effective exchange rate, relative export price (lagged two quarter) and a dummy variable capturing the effects of trade liberalization programme have all emerged as important determinants of an aggregate export supply function for Bangladesh.

Similarly, Sanites-Paulino (2000) examined the impact of trade liberalization on export performance for a sample of developing economies using the export function approach. Results from this study showed that exports react negatively to an increase in relative prices and positively to an increase in world income growth, while export duties have detrimental effect on export performance although the impact is relatively small among regional blocs, the result indicated that Latin America and Africa possessed high- income elasticity and highest long run price elasticity. It was concluded that trade liberalization emerges as a fundamental determinant of export growth in all the countries in their sample.

Utkulu *et al* (2003) argued that a traditional model of export supply with explanatory variables such as export prices, variable home and foreign costs and productive capacity can be further extended by taking the effects of trade reform which consists of measures to reduce anti-export bias. He argued that tariff reform leads to the reduction of anti-export bias and strong supply response. The result reveals that prices and real exchange rates have no significant effect on the Turkish export supply in the long run. In addition, the result from the extended model also showed that factors such as trade reform, import compression and technological innovation have significant effect on the Turkish export supply. Sanguinetti, Pantano and Posadas (2002) examined the consequences of the unilateral liberalization and regional agreements on the trade structure of Argentina which has suffered a significant modification in particular imports and exports have been subject to a process of de-concentration due to trade reform. Their result revealed that tariff preferences and economics of scale were responsible for these changes.

Nevertheless, evidence tends to show that successful trade liberalization has been associated with devaluations either at the same or beforehand (Ahmed 2000 and Edwards 1993). For instance, Jenkins (1996) established that one of the anticipated gains from the trade liberalization policies adopted by many Latin America countries in recent years is improved export performance. It was concluded that improved export performance is largely the result of a more realistic and more stable real exchange rate, while the trade policies reforms have had little impact. However, certain deficiencies in Bolivia's export performance were noted, such as the increased emphasis on primary and semi- processed products and the lack of diversification in terms of both and markets. In the same vein, Cameron and Kihangire (2002) examined the long run elasticity of response of the predominantly agricultural primary commodity exports during the floating exchange rate regime in Uganda. The results suggest that Uganda's exports are positively and significantly correlated with relative price and the levels of exchange rate but negatively correlated with the terms of trade-capacity utilization and exchange rate variability. Closer examination of individual sub-sectors indicates that the negative response to exchange rate variability is not universal for all products Policy-wise the result suggest that Uganda's export-led growth strategy must recognize the importance of the issues, but that it should also take full account of the difference in supply conditions and responses particular sub-sectors. It has been argued that the adoption of unilateral liberalization can enhance the performance of a country in preferential trade agreements. Austria (2001) examined the policies pursued by the Philippines in response to the increasing economic integration and interdependence of nations and regions around the world, focusing in particular on the country's multi-track approach to trade and investment liberalization.

The country's experience points to the importance of domestic policies that foster domestic efficiency and competitiveness before one can participate in regional integration and face global competition. The country first pursued trade and investment liberalization policies in the 1980s and 1990 to eliminate the inefficiency of domestic industries arising from its past protectionist regime. The unilateral liberalization efforts resulted to a better allocation of resources and improvement in overall competitiveness of domestic industries. The improved competitiveness enables the country to participate in the 1990's regional trading arrangements. AFTA(ASEAN Free Trade Area) and APEC(Asia-Pacific Economic Cooperation) and in the much bigger WTO. The challenge facing the country now is how to deepen and expand its participation in regional integration as the proliferation of regional integration has brought forth many new competitors for the country, both for its markets and sources of foreign direct investment.

Similarly, Mengistae and Teal (1998) examined the role of trade liberalization regional integration and firm performance in Africa's manufacturing sector. Their study attempted to understand the role of regional trade and its effects on the performance of firms. The evidence from the study revealed that unilateral tariff reductions have enhanced regional trade. Regional trade can be a method for firm growth provided it is treated as a stepping stone to the international market and not used as a device to protect firms that cannot compete internationally in a similar study. Kagira (2001) examined the effects of regional integration on the performance of intra industry trade in Eastern and southern Africa. Augmented gravity model approach was used and the result showed that African regional trade agreements generated significant exports growth between member countries. For the particular case of the Frac Zone, the study revealed that monetary unions (UEMOA and CEMAC) had largely reinforced by positive effect of the preferential trade agreements on intra – regional exports. In contrast to the argument of earlier studies, Jebuni (1997) recognized the challenges of trade reform in Africa and argued that full trade liberalization is a more useful approach to development than merely engaging in preferential trade agreements. He argued that regional trade integration may be difficult to enforce since it may lead to losses in government tariff revenues and instability in the balance of payments. He observed that African countries usually face high transportation costs for intra-regional trade compared to the costs involved in relation with industrialized countries. He finally concluded that these factors undermine the of trade integration in SSA.

Amphonsah (2002) examined the analytical and empirical evidence of trade policy effects of region integration within Africa framework. Greater trade policy liberalization may lead to stronger economic growth. Notwithstanding, the controversies pertaining to trade and development policies and the mixed results of impacts from various studies. A major complement of RTAs is the ability to import knowledge, ideas, investment goods and inputs (technology and skilled management) from successful integrating regions. Pursuit of open economic strategies is the key incentive to gaining greater access to market. Therefore, countries must adopt trading system that are open transparent, rules based and fair. They must also learn to negotiate as a trading bloc.

Ajayi (2005) reviewed the process of regional financial and economic integration in West Africa. The research sought to determine the prospects for further integration in West Africa given the region's unique characteristics and the particular experience of ECOWAS countries. Based on results from a gravity model analysis, it was revealed that participation in the CFA monetary union and ECOWAS' preferential trade agreements appear to have improved intra- regional trade. However, the challenges of political instability, maintaining fiscal resources, and ending a suitable monetary anchor present considerable concerns for the creation of a single West African (Babatunde, (2006)).

In trade policy reform, regional integration and export performance in the ECOWAS sub-region concluded that common external tariff has improved export performance; it was also opined that the existence of artificial barrier to trade among ECOWAS countries negatively affects export performance. However, it was advised that increased utilization of trade policy tools such as tariff and non - tariff barriers, export subsidies, and credits to exchange rate policies should be used to reduce anti - export bias. Other trade restrictive measures such as rules of origin, import duties and taxes, import prohibitions quantitative restrictions and licensing should be reduced to the barest minimum if not completely eliminated. (Babatunde, 2006).

Adewuyi (2006) examines the impact of trade policy reform on technical efficiency in Nigeria's manufacturing sector, specifically quantifies and analyses levels of pure-technical and scale efficiency in the sector. It also examines the impact of trade policy reform on the two forms of technical efficiency. The study utilizes panel data for ten manufacturing sub-sectors over some selected trade policy liberalization episodes and years covering the period before, during and after the implementation of (SAP) in Nigeria. It employs a non-parametric technique - Data Envelopment Analysis (DEA) to obtain the technical efficiency measures which were used in panel regression analysis. Findings show that lower nominal protection rate promotes pure-technical efficiency in the sector. Both nominal protection rate and import penetration ratio foster scale efficiency in the sector, the study concluded that trade policy reform produced positive impact on technical efficiency in Nigeria's manufacturing sector.

Empirical results revealed, however, that other policies (particularly exchange and interest rates deregulation policies) implemented alongside with trade policy reform produced negative effects on factor efficiency. Thus, they might have worked to nullify the positive effect of trade policy during these periods.

Therefore, these policies have to be designed to work in complementary with one another so that efficiency and total factor productivity (TFP) can be promoted in Nigeria's manufacturing sector.

Olorunfemi *et al* (2013) found out that there is a positive relationship between manufacturing and each of capacity utilization and import as 1 % increase in capacity utilization and import lead to 43081 and 3.8 % change in manufacturing respectively. They concluded that, there is a negative relationship between manufacturing and each of investment, exchange rate, and export lead to 0.04 and 0.3 percentage reductions in manufacturing respectively.

Rahul and Boyang (2016) investigated South Africa's exports performance using panel autoregressive distributed lag (panel ARDL) model and found out that electric bottlenecks, limited products market competition and labour market constraints have reduced the responsiveness of firm's exports to the rand depreciation. Also a firm ability to diversify its exports has helped benefit more from currency movement.

Romanus and Nyaba (2011) examined trade policy and domestic manufacturing in Ghana, uses input and output model with enterprise growth theory in a research report found out that reforms have contributed positively to export performance and have enhanced technology transfer, also exposure of local firms to international competition have improved their efficiency and the quality of their products all to the benefit of the consumer and to a large degree trade policy reforms have been successful in placing Ghana and its firms on a path to global competitiveness.

Dogruel et al (2010) also make use of input output model with production cost theory found out that the share of imported inputs and the profits gained from dollar – euro parity changes are important determinants of the Turkish manufacturing.

A very recent study by Ajinaya et al, (2017) used ordinary least square estimate and linear regression method and found out that exchange rate fluctuation have positive relationship on export performance. Export promotion strategies were recommended to retain a surplus balance of trade.

Wilson and Choga (2015) examined linkage between exchange rate volatility and export performance in South Africa using GARCH method and regression analysis with new trade theory opined that exchange rate volatility had a significantly negative effect on South African exports in the period of 2000 – 2011 when exports were regressed against real effective exchange rate, trade openness and capacity utilization.

Rowbotham and Mbululu (2014) assessed exchange rate policy and export performance in efficiency driven economy uses fixed effects method and panel data model concluded that a weakening of the exchange rate does not necessarily improve export performance. Also export growth seems to be associated with stronger exchange rates. The lag effect of exchange rate movement on export performance is slightly more pronounced, the relationship nevertheless remain statistically insignificant.

Nazli and Yalcin (2016) investigated exports in manufacturing, exchange rates and external exposure: firm level evidence from Turkey, using heterogeneous firm model and regression analysis discovered that a real depreciation of the Turkish lira has a positive impact on exports firms. This positive impact in mutted for manufacturing firms operating in sectors that use imported inputs intensively.

Saliu (2017) examined the performance of manufacturing sector and utilization capacity in Nigeria used ordinary least square method of multiple regression models found out that capacity utilization is been influenced by inflation, exchange rate, interest rate, loan and advances, per capital income and electricity.

Wong (2016) investigated the productivity and trade openness: micro-level evidence from manufacturing industries in Ecuador make use of production function dynamic model and ordinary least square with GMM estimation conclude that there is a positive and significant effect of trade openness on the productivity of manufacturing industries in export oriented industries in the years after trade reforms were implemented but decreasing productivity after 2010.

Afolabi (2015) examined the effect of trade liberalization on manufacturing sector performance in Nigeria, published in journal of international development using granger causality, VAR and IRF (impulse responsive function) found out that Granger cause trade openness affect capacity utilization of manufacturing sector performance, total domestic demand granger cause manufacturing output while trade openness affect total domestic demand all in one way causality relationship. Vector autoregressive (VAR) and Impulse response function (IRF) approach shows that the country's manufacturing sector performance growth rate is affected by the past values of the GDP.

Jenkins (2012) analysed the effect of trade liberalization on manufacturing in Bolivia in institute of Latin American studies research papers, uses multiple regression found concluded that trade policy changes which formed a key part of the new economy policy have significantly altered the conditions facing Bolivia manufacturing.

Shameek and Shahana (2014) studied trends and drivers of India export performance using graphical approach and simple percentages found out that gem and jewelry exports constitute a significant share of the country's aggregate exports and have also performed well internationally thereby making Indian an indispensable in this market. There is also decline in cotton export which uses to be India major export in the past. There is evidence of better performance in India export since introduction of trade liberalization policies.

Kankesu (2012) examined the impact of liberalization on manufacturing sector performance in developing countries by surveying the literature and using descriptive method found out that evidence from least developed country based indicates that trade liberalization is a necessary but not a sufficient condition for rapid total factor productivity. These countries need to address deficiencies such as shortage of human capital, physical infrastructure and institutions to strengthen the case for trade liberalisation.

Ebenyi (2015) studied the impact of trade liberalization on manufacturing value added in Nigeria using GMM(general methods of moment) and ordinary least square method found out that Nigerian economy has not changed its export structure over the 1970 – 1990 period, also the inability of the Nigerian manufacturing sector to respond positively to the export potential inherent in trade liberalization was due to high cost of production.

Karamuriro (2015) used gravity model to estimate the regional economic integration and exports performance in the COMESA region and found out that COMESA trading bloc has promoted intra – regional exports, implying intra – COMESA exports have grown by approximately 35 percent since COMESA was formed. It was also suggested that in order to enhance export flows in the region, the process of economic integration should be deepened. Thus, there is need for increased investment in transport infrastructure that will reduce long distance cost of doing business.

2.4 Methodological Reviews of Trade policy and Manufacture Export Performance

Sangeeta *et al* (2007) on the impact of tariff reductions under the East African Community customs union, intra-trade effects on Uganda make use of partial equilibrium approach to estimate the effects of transitional arrangements and phased tariff reductions for sensitive products under the EAC CU protocol on Uganda. The model measures trade creation effect as follows:

$$TCijk\ iy = Mijk\ y * \qquad \frac{\Delta t\ ijk}{(1+tijk)1\ (-\frac{y}{\beta})} \quad \ldots\ldots\ldots\ldots\ldots\ldots 2.1$$

$TCijk$ – Trade creation on commodity i imported from country K into country j.

$Mijk$ - Imports of commodity I to country j from exporting country K

Y - Import elasticity of demand in the importing country J

$tijk$ - Tariff

β - Export supply elasticity

It was observed that the model was employed to quantify trade creation, trade diversion as well as welfare and revenue effects for Ugandan within the EAC (East African Community) and it makes use of a lot of assumptions like assuming export supply elasticity as infinite because Uganda is a small country, assuming import substitution elasticity to be 1.5 and also the import demand elasticity for Uganda are taken from the World bank survey.

Oliver and Andrew (2005) research on explaining Africa's export performance - Taking a New look, make use of dynamic panel data analysis for 48 African countries over the period 1987-2002 to ascertain the key determinants of export performance, Rodrik (1999) earned out a regression analysis on pooled data for the period of 1954 to 1994. The dependent variables were the share of trade in GDP (either total trade or exports) and their rate of growth. The model used is:

$$VIit = C + aiPi,t + a2GDPCAPi,t + a3MANi,t + a4GFCi,t + a5FDIi,t + a6REERi,t + a7TAXi,t + a8DIVERSi,t + a9DPRICEi,t + a10DLANDLOCKi,t + \varepsilon i,t \quad \ldots\ldots\ldots \; 2.2$$

Where VI is the volume index of exports, and P is the unit price data for exports. The other control variables were chosen to better reflect the supply side of the African economies under analysis.

The Dynamic panel data model focused on providing optimal linear Generalized Methods of Moment (GMM) estimators under relatively exogeneity of the covariate processes and the properties of the heterogeneity and error term processes. It was also found out that GMM have large finite sample bias and poor precision in simulation studies. Kiliappa (2007) on a comparative analysis of recent export performance of China and India make use of the gravity model which is defined following Newton's Law of Gravitation which explains trade flows between two countries. This is calculated from OLS estimates of the gravity model as potential exports which were adopted from (Baldwin, 1994) and Nilsson, 2000). A simple base line gravity model was written as:

$Xij = CY\beta iYy$ ……………………………………………………….. 2.3

Where C, β δ and y are positively coefficients Xij is the exports of country I to Country j D are the distance between capital cities. Yi and Yj. Are the national gross domestic products of countries I and j respectively.

Babatunde (2006) make` use of gravity model follows similar model of (Freinkman etal 2004) and (Helpman and Kringman 1935) He presented his gravity model in this form;

$In(Xij) = \beta o + \beta 1In\,(Dij) + \beta 2In\,(Yij) + \beta 3In(Yij) + \beta 4In(POPij) +$

$\beta 5In(POPij) + \beta 6(TRFij) + \beta 7(MP) + \delta z + \cup ij$ ……………… 2.4

Where X_{ij} denotes the level of country j:D_{ij} denotes the distance between two countries. Y denotes real GDP, Pop denotes population; Z denotes a vector of other controls (common language and shared border), BMP denotes black market premium; TRF is average tariff rate; β and δ are coefficient which measure the impact of each variables and U, is the error term. The expected signs for the co-efficient of this works are β_1, β_2, β_3, β_4 β_5, β_6, $\beta_7 < \beta_2\ \beta_3\ \delta > 0$. The model is expected to test the hypothesis that participation in a regional trade arrangement within ECOWAS encourages export performance.

It was observed that the model has failed to provide an explanation for the adoption of the gravitational constant in a regression, considering the logarithmic transformation of that variable, such as the simple intercept of a straight line. Also, despite the wide spread use in estimating numerous economic determinants, the gravitational model has presented numerous discrepancies over the years. Amongst these, the most critical problem has certainly been (from the practical point of view of compiling a data-set) that of defining the parameters involved in Newton's original formulation.

Oyelabi (1973) on Tariffs Domestic prices and industrial growth in Nigeria make uses of general model given as:

$DP = f(IP, IR, OF)$ ………………………………..…………………….. 2.5

Where DP = domestic price level

IP = import price index

IR = import restricting policy and

OF = other factors

Afangideh (2003) on the impact of world trade organization on Nigerian manufacture exports performance used of multivariate co-integration analysis of the manufacture exports on the explanatory variables with a view to establishing a long run relationship between them. The model is specified thus:

$$MEt = f(TOPt.EXRt.ATRt.CUt) \qquad 2.6\text{ a}$$

$$MEt = bo + b1TOP + b2EXRt + b3ATR + B4CU + Ui \qquad 2.6\text{ b.}$$

Where

MEt = Manufacture exports at time

$TOPt$ = Trade openness at time t, measure as sum of export and import divided by Gross Domestic Product, GDP

$EXTt$ = Exchange rate at time t

$ATRt$ = Average tariff rate at time t, calculated as non - oil revenue divided by total imports.

CUt = Manufacturing capacity utilization at lime t

Ut = Stochastic error term at time t

Oyefide (1975) on tariff policy and industrialization in Nigeria used of simple econometrics model thus:

$$ISK = f(NERP) \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots . 2.7$$

That is the import substitution ration (ISR) is a function of tariff protection where tariff protection is measured by the net effective rate of protection (NERP)

$ISR = f(NERP\ PSE\ .PCIE)$ …………………………………. 2.8

Where PSE is population size elasticity and PCIE is per capita income elasticity.

2.5 Research Gaps

Most of the literatures look at only exports performance of Nigeria which comprises of oil exports and non oil exports of Nigeria. They didn't disaggregate manufactures from non manufactures. This research concentrates on the factor proportion theory, new trade theory and Lerner's symmetry theorem and country specific tariffs which supported the research under consideration.

In terms of scope, no recent study has been carried out in Nigeria on the performance of manufacturing subsectors which is the concern of this study from the pre structure adjustment era to the post structure adjustment programme introduced in 1986 by the Federal Government of Nigeria in order to diversify the economy from oil exporting economy to manufacturing exporting country. This research performed a comparison analysis on the impact of trade policy on manufacturing export performance before structural adjustment programme and after the structural adjustment programme of the federal government of Nigeria.There has been no consensus as regard to methodology used in many related literatures of study. Some literatures like Sangeeta *et al* make use of partial equilibrium approach while Oliver and Andrew (2005) used dynamic panel data analysis, Rodrik (1999) used regression analysis, and Bababatunde (2006) used gravity model to measure the impact of trade on manufacturing subsector export performance in Nigeria. However, this research used multivariate co-integration analysis of the manufactured exports on the explanatory variables with a view to establishing a long run relationship and using E-view package to run the regression. The reason for this choice is because empirical research in economics is based on time series. Therefore, it is standard to view time series as the realization of a stochastic process. Model builders can use statistical inference in constructing and testing the equations that characterize relationships between economic variables.

The two central properties of many economic time series are non-stationarity and time-volatility (Wei, 2006). These two properties have led to many applications in both economics and statistics.

Non-stationarity is a property common to many applied time series. This means that a variable has no clear tendency to return to a constant value or linear trend. It is generally correct to assume that economic processes have been generated by a non-stationary process and follow stochastic trends. One major objective of empirical research in economics it to test hypotheses and estimate relationships derived from economic theory, among other such aggregated variables (Pfaff, 2006).

The classical statistical methods used in building and testing large simultaneous equation models, such as Ordinary Least Squares (OLS), were based on the assumption that the variables involved are stationary. The problem is that the statistical inference associated with stationary processes is no longer valid if time series are a realization of non-stationary processes. If time series are non-stationary it is not possible to use OLS to estimate their long-run linear relationships because it would lead to spurious regression. Spurious regression is a situation in which there appears to be a statistically significant relationship between variables but the variables are unrelated. A few decades ago the docility of nonstationarity was not well understood by model builders. However, this is no longer the case because the technique of cointegration has been introduced according to which models containing non-stationary stochastic variables can be constructed in such a way that the results are both statistically and economically meaningful.

Co-integration is an econometric concept which mimics the existence of a long-run equilibrium among economic time series. If two or more series are themselves non stationary, but a linear combination of them is stationary, then they are said to be co-integrated (Wei, 2006). We should be concerned about co-integration because it is a possible solution to non-stationarity found in many economic time series, and if time series are non-stationary the assumptions upon which OLS estimation rest are violated, rendering its application inappropriate.

Previously, the usual procedure for testing hypotheses concerning the relationship between non-stationary variables was to run OLS regressions on data which had initially been differenced. Data are differenced in order to reduce non-stationary series to stationary. Although this method is correct in large samples, it may give rise to misleading inferences or spurious regressions in small samples.

Moreover, estimation of a single equation framework with integrated or non-stationary variables tends to create the following problems: non-standard distribution of the coefficient estimates generated by the process not being stationary, explanatory variables generated by the process that display autocorrelation, the existence of more than one co-integrated vector and tendency to weak exogeneity (Banerejee et al., 1993).

The remedy for problematic regressions with integrated variables is to test for co-integration and to estimate a vector error-correction model to distinguish between short-run and long-run responses, since co-integration provides more powerful tools when the data sets are of limited length. The technique of co-integration and the error-correction model have both been used before in modeling a number of studies, for example, in modeling Danish gasoline demand (Bentzen et al.,1995), the road transport energy demand for Australia (Samimi, 1995), demand for coal in India (Kulshreshtha and Parikh, 1999), coal demand in China (Chan and Lee, 1997) and the United Kingdom's nal user energy demand (Fouguet et al., 1997). Also, E-view package was used because is a statistical package for windows used mainly for time – series oriented econometric analysis software (QMS). It can be used for general statistical analysis and econometric analyses, such as Cross – section and Panel data analysis and time series estimation and forecasting.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter looked at the various instruments, models and methods of analysis used in analyzing the research dissertation, objective by objective.

3:1 Research Design

This study aims at analysing the impact of trade policy on the performance of the export manufacturing industries in Nigeria from 2000 to 2014. An *ex post facto* (after - the- fact) research design was adopted as guide in this investigation and analysis. *Ex post facto* research design according to Asika (2006: 35) is a form of an experimental design where an existing case is observed for some time in order to study or evaluate. It is a research design that attempts to explore cause and affect relationships where causes already exist and cannot be manipulated. Given that this study aims at establishing the impact of trade policy on the performance of the export manufacturing industries in Nigeria using observations from the indicators that already exist, *ex post facto* research design was considered appropriate. More so, the events that produced the observations had already taken place, so the data were already observed and cannot be manipulated.

3.2 Nature and Sources of Data

The data for this study was generated from secondary sources. The data consisted of the annual observation of Manufacture Export (ME), Average Tariff (AT), Trade Openness (TOP), Exchange Rate (EX), and Capacity Utilisation (CU) series. The annual observations of Manufacture Export and Capacity Utilisation were obtained from the Nigeria National Bureau of Statistics website: http://www.nbs.gov.ng/, whereas the annual observations of Average Tariff, Trade Openness, and Exchange Rate where collected from the Central Bank of Nigeria (CBN) statistics databank: http://www.cenbank.org/.

Other information for this study were extracted from the Annual reports and other publications of CBN, Annual reports and other publications of the Securities and Exchange Commission annual reports and other publications, National Bureau of Statistics annual economic indicator, and annual abstract of statistics.

3.3 Description of Research Variables

The variables for this study are Manufacture Export (ME), Average Tariff (AT), Trade Openness (TOP), Exchange Rate (EX), and Capacity Utilisation (CU) series. financial market indicators which include stock market returns, Naira/US$ exchange rates, interest rates, and inflation rates. The Manufacture Export serves as the dependent variable, whereas Average Tariff, Trade Openness, Exchange Rate (EX), and serve as the independent variables.

3.3.1 Manufacture Export (ME)

This is the total monetary value of all industrial products produce or manufactured and exported out of a country within a particular period or the real dollar value of manufacturing or other prominent industry exports from a particular country. E.g, food manufacturing, chemical manufacturing, plastics and rubber products, fabricated metal products, cements and textiles. It provides a very good proxy of manufactured export because it mirrors the general movement of the export of manufactured product in Nigeria.

3.3.2 Average Tariff (AT)

The Average Tariff is calculated as addition of non-oil revenue divided by total imports. It is used to measure the degree of protectionism within an economy since tariffs generally reduce imports of foreign products, the higher the tariff, the greater the protection afforded to the country's import – competing industries. In fact tariff is the most commonly applied trade theory. The major problem associated with average tariff rate is that there are several different ways to calculate an average tariff rate and each method can give a very different impression about the level of protection.

3.3.3 Trade Openness (TOP)

This is a measure of how open an economy is to world trade. It implies that there is minimal or no restrictions to trade and defined as the sum of export and import relative to the gross domestic product. It is argued that trade openness brings many economic benefits, including increased technology transfer, transfer of skills, increased labour and total factor productivity and economic growth and development. Trade openness has increased for most trading nations, and is a result of globalisation, and trade liberalisation. In this study, Trade Openness is measured as a ratio of trade (import + export) to GDP.

3.3.4 Exchange Rate (EX)

Exchange rate refers to the rate at which one currency exchanges for another. It is said to depreciate if the amount of domestic currency require buying a foreign currency increases, while the exchange rate appreciates if the amount of domestic currency require buying a foreign currency reduces. An appreciation in the real exchange rate may create current account problems because it leads to overvaluation. Overvaluation in turn makes imports artificially cheaper while exports relatively expensive, thus reducing the international competitiveness of a country. The yearly official Naira/US$ exchange rate is chosen as a proxy for exchange rate because majority of the raw material used in manufacturing export product are bought in dollars. In addition export receipt is in US dollars. The official exchange rate is determined by the Monetary Policy Committee of the CBN.

3.3.5 Capacity Utilisation (CU)

This is the extent to which an enterprise or a nation actually uses its installed productive capacity. It is the relationship between output that is actually produced with the installed equipment and the potential output which could be produced with it, if capacity was fully used. Capacity utilisation is computed in percentages by the National Bureau of Statistic.

3.4 Model Specification

Econometricians build models as a way of simplifying the complexities of real life. A model is, thus, an abstraction of reality. This study therefore, employed a dynamic regression model to estimate the determinants manufactured exports in Nigeria. The application of dynamic regression model for this study agrees with prior studies in both developed and emerging stock markets (see for example, Lothian and McCarthy, 2001; Akmal 2007). The general form of the model used is:

$$MEt = F(ATRt, TOPt, EXRt, CUt) \quad (3.1)$$

When expressed as an additive function, the relationship above may be translated into a multiple equation as follows:

$$MEt = bo + b1TOP + b2EXRt + b3ATR + B4CU + Ui \quad (3.2)$$

Where;

MEt = Manufacture Exports at time t

$TOPt$ = Trade Openness at time t. (measures as sum of export and import divided by GDP)

$EXRt$ = Exchange rate at time t

$ATRt$ = Average tariff rate at time t

CUt = Manufacturing capacity utilization at time t

Ut = Stochastic error term

$b_0 - b_4$ = Parameters of the model representing the coefficient of the explanatory variables.

Model specifications, apart from involving the determination of the dependent and explanatory variables which were used, also involve the assessment of the theoretical expectations about the sign and the size of the parameters of the function as outline below.

b_1, $b_4 > 0$; $b_3 < 0$ and $b_{2\ ><}\ 0$

The *a priori* expectations of the error term are serial uncorrelation and absence of heteroscedasticity.

3.5 Techniques of Data Analysis

The data collected for this study were analysed sequentially in accordance with the objectives stated in chapter one. The techniques of data analysis comprise of descriptive statistics, Unit root tests, Auto Regressive Distributed Lag, and Granger causality tests.

3.5.1 Descriptive statistics

The descriptive statistics involved computing the mean, standard deviation, skewness, kurtosis, minimum and maximum return of the variables under study, which include manufacturing export, average tariff, trade openness, exchange rate, and capacity utilisation. While the mean presents information on the average of each variable, the standard deviation shows the level of variation of the series from their average. The skewness and the kurtosis provide insight into the distributional pattern of the variables.

3.5.2 Tests for unit roots, autocorrelation, lag selection

3.5.2.1 Tests for unit roots

The unit root tests will be conducted to determine the order of integration of stock market returns at time *t* and financial market indicators at time *t* using the following testing methodologies: Augmented Dickey-Fuller (from fuller, 1979 and Dickey and Fuller, 1981) and Phillips-Perron (Phillips and Perron, 1988). The difference between the two is in their treatment of serial correlation and heteroscedasticity in the errors. While the ADF tests use a parametric autoregression to approximate the ARMA structure in the errors in the test regression, PP tests ignore any serial correlation in the test regression ( ). The ADF test with is estimated thus:

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{i=2}^{n} \beta_1 \Delta Y_{t-1} + \varepsilon_t \qquad (3.3)$$

The null hypothesis to be tested is that Y_t is $I(1)$ with drift (i.e., $\alpha_1 = 0$), against the alternative that Y_t is $I(0)$ about a deterministic time trend (i.e., $\alpha_1 < 0$). Dickey and Fuller (1981) provide cumulative distribution function of the ADF statistic. If the computed absolute value of the coefficient of α_1 is less than the ADF critical tau values, reject the null hypothesis that $\alpha_1 = 0$, in which case Y_t does not contain unit root. Otherwise accept the null hypothesis, in which case Y_t contains unit root.

Phillips-Perron non-parametric test is used to confirm the result of the ADF test (see, Phillips and Perron, 1988). One of the advantages of the PP tests over ADF is that PP tests are robust to general forms of heteroscedasticity in error term ε_t. Another advantage is that the user does not have to specify a lag length for the test regression. The Phillips-Perron is estimated as follows:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \varepsilon_t \tag{3.4}$$

The null hypothesis of the PP tests is that there is a unit root in Y_t series (i.e. $\alpha = 0$), against the alternative hypothesis that there is no unit root in Y_t (i.e., $\alpha_1 < 0$). The decision rule of PP tests is the same with ADF (Emenike, 2015).

3.5.2.2 Serial Correlation Test

Autocorrelation function (ACF) measures the linear dependence between returns at current period and its past values. The lag-*i* sample autocorrelation of r_t is specified according to Tsay (2005) as:

$$\rho\ell = \frac{\sum_{t=\ell+1}^{n}(r_t - \bar{r})(r_{t-\ell} - \bar{r})}{\sum_{t=1}^{n}(r_t - \bar{r})^2}, \quad 0 \le \ell < n-1. \tag{3.5}$$

Where, $\rho\ell$ is the autocorrelation coefficient of the returns of lag ℓ, n is the number of observations, r_t is the return for period t, $\bar{r}$ is the sample mean of return, and ℓ is lag of the period. The ACF is used to detect whether the serial correlation coefficients are significantly different from zero under the null hypothesis ρ_1=0 versus the alternative hypothesis $\rho_1 \neq 0$. If r_t is uncorrelated sequence, the *p*-value is greater than the significance level (α)**.**

3.5.3 Measuring major determinants of manufactured export performance in Nigeria

The Vector Autoregressive (VAR) model was employed to evaluate the determinants of manufacturing export in Nigeria. For simplicity, the basic model to be estimated in this work using VAR contains five equations, given the number of variables and the lag length adopted, each equation with a lag length of two values contains the annual data of Nigeria's ME, TOP, EXR, ATR and CU as regressions. This generated a total of 55 parameters including the constants cased on the formulae, ($m+pm^2$) where m = no of variable-of the equations using OLS, The actual model we estimate is:

$$MEt = \alpha 1 \sum \beta 1 MEt + \sum \emptyset TOPt - 1 + \sum y1EXRt - 1 + \sum ATR1 + \sum \delta CU1 + U1 \qquad (3.6)$$

$$TOPt = \alpha 2 \sum W1MEt + \sum \lambda \mathrm{iTOPt} - 1 + \sum y1EXRt - 1 + \sum a1ATR1 + \sum pCU1 + U21 \qquad (3.7)$$

$$EXRt = \alpha 3 \sum h1MEt + \sum \lambda \mathrm{iTOPt} - 1 + \sum \mathrm{x1EXRt} + \sum \mathrm{g1ATR1} + \sum \mathrm{hCU1} + \mathrm{U31} \qquad (3.8)$$

$$ATRt = \alpha 4 \sum K1MEt + \sum \lambda \mathrm{TOPt} - 1 + \sum \mathrm{b1EXRt} + \sum \lambda \mathrm{1ATR1} + \sum \mathrm{qCU1} + \mathrm{U41} \qquad (3.9)$$

$$CUt = \alpha 5 \sum v1MEt + \sum mTOPt - 1 + \sum t1EXRt + \sum c1ATR1 + \sum uCU1 + U51 \qquad (3.10)$$

Where the U's are the stochastic error terms, called impulses or innovations in the language of VAR and n = 2 represents the largest number of lags that are needed to capture most of the effects that variables have on each other. Each equations of the model is estimated using the OLS to produce separate efficient estimation, thus all the equations in the model are linear.

3.5.4 Measuring causal relationship between manufactured export trade policy in Nigeria

The Granger causality test was estimated to examine the causal relationship between Manufacture Exports and Trade Openness, Exchange Rate, Average Tariff Rates and Capacity Utilization. The Granger causality test was carried out based on the following estimated equations:

$$InMEt = \sum \Phi \mathrm{tInTOPt} + \beta \mathrm{tInMEt} - 1 + \mathrm{U1t} \qquad (3.11)$$

$$InTOPt = \sum \mathrm{ulnTOPt} - 1 + \sum \mathrm{t}\lambda \mathrm{lnMEt} - 1 + \mathrm{U2t} \qquad (3.12)$$

$$lnMEt = \sum \Phi \mathrm{tInEXPt} - 1 + \sum \mathrm{tInME} + \mathrm{U3t} \qquad (3.13)$$

$$lnEXRt = \sum ptInEXRt - 1 + \sum \mathrm{t}\, \Delta \mathrm{InMEt} - 1 + \mathrm{U4t} \qquad (3.14)$$

$$lnMEt = EXRtlnATRt - 1 + \sum \mathrm{t}\Delta \mathrm{InMEt} - 1 + \mathrm{U5t} \qquad (3.15)$$

$$InATRt = \sum atATRt - 1 + \sum \mathrm{tktInMEt} - 1 + \mathrm{U6t} \qquad (3.16)$$

$$lnMEt = \sum \text{ytlnCUt} - 1 + \sum \text{wt InMEt} - 1 + \text{U7t} \quad (3.17)$$

$$lnCUt - 1 \sum \text{qt InCUt} - 1 + \sum \text{gtlnMEt} - 1 + \text{U8t} \quad (3.18)$$

Where the disturbances U_{11t} U_{18t} are assumed uncorrelated. Equation (3.11) postulates that current ME is related to its past values as those of TOP. Equation (3.12) postulates that current TOP is related to it past values of ME Equations (3.12) to (3.18) are similarly explained. Note that these regressions can be cast in growth forms Thus. ME, TOP, EXR, ATR and CU, with a dot over a variable indicate its growth rate. Accordingly, we now identify the probable outcome for equation (3.11) and (3.18) as follows;

i. Unidirectional causality from TOP to ME is indicated if the estimated coefficients on lagged In TOP in (3.8) are statistically different from zero (statistically significant) as a

ii. group (i.e. $Ø \neq 0$) and the set of estimated coefficients on lagged InME in (3.9) is not statistically different from zero, (i.e $\Sigma = 0$).

iii. Conversely, unidirectional causality from ME to TOP exists if the set of lagged InTOP coefficients in (3.8) is statistically different from zero (i.e $\Sigma\Phi_t = 0$} and the set of lagged InME coefficients in (3.9) is statistically different from zero (i.e.$\Sigma\lambda_1 = 0$).

iv. Bilateral or feedback causality, is suggest when the sets of InTOP and InME coefficients are statistically significant different from zero in both regressions.

v. Independence is suggested when the sets of InTOP and InME coefficients are not statistically significant in both the regressions.

The same interpretations and conclusions are reached for the casual relationship between InME and LnEXR InME and InATR. InME and fnCU m equations (3.13), (3.14) and (3.16), and (3.18) in that order.

3.5.5 Measuring effect of trade policy on performance of manufactured export in Nigeria

The multiple regression models was use to estimate the effect the effect of trade policy on performance of the manufacturing industries on Nigerian economy pre and post-structural adjustment programme (SAP). The regression model was estimated as follows:

$$ME_t = f(TOP_t,\ EXR_t, ATR_t\ , CU_t) \qquad (3.19)$$

$$ME_{presap} = b_0 + b_1TOP_1 + b_2EXR_2 + b_3ATR_3 + b_4CU_4 + \ U_i \qquad (3.20)$$

$$ME_{posap} = b_0 + b_1TOP_1 + b_2\,EXR_2 + b_3\,ATR_3 + b_4CU_4 + U_i \qquad (3.21)$$

Where the variables are as explained in Equation 3.1. If TOP_t is increased by one unit while holding the values of the other independent variables constant, ME_t would change by an amount, b_1.The *a priori* expectation is that b_1, $b_4 > 0$; $b_3 < 0$ and $b_{2\ ><}\ 0$.

3.5.6 Diagnostic tests

To evaluate the adequacy of models is to examine the residuals for serial correlation and heteroscedasticity. The estimated residuals, according to Engle & Paton (2001) and Enders (2004), should be serially uncorrelated and should not display any remaining conditional volatility. The robustness of the models was, therefore, evaluated using the following diagnostics tests: Autocorrelation function (ACF), Ljung & Box (1978) Q test statistic, and Engle (1982) Lagrange multiplier (LM) test. The ACF and L-B Q test statistics were used to test the null hypothesis of no autocorrelation in the estimated residuals up to a specific lag. The LM test was used to examine the squared residuals for existence of heteroscedasticity up to a specific lag.

The serial correlation in residuals was evaluated using the Autocorrelation function (ACF) to test the null hypothesis of no autocorrelation in the estimated residuals up to a specific lag. The lag-*i* sample autocorrelation of $\mathrm{r_t}$ is specified according to Tsay (2005) and Emenike (2015) as:

$$\rho\ell = \frac{\sum_{t=\ell+1}^{n}(r_t-\bar{r})(r_{t-\ell}-\bar{r})}{\sum_{t=1}^{n}(r_t-\bar{r})^2}, \quad 0 \le \ell < n-1. \tag{3.22}$$

Where, $\rho\ell$ is the autocorrelation coefficient of the returns of lag ℓ, n is the number of observations, $\mathrm{r_t}$ is the return for period t, $\bar{r}$ is the sample mean of return, and ℓ is lag of the period. The ACF is used to detect whether the serial correlation coefficients are significantly different from zero under the null hypothesis ρ_1=0 versus the alternative hypothesis $\rho_1 \neq 0$. If r_t is uncorrelated sequence, the *p*-value is greater than the significance level (α).

The Ljung-Box Q test used to evaluate serial correlation at various lags are estimated as follows:

$$Ljung - Box\ Q\ Test\ (Q_{LB}(m) = T(T+2)\sum_{\ell=1}^{m}\frac{\hat{\rho}_{\ell}^{2}}{T-\ell} \quad (3.23)$$

Where *T* is the sample size, *m* is the number of autocorrelation used in the test. Under the condition that several autocorrelations of r_t are zero, the Q-statistic is asymptotically a chi-square random variable with degrees of freedom equal to the number of autocorrelation (*m*). The null hypothesis is that the first *m* lags of ACF of ε_t^2 are zero (Tsay, 2005). The decision rule therefore is to reject null hypothesis of model inadequacy if the *p*-value is less than or equal to α, the significance level.

The Engle (1982) Lagrange multiplier test was used to test the null hypothesis of no remaining ARCH effects up to a specific lag. The ARCH-LM was estimated in accordance with Engle (1982), Tsay, (2005) and Emenike (2015) as follows:

$$\varepsilon_t^2 = c_0 + \alpha_1\varepsilon_{t-1}^2 + \alpha_2\varepsilon_{t-2}^2 + ... + \alpha_q\varepsilon_{t-q}^2 \quad (3.24)$$

Where ε_t^2 's are squared residuals from appropriate regression model, c_0 is constant, α_1 to α_q are coefficients of the lags of the squared residuals. If there is no heteroscedastic effects, the estimated values of α_1 through α_q should not be significantly different from zero. The decision rule is to reject the null hypothesis of no heteroscedasticity if the *p*-value is less than the level of significance (Bollerslev, Chou & Kroner, 1992; Enders, 2004; Tsay, 2005; Rachev *et al.*, 2007). Evidence in support of the null hypothesis of no heteroscedasticity provides support for model adequacy.

3.7 Decision Rules and Significance Level

The *f*-statistic will be used to test the hypotheses in order to ascertain the significance of the parameters at 5% levels of significance. The decision rule is to accept the null hypothesis if the computed *t* statistics is greater than the critical *t* statistics, and to reject otherwise. Also the p-value involves comparing the p-value with the chosen significance level. If the p-value is less than or equal to the significance level, we would reject the null hypothesis. Otherwise we would not reject the null hypothesis.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.0 Introduction

This chapter focuses essentially on the presentation, analysis and interpretation of the empirical results. In this chapter, each of the objectives was achieved using the prescribed methods discussed extensively in chapter three of the study. Here, four objectives were the following: first, to evaluate the major determinants of manufactured export performance in Nigeria; second, to the causal relationship between manufactured exports and trade policy in Nigeria; third, to determine the effect of trade policy on performance of the manufacturing industries of Nigerian economy pre–structural adjusted programme (SAP); and fourth, to determine the effect of trade policy on performance of the manufacturing industries of Nigerian economy post–structural adjusted programme (SAP).

To streamline the analyses, the preliminary analyses were presented in Section 4.1, followed accordingly by the order of the objectives and hypotheses formulated in chapter one.

4.1. Preliminary Analysis

The preliminary analysis are not conducted to achieve objective or to test hypotheses. They are conducted to evaluate the characteristics of the data as well as the order of integration. They include descriptive statistics, unit roots test, serial correlation tests, and lag selection models.

4.1.1 Descriptive Statistics

In this section, emphasis is on discussing the trend of export performance in Nigeria; here descriptive analysis was used to achieve the objective. From 1970 to 1980 the level of manufactured export was very low accounting for less than 43.5 million on average. This was due to the neglect of the manufacturing sector as a result of the concentration on crude oil explorations which generated over 90% of government revenue since discovery of crude oil. Other factors that caused this low manufactured export is political instability and frequent change of government.

Figure Showing Manufactured Export in Nigeria-1970-2014

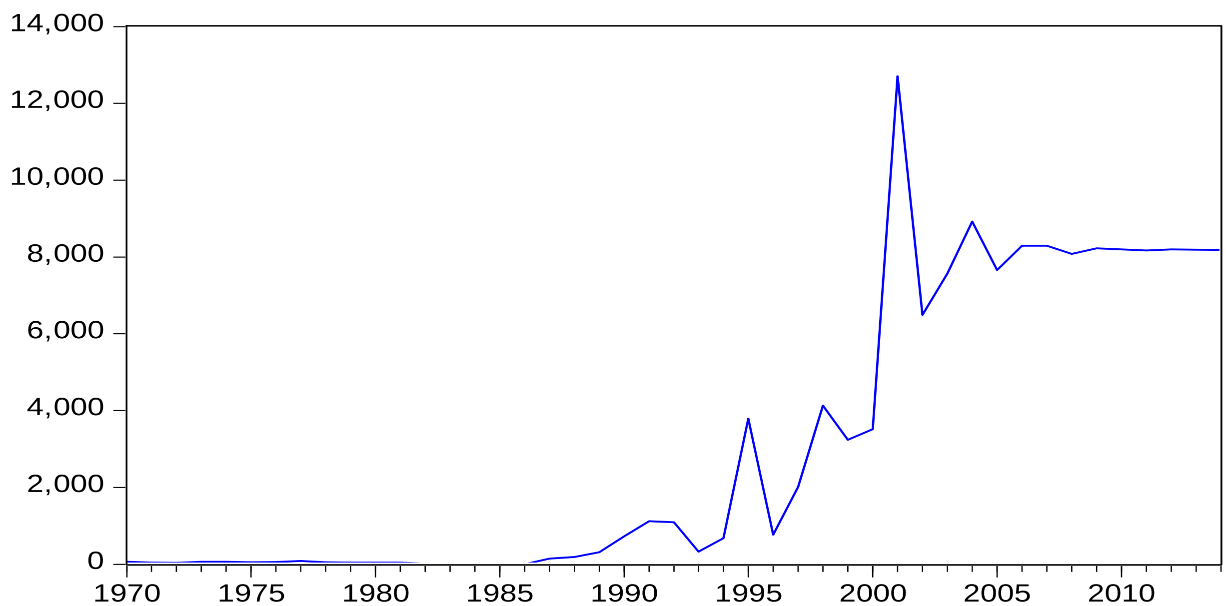


Figure 4.1: A graph showing manufactured export in Nigeria (1970 – 2014)

Source: Researcher (2016).

From 1985 – 1990 witness a pick in the manufactured export of the country which was as a result of realization that the country cannot rely so much on the export of crude oil following the sudden fall in the price of crude petroleum in early 1980's. This is because the fall in the price of crude petroleum in the international market brought government activities to a standstill and as a result of the growth in size of government due to the large revenues coming to her during the boom era, between 1995 - 2002 witness a very high increase in the manufacturing export of the country which was due to change in government from the military to the civilian government and the quest of the new government to develop infrastructures which is a catalyst to manufacturing sector development, also, government policies that was drive towards encouraging manufacturing sectors. However, there was a sharp decline in the manufactured exports between 2002 – 2002; this shock was due to the bad state of the power sectors as a result of corruption and lack of maintenance of the national power grade which lead to most manufacturers making use of power generating set to source for energy which subsequently lead to high cost of production and most has to relocated to neighboring countries. From 2002 till 2014, the country witnessed a stable but low manufactured export volume of the country as a result of relatively political stability and favourable government policies that geared toward infrastructural development and diversification of the economy.

Table 4.1: Descriptive Statistics

Statistics	Manufacture Export	Average Tariff	Trade Openness	Exchange Rate	Capacity Utilisation
Mean	3110.21	0.34	0.31	51.50	54.36
Maximum	12707.90	0.75	0.68	158.55	85.20

Minimum	3.90	0.16	0.01	0.54	29.29
Std. Dev.	3790.87	0.14	0.18	62.49	16.84
Skewness	0.78	1.17	0.10	0.69	0.29
	(0.03)	(0.00)	(0.79)	(0.06)	(0.44)
Kurtosis	2.08	0.76	-1.04	-1.38	-1.11
	(0.26)	(0.33)	(0.18)	(0.08)	(0.15)
Jarque-Bera	6.13	11.43	2.10	7.24	2.95
	(0.05)	(0.00	(0.34)	(0.02)	(0.22)

Source: Author's Calculation

Note: The probability values are in parenthesis

This section also provides some preliminary analyses involving the description of relevant statistical properties of manufactured exports in Nigeria, average tariff rate, trade openness, exchange rate, and capacity utilisation. Table 4.1 above shows the descriptive statistics for manufactured export. There seems to be evidence of significant variations in the manufactured export as shown by the large difference between the minimum value of 3.90 million and the maximum value of 12707.9million as well as when these values are compared with the mean value of 3110.2 million naira. However, the magnitude of fluctuations in manufactured exports appears to be volatile as shown by the standard deviations of 3790.87 million. Regarding the statistical distributions of the variables, manufactured exports is positively skewed implying that the right tail is particularly extreme and it is also platykurtic. This is an indication of thin tails (in the case of platykurtic distribution) than the normal distribution. Overall, the Jarque Bera (JB) statistic that uses the information from skewness and kurtosis to test for normality shows evidence of non-normality for the manufactured exports and therefore, the alternative inferential statistics that follow non-normal distributions are appropriate in this case.

Table 4.1 also shows the descriptive statistics for average tariff rates. The mean of the average tariff rate is 0.34. The variation between the minimum value of 0.16 and the maximum value of 0.75 is glaring compared with the mean value of 0.34. The skewness value of the average tariff rates is positive, but not leptokurtic. Overall, the Jarque-Bera statistic that uses the information from skewness and kurtosis to test for normality shows evidence of non-normality for the average tariff rates and therefore, the alternative inferential statistics that follow non-normal distributions are appropriate in this case.

Observe also from Table 4.1 that the mean for trade openness 0.31. The variation between the minimum value of 0.01 and the maximum value of 0.68 is significant compared with the mean value of 0.31. The skewness value for trade openness is zero, and not leptokurtic. Overall, the Jarque-Bera statistic that uses the information from skewness and kurtosis to test for normality shows evidence of normality for the trade openness.

Table 4.1 also shows the descriptive statistics for exchange rates. The mean of the exchange rate is 51.50 Naira to one dollar. The variation between the minimum value of 0.54 and the maximum value of 158.5 is very large compared with the mean value of 51 Naira. The skewness value of the average tariff rates is positive. This implies that the Naira has depreciated significantly over the study period. The kurtosis value is flat at the

5% significant level. In addition, Jarque-Bera statistic shows evidence of non-normality for the exchange rates at the 5% significance level but normal at the 1% significant level. Consequently, the alternative inferential statistics that follow non-normal distributions are appropriate in this case.

Notice also from Table 4.1 that the mean for capacity utilisation is 54 percent. The dispersion between the minimum value of 29 percent and the maximum value of 85 percent is significant compared with the mean value of 54 percent. The skewness value (0.29) for capacity utilisation is zero, and not leptokurtic. Overall, the Jarque-Bera statistic that uses the information from skewness and kurtosis to test for normality shows evidence of normality for the capacity utilisation.

4.1.2 Unit Root Tests

Table 4.3 presents the results of unit roots tests on the log-level and first difference series of the manufactured exports, average tariff rate, capacity utilization, exchange rate and trade openness. The unit roots tests were conducted using augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The ADF and PP tests were conducted at 5% level of significance in order not to accept a false null hypothesis.

As we can see from Table 4.3, manufactured exports, average tariff rate, capacity utilization, exchange rate and trade openness series contain unit roots, that is, they are not stationary at their levels. This is evidenced in the computed ADF coefficients being less than theoretical values in absolute terms. Similar results were obtained from PP test except for the consumer price index.

In their first differences, however, the absolute values of the computed ADF coefficients exceed the critical values at 5% significance level. Table 4.3 shows that the computed ADF coefficient -4.09, -3.74, -3.78, -3.73, and -4.53 respectively for the manufactured exports, average tariff rate, capacity utilization, exchange rate and trade openness are greater than the theoretical value (-3.43) at 5% significance level. These imply that the manufactured exports, average tariff rate, capacity utilization, exchange rate and trade openness series require first differencing to become stationary.

Table 4.2 Unit Root Results for the period 1970-1985

Variables	ADF	PP
ME	0.438	-1.000
ΔME	-4.098**	-6.582*
ATR	0.330	0.389
ΔATR	-3.746**	-1.712*
CU	2.055	-0.476
ΔCU	-3.784**	-1.764*
EXR	1.132	-1.082
ΔEXR	-3.738**	-2.305*
TOP	-2.143	-2.143
ΔTOP	-4.537**	-5.088***

Note: *, ** and *** denote significant at 10, 5 and 1 per cent levels respectively. The results are generated using EVIEWS software

Source: Author's computation

4.2 Results of Determinants of Manufactured Exports Performance in Nigeria

This section focuses on the determinants of manufacturing exports in Nigeria; to do this the study used a plethora of statistical techniques to achieve this objective so as to validate the results. Here, we used the simple correlation coefficient to know the if there is a direct or inverse relationship exists between manufactured exports (the dependent variable) and the explanatory variables which are average tariff rates, trade openness, exchange rates and capacity utilization. As a test of confirmation, we also used the ordinary least square (OLS) estimates as well as the Vector Autoregressive Models (VAR) to examine the dynamic interactions between the variable. In the VAR, the impulse response function as well as the variance decomposition was used. These are discussed below sequentially.

4.2.1 Cross Correlation

The main objective is to find out if there is a positive or a negative relationship between manufactured exports and the explanatory variables. Table 4.2 below presents the simple correlation coefficient between the variables of discourse. First, we found that there is a negative relationship between manufactured exports and average tariff rate, this implies that this variables move in opposite direction. An increase in the average tariff rate leads to a decline in Nigeria's manufactured exports. Similarly, we found an inverse relationship between manufactured exports and capacity utilization. This implies that if capacity utilization is increasing, then manufactured exports declines. In reality, we expect a positive relationship between these two variables; however, this is not unconnected to the political instability as well as a volatile exchange rate that does not favor countries of the world to trade with Nigeria. Furthermore, we found a positive relationship between manufactured export and trade openness on one hand and between manufactured exports and exchange rate on the other hand. This implies that an increase in trade openness and exchange rate will lead to an increase in manufactured exports.

Table 4.3 Ordinary correlations

	LMET	ATRT	EXTT	TOPT
LMET	1.000000			
ATRT	-0.582707	1.000000		
EXTT	0.844412	-0.362620	1.000000	
TOPT	0.799422	-0.623156	0.635771	1.000000
CUT	-0.340062	0.345208	-0.103972	-0.502914

Source: Researcher (2016)

KEY

LMET = Log of Manufacture Export at time t

ATRT = Average tariff rate at time t

EXTT = Exchange rate at time t

TOPT = Trade openness at time t

4.2.2 Ordinary Least Square Estimates

The OLS estimates show that an increase in the average tariff rate would lead to a decline in the manufactured exports and it is statistically significant at the 5 % level of significance. This implies that average tariff rate is a significant factor influencing the level of manufactured exports in Nigeria. Also, we found that if the average tariff rate increase by 1 unit, manufactured exports will reduced by 296 %. Also, capacity utilization has a negative and insignificant relationship with manufactured exports. Thus, capacity utilization is not a significant factor influencing manufactured exports in Nigeria. Furthermore, we found a positive and significant relationship between exchange rate and trade openness at 1 and 5 % level of significance respectively. In addition, a unit increase in exchange rate and trade openness will lead to an increase of about 2 and 362 % respectively. Asides from the magnitude and signs of the parameter estimates, we also consider the adjusted R-square, as well as the *F* statistic. The adjusted R-square which measures the goodness of fit of the model is 84 %. This implies that average tariff rate, exchange rate, trade openness and capacity utilization explains about 84 per cent changes in manufactured exports, while the remaining 16 % are other factors which affect manufactured exports, but were not captured in the model. The *F* statistic which explains the joint significant of the explanatory variables on the dependent variable is 57.14 and statistically significant at 1 %. This implies that found that average tariff rate, exchange rate, trade openness and capacity utilization jointly explains changes in the manufactured exports.

Table 4.4 Regression Results of Trade Policy and Performance of Manufactured Exports in Nigeria

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.556140	1.068160	5.201597	0.0000
ATRT	-2.967273	1.389229	-2.135913	0.0389
EXTT	0.024206	0.003350	7.225905	0.0000
TOPT	3.617647	1.457439	2.482194	0.0174
CUT	-0.012549	0.011093	-1.131210	0.2647

R-squared	0.851072	Mean dependent var	6.242542
Adjusted R-squared	0.836179	S.D. dependent var	2.503743
S.E. of regression	1.013384	Akaike info criterion	2.968906
Sum squared resid	41.07786	Schwarz criterion	3.169646
Log likelihood	-61.80039	Hannan-Quinn criter.	3.043740
F-statistic	57.14664	Durbin-Watson stat	1.962488

Prob(F-statistic)	0.000000

Dependent Variable: LMET
Method: Least Squares
Date: 01/06/16 Time: 01:26
Sample: 1970 2014
Included observations: 45

Source: Researcher (2016)

Key

ATRT = Average tariff rate at time t

EXTT = Exchange rate at time t

TOPT = Trade openness at time t

CUT = Capacity Utilization at time t

4.2.3 Vector Autoregressive Models (VAR)

In estimating the determinants of manufactured exports in Nigeria, the study also used the Vector Autoregressive Models (VAR). In this sub-section, the study performed some preliminary test that will aid a non-spurious regression of the VAR model; the preliminary tests are selection of the appropriate lag length, auto correlation test and inverse roots of polynomial characteristics.

VAR Basic Identification

The basic identification scheme uses a recursive VAR model (proposed by Sims (1980) in which the ordering of the variables is {ME_t , ATR_t , CU_t , EXT_t TOP_t},where the contemporaneously exogenous variables are ordered first. The variable in the VAR is thus ordered from the most exogenous to the least exogenous one.

Manufactured exports were ordered first so that a shock in export may have an instantaneous effect on all the other variables not vice versa. However, manufactured exports do not respond contemporaneously to any structural disturbances to the remaining variables due. In other words, average tariff rate, exchange rate, trade openness and capacity utilization affect manufactured exports sequences with a one-period lag. For instance, a shock in average tariff rate, the second variable, does not have an instantaneous impact on manufactured exports only but on exchange rate, trade openness and capacity utilization. This ordering implies that average tariff rate respond to manufactured exports in a contemporaneous way, but not to shocks to the other variables. Also, average tariff rate affect capacity utilization contemporaneously. The trade openness is the least exogenous variable, and it is assumed that its shocks do not affect the other variables simultaneously. Moreover, it does react contemporaneously to shocks to the remaining variables in the model. The VAR were estimated using the levels of all the series for the case Nigeria.

Lag Order Selection for VAR

It is established in the literature that VAR analysis depends critically on the lag order selection of the VAR model. Sometimes, different lag orders can seriously affect the substantive interpretation of VAR estimates when those differences are large enough (see Hamilton and Herrera 2004, Kilian 2001). The strategy in empirical studies is to select the lag order by some pre-specified criterion and to condition on this estimate in constructing the VAR estimates.

In the econometric literature, a number of selection criteria have been proposed that can be used to determine the optimal lag order. The selection criteria considered in this study are the Akaike Information Criterion (AIC), the Schwarz Information Criterion (SIC) and the Hannan-Quinn Criterion (HQC). Since these criteria may not always draw the same conclusion on the lag order, Ivanov and Kilian (2005) use Monte - Carlo simulations to compare these criteria. In their study, they conclude that for monthly VAR models, the AIC tends to produce the most accurate structural and semi-structural estimates for realistic sample sizes. For quarterly VAR models, the HQC appears to be the most accurate criterion if sample sizes are larger than 120. However, if sample sizes are smaller than 120, then the SIC becomes the most accurate criterion.

Table 4.5: VAR Lag Order Selection Criteria

Endogenous variables: LMET ATRT CUT EXTT
TOPT
Exogenous variables: C
Date: 01/06/16 Time: 02:06
Sample: 1970 2014
Included observations: 40

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-373.2772	NA	112.6770	18.91386	19.12497	18.99019
1	-209.8445	277.8356	0.112393*	11.99222	13.25888*	12.45021*
2	-195.0490	21.45351	0.199032	12.50245	14.82466	13.34209
3	-179.0029	19.25521	0.366870	12.95015	16.32791	14.17144
4	-135.0342	41.77034*	0.200789	12.00171	16.43502	13.60465
5	-92.29684	29.91612	0.161774	11.11484*	16.60370	13.09944

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion
Source: Researcher (2016)

Table 4.4 gives the optimal lag order selected by the lag length criteria. The FPE, SC and HQ select a lag for the model, while the AIC selects lag 5. After considering that yearly data are used in the study, lag 1 is used for the VAR models.

Inverse Roots of AR Characteristics Polynomial

The graph below shows the inverse roots of AR polynomial, it shows that all the points are within the circle, this implies that the VAR estimation is not spurious.

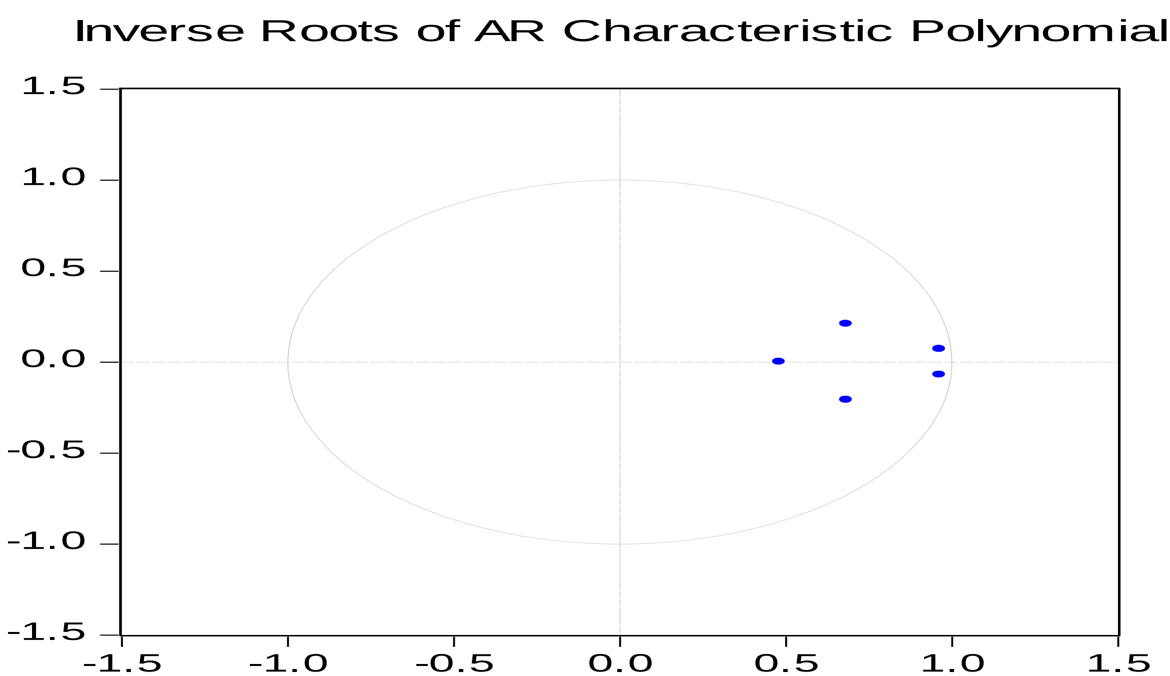


Figure 4.2: Inverse Roots of AR Characteristic Polynomial

Source: Researcher (2016)

Serial Correlation Test

The LM serial correlation test shows if the subsequent error terms are correlation, the test shows that any of the lag length, there is no presence of serial correlation. Given that the preliminary tests were okay, VAR estimations can now be estimated.

Table 4.6 VAR Residual Correlation LM Tests

Null Hypothesis: no serial correlation at lag order h
Date: 01/06/16 Time: 02:08
Sample: 1970 2014
Included observations: 44

Lags	LM-Stat	Prob
1	20.27223	0.7324
2	17.53244	0.8616
3	25.79155	0.4188
4	33.26492	0.1246
5	24.25360	0.5048
6	24.16118	0.5101
7	24.74821	0.4766
8	19.12948	0.7909
9	34.50780	0.0975
10	17.74661	0.8530
11	22.36499	0.6146
12	33.13562	0.1277

Probs from chi-square with 25 df.

Source: Researcher (2016)

Impulse Response Function Results

Further information about the relationships between the pre-specified variables and manufactured exports is generated by the impulse responses and variance decompositions. The ordering of the variables is important in the decomposition since it is effective equivalent to an identifying restriction on the primitive form of the VAR. Thus, we follow the orderings ME_t , ATR_t , CU_t , EXT_t and TOP_t.

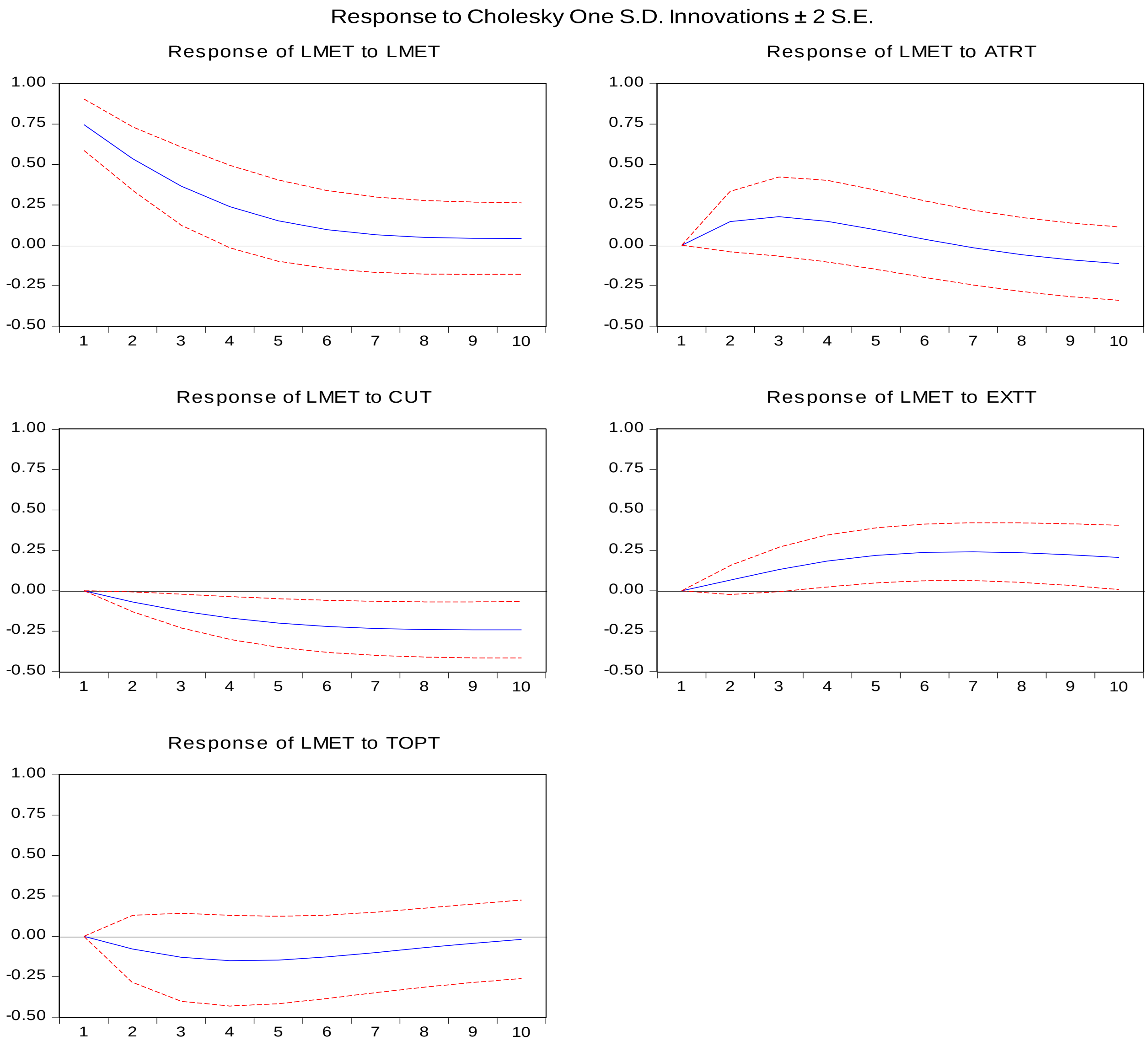


Figure 4.3: Impulse Response Function

The impulse response functions shows the direction, magnitude and the time path of manufactured exports shocks emanating from average tariff rate, exchange rate, trade openness and capacity utilization. The figures show the manufactured exports profile for Nigeria, where the dotted lines denote the 5 % confidence bands. The impulse response function shows that manufactured exports respond positively to exchange rate and trade openness. This implies that positive shocks in manufactured exports will results to an increase in the response to exchange rate and trade openness. In response to a positive manufactured exports shock, average tariff rate and capacity utilization decreases in the case of Nigeria.

Variance Decomposition Results

Impulse response analysis is useful in considering the signs and magnitude of responses to specific shocks; however, the relative importance of shocks for given variable fluctuations is better assessed through the variance decompositions. The below tables give variance decomposition of manufactured exports and average tariff rate, capacity utilization, exchange rate and trade openness shocks.

Table 4.7 Variance Decomposition

Period	S.E.	LMET	ATRT	CUT	EXTT	TOPT
1	0.745889	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.938375	95.84907	2.427279	0.534344	0.499351	0.689957
3	1.046696	89.24456	4.803602	1.860622	1.988514	2.102704
4	1.122414	82.13721	5.925494	3.874181	4.419098	3.644022
5	1.183827	75.47928	5.976094	6.327091	7.394191	4.823344
6	1.238275	69.59753	5.553873	8.950783	10.42925	5.468559
7	1.288619	64.52108	5.142032	11.53567	13.14939	5.651830
8	1.335826	60.17732	4.973664	13.95433	15.35547	5.539220
9	1.380096	56.47455	5.090339	16.14925	16.99892	5.286939

10	1.421388	53.32515	5.438709	18.10895	18.12500	5.002184

Source: Researcher (2016)

The variance decomposition is used to examine the effects of innovations to average tariff rate, capacity utilization, exchange rate and trade openness.

The variance decomposition of manufactured exports indicates that between 53-99 % of the forecast error of manufactured exports is accounted for by its own innovation in the first ten years of estimation. The fluctuations in the average tariff rate and trade openness is between 1-6 %. Innovations in capacity utilization and exchange rate contributed between 1- 18 % after a 10 years horizon.

Table 4.8 Summary of Results for the Determinants of Manufacturing Exports in Nigeria

Dependent Variables: Manufactured Exported

	Correlation	**OLS**	**VAR**
ATR	Negative	Negative	Negative
CU	Negative	Negative	Negative
EXTR	Positive	Positive	Positive
TOP	Positive	Positive	Positive

Source: Researcher (2016)

Hypothesis 1

H_{01} Trade policy does not significantly determine the performance of export manufacturing industries in Nigeria.

Decision

The decision rule is if the computed t-statistic is less than the critical t-statistic, we would not reject the null hypothesis. Otherwise we would reject the null hypothesis. Also the p-value involves comparing the p-value with the chosen significance level of 5%. If the p-value is less than or equal to the significance level, we would reject the null hypothesis. Otherwise we would not reject the null hypothesis. The battery of evidence provided in Section 4.2 are not in support of the stated null hypothesis (H_{01}) given that the calculated *t*-statistic of the coefficients of trade policy determinants presented in Table 4.4 are greater than the critical *t*-statistic at the 5% significance level (±1.960). Similarly, *p*-values of the coefficients of trade policy determinants are greater than the significance level (0.05). These imply that trade policy variables are significant determinants of the performance of manufactured exports in Nigeria. Nigeria. Hence, we reject the null hypothesis that trade policy does not determine the performance of export manufacturing industries in Nigeria at the 5% significance level. Consequently, H_{01} is rejected.

4.3 Results of Causal Relationship between Manufactured Exports and Trade Policy in Nigeria.

In this section we present results of the Granger Causality model estimated to investigate the causal relationship between manufactured export and trade policy in Nigeria. In assessing the causal relationship between manufactured exports and other economic variables, the Granger causality test were used. Prior to interpreting the Granger-causality test, it important to make a clarification on what the test does. The test does not provide an answer whether the movement of a variable can be ascribed to changes in other variable; rather it only explains that the movement of one variable is followed by another variable (Brooks 2008). *F*-tests for the null hypothesis that all of the lags of a given variable are jointly insignificant in a given equation are presented in the above tables. Here, we analyze the causal relationship between manufactured exports and other variables and the results are classified as; {(ME ATR) (ME CU) (ME EXR) (ME TOP)}.

Table 4.9 VAR Granger Causality Test

Dependent Variable	ME	ATR	CU	EXR	TOP
ME	-	0.15	0.00	0.12	0.45
ATR	0.18	-	0.75	0.22	0.43
CU	0.00	0.01	-	0.56	0.63
EXR	0.05	0.74	0.38	-	0.42
TOP	0.27	0.87	0.12	0.95	-

Source: Researcher (2016)
Note: The table gives marginal significance levels which test the hypothesis that all lags of a particular variable have no explanatory power for the dependent variable. For example, the figure 0.00 in the first row of the third column indicates that the null hypothesis that lags of the capacity utilization have no explanatory power for the manufactured exports is rejected at the 1 per cent level of significance. The numbers shown in the table represents probability values

The tables show that the manufactured exports Granger-cause the capacity utilization and exchange rate at 1 and 5 % respectively. We also discovered that it is only capacity utilization that Granger-cause manufactured exports in Nigeria. This implies that there is evidence of bi-directional causality in between capacity utilization and manufactured exports in Nigeria, while there is uni-directional causality from manufactured exports to exchange rate in Nigeria.

Hypothesis 2

H_{02} There is no causal significant relationship between manufactured exports and trade policy in Nigeria.

Decision

The decision rule adopted is the p-value, which involves comparing the p-value with the chosen significance level of 5%. If the p-value is less than or equal to the significance level, we would reject the null hypothesis. Otherwise we would not reject the null hypothesis. The results presented in Table 4.8 are not in support of the stated null hypothesis (H_{02}) given that the *p*-value of the causal relationship (0. 35) is far greater than the significance level (0.05), and thus indicates evidence against significant no causal relationship between manufactured export and trade policy in Nigeria. This implies that there is significant causal relationship between manufactured export and trade policy in Nigeria. Hence, we reject the null hypothesis of no significant causal relationship between manufactured export and trade policy in Nigeria at the 5% significance level. Consequently, H_{02} is rejected.

4.4 Results of the Effect of Trade Policy on Performance of Manufactured Exports in Nigerian Economy Pre-SAP

Section 4.4 presents the results of the multiple regression model estimates of the effect of trade policy on the performance of manufactured exports in Nigerian pre-SAP economy. Notice from Table 4.10 that average tariff rates, exchange rates, and capacity utilisation do significantly affect performance of manufactured exports in Nigeria pre-SAP era at the 5% percent significance level. This is evident in the significance of the t-statistic being less than the theoretical t-statistic and the p-value being above the significance level.

Table 4.10 Regression Results of Trade Policy and Performance of Manufactured Exports in Nigerian Economy Pre-SAP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.218110	4.464758	1.670547	0.1229
ATRT	-4.401025	2.641499	-1.979323	0.0433
EXTT	1.100444	2.004903	2.467815	0.0171
TOPT	24.199390	48.004216	0.504114	0.6241
CUT	2.102797	0.611830	3.436901	0.0055

R-squared	0. 757134	Mean dependent var	3.543750
Adjusted R-squared	0. 668819	S.D. dependent var	2.562800
S.E. of regression	2.984510	Akaike info criterion	3.877815
Sum squared resid	54.57275	Schwarz criterion	4.270745
Log likelihood	-60.72560	Hannan-Quinn criter.	4.06850
F-statistic	8.57314	Durbin-Watson stat	1.83274
Prob(F-statistic)	0.002150		

Dependent Variable: LMET

Method: Least Squares

Date: 11/09/17 Time: 17:13

Sample: 1970 1985

Included observations: 16

Source: Authors calculation

Key

ATRT = Average tariff rate at time t

EXTT = Exchange rate at time t

TOPT = Trade openness at time t

CUT = Capacity Utilization at time t

Hypothesis 3

H_{03} Trade policy has no significant effect on the performance of the export manufacturing industries in Nigeria pre–structural adjusted programme (SAP) economy.

Decision

The decision rule is that if the computed t-statistic is less than the critical t-statistic, we would not reject the null hypothesis. Otherwise we would reject the null hypothesis. Also the p-value involves comparing the p-value with the chosen significance level of 5%. If the p-value is less than or equal to the significance level, we would reject the null hypothesis. Otherwise we would not reject the null hypothesis. The results displayed in Section 4.10 are not in support of the stated null hypothesis (H_{01}) given that the calculated *t*-statistic of the coefficients of trade policy (exchange rates, capacity utilization, and average tariff rates) are greater than the critical *t*-statistic at the 5% significance level (±1.960). Similarly, *p*-values of the coefficients of trade policy are less than the significance level (0.05). These imply that trade policy has significant effect on the performance of manufactured exports in pre-SAP Nigerian economy. Nigeria. For this reason, we reject the null hypothesis that trade policy has no significant effect on the performance of the export manufacturing industries in Nigeria pre–structural adjusted programme (SAP) economy at the 5% significance level. Consequently, H_{03} is rejected.

4.5 Results of the Effect of Trade Policy on Manufactured Export in Nigerian Post-SAP Economy.

Section 4.5 displays the results of the multiple regression analysis conducted to evaluate the effect of trade policy on the performance of manufactured exports in Nigerian post-SAP economy. Observe from Table 4.11 that average tariff rates, exchange rates, and trade openness have significant effect on performance of manufactured exports in Nigeria post-SAP era at the 5% percent significance level. This is evident in the significance of the t-statistic being less than the theoretical t-statistic, and the p-value being above the significance level.

Table 4.11 Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.133811	3.069126	0.967257	0.3434
ATRT	-2.880368	0.493794	-3.70734	0.0486
EXTT	0.930219	0.598305	4.711152	0.0000
TOPT	8.795285	3.411183	2.147221	0.0425
CUT	1.481360	9.163308	0.025040	0.9802

R-squared	0.840331	Mean dependent var	3.526428
Adjusted R-squared	0. 812797	S.D. dependent var	6.636846
S.E. of regression	12.401129	Akaike info criterion	3.079017
Sum squared resid	60.283620	Schwarz criterion	5.270757
Log likelihood	-243.76980	Hannan-Quinn criter.	5.054850
F-statistic	30.30724	Durbin-Watson stat	2.699624
Prob(F-statistic)	0.000000		

Dependent Variable: LMET

Method: Least Squares

Date: 11/09/17 Time: 17:31

Sample: 1987 2014

Included observations: 28

Source: Authors calculation

Key

ATRT = Average tariff rate at time t

EXTT = Exchange rate at time t

TOPT = Trade openness at time t

CUT = Capacity Utilization at time t

Hypothesis 4

H_{04} Trade policy has no significant effect on the performance of the export manufacturing industries in Nigeria post–structural adjusted programme (SAP) economy.

Decision

The decision rule is that if the computed t-statistic is less than the critical t-statistic, we would not reject the null hypothesis. Otherwise we would reject the null hypothesis. Also the p-value involves comparing the p-value with the chosen significance level of 5%. If the p-value is less than or equal to the significance level, we would reject the null hypothesis. Otherwise we would not reject the null hypothesis. The results displayed in Section 4.11 are not in support of the stated null hypothesis (H_{01}) given that the calculated *t*-statistic of the coefficients of trade policy (exchange rates, trade openness, and average tariff rates) are greater than the critical *t*-statistic at the 5% significance level (±1.960). Similarly, *p*-values of the coefficients of trade policy are less than the significance level (0.05). These imply that trade policy has significant effect on the performance of manufactured exports in post-SAP Nigerian economy. Nigeria. For this reason, we reject the null hypothesis that trade policy has no significant effect on the performance of the export manufacturing industries in Nigeria post–structural adjusted programme (SAP) economy at the 5% significance level. Consequently, H_{04} is rejected.

4.5 Diagnostic Tests

As stated in Section 3.5.6, the models adequacies were examined by evaluating the residuals for serial correlation using the Durbin-Watson (DW) statistic and Ljung-Box Q statistics (L-B Q), and heteroscedasticity using ARCH LM. The L-B Q test statistics were used to test the null hypothesis of no serial correlation in the estimated residuals up to a specific lag. The LM test was used to examine the squared residuals for existence of heteroscedasticity up to a specific lag.

Notice from Tables 4.4, 4.10, and 4.11, the DW statistics are 1.96, 1.88, and 2.69 respectively. These Durbin-Watson coefficients suggest that there is absence of first degree serial correlation in the residual series of the model. Thus suggest that the model estimates are reliable.

Notice also from Table 4.12 that the null hypothesis of no heteroscedasticity in the residuals of the multiple regression models cannot be rejected at the 5% significance level. The results of Ljung-Box Q tests also accept the null hypotheses of no serial correlations in the residual of the models. There is therefore no serial correlation and heteroscedasticity in the residuals of the estimated regression models. Hence, models are adequate to explain the impact of trade policy on performance of export manufacturing industries in Nigeria.

Table 4.12 Diagnostic Tests Results

Ljung-Box Q (2) A	0.570 [0.409]
Ljung-Box Q (2) B	3.377 [0.764]
Ljung-Box Q (2) C	1.990 [0.994)
ARCH-LM (2) A	2.64 (0.350)
ARCH-LM (2) B	2.44 (0.297)
ARCH-LM (2) C	2.08 (0.279)

Source: Authors calculation

Note: A, B, and C represents estimates for Tables 4.4, 4.10, and 4.11

4.6 Discussion of Findings

Discussion of Findings

This chapter which is the core of this research work centers on the data presentation, analysis and interpretation. Four objectives were achieved using various econometrics techniques as well as descriptive statistics. For the first objective, the study examined firstly the determinants of manufactured exports in Nigeria using three different econometrics techniques. Using the simple correlation coefficient, it was observed that there is a negative relationship between manufactured exports and average tariff rate; that is when there is an increase in the average tariff rate chargeable on export of manufactured goods, it will have an adverse effect thereby discouraging manufacturers from exporting their products will lead to low export of manufactured goods. Similarly, we found an inverse relationship between manufactured exports and capacity utilization. This implies that if capacity utilization is increasing, then manufactured exports declines.

In reality, we expect a positive relationship between these two variables; however this is not unconnected to the political instability as well as a volatile exchange rate that does not favour countries of the world to trade with Nigeria. Also, we found a positive relationship between manufactured export and trade openness on one hand and between manufactured exports and exchange rate on the other hand. This implies that an increase in trade openness and exchange rate will lead to an increase in manufactured exports. The study agrees with Afangideh (2003) and Olorunfemi *et al* (2013) that there is a positive relationship between manufactured export and trade openness on one hand and exchange rate, but disagreed with Olorunfemi *et al* (2013) that concluded that there is positive relationship between manufacturing exports and capacity utilization.

Two, we also used the ordinary least squares (OLS) to confirm the results from the simple correlation coefficient, our results is in conformity with the results generated from the correlation test. We found that an increase in the average tariff rate and capacity utilization would lead to a decline in the manufactured exports. Furthermore, we found a positive and significant relationship between exchange rate and trade openness.

This also agreed with Ajinaya et al. (2017) who found that exchange rate fluctuation have positive relationship on export performance and the work of Wilson and Choga (2015) who found out that exchange that exchange rate volatility has significantly negative effect on South African manufacturing exports when exports were regressed against real effective exchange rate, trade openness and capacity utilization.

These contradicted the findings of Xinxin (2013) who found negative relationship between tariff and manufactured export performance in Asian developing countries especially after the elimination of the quota system. The adjusted R-square, shows that average tariff rate, exchange rate, trade openness and capacity utilization explains about 84 per cent changes in manufactured exports, while the remaining 16 per cent are other factors which affect manufactured exports.

Rahual and Boyan (2016) also conformed to result that over 80 per cent of changes in manufactured exports are explained by average tariff rate, exchange rate, trade openness and capacity utilization.

The study uses the Vector Autoregressive Model to examine the dynamic interactions between manufactured exports, average tariff rate, exchange rate, trade openness and capacity utilization. The impulse response function shows that manufactured exports respond positively to exchange rate and trade openness on one hand, and manufactured exports shock respond to a positive average tariff rate and capacity utilization decreases in Nigeria. This also conform with the work of Wong (2016) who found out that there is a positive and significant effect of trade openness on productivity of manufacturing industries in export oriented industries in the years after trade reforms were implemented.

The second objective of the study, examined the causal relationship between manufactured exports and average tariff rate, trade openness, exchange rare and capacity utilization variables using the Granger causality test. The results show that manufactured exports Granger-cause capacity utilization and exchange rate. It was also discovered that capacity utilization also Granger-cause manufactured exports in Nigeria. This is also in line with the work of Afaigideh (2003) who also found that manufactured exports granger – cause capacity utilization and exchange rate, also Saliu (2017) agreed with the results that capacity utilization and exchange rate granger caused manufacturing exports.

Thirdly, the study examined the impacts of trade policies on manufacturing exports in Nigeria: pre structural adjustment programme (SAP), using the multiple regression analysis. The results show that the trade policies significantly impacts manufacturing exports in the Nigerian Pre-SAP economy at 5% significance level. All the above results also conformed to most of the literatures among others is Olorunfemi et al (2013), who found out that there is a positive relationship between manufacturing export and capacity utilization, also a negative relationship between manufacturing export and exchange rate because the result indicates that a 1% change in capacity utilization will lead to 3.9 percent change in manufacturing export. It also agreed with the work of Jenkins (2012), Nazli and Yalcin 2016, Shameek and Shahoma 2014, Afolabi 2015 who also found out a long run significant relationship between manufactured export and the exchange rate, average tariff rate, trade openness and capacity utilization.

Fourthly, the study examined the effect of trade policy on manufacturing exports in Nigeria: Post structural adjustment programme (SAP), using the multiple regression model. The results show that the trade policies significantly impacts manufacturing exports in the Nigerian Post-SAP economy at 5% significance level. The results are in agreement with the work of Nazli and Yalcin (2016), Afolabi (2015) and Sahameek and

Shaham (2014) who found out that manufactured export has significant impact on average tariff rate, exchange rate, capacity utilization and trade openness in the long run.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter begins with the summary of the study in section 5.2. Section 5.3 presents the recommendations of the study based on our findings. This is sub-divided into two parts: recommendations for policy purposes and recommendations for further studies. Finally, conclusion in section 5.4 ends the study.

5.1 Summary

This study concentrated on the impact of trade policy on manufacturing export performance in Nigeria from 1970 – 2014. Export generally provide the key to successful development because they provide the necessary foreign exchange to purchase imports needed for economic development and also generate additional growth in various sectors of the economy. The uncertainties in the World oil market and the tendency of agricultural commodity prices to decrease had dawn on policy makers in Nigeria that adequate attention must be paid to the manufacturing sub-sector as it is the only sector that is independent of the vagaries that afflict a mono economy like Nigeria's. Thus, a concerted effort was made in 1986 through SAP, to restructure the Nigerian economy away from oil by embarking on diversification drive that will broaden the base of the economy. The totality of that exercise and the impact it had created is ongoing. This study attempted to tang to the fore the performance of the manufacturing sub-sector in Nigeria vis-à-vis the role of the trade policy regime of Nigeria growth the tendency of the global body to be dominated by the highly industrialized countries and their interest

Nigeria along with other developing countries will have to master enough courage to withstand the emerging global threat by taking active part in the new world economic trend. This study adopted various estimation techniques, based on time-series analysis to identify the determinants of manufacturing exports and their long run convergence.

The study examined the trend of export performance in Nigeria using a descriptive and statistical analysis. It was observed that manufactured exports were not stable over the years and this is attributed to low manufactured export volume of the country as a result of relatively political stability and favourable government policies that geared toward infrastructural development and diversification of the economy. The determinants of manufactured exports in Nigeria using three different econometrics techniques were also determined. Using the simple correlation coefficient, it was observed that there is a negative relationship between manufactured exports and average tariff rate; similarly, we found an inverse relationship between manufactured exports and capacity utilization. Also, we found a positive relationship between manufactured export and trade openness on one hand and between manufactured exports and exchange rate on the other hand.

Furthermore, we also used the ordinary least squares (OLS) to confirm the results from the simple correlation coefficient, our results is in conformity with the results generated from the correlation test. We found that an increase in the average tariff rate and capacity utilization would lead to a decline in the manufactured exports. Furthermore, we found a positive and significant relationship between exchange rate and trade openness. The adjusted R-square, shows that average tariff rate, exchange rate, trade openness and capacity utilization explains about 84 per cent changes in manufactured exports, while the remaining 16 per cent are other factors which affect manufactured exports.

Also, the study used the Vector Autoregressive Model to examine the dynamic interactions between manufactured exports, average tariff rate, exchange rate, trade openness and capacity utilization. The impulse response function shows that manufactured exports respond positively to exchange rate and trade openness on one hand, and manufactured exports shock respond to a positive average tariff rate and capacity utilization decreases in Nigeria.

We also examined the causal relationship between manufactured exports and other economic variables using the Granger causality test. The results show that manufactured exports Granger-cause capacity utilization and exchange rate. It was also discovered that capacity utilization that Granger-cause manufactured exports in Nigeria.

Lastly, the study examined the impacts of trade policies on manufacturing exports in Nigeria in pre and post SAP era using the multiple regression models. The results show that trade policy has significant effect on the performance of manufactured export in Nigeria pre SAP and post SAP eras.

5.2 Conclusions

- In conclusion, there has not been improvement in the trend of manufactured exports performance as expected by the various policy makers of the government as showed in the trend of the export performance of Nigeria over time.
- Exchange rate and trade openness determine the performance of manufactured exports in Nigeria and as such a more liberalization policy that is based on national interest objective through regional integration should be adopted and policies to discourage importation which normally put pressure on the demand for foreign exchange put in place.
- Moreover, there is a bi directional relationship between manufactured export and capacity utilization and as such the Nigeria economy should be liberalize to attract foreign direct investment that will create opportunities for her large labour force thereby leading to the diversification of the economy from mono cultured status the country is currently experiencing.
- Since there exist a long run relationship between manufactured export and trade policy; average tariff rate, exchange rate, trade openness and capacity utilization, there should be a long run development plan and policies that will gear towards improving manufactured export performance.

5.3 Recommendations

- **Diversifying the economy:**

One reality that enjoys unanimity among policy makers and scholars alike in Nigeria today is the fact that there is urgent need to diversify the economy away from a single commodity, oil. Given the uncertainties in the world oil market and declining prices of agricultural product(s) in the face of huge subsidies in the agricultural sector by the highly industrialized nations thereby providing limited access to Nigeria's agricultural products, the path to economic renaissance in Nigeria is the strengthening and restructuring of the manufacturing sub-sector to make it more productive and responsive to the needs of the citizenry and for export. Once the sector is fortified to satisfy domestic demand, it will then venture into export, which will bring about more employment, foreign exchange and improved standard of living among others. This will lead to an improvement in the trend of manufactured exports in Nigeria.

- **Trade liberalization policy where export liberalization is pursued at the expense of import liberalization.**

The results, thus far, have shown that the policy options to raise the level of manufacturing which has remained embarrassingly low (less than 1% of total export since 1978 and of GDP since 1971), is to adopt policies that will ensure greater market access for the country's manufacture exports as well as boosting their competitiveness at the international market. These could be achieved through the adoption of trade and exchange rate liberalization policies that are devoid of control and regulations.

As trade openness variables has indicated the expected positive sign, trade liberalization policy has more than responded to manufacture export. However, we must emphasis that export liberalization at the expense of import liberalization, which has been found to have negative impact on productivity in Nigeria (Adenikinju and Chete, 1999), is advocated. This is intended to protect the local industries against undue competition from foreign firms at some unspecified level, as well as ensure tariff revenue for government. This will place national interest above any other interest.

- **Flexible exchange rate policy rather than fixed exchange rate should be adopted with total ban on some items that are been produced locally.**

The results have shown that exchange rate is a positive and significant variable in explaining current manufacture export in Nigeria. It's is thus recommended for policy as a means of improving international competitiveness of Nigeria's manufacture exports. It is also true that exchange rate adjustment is much more relevant in stimulating foreign demand for manufactured exports prices are fairly flexible in the world market. Since the profitability of manufacture exports show response in terms of increased foreign exchange earnings, through its higher income elasticity of demand with faster growth as the global economy expands, less susceptibility to price swings with its higher price elasticity's of demand and supply and greater prospects for dynamic production gains.

- **Depreciation of country's currency so as to attract foreign demand for the country manufactured goods.**

However, one major problem with Nigeria's experience with currency depreciation is that given the very high import-dependence of domestic production, the increased profitability of exports tended to be counterbalanced by the highly increased Naira costs of imported input used but the producing sectors. Thus, the policy option here is to moderate import liberalization for the reasons stated above in order to reap the benefit of a positively related and significant exchange rate variable with manufacture exports within the framework of market determined exchange rate. More technically, if the objective is to boost manufacture export which is what this study set out to achieve, the expected sign of the exchange rate parameter is positive. But if the cost of domestic production is to be considered the expected sign of the exchange rate parameters is negative given the dependence of domestic production on imported raw materials and machinery (inputs).

The results have also shown a positive and significant relationship between the first and third lag of manufacture exports with its current value. Thus, manufacture exports in Nigeria over the data period is significantly influenced by immediate and third past manufacture exports period habits exceeding a year period.

5.4 Contributions to Knowledge

The research work will not in small measure contribute to knowledge. It will open the eyes of the Nigerian government towards provision of infrastructural facilities that will make manufacturing sectors attractive to investors.

The policy maker will find all the suggestions useful in policy formulation of the government and the economic planning. Subsequently, the model will also serve as a template for other developing countries that are faced with the same economy situation with Nigeria and the entire world at large.

It gives a current picture of the situation of manufacturing industries in Nigeria.

Lastly, for the academic world, the use of granger causality test and co-integration analysis to measure the impact of trade policy on manufacturing industry performance in Nigeria will be a reference point to those who will like to do similar research in future.

5.5 Suggestions for Further Research

This study adopted an aggregated approach of the Nigerian manufacturing sub-sector based on time series data. It is an indefatigable fact that no research work is ever conclusive in any specific area. More so, research work in the manufacturing sub-sector in Nigeria is still comparatively scanty. Given the above explanation, further research in the manufacturing sub-sector in Nigeria should attempt a disaggregated paradigm in order to determine the specific impact of each sub-sector within the manufacturing industry and even on the overall economy. This will help to determine the overall manufacturing output based on the vectors of physical inputs, and policy variables inherent in the industry. These are expected to affect the manufacturing output in order to account for some policy changes or otherwise. Such physical inputs include labour, capital etc, while policy variables could include tariff, a movement in the real exchange rate and availability of intermediate inputs.

This suggestion is very important because such sub-sectoral appraisal and analysis will identify the specific sub-sectors of which Nigeria has a potential comparative advantage. There and then, effort will be geared towards making appropriate policy incentives to make such firms competitive both in the domestic and international markets.

REFERENCES

Adenikinju, A., & Chete, L. (1995). Productivity growth in Nigerian manufacturing sectors and its correlation with trade policy regimes indices. Retreieved from https://www.africaportal.org/publications/productivity-growth-in-nigerian-manufacturing-and-its-correlation-to-trade-policy-regimesindexes-19621985/

Adenikinju, A. & Olofin, S. (2000). Economic policy and manufacturing and sector growth performance in African. *The Nigerian journal of economic and social studies. 42*(1), 1-22.

Adenikinju, A. & Chete, L. (1991). Trade liberalization market structure and productivity in Nigeria manufacturing. *The Nigeria journal of economic and social studies*. *41*(3), 385-403.

Adenitikinju, A. (2002). African imperative in the new world trade order country case study of the manufacturing sector. *Nigeria report present to the African economic research consortium (AERC), Nairobi, Kenya.*

Adewuyi, A. (2006). Trade policy reform and technical efficiency in Nigeria's Manufacturing sector. *African econometrics society (AEES) Conference.*

Agberu, B. (1991). Exchange rate policy in developing countries; some analytical issues, *International monetary fund occasional paper* 78 (1), Washington D.C.

Afangideh, J. (2007). Impact of World trade organization on Nigerian manufacture Export performance, *Unpublished master's thesis*, University of Ibadan.

Afolabi, L. (2015). Effect of trade liberalization on manufacturing sector performance in Nigeria. *Journal of international development*, *3*(14), 72-97.

Ajayi, K. & Osafo-Kwaako, P. (2007). Research and Trade Policy Formulation the case of Nigeria's adoption of the ECOWAS Common external tariff. *Working paper* - Latin American trade network (LATN).

Ajinaya, O. (2017). Impact of exchange rate volatility on export performance in Nigeria economy. *International journal of management and business Studies, 7*(1), 40-43.

Akaike, H. (1973). Information theory and an extension of the maximum likelihood principle in B N. petrol and F. Csaki (eds) 2nd international symposium on information Theory Budapest Akademini, kiado. 267-281.

Akinrinade, L. A. (1988). Foreword: Industrial policy of Nigeria: policies incentives guideline and institutional framework. Retrieved from https://www.tips.org.za/tips-resources/industrial-policy-reference-resource/item/1211-industrial-policy-of-nigeria-targets-policies-incentives-guidelines-and-institutional-framework

Akmal, S.K. (2007), Stock returns and inflation: an ardl econometric investigation utilizing Pakistan data, *Pakistani Economic and Social Review*, 45 (1) 89-105.

Anyanwu, C. M. (1996). Productivity in the Nigerian manufacturing industry. Research department CBN.

Asika, N. (1991). *Research Methodology in Behavioural Science*. Lagos: Longman.

Appleyard, D. R & Field, A. J. (1998). International economic. (3rd ed.). Irwin, MC craw till.

Babatunde, M. A. (2006). Trade policy reform, regional integration and export performance in the ECOWAS sub-region, AERC.

Balassa, B. (1978). Export and economic growth further evidence. *Journal of development*, economic (5), 181-189.

Berg, A. & Akrueger (2002). Lifting all boats: why openness helps curb poverty. *Finance and development IMF*, Washington, D.C.

Bliagwati, J. N. (1988). Export promoting trade strategy issues and evidence. *The World Bank research observer*, 27-57.

Boughton, J. M. (1991). Long run money demand in large industrial countries. *IMF staff Papers* (38), 1-32.

Central bank of Nigeria, (2000) Productivity and capacity building in Nigeria, *proceeding of the 9th annual conference of the zonal research unit*. Research Department.

Central bank of Nigeria (2006), *Statistical bulletin*. Central bank of Nigeria, annual report and statement of accounts, various issues.

Chen, E.K. (1977). Factor input total Productivity and economic growth: The Asian case. *The journal of developing economic*, *15*(1), 121-143.

Chete, L. & Adenikinju, A. (1994). Trade policy and productivity growth evidence from Nigeria. *final report presented at a work shop by the African economic research consortium*, AERC May 28 –June 2.

Cottani, J.A., Cavallo, D. F. & Khan, M. S. (1996). Economic performance in LDC'S economic development and cultural change, 39 (1). 78-91.

Dickey, D. A. & Fuller, W. A. (1979). Distribution of the estimation for auto-regressive time series with a unit roots, *journal of the American statistical association*, 74(6), 427-437.

Dickey, D. A. & W.A Fuller, W. F. (1981). Likelihood ratio statistics for autoregressive process, *Econometrics*, 49(4), 1057-1072.

Dickey, D. A , Janson, K. & Thornton, D. I. (1991). A primer on co-integration with an application to money and Income. *Economic Review*, Federal reserve bank of St Louis, 59.

Dugrual, S. (2010). Changing in exchange rates and the performance of the manufacturing sectors in Turkey. *Middle Eastern and African economics Journal, 12*(5),

Ebenyi, V. (2015). The impact of trade liberalization on manufacturing value added in Nigeria, *Saudi Journal of business management studies*.

Ekpo A.H and F.E Egwaikhide (1994), Export and Economic growth in Nigeria: A reconsideration of the evidence *Journal of economic management NCEMA*, Ibadan Nigeria Dec vol. 1.PP100-112.

Enders, W. (2004). *Applied Econometric Time Series (2nd Ed.)*. Singapore: John Wiley & Sons (ASIA) *Pte* Ltd.

Engle, R.F. (1982). Autoregressive conditional heteroscedasticity with estimates of the variance of the United Kingdom inflation. *Econometrica*, 50, 987-1008.

Engle, R. F. & Granger, C. W. J. (1987). Co-integration and error-correction: Representation estimation and testing, *Econometrical*, 55, 251-276.

Engle, R. F & Granger, C. W. T. (1991), Long run economic relations readings in co- integration. Oxford university press, oxford.

Fajana, O. (1979). Trade and growth the Nigeria experience, *World Development,* 18(2): 831-835

Finch, D. & Michaels P. (1988). Development trade and international organization in: Development with trade A.O Krueger (eds.). International Central for Economic Growth.

Helleiner, G. K. (1973) Manufactured exports from less developed countries and multinational firms. *The economic Journal, 83 (329), 21 -47.*

Ghura, D & T.J Grenness, T. J. (1993). The real exchange rate and macroeconomic performance in sub-saharan African. *Journal of development economic* 42 (1), 155-174.

Granger, C.W.J (1969). Investigating causal relations by economic model and cross-spectral methods, *Econometrical*, 37, 424 - 438.

Granger, C.W.J. & Newbold, P. (1974). Spurious regression in econometrics. *Journal of econometrics*, 2(3), 111-120.

Gujaranti, D. N. (1995). Basic Econometrics, (3rd ed.) McGraw-hill, New York.

Harberler, G. (1995). International trade and economic development. *International Central for Economic Growth.*

Harvey, A. (1990). Econometric analysis of time series.The Mill press, (2nd ed.), Cambridge, Mass. (88).

Harry G. J. (1958). Tariffs and balance of payment comment, the quarterly *Journal of Economics.* 72(2), 301 - 302.

Helleiner, G. K. (1992). Introduction in G.K Helleiner, (ed), Trade policy industrialization and development: New perspectives Clarendon press Oxford.

Helleirner, G. K. (1995). Trade, trade policy and industrialization reconsidered, *World Development Studies*, 6, WIDER (UNU), Helsinki.

Heller, P. & Moore R. (1971). Trade and development in Nigeria, 1960 - 1965", *Economic internationals*, May.

Hoekman, B. F. & Olareaga, M. (2002). Eliminating excessive tariffs on exports of least developed countries. *The World Bank Economic Review*, l6(1),

Hylleberg, S. & Mizon, G. E. (1989). Co - integration and error correction Mechanism. *The Economic Journal,* 99(6), 113 -125.

Inye, N. B, (2005) Nigeria: Protecting domestic productions in times of liberalization and the short, medium and long term. Implications for regional integration working paper presented at the ECOWAS regional workshop on multilateral trade agreements Ghana,

Inye, N. B. (2007). Nigeria: Mainstreaming trade policy into national development Strategies, ATPC, ECA.

Iyoha, M. A. (1995). Traditional and contemporary theories of external trade. In: external trade and economic development in Nigeria, selected papers for the 1995 annual conference. Nigeria economic society.

Javryly, S, O. (1990). "Exports of developing countries: How direction affects performance," A paper presented at World Bank symposium. Washington D.C.

Jerome, A. & Adenikinju, A. (1995). "Trade policies and the promotions of Manufactured Exports in Nigeria" In: External trade and economic development in Nigeria. Selected papers for the 1995 Annual conference, NES.

Johansen, S. and Juselium, K. (1990). Maximum likelihood estimation and inference on co-integration - with application to the demand for money. Oxford bulletin of economics and statistics, 52, 169-210.

Jose, I. B. (1988). Good -will message: Industrial policy of Nigeria policies, incentives, guidelines and institutional framework.

Kankesu, J. (2012). The impact of liberation on manufacturing sector performance in developing countries: A survey of the Literature. University of Wollongong, economics working papers.

Kaliappa, K. & Kanharya, S. (2007): A comparative analysis of recent export performance of China and Indian. Paper presented at the Asian economic panel meeting at the Brookings institution, Washington. D.C.

Ajayi, K. & Osafo-Kwakwo, P. (2006). The role of research in trade policy formulation: The case of Nigeria's adopting of the ECOWAS common external tariff.

Komolafe, O. S. (1996): Co-integration theory: Technique and application, In macroeconomics policy Analysis: tools techniques and applications to Nigeria, Obadan, M.I and M.A lyoha (eds), NCEMA, Ibadan.

Kower, H. & Wolfensoln, J. D. (2001), Call for New Trade Round Centered on Needs of Developing Countries, IMF survey, 30(21), North.

Krugman, P. R. & Obstfield, M. (2000). International Economics. Theory and policy, Addison -Wesley, Longman (person Asia Education)

Langley, K. M. (1968). The external resource factor in Nigeria economic development.World Bank research observer, 2(2).

Lankes, H.P. (2002). Market access for developing countries, finance and development IMF, Sodarbom and Francis.

Lindsay, F. (1990), A common external tariff, external trade and industrial development policies. Australia - New Zealand business council.

Ljung, G.M. & Box, G.E.P. (1978). On a measure of lack of fit in time series models. *Biometrika*, *67*, 279-303.

Lothian, J.R. and McCarthy, C. (2001). Equity returns and inflation: the puzzlingly long lags, *Research in Banking and Finance Elsevier*, 2, 149-166.

lyoha, M.A (2005). Enhancing Africa's trade from marginalization to an export- led approach to development. Economic research working paper, Oxford, UK.

Nazli, T. & Cihan, Y. (2016). Exports in manufacturing, exchange rates and external exposure: Firm level evidence from Turkey journal of international Economic review, 5.

Nicola, R. & Mbululu, D. (2014). Exchange rate policy and export performance in efficient driven economy, ERSA working paper.

Notiri, H. A. (1971). External trade and payments and capital flows reconstruction and development in Nigeria A.A Ayida and H.M.A Onitiri (Eds) Nigeria economic society, annual conference Ibadan.

Ogunkola, O., Bankole, A. S. & Adewuyi, A. O. (2006). An evaluation of the impact of Nigeria's trade and investment policy reforms, trade policy training programme (TPRTP) department of economics, U.I

Okoh, R. N. (2004). Global integration and the growth of Nigeria's non-oil exports, *Conference Paper*. Oxford, UK.

Olorunfemi S. (2013). Manufacturing performance in Nigeria; implication for sustainable development, *Journal of Asian economic and financial review*.

Olorunsola, J. A. (2002), Basic features of Nigeria manufacturing sub- sector' in diversification of Nigeria economy, *Bullion CBN*, 26(4), Educational issues, Accra New Town, Ghana.

Osinusi, K. B., Oduntan, K. & Sokoya, O. E. (2008). The impact of trade policy on Nigeria manufacture exports performance, *African Journal for the Study*.

Oyejide, T. A.(1999) .Trade policy and sustainable human development in African, UNCTAD, (pp. 136).

Oyejide T. A (1975). Tariff Policy and Industrialization in Nigeria the Ibadan University Press.

Oyejide, T.A, Ogunkola, E. O. & Bankole, S. A. (2000) Quantifying and trade impact of sanitary and photo sanitary standard what is known and issue of importance for sub-Saharan African, World Bank Workshop on quantifying the trade effects of standard and regulatory banners. Is it possible? *World Bank*, Washington, D.C.

Phillips, P.C.B. and Perron, P. (1988), Testing for unit roots in a time series regression, *Biometrika*, 75, 335-346

Rahul, A. (2016) South Africa's exports performance: Any role for structural factors African department and strategy policy and review.

Rhys, J. (2012) Trade liberalization and manufacturing in Bolivia, Institute of Latin American studies research papers.

Romanns, D. & Nyaba, C. (2011). Trade policy and domestic manufacturing in Ghana SAPRT research report.

Sara, A. (2016). Productivity and trade openness micro-level evidence from manufacturing industries in Ecuador IMF working paper.

Saliu, O. (2017). The performance of manufacturing sector and utilization capacity in Nigeria.

Shameek, M. & Shahana, (2014). Overview of India export performance trends and drivers. Indian Institute of Management working paper.

Tsay, R. S. (2005). *Analysis of financial time series (2nd Ed)*. Hoboken New Jersey: John Wiley & Sons Inc.

Wilson, A. & Choga, S. (2015). Exchange rate volatility and export performance in South Africa, *Journal of Economic review*, South Africa.

Xinxin, (2013). The determinants of textile and apparel export performance in Asian Countries, graduate thesis, Iowa State University.

APPENDICES

Appendix 1 Results

Descriptive Analysis for Manufactured Export
SS

	MET
Mean	3110.208
Median	730.8000
Maximum	12707.90
Minimum	3.900000
Std. Dev.	3790.879
Skewness	0.780110
Kurtosis	2.088003
Jarque-Bera	6.123800
Probability	0.046799
Sum	139959.3
Sum Sq. Dev.	6.32E+08
Observations	45

Appendix 2

YEAR	MEt	TOPt	EXTt	ATRt	Cut
1970	65.8	0.0303	0.7143	0.6179	85.2
1971	42.2	0.0361	0.6955	0.6105	83.5
1972	37.3	0.035	0.6579	0.6472	81.9
1973	63.9	0.0475	0.6579	0.5546	80.2
1974	67	0.0914	0.6299	0.4682	78.6
1975	53.8	0.1081	0.6159	0.3341	76.6
1976	58.9	0.01339	0.6265	0.2721	77.4
1977	84.1	0.1532	0.6466	0.2766	78.7
1978	48.8	0.1607	0.606	0.3428	72.9
1979	42.6	0.2008	0.5957	0.2719	71.5
1980	42.5	0.4691	0.5464	0.31666	70.1
1981	43.5	0.25299	0.61	0.36809	73.3
1982	14.5	0.18787	0.6729	0.33599	63.6
1983	9	0.14906	0.7241	0.36566	49.7
1984	14.3	0.1399	0.7649	0.41571	43
1985	8.5	0.13956	0.8938	0.5843	38.8
1986	3.9	0.11073	2.0206	0.75013	38.3
1987	149.8	0.24969	4.0179	0.35571	40.3
1988	187	0.19992	4.5367	0.36208	42.4
1989	316.7	0.23238	7.3916	0.47764	43.8
1990	730.8	0.32922	8.0378	0.57341	40.3
1991	1120.8	0.38672	9.9095	0.20478	42
1992	1095.5	0.39843	17.2984	0.18425	38.1
1993	330.2	0.35276	22.0511	0.18515	37.2
1994	678.9	0.26352	21.8861	0.25627	30.4
1995	3792.7	0.58671	21.8861	0.17936	29.29
1996	772	0.46429	21.8861	0.20407	32.46
1997	2010.7	0.49827	21.8861	0.19628	30.4
1998	4134.4	0.39837	21.8861	0.16634	32.4
1999	3242.5	0.43843	92.6934	0.26059	34.6
2000	3518.5	0.43654	102.105	0.31927	36.1
2001	12707.9	0.46788	111.943	0.38579	42.7
2002	6489.63	0.41778	120.97	0.33119	54.9
2003	7572.01	0.52132	129.357	0.24075	56.5
2004	8923.18	0.57749	133.5	0.28469	55.7
2005	7661.61	0.68767	132.147	0.28031	54.8
2006	8292.39	0.56199	128.652	0.21796	53.3

2007	8292.39	0.59164	125.833	0.32019	53.38
2008	8082.13	0.6319	118.567	0.25504	53.84
2009	8222.3	0.54523	148.88	0.32301	55.14
2010	8198.94	0.35341	150.298	0.25051	56.22
2011	8167.79	0.38691	153.862	0.21865	57.44
2012	8196.34	0.33622	157.499	0.28859	58.63
2013	8187.69	0.30841	157.311	0.31258	59.82
2014	8183.94	0.26391	158.553	0.31077	61

Source:

Appendix 3

YEAR	GDP	Non Oil Rev	Total Import	Total Export
1970	54148.9	467.4	885.4	1461.8
1971	65707	658.7	1293.4	2372.3
1972	69310.6	640.8	1434.2	2424.3
1973	73763.1	679.3	2278.4	3503.2
1974	82424.8	813.4	5794.8	7532.1
1975	79988.5	1243.2	4925.5	8647
1976	88854.3	1400.7	6751.1	11899.6
1977	96098.5	1961.8	7630.7	14724.4
1978	89020.9	2815.2	6064.4	14276.1
1979	91190.7	2031.6	10836.8	18309.3
1980	49,632.32	2880.2	9095.6	14186.7
1981	94,325.02	4726.1	12839.6	11023.3
1982	101,011.23	3618.8	10770.5	8206.4
1983	110,064.03	3255.7	8903.7	7502.5
1984	116,272.18	2984.1	7178.3	9088
1985	134,585.59	4126.7	7062.6	11720
1986	134,603.32	4488.5	5983.6	8920.6
1987	193,126.20	6,353.60	17,861.70	30,360.60
1988	263,294.46	7,765.00	21,445.70	31,192.80
1989	382,261.49	14,739.90	30,860.20	57,971.20
1990	472,648.75	26,215.30	45,717.90	109,886.10
1991	545,672.41	18,325.20	89,488.20	121,535.40
1992	875,342.52	26,375.10	143,151.20	205,611.70
1993	1,089,679.72	30,667.00	165,629.40	218,770.10
1994	1,399,703.22	41,718.40	162,788.80	206,059.20
1995	2,907,358.18	135,439.70	755,127.70	950,661.40

1996	4,032,300.34	114,814.00	562,626.60	1,309,543.40
1997	4,032,300.34	166,000.00	845,716.60	1,241,662.70
1998	3,989,450.28	139,297.60	837,418.70	751,856.70
1999	4,679,212.05	224,765.40	862,515.70	1,188,969.80
2000	6,713,574.84	314,483.90	985,022.40	1,945,723.30
2001	6,895,198.33	523,970.10	1,358,180.30	1,867,953.90
2002	7,795,758.35	500,986.30	1,512,695.30	1,744,177.70
2003	9,913,518.19	500,815.30	2,080,235.30	3,087,886.40
2004	11,411,066.91	565,700.00	1,987,045.30	4,602,781.50
2005	14,610,881.45	785,100.00	2,800,856.30	7,246,534.80
2006	18,564,594.73	677,535.00	3,108,519.30	7,324,680.60
2007	20,657,317.67	1,252,550.00	3,911,952.60	8,309,758.30
2008	24,296,329.29	1,335,960.00	5,238,195.24	10,114,738.17
2009	24,794,238.66	1,652,654.37	5,116,459.71	8,402,151.17
2010	54,204,795	1,907,580.50	7,614,656.23	11,542,023.15
2011	63,258,579.00	2,237,887.08	10,235,174.22	14,240,232.15
2012	71,713,935.05	2,628,776.60	9,109,032.49	15,002,867.70
2013	80,092,563.31	2,950,563.30	9,439,424.70	15,262,013.60
2014	89,043,615,26	3,275,121.05	10,538,780.60	12,960,493.20

Source:

APPENDICES

Appendix 1 Results

Descriptive Analysis for Manufactured Export
SS

	MET
Mean	3110.208
Median	730.8000
Maximum	12707.90
Minimum	3.900000
Std. Dev.	3790.879
Skewness	0.780110
Kurtosis	2.088003
Jarque-Bera	6.123800
Probability	0.046799
Sum	139959.3
Sum Sq. Dev.	6.32E+08

Observations 45

FIGURE 2

Objective 1

Correlation

Ordinary correlations:

	LMET	ATRT	EXTT	TOPT
LMET	1.000000			
ATRT	-0.582707	1.000000		
EXTT	0.844412	-0.362620	1.000000	
TOPT	0.799422	-0.623156	0.635771	1.000000
CUT	-0.340062	0.345208	-0.103972	-0.502914

OLS

Dependent Variable: LMET
Method: Least Squares
Date: 01/06/16 Time: 01:26

Sample: 1970 2014
Included observations: 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.556140	1.068160	5.201597	0.0000
ATRT	-2.967273	1.389229	-2.135913	0.0389
EXTT	0.024206	0.003350	7.225905	0.0000
TOPT	3.617647	1.457439	2.482194	0.0174
CUT	-0.012549	0.011093	-1.131210	0.2647

R-squared	0.851072	Mean dependent var	6.242542
Adjusted R-squared	0.836179	S.D. dependent var	2.503743
S.E. of regression	1.013384	Akaike info criterion	2.968906
Sum squared resid	41.07786	Schwarz criterion	3.169646
Log likelihood	-61.80039	Hannan-Quinn criter.	3.043740
F-statistic	57.14664	Durbin-Watson stat	0.562488
Prob(F-statistic)	0.000000		

VAR Estimations

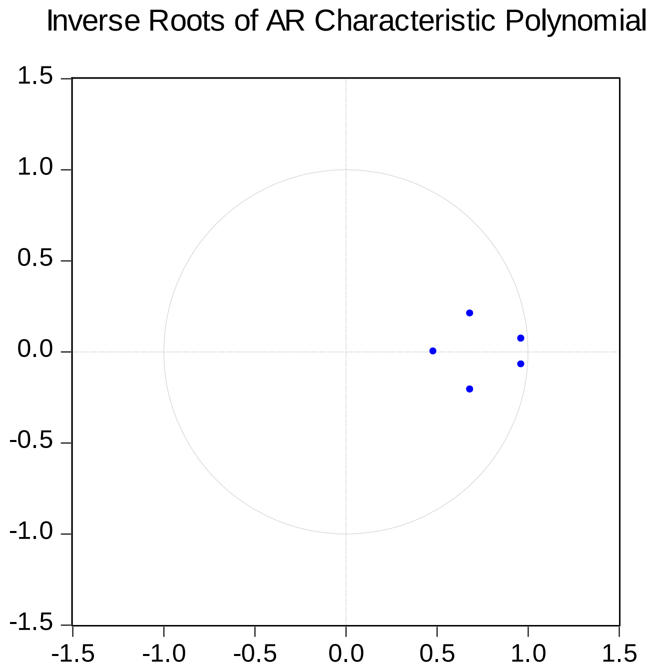
Preliminary Tests

VAR Lag Order Selection Criteria
Endogenous variables: LMET ATRT CUT EXTT TOPT
Exogenous variables: C
Date: 01/06/16 Time: 02:06
Sample: 1970 2014
Included observations: 40

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-373.2772	NA	112.6770	18.91386	19.12497	18.99019
1	-209.8445	277.8356	0.112393*	11.99222	13.25888*	12.45021*
2	-195.0490	21.45351	0.199032	12.50245	14.82466	13.34209
3	-179.0029	19.25521	0.366870	12.95015	16.32791	14.17144
4	-135.0342	41.77034*	0.200789	12.00171	16.43502	13.60465
5	-92.29684	29.91612	0.161774	11.11484*	16.60370	13.09944

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

FIGURE 3

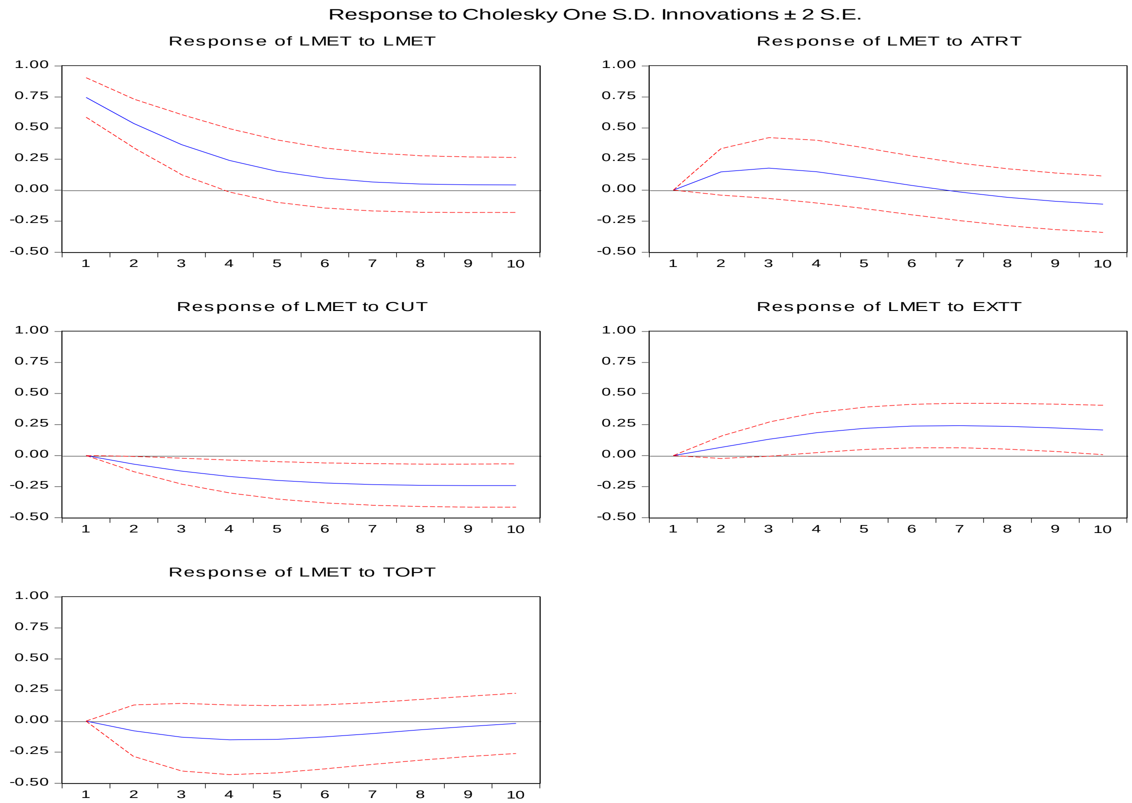


VAR Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Date: 01/06/16 Time: 02:08
Sample: 1970 2014
Included observations: 44

Lags	LM-Stat	Prob
1	20.27223	0.7324
2	17.53244	0.8616
3	25.79155	0.4188
4	33.26492	0.1246
5	24.25360	0.5048
6	24.16118	0.5101
7	24.74821	0.4766
8	19.12948	0.7909
9	34.50780	0.0975
10	17.74661	0.8530
11	22.36499	0.6146
12	33.13562	0.1277

Probs from chi-square with 25 df.

Impulse Response Function



Variance Decomposition

Period	S.E.	LMET	ATRT	CUT	EXTT	TOPT
1	0.745889	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.938375	95.84907	2.427279	0.534344	0.499351	0.689957
3	1.046696	89.24456	4.803602	1.860622	1.988514	2.102704
4	1.122414	82.13721	5.925494	3.874181	4.419098	3.644022
5	1.183827	75.47928	5.976094	6.327091	7.394191	4.823344
6	1.238275	69.59753	5.553873	8.950783	10.42925	5.468559
7	1.288619	64.52108	5.142032	11.53567	13.14939	5.651830
8	1.335826	60.17732	4.973664	13.95433	15.35547	5.539220
9	1.380096	56.47455	5.090339	16.14925	16.99892	5.286939
10	1.421388	53.32515	5.438709	18.10895	18.12500	5.002184

Cholesky Ordering: LMET ATRT CUT EXTT TOPT

Objective 2 – Granger Causality Test

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 01/06/16 Time: 02:19
Sample: 1970 2014
Included observations: 44

Dependent variable: LMET

Excluded	Chi-sq	df	Prob.
ATRT	2.057633	1	0.1514
CUT	9.092796	1	0.0026
EXTT	2.345309	1	0.1257
TOPT	0.570013	1	0.4503
All	12.44575	4	0.0143

Dependent variable: ATRT

Excluded	Chi-sq	df	Prob.
LMET	1.792486	1	0.1806
CUT	0.098093	1	0.7541
EXTT	1.422050	1	0.2331
TOPT	0.601241	1	0.4381
All	4.662575	4	0.3237

Dependent variable: CUT

Excluded	Chi-sq	df	Prob.
LMET	7.351184	1	0.0067
ATRT	5.959328	1	0.0146
EXTT	0.337389	1	0.5613
TOPT	0.224348	1	0.6357
All	17.67001	4	0.0014

Dependent variable: EXTT

Excluded	Chi-sq	df	Prob.
LMET	3.574157	1	0.0587
ATRT	0.107716	1	0.7428
CUT	0.752847	1	0.3856
TOPT	0.641213	1	0.4233

All	7.754795	4	0.1010

Dependent variable: TOPT

Excluded	Chi-sq	df	Prob.
LMET	1.236864	1	0.2661
ATRT	0.024221	1	0.8763
CUT	2.355068	1	0.1249
EXTT	0.003527	1	0.9526
All	5.045764	4	0.2826

Objective 3

1970-2014

Null Hypothesis: ATRT has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.515241	0.1202
Test critical values:	1% level	-2.618579	
	5% level	-1.948495	
	10% level	-1.612135	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ATRT)
Method: Least Squares
Date: 01/06/16 Time: 03:22
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATRT(-1)	-0.064807	0.042770	-1.515241	0.1370

R-squared	0.046644	Mean dependent var	-0.006980
Adjusted R-squared	0.046644	S.D. dependent var	0.108191
S.E. of regression	0.105638	Akaike info criterion	-1.635131
Sum squared resid	0.479854	Schwarz criterion	-1.594582
Log likelihood	36.97289	Hannan-Quinn criter.	-1.620094
Durbin-Watson stat	2.184351		

Null Hypothesis: D(ATRT) has a unit root
Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.309106	0.0000
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ATRT,2)
Method: Least Squares
Date: 01/06/16 Time: 03:22
Sample (adjusted): 1973 2014
Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ATRT(-1))	-1.437726	0.227881	-6.309106	0.0000
D(ATRT(-1),2)	0.293825	0.152909	1.921571	0.0620
C	-0.011335	0.016705	-0.678531	0.5014

R-squared	0.594884	Mean dependent var	-0.000917
Adjusted R-squared	0.574109	S.D. dependent var	0.165025
S.E. of regression	0.107696	Akaike info criterion	-1.550266
Sum squared resid	0.452336	Schwarz criterion	-1.426147
Log likelihood	35.55559	Hannan-Quinn criter.	-1.504771
F-statistic	28.63440	Durbin-Watson stat	2.101451
Prob(F-statistic)	0.000000		

Null Hypothesis: ATRT has a unit root
Exogenous: None
Bandwidth: 43 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.478198	0.1286
Test critical values:	1% level	-2.618579	
	5% level	-1.948495	
	10% level	-1.612135	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.010906
HAC corrected variance (Bartlett kernel)	0.007757

Phillips-Perron Test Equation
Dependent Variable: D(ATRT)
Method: Least Squares

Date: 01/06/16 Time: 03:23
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATRT(-1)	-0.064807	0.042770	-1.515241	0.1370

R-squared	0.046644	Mean dependent var	-0.006980
Adjusted R-squared	0.046644	S.D. dependent var	0.108191
S.E. of regression	0.105638	Akaike info criterion	-1.635131
Sum squared resid	0.479854	Schwarz criterion	-1.594582
Log likelihood	36.97289	Hannan-Quinn criter.	-1.620094
Durbin-Watson stat	2.184351		

Null Hypothesis: D(ATRT) has a unit root
Exogenous: Constant
Bandwidth: 39 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-11.20106	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.011561
HAC corrected variance (Bartlett kernel)	0.001788

Phillips-Perron Test Equation
Dependent Variable: D(ATRT,2)
Method: Least Squares
Date: 01/06/16 Time: 03:24
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ATRT(-1))	-1.111168	0.155210	-7.159130	0.0000
C	-0.007760	0.016828	-0.461123	0.6471

R-squared	0.555571	Mean dependent var	0.000130
Adjusted R-squared	0.544731	S.D. dependent var	0.163193
S.E. of regression	0.110112	Akaike info criterion	-1.529241
Sum squared resid	0.497111	Schwarz criterion	-1.447325
Log likelihood	34.87868	Hannan-Quinn criter.	-1.499033
F-statistic	51.25314	Durbin-Watson stat	2.061121
Prob(F-statistic)	0.000000		

Null Hypothesis: CUT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.271071	0.8818
Test critical values:	1% level	-4.186481	
	5% level	-3.518090	
	10% level	-3.189732	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CUT)
Method: Least Squares
Date: 01/06/16 Time: 03:25
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CUT(-1)	-0.049567	0.038996	-1.271071	0.2112
D(CUT(-1))	0.418372	0.146601	2.853816	0.0069
C	1.427002	3.012991	0.473617	0.6384
@TREND(1970)	0.041226	0.055139	0.747671	0.4591

R-squared	0.297968	Mean dependent var	-0.523256
Adjusted R-squared	0.243966	S.D. dependent var	4.146940
S.E. of regression	3.605773	Akaike info criterion	5.491358
Sum squared resid	507.0625	Schwarz criterion	5.655190
Log likelihood	-114.0642	Hannan-Quinn criter.	5.551774
F-statistic	5.517686	Durbin-Watson stat	1.961505
Prob(F-statistic)	0.002950		

Null Hypothesis: D(CUT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.827436	0.0053
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CUT,2)
Method: Least Squares

Date: 01/06/16 Time: 03:25
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CUT(-1))	-0.527669	0.137865	-3.827436	0.0004
C	-0.244471	0.570198	-0.428747	0.6704

R-squared	0.263243	Mean dependent var	0.066977
Adjusted R-squared	0.245273	S.D. dependent var	4.259872
S.E. of regression	3.700765	Akaike info criterion	5.500351
Sum squared resid	561.5221	Schwarz criterion	5.582268
Log likelihood	-116.2576	Hannan-Quinn criter.	5.530560
F-statistic	14.64927	Durbin-Watson stat	1.963332
Prob(F-statistic)	0.000435		

Null Hypothesis: CUT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.926657	0.9436
Test critical values:	1% level	-4.180911	
	5% level	-3.515523	
	10% level	-3.188259	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	14.01813
HAC corrected variance (Bartlett kernel)	22.10987

Phillips-Perron Test Equation
Dependent Variable: D(CUT)
Method: Least Squares
Date: 01/06/16 Time: 03:26
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CUT(-1)	-0.027057	0.040685	-0.665029	0.5098
C	-1.338235	3.074534	-0.435265	0.6657
@TREND(1970)	0.100226	0.053877	1.860292	0.0700

R-squared	0.147636	Mean dependent var	-0.550000
Adjusted R-squared	0.106057	S.D. dependent var	4.102274
S.E. of regression	3.878640	Akaike info criterion	5.614592
Sum squared resid	616.7977	Schwarz criterion	5.736241
Log likelihood	-120.5210	Hannan-Quinn criter.	5.659706
F-statistic	3.550764	Durbin-Watson stat	1.203328

Prob(F-statistic)	0.037828

Null Hypothesis: D(CUT) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.844494	0.0051
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	13.05865
HAC corrected variance (Bartlett kernel)	13.28587

Phillips-Perron Test Equation
Dependent Variable: D(CUT,2)
Method: Least Squares
Date: 01/06/16 Time: 03:26
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CUT(-1))	-0.527669	0.137865	-3.827436	0.0004
C	-0.244471	0.570198	-0.428747	0.6704

R-squared	0.263243	Mean dependent var	0.066977
Adjusted R-squared	0.245273	S.D. dependent var	4.259872
S.E. of regression	3.700765	Akaike info criterion	5.500351
Sum squared resid	561.5221	Schwarz criterion	5.582268
Log likelihood	-116.2576	Hannan-Quinn criter.	5.530560
F-statistic	14.64927	Durbin-Watson stat	1.963332
Prob(F-statistic)	0.000435		

Null Hypothesis: EXTT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.794489	0.6905
Test critical values:	1% level	-4.180911	
	5% level	-3.515523	
	10% level	-3.188259	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXTT)
Method: Least Squares
Date: 01/06/16 Time: 03:27
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXTT(-1)	-0.110396	0.061519	-1.794489	0.0801
C	-5.482898	4.477798	-1.224463	0.2278
@TREND(1970)	0.643866	0.292268	2.203002	0.0333

R-squared	0.108201	Mean dependent var	3.587234
Adjusted R-squared	0.064699	S.D. dependent var	11.73336
S.E. of regression	11.34744	Akaike info criterion	7.761608
Sum squared resid	5279.342	Schwarz criterion	7.883257
Log likelihood	-167.7554	Hannan-Quinn criter.	7.806721
F-statistic	2.487252	Durbin-Watson stat	1.901675
Prob(F-statistic)	0.095603		

Null Hypothesis: D(EXTT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.081037	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXTT,2)
Method: Least Squares
Date: 01/06/16 Time: 03:38
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTT(-1))	-0.947786	0.155859	-6.081037	0.0000

C	3.480942	1.913983	1.818691	0.0763

R-squared	0.474217	Mean dependent var	0.029307
Adjusted R-squared	0.461394	S.D. dependent var	16.33227
S.E. of regression	11.98622	Akaike info criterion	7.850788
Sum squared resid	5890.451	Schwarz criterion	7.932704
Log likelihood	-166.7919	Hannan-Quinn criter.	7.880996
F-statistic	36.97901	Durbin-Watson stat	2.007599
Prob(F-statistic)	0.000000		

Null Hypothesis: EXTT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.813015	0.6814
Test critical values:	1% level	-4.180911	
	5% level	-3.515523	
	10% level	-3.188259	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	119.9851
HAC corrected variance (Bartlett kernel)	125.4069

Phillips-Perron Test Equation
Dependent Variable: D(EXTT)
Method: Least Squares
Date: 01/06/16 Time: 03:39
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXTT(-1)	-0.110396	0.061519	-1.794489	0.0801
C	-5.482898	4.477798	-1.224463	0.2278
@TREND(1970)	0.643866	0.292268	2.203002	0.0333

R-squared	0.108201	Mean dependent var	3.587234
Adjusted R-squared	0.064699	S.D. dependent var	11.73336
S.E. of regression	11.34744	Akaike info criterion	7.761608
Sum squared resid	5279.342	Schwarz criterion	7.883257
Log likelihood	-167.7554	Hannan-Quinn criter.	7.806721
F-statistic	2.487252	Durbin-Watson stat	1.901675
Prob(F-statistic)	0.095603		

Null Hypothesis: D(EXTT) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.079834	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	136.9872
HAC corrected variance (Bartlett kernel)	136.2651

Phillips-Perron Test Equation
Dependent Variable: D(EXTT,2)
Method: Least Squares
Date: 01/06/16 Time: 03:39
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTT(-1))	-0.947786	0.155859	-6.081037	0.0000
C	3.480942	1.913983	1.818691	0.0763

R-squared	0.474217	Mean dependent var	0.029307
Adjusted R-squared	0.461394	S.D. dependent var	16.33227
S.E. of regression	11.98622	Akaike info criterion	7.850788
Sum squared resid	5890.451	Schwarz criterion	7.932704
Log likelihood	-166.7919	Hannan-Quinn criter.	7.880996
F-statistic	36.97901	Durbin-Watson stat	2.007599
Prob(F-statistic)	0.000000		

Null Hypothesis: LMET has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.530306	0.3129
Test critical values:	1% level	-4.180911	
	5% level	-3.515523	
	10% level	-3.188259	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LMET)
Method: Least Squares
Date: 01/06/16 Time: 03:40
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMET(-1)	-0.252489	0.099786	-2.530306	0.0153
C	0.647949	0.333173	1.944785	0.0587
@TREND(1970)	0.045421	0.019393	2.342067	0.0241

R-squared	0.136156	Mean dependent var	0.109621
Adjusted R-squared	0.094017	S.D. dependent var	0.816336
S.E. of regression	0.777014	Akaike info criterion	2.399030
Sum squared resid	24.75380	Schwarz criterion	2.520679
Log likelihood	-49.77866	Hannan-Quinn criter.	2.444144
F-statistic	3.231136	Durbin-Watson stat	2.130944
Prob(F-statistic)	0.049765		

Null Hypothesis: D(LMET) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.854115	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LMET,2)
Method: Least Squares
Date: 01/06/16 Time: 03:40
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMET(-1))	-1.196172	0.152299	-7.854115	0.0000
C	0.144507	0.125469	1.151736	0.2561

R-squared	0.600729	Mean dependent var	0.010320
Adjusted R-squared	0.590991	S.D. dependent var	1.274498
S.E. of regression	0.815090	Akaike info criterion	2.474360
Sum squared resid	27.23927	Schwarz criterion	2.556276
Log likelihood	-51.19874	Hannan-Quinn criter.	2.504568
F-statistic	61.68712	Durbin-Watson stat	2.100874
Prob(F-statistic)	0.000000		

Null Hypothesis: LMET has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.612038	0.2772
Test critical values:	1% level	-4.180911	
	5% level	-3.515523	
	10% level	-3.188259	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.562586
HAC corrected variance (Bartlett kernel)	0.617111

Phillips-Perron Test Equation
Dependent Variable: D(LMET)
Method: Least Squares
Date: 01/06/16 Time: 03:41
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMET(-1)	-0.252489	0.099786	-2.530306	0.0153
C	0.647949	0.333173	1.944785	0.0587
@TREND(1970)	0.045421	0.019393	2.342067	0.0241

R-squared	0.136156	Mean dependent var	0.109621
Adjusted R-squared	0.094017	S.D. dependent var	0.816336
S.E. of regression	0.777014	Akaike info criterion	2.399030
Sum squared resid	24.75380	Schwarz criterion	2.520679
Log likelihood	-49.77866	Hannan-Quinn criter.	2.444144
F-statistic	3.231136	Durbin-Watson stat	2.130944
Prob(F-statistic)	0.049765		

Null Hypothesis: D(LMET) has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.852119	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.633471
HAC corrected variance (Bartlett kernel)	0.635213

Phillips-Perron Test Equation
Dependent Variable: D(LMET,2)
Method: Least Squares
Date: 01/06/16 Time: 03:42
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMET(-1))	-1.196172	0.152299	-7.854115	0.0000
C	0.144507	0.125469	1.151736	0.2561

R-squared	0.600729	Mean dependent var	0.010320
Adjusted R-squared	0.590991	S.D. dependent var	1.274498
S.E. of regression	0.815090	Akaike info criterion	2.474360
Sum squared resid	27.23927	Schwarz criterion	2.556276
Log likelihood	-51.19874	Hannan-Quinn criter.	2.504568
F-statistic	61.68712	Durbin-Watson stat	2.100874
Prob(F-statistic)	0.000000		

Null Hypothesis: TOPT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.413974	0.3677
Test critical values:	1% level	-4.180911	
	5% level	-3.515523	
	10% level	-3.188259	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TOPT)
Method: Least Squares
Date: 01/06/16 Time: 03:42
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOPT(-1)	-0.316478	0.131102	-2.413974	0.0203
C	0.045536	0.029977	1.519037	0.1364
@TREND(1970)	0.002671	0.001919	1.392200	0.1714

R-squared	0.140868	Mean dependent var	0.005309
Adjusted R-squared	0.098959	S.D. dependent var	0.100364
S.E. of regression	0.095269	Akaike info criterion	-1.798485
Sum squared resid	0.372121	Schwarz criterion	-1.676835
Log likelihood	42.56666	Hannan-Quinn criter.	-1.753371
F-statistic	3.361289	Durbin-Watson stat	2.171966
Prob(F-statistic)	0.044487		

Null Hypothesis: D(TOPT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.652513	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TOPT,2)
Method: Least Squares
Date: 01/06/16 Time: 03:43
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TOPT(-1))	-1.295227	0.149694	-8.652513	0.0000
C	0.007207	0.015011	0.480136	0.6337

R-squared	0.646143	Mean dependent var	-0.001170
Adjusted R-squared	0.637512	S.D. dependent var	0.163152
S.E. of regression	0.098229	Akaike info criterion	-1.757637
Sum squared resid	0.395606	Schwarz criterion	-1.675721
Log likelihood	39.78920	Hannan-Quinn criter.	-1.727429
F-statistic	74.86598	Durbin-Watson stat	2.032207
Prob(F-statistic)	0.000000		

Null Hypothesis: TOPT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.313137	0.4183
Test critical values:	1% level	-4.180911	
	5% level	-3.515523	
	10% level	-3.188259	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.008457
HAC corrected variance (Bartlett kernel)	0.007927

Phillips-Perron Test Equation
Dependent Variable: D(TOPT)
Method: Least Squares
Date: 01/06/16 Time: 03:43
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOPT(-1)	-0.316478	0.131102	-2.413974	0.0203
C	0.045536	0.029977	1.519037	0.1364
@TREND(1970)	0.002671	0.001919	1.392200	0.1714

R-squared	0.140868	Mean dependent var	0.005309
Adjusted R-squared	0.098959	S.D. dependent var	0.100364
S.E. of regression	0.095269	Akaike info criterion	-1.798485
Sum squared resid	0.372121	Schwarz criterion	-1.676835
Log likelihood	42.56666	Hannan-Quinn criter.	-1.753371
F-statistic	3.361289	Durbin-Watson stat	2.171966
Prob(F-statistic)	0.044487		

Null Hypothesis: D(TOPT) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-8.754143	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.009200
HAC corrected variance (Bartlett kernel)	0.008493

Phillips-Perron Test Equation
Dependent Variable: D(TOPT,2)
Method: Least Squares
Date: 01/06/16 Time: 03:44
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TOPT(-1))	-1.295227	0.149694	-8.652513	0.0000
C	0.007207	0.015011	0.480136	0.6337

R-squared	0.646143	Mean dependent var	-0.001170
Adjusted R-squared	0.637512	S.D. dependent var	0.163152
S.E. of regression	0.098229	Akaike info criterion	-1.757637

Sum squared resid	0.395606	Schwarz criterion	-1.675721
Log likelihood	39.78920	Hannan-Quinn criter.	-1.727429
F-statistic	74.86598	Durbin-Watson stat	2.032207
Prob(F-statistic)	0.000000		

OLS FOR 1970-2014

Dependent Variable: LMET
Method: Least Squares
Date: 01/06/16 Time: 03:46
Sample: 1970 2014
Included observations: 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.556140	1.068160	5.201597	0.0000
ATRT	-2.967273	1.389229	-2.135913	0.0389
EXTT	0.024206	0.003350	7.225905	0.0000
TOPT	3.617647	1.457439	2.482194	0.0174
CUT	-0.012549	0.011093	-1.131210	0.2647

R-squared	0.851072	Mean dependent var	6.242542
Adjusted R-squared	0.836179	S.D. dependent var	2.503743
S.E. of regression	1.013384	Akaike info criterion	2.968906
Sum squared resid	41.07786	Schwarz criterion	3.169646
Log likelihood	-61.80039	Hannan-Quinn criter.	3.043740
F-statistic	57.14664	Durbin-Watson stat	0.562488
Prob(F-statistic)	0.000000		

Null Hypothesis: RED has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.910786	0.0046
Test critical values:	1% level	-2.618579	
	5% level	-1.948495	
	10% level	-1.612135	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RED)
Method: Least Squares
Date: 01/06/16 Time: 03:48
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RED(-1)	-0.304735	0.104692	-2.910786	0.0057

Johansen Cointegration Test

Date: 01/06/16 Time: 04:01
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments
Trend assumption: Linear deterministic trend
Series: LMET ATRT EXTT TOPT CUT
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.337908	53.52279	69.81889	0.4823
At most 1	0.278510	35.79172	47.85613	0.4069
At most 2	0.195428	21.75493	29.79707	0.3123
At most 3	0.157329	12.40480	15.49471	0.1385
At most 4 *	0.110686	5.044110	3.841466	0.0247

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.337908	17.73106	33.87687	0.8907
At most 1	0.278510	14.03679	27.58434	0.8201
At most 2	0.195428	9.350126	21.13162	0.8032
At most 3	0.157329	7.360693	14.26460	0.4474
At most 4 *	0.110686	5.044110	3.841466	0.0247

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

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

LMET	ATRT	EXTT	TOPT	CUT
0.584096	10.90469	-0.022739	5.103376	0.032748
-0.344800	3.755600	0.015282	-1.968621	-0.075500
1.077150	0.474437	-0.014848	-9.799381	-0.023521
-0.032213	-2.415224	-0.021739	1.828306	-0.001137
-0.205834	-1.222400	0.010813	-5.871892	0.010422

Unrestricted Adjustment Coefficients (alpha):

D(LMET)	0.071746	0.398722	0.036056	0.015457	0.036940
D(ATRT)	-0.057506	-0.015967	-0.004977	0.005601	-0.006422
D(EXTT)	-0.212027	-0.104673	2.253127	1.921788	-2.895671
D(TOPT)	-0.001779	0.011800	0.030006	0.009492	0.019091
D(CUT)	-0.068991	0.473832	0.661525	-0.888040	-0.362179

1 Cointegrating Equation(s): Log likelihood -227.8331

Normalized cointegrating coefficients (standard error in parentheses)

LMET	ATRT	EXTT	TOPT	CUT
1.000000	18.66934	-0.038930	8.737216	0.056065
	(4.36699)	(0.01114)	(4.79172)	(0.03400)

Adjustment coefficients (standard error in parentheses)

D(LMET)	0.041907
	(0.07549)
D(ATRT)	-0.033589
	(0.00876)
D(EXTT)	-0.123844
	(1.08985)
D(TOPT)	-0.001039
	(0.00922)
D(CUT)	-0.040297
	(0.29611)

2 Cointegrating Equation(s): Log likelihood -220.8147

Normalized cointegrating coefficients (standard error in parentheses)

LMET	ATRT	EXTT	TOPT	CUT
1.000000	0.000000	-0.042334	6.825059	0.158946
		(0.01424)	(5.29553)	(0.04366)
0.000000	1.000000	0.000182	0.102422	-0.005511
		(0.00082)	(0.30544)	(0.00252)

Adjustment coefficients (standard error in parentheses)

D(LMET)	-0.095573	2.279812
	(0.07519)	(1.27857)
D(ATRT)	-0.028084	-0.687046
	(0.01001)	(0.17019)
D(EXTT)	-0.087753	-2.705203
	(1.26552)	(21.5187)
D(TOPT)	-0.005108	0.024914
	(0.01063)	(0.18072)
D(CUT)	-0.203674	1.027201
	(0.33966)	(5.77555)

3 Cointegrating Equation(s): Log likelihood -216.1396

Normalized cointegrating coefficients (standard error in parentheses)

LMET	ATRT	EXTT	TOPT	CUT

1.000000	0.000000	0.000000	-16.91908	-0.106271
			(3.64396)	(0.04008)
0.000000	1.000000	0.000000	0.204679	-0.004368
			(0.19130)	(0.00210)
0.000000	0.000000	1.000000	-560.8745	-6.264839
			(145.179)	(1.59694)

Adjustment coefficients (standard error in parentheses)

D(LMET)	-0.056735	2.296918	0.003926
	(0.14091)	(1.27777)	(0.00345)
D(ATRT)	-0.033445	-0.689407	0.001138
	(0.01875)	(0.17006)	(0.00046)
D(EXTT)	2.339201	-1.636236	-0.030233
	(2.32639)	(21.0962)	(0.05695)
D(TOPT)	0.027213	0.039149	-0.000225
	(0.01890)	(0.17142)	(0.00046)
D(CUT)	0.508887	1.341053	-0.001013
	(0.62180)	(5.63860)	(0.01522)

4 Cointegrating Equation(s): Log likelihood -212.4593

Normalized cointegrating coefficients (standard error in parentheses)

LMET	ATRT	EXTT	TOPT	CUT
1.000000	0.000000	0.000000	0.000000	0.139514
				(0.05246)
0.000000	1.000000	0.000000	0.000000	-0.007342
				(0.00233)
0.000000	0.000000	1.000000	0.000000	1.883019
				(1.44906)
0.000000	0.000000	0.000000	1.000000	0.014527
				(0.00404)

Adjustment coefficients (standard error in parentheses)

D(LMET)	-0.057232	2.259586	0.003590	-0.743857
	(0.14091)	(1.30508)	(0.00420)	(1.25834)
D(ATRT)	-0.033625	-0.702934	0.001016	-0.203030
	(0.01872)	(0.17339)	(0.00056)	(0.16718)
D(EXTT)	2.277294	-6.277784	-0.072010	-19.44163
	(2.29111)	(21.2194)	(0.06837)	(20.4594)
D(TOPT)	0.026907	0.016223	-0.000431	-0.308993
	(0.01880)	(0.17413)	(0.00056)	(0.16789)
D(CUT)	0.537494	3.485868	0.018292	-9.391024
	(0.59276)	(5.48991)	(0.01769)	(5.29327)

Pre SAP 1970-1985

Null Hypothesis: ATRT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.330069	0.9965
Test critical values:	1% level	-4.728363	
	5% level	-3.759743	

	10% level	-3.324976	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 15
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ATRT)
Method: Least Squares
Date: 01/06/16 Time: 04:07
Sample (adjusted): 1971 1985
Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATRT(-1)	0.062522	0.189421	0.330069	0.7470
C	-0.119255	0.115326	-1.034075	0.3215
@TREND(1970)	0.011398	0.005637	2.022071	0.0660

R-squared	0.339414	Mean dependent var	-0.002240
Adjusted R-squared	0.229316	S.D. dependent var	0.078426
S.E. of regression	0.068849	Akaike info criterion	-2.336940
Sum squared resid	0.056883	Schwarz criterion	-2.195330
Log likelihood	20.52705	Hannan-Quinn criter.	-2.338448
F-statistic	3.082844	Durbin-Watson stat	1.645465
Prob(F-statistic)	0.083095		

Null Hypothesis: D(ATRT) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.746400	0.0767
Test critical values:	1% level	-2.740613	
	5% level	-1.968430	
	10% level	-1.604392	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 14
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ATRT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:08
Sample (adjusted): 1972 1985
Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ATRT(-1))	-0.549798	0.314818	-1.746400	0.1043

R-squared	0.170043	Mean dependent var	0.012571
Adjusted R-squared	0.170043	S.D. dependent var	0.083052
S.E. of regression	0.075662	Akaike info criterion	-2.256321
Sum squared resid	0.074422	Schwarz criterion	-2.210674
Log likelihood	16.79425	Hannan-Quinn criter.	-2.260546
Durbin-Watson stat	1.746227		

Null Hypothesis: ATRT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		0.389177	0.9970
Test critical values:	1% level	-4.728363	
	5% level	-3.759743	
	10% level	-3.324976	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 15

Residual variance (no correction)	0.003792
HAC corrected variance (Bartlett kernel)	0.003639

Phillips-Perron Test Equation
Dependent Variable: D(ATRT)
Method: Least Squares
Date: 01/06/16 Time: 04:09
Sample (adjusted): 1971 1985
Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATRT(-1)	0.062522	0.189421	0.330069	0.7470
C	-0.119255	0.115326	-1.034075	0.3215
@TREND(1970)	0.011398	0.005637	2.022071	0.0660

R-squared	0.339414	Mean dependent var	-0.002240
Adjusted R-squared	0.229316	S.D. dependent var	0.078426
S.E. of regression	0.068849	Akaike info criterion	-2.336940
Sum squared resid	0.056883	Schwarz criterion	-2.195330
Log likelihood	20.52705	Hannan-Quinn criter.	-2.338448
F-statistic	3.082844	Durbin-Watson stat	1.645465
Prob(F-statistic)	0.083095		

Null Hypothesis: D(ATRT) has a unit root
Exogenous: None
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.712081	0.0819
Test critical values:	1% level	-2.740613	
	5% level	-1.968430	
	10% level	-1.604392	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 14

Residual variance (no correction)	0.005316
HAC corrected variance (Bartlett kernel)	0.005171

Phillips-Perron Test Equation
Dependent Variable: D(ATRT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:09
Sample (adjusted): 1972 1985
Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ATRT(-1))	-0.549798	0.314818	-1.746400	0.1043

R-squared	0.170043	Mean dependent var	0.012571
Adjusted R-squared	0.170043	S.D. dependent var	0.083052
S.E. of regression	0.075662	Akaike info criterion	-2.256321
Sum squared resid	0.074422	Schwarz criterion	-2.210674
Log likelihood	16.79425	Hannan-Quinn criter.	-2.260546
Durbin-Watson stat	1.746227		

Null Hypothesis: CUT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		2.055399	1.0000
Test critical values:	1% level	-4.992279	
	5% level	-3.875302	
	10% level	-3.388330	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 12

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CUT)
Method: Least Squares
Date: 01/06/16 Time: 04:10

Sample (adjusted): 1974 1985
Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CUT(-1)	2.678137	1.302977	2.055399	0.0856
D(CUT(-1))	-2.596436	1.342676	-1.933776	0.1013
D(CUT(-2))	-2.795482	1.184496	-2.360059	0.0563
D(CUT(-3))	-1.958120	0.919846	-2.128747	0.0773
C	-236.1611	117.0429	-2.017732	0.0902
@TREND(1970)	2.779805	1.864392	1.490998	0.1866

R-squared	0.688022	Mean dependent var	-3.450000
Adjusted R-squared	0.428041	S.D. dependent var	4.896102
S.E. of regression	3.702823	Akaike info criterion	5.762921
Sum squared resid	82.26540	Schwarz criterion	6.005374
Log likelihood	-28.57753	Hannan-Quinn criter.	5.673156
F-statistic	2.646429	Durbin-Watson stat	2.059290
Prob(F-statistic)	0.133906		

Null Hypothesis: D(CUT) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.784004	0.0715
Test critical values:	1% level	-2.740613	
	5% level	-1.968430	
	10% level	-1.604392	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 14

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CUT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:11
Sample (adjusted): 1972 1985
Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CUT(-1))	-0.411107	0.230441	-1.784004	0.0978

R-squared	0.195619	Mean dependent var	-0.178571
Adjusted R-squared	0.195619	S.D. dependent var	5.120874
S.E. of regression	4.592772	Akaike info criterion	5.955594
Sum squared resid	274.2162	Schwarz criterion	6.001241
Log likelihood	-40.68916	Hannan-Quinn criter.	5.951368
Durbin-Watson stat	1.891794		

Null Hypothesis: CUT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.475909	0.9716
Test critical values:	1% level	-4.728363	
	5% level	-3.759743	
	10% level	-3.324976	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 15

Residual variance (no correction)	13.69097
HAC corrected variance (Bartlett kernel)	14.64656

Phillips-Perron Test Equation
Dependent Variable: D(CUT)
Method: Least Squares
Date: 01/06/16 Time: 04:11
Sample (adjusted): 1971 1985
Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CUT(-1)	-0.076301	0.188978	-0.403755	0.6935
C	7.665227	17.38056	0.441023	0.6670
@TREND(1970)	-0.654171	0.507980	-1.287788	0.2221

R-squared	0.243117	Mean dependent var	-3.093333
Adjusted R-squared	0.116970	S.D. dependent var	4.402348
S.E. of regression	4.136872	Akaike info criterion	5.854613
Sum squared resid	205.3645	Schwarz criterion	5.996223
Log likelihood	-40.90960	Hannan-Quinn criter.	5.853105
F-statistic	1.927252	Durbin-Watson stat	1.544816
Prob(F-statistic)	0.188006		

Null Hypothesis: D(CUT) has a unit root
Exogenous: None
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.763794	0.0743
Test critical values:	1% level	-2.740613	
	5% level	-1.968430	
	10% level	-1.604392	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 14

Residual variance (no correction)	19.58687
HAC corrected variance (Bartlett kernel)	18.99224

Phillips-Perron Test Equation
Dependent Variable: D(CUT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:19
Sample (adjusted): 1972 1985
Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CUT(-1))	-0.411107	0.230441	-1.784004	0.0978

R-squared	0.195619	Mean dependent var	-0.178571
Adjusted R-squared	0.195619	S.D. dependent var	5.120874
S.E. of regression	4.592772	Akaike info criterion	5.955594
Sum squared resid	274.2162	Schwarz criterion	6.001241
Log likelihood	-40.68916	Hannan-Quinn criter.	5.951368
Durbin-Watson stat	1.891794		

Null Hypothesis: EXTT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.132347	0.9997
Test critical values:	1% level	-4.728363	
	5% level	-3.759743	
	10% level	-3.324976	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 15

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXTT)
Method: Least Squares
Date: 01/06/16 Time: 04:19
Sample (adjusted): 1971 1985
Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXTT(-1)	0.190252	0.168016	1.132347	0.2796
C	-0.174392	0.110606	-1.576700	0.1408

@TREND(1970)	0.007814	0.002127	3.673387	0.0032

R-squared	0.555834	Mean dependent var	0.011967
Adjusted R-squared	0.481806	S.D. dependent var	0.049428
S.E. of regression	0.035581	Akaike info criterion	-3.657167
Sum squared resid	0.015192	Schwarz criterion	-3.515557
Log likelihood	30.42875	Hannan-Quinn criter.	-3.658676
F-statistic	7.508459	Durbin-Watson stat	2.133092
Prob(F-statistic)	0.007678		

Null Hypothesis: D(EXTT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.737834	0.2386
Test critical values:	1% level	-4.800080	
	5% level	-3.791172	
	10% level	-3.342253	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 14
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXTT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:23
Sample (adjusted): 1972 1985
Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTT(-1))	-0.962315	0.351488	-2.737834	0.0193
C	-0.057919	0.028782	-2.012336	0.0693
@TREND(1970)	0.008464	0.003259	2.597577	0.0248

R-squared	0.443229	Mean dependent var	0.010550
Adjusted R-squared	0.341997	S.D. dependent var	0.047036
S.E. of regression	0.038155	Akaike info criterion	-3.506926
Sum squared resid	0.016014	Schwarz criterion	-3.369986
Log likelihood	27.54849	Hannan-Quinn criter.	-3.519603
F-statistic	4.378381	Durbin-Watson stat	1.806963
Prob(F-statistic)	0.039923		

Null Hypothesis: EXTT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		2.305092	1.0000
Test critical values:	1% level	-4.728363	

	5% level	-3.759743
	10% level	-3.324976

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 15

Residual variance (no correction)	0.001013
HAC corrected variance (Bartlett kernel)	0.000531

Phillips-Perron Test Equation
Dependent Variable: D(EXTT)
Method: Least Squares
Date: 01/06/16 Time: 04:25
Sample (adjusted): 1971 1985
Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXTT(-1)	0.190252	0.168016	1.132347	0.2796
C	-0.174392	0.110606	-1.576700	0.1408
@TREND(1970)	0.007814	0.002127	3.673387	0.0032

R-squared	0.555834	Mean dependent var	0.011967
Adjusted R-squared	0.481806	S.D. dependent var	0.049428
S.E. of regression	0.035581	Akaike info criterion	-3.657167
Sum squared resid	0.015192	Schwarz criterion	-3.515557
Log likelihood	30.42875	Hannan-Quinn criter.	-3.658676
F-statistic	7.508459	Durbin-Watson stat	2.133092
Prob(F-statistic)	0.007678		

Null Hypothesis: D(EXTT) has a unit root
Exogenous: None
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.813026	0.3457
Test critical values:	1% level	-2.740613	
	5% level	-1.968430	
	10% level	-1.604392	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 14

Residual variance (no correction)	0.001987
HAC corrected variance (Bartlett kernel)	0.001690

Phillips-Perron Test Equation
Dependent Variable: D(EXTT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:26
Sample (adjusted): 1972 1985

Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTT(-1))	-0.356151	0.329268	-1.081646	0.2991

R-squared	0.032862	Mean dependent var	0.010550
Adjusted R-squared	0.032862	S.D. dependent var	0.047036
S.E. of regression	0.046257	Akaike info criterion	-3.240454
Sum squared resid	0.027816	Schwarz criterion	-3.194807
Log likelihood	23.68318	Hannan-Quinn criter.	-3.244679
Durbin-Watson stat	1.896750		

Null Hypothesis: LMET has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.438409	0.9967
Test critical values:	1% level	-4.992279	
	5% level	-3.875302	
	10% level	-3.388330	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 12
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LMET)
Method: Least Squares
Date: 01/06/16 Time: 04:28
Sample (adjusted): 1974 1985
Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMET(-1)	0.173363	0.395437	0.438409	0.6764
D(LMET(-1))	-0.930765	0.546260	-1.703888	0.1393
D(LMET(-2))	-1.273488	0.462729	-2.752124	0.0332
D(LMET(-3))	-0.594412	0.490766	-1.211192	0.2714
C	0.363824	1.692673	0.214940	0.8369
@TREND(1970)	-0.155193	0.049308	-3.147459	0.0199

R-squared	0.753240	Mean dependent var	-0.168104
Adjusted R-squared	0.547607	S.D. dependent var	0.434949
S.E. of regression	0.292548	Akaike info criterion	0.686475
Sum squared resid	0.513505	Schwarz criterion	0.928928
Log likelihood	1.881151	Hannan-Quinn criter.	0.596710
F-statistic	3.663025	Durbin-Watson stat	1.985314
Prob(F-statistic)	0.072632		

Null Hypothesis: D(LMET) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on SIC, maxlag=3)

	t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		-4.098438	0.0362
Test critical values:	1% level	-4.992279	
	5% level	-3.875302	
	10% level	-3.388330	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LMET,2)
Method: Least Squares
Date: 01/06/16 Time: 04:30
Sample (adjusted): 1974 1985
Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMET(-1))	-3.311383	0.807962	-4.098438	0.0046
D(LMET(-1),2)	1.565330	0.526704	2.971936	0.0208
D(LMET(-2),2)	0.450209	0.342567	1.314221	0.2302
C	1.085850	0.367635	2.953607	0.0213
@TREND(1970)	-0.159357	0.045507	-3.501834	0.0100

R-squared	0.891334	Mean dependent var	-0.088210
Adjusted R-squared	0.829239	S.D. dependent var	0.665848
S.E. of regression	0.275150	Akaike info criterion	0.551340
Sum squared resid	0.529954	Schwarz criterion	0.753384
Log likelihood	1.691963	Hannan-Quinn criter.	0.476535
F-statistic	14.35433	Durbin-Watson stat	2.027418
Prob(F-statistic)	0.001743		

Null Hypothesis: LMET has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.000400	0.9126
Test critical values:	1% level	-4.728363	
	5% level	-3.759743	
	10% level	-3.324976	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 15

Residual variance (no correction)	0.139962
HAC corrected variance (Bartlett kernel)	0.073627

Phillips-Perron Test Equation
Dependent Variable: D(LMET)
Method: Least Squares
Date: 01/06/16 Time: 04:30
Sample (adjusted): 1971 1985
Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMET(-1)	-0.356491	0.239654	-1.487525	0.1627
C	1.649852	1.097423	1.503387	0.1586
@TREND(1970)	-0.059607	0.034771	-1.714298	0.1122

R-squared	0.205731	Mean dependent var	-0.136437
Adjusted R-squared	0.073352	S.D. dependent var	0.434513
S.E. of regression	0.418273	Akaike info criterion	1.271491
Sum squared resid	2.099425	Schwarz criterion	1.413101
Log likelihood	-6.536179	Hannan-Quinn criter.	1.269982
F-statistic	1.554112	Durbin-Watson stat	1.850687
Prob(F-statistic)	0.251077		

Null Hypothesis: D(LMET) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.581984	0.0007
Test critical values:	1% level	-4.800080	
	5% level	-3.791172	
	10% level	-3.342253	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 14

Residual variance (no correction)	0.152052
HAC corrected variance (Bartlett kernel)	0.024355

Phillips-Perron Test Equation
Dependent Variable: D(LMET,2)
Method: Least Squares
Date: 01/06/16 Time: 04:31
Sample (adjusted): 1972 1985
Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMET(-1))	-1.160403	0.282565	-4.106682	0.0017
C	0.224205	0.274514	0.816734	0.4314
@TREND(1970)	-0.041900	0.029534	-1.418674	0.1837

R-squared	0.613707	Mean dependent var	-0.005428
Adjusted R-squared	0.543472	S.D. dependent var	0.651074
S.E. of regression	0.439910	Akaike info criterion	1.382917
Sum squared resid	2.128730	Schwarz criterion	1.519858
Log likelihood	-6.680418	Hannan-Quinn criter.	1.370240
F-statistic	8.737904	Durbin-Watson stat	2.355657
Prob(F-statistic)	0.005346		

Null Hypothesis: TOPT has a unit root

Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.143024	0.4836
Test critical values:	1% level	-4.728363	
	5% level	-3.759743	
	10% level	-3.324976	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 15
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TOPT)
Method: Least Squares
Date: 01/06/16 Time: 04:31
Sample (adjusted): 1971 1985
Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOPT(-1)	-0.602196	0.281003	-2.143024	0.0533
C	0.037689	0.052367	0.719714	0.4855
@TREND(1970)	0.006614	0.007311	0.904741	0.3834

R-squared	0.288895	Mean dependent var	0.007284
Adjusted R-squared	0.170378	S.D. dependent var	0.105662
S.E. of regression	0.096241	Akaike info criterion	-1.667075
Sum squared resid	0.111147	Schwarz criterion	-1.525465
Log likelihood	15.50307	Hannan-Quinn criter.	-1.668584
F-statistic	2.437573	Durbin-Watson stat	1.939230
Prob(F-statistic)	0.129301		

Null Hypothesis: D(TOPT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.536749	0.0152
Test critical values:	1% level	-4.800080	
	5% level	-3.791172	
	10% level	-3.342253	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 14
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TOPT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:32
Sample (adjusted): 1972 1985
Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(TOPT(-1))	-1.301966	0.286982	-4.536749	0.0008
C	0.051169	0.070942	0.721285	0.4858
@TREND(1970)	-0.004872	0.007521	-0.647859	0.5304

R-squared	0.651719	Mean dependent var	-0.000439
Adjusted R-squared	0.588395	S.D. dependent var	0.175217
S.E. of regression	0.112413	Akaike info criterion	-1.345869
Sum squared resid	0.139003	Schwarz criterion	-1.208928
Log likelihood	12.42108	Hannan-Quinn criter.	-1.358546
F-statistic	10.29186	Durbin-Watson stat	2.134520
Prob(F-statistic)	0.003024		

Null Hypothesis: TOPT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.143024	0.4836
Test critical values:	1% level	-4.728363	
	5% level	-3.759743	
	10% level	-3.324976	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 15

Residual variance (no correction)	0.007410
HAC corrected variance (Bartlett kernel)	0.007410

Phillips-Perron Test Equation
Dependent Variable: D(TOPT)
Method: Least Squares
Date: 01/06/16 Time: 04:32
Sample (adjusted): 1971 1985
Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOPT(-1)	-0.602196	0.281003	-2.143024	0.0533
C	0.037689	0.052367	0.719714	0.4855
@TREND(1970)	0.006614	0.007311	0.904741	0.3834

R-squared	0.288895	Mean dependent var	0.007284
Adjusted R-squared	0.170378	S.D. dependent var	0.105662
S.E. of regression	0.096241	Akaike info criterion	-1.667075
Sum squared resid	0.111147	Schwarz criterion	-1.525465
Log likelihood	15.50307	Hannan-Quinn criter.	-1.668584
F-statistic	2.437573	Durbin-Watson stat	1.939230
Prob(F-statistic)	0.129301		

Null Hypothesis: D(TOPT) has a unit root

Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.087628	0.0064
Test critical values:	1% level	-4.800080	
	5% level	-3.791172	
	10% level	-3.342253	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 14

Residual variance (no correction)	0.009929
HAC corrected variance (Bartlett kernel)	0.005239

Phillips-Perron Test Equation
Dependent Variable: D(TOPT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:33
Sample (adjusted): 1972 1985
Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TOPT(-1))	-1.301966	0.286982	-4.536749	0.0008
C	0.051169	0.070942	0.721285	0.4858
@TREND(1970)	-0.004872	0.007521	-0.647859	0.5304

R-squared	0.651719	Mean dependent var	-0.000439
Adjusted R-squared	0.588395	S.D. dependent var	0.175217
S.E. of regression	0.112413	Akaike info criterion	-1.345869
Sum squared resid	0.139003	Schwarz criterion	-1.208928
Log likelihood	12.42108	Hannan-Quinn criter.	-1.358546
F-statistic	10.29186	Durbin-Watson stat	2.134520
Prob(F-statistic)	0.003024		

OLS REGRESSION

Dependent Variable: LMET
Method: Least Squares
Date: 01/06/16 Time: 04:34
Sample: 1970 1985
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.728977	2.958127	-0.246432	0.8099
ATRT	-1.360786	1.101990	-1.234845	0.2426
CUT	0.054209	0.015812	3.428439	0.0056
EXTT	1.520933	3.154129	0.482204	0.6391
TOPT	0.421571	1.240579	0.339818	0.7404

R-squared	0.847037	Mean dependent var	3.577295

Adjusted R-squared	0.791414	S.D. dependent var	0.734730
S.E. of regression	0.335560	Akaike info criterion	0.904277
Sum squared resid	1.238608	Schwarz criterion	1.145711
Log likelihood	-2.234214	Hannan-Quinn criter.	0.916640
F-statistic	15.22816	Durbin-Watson stat	1.482479
Prob(F-statistic)	0.000185		

RESID UNIT ROOT

Null Hypothesis: RED1 has a unit root
Exogenous: None
Lag Length: 3 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.060768	0.0422
Test critical values:	1% level	-2.771926	
	5% level	-1.974028	
	10% level	-1.602922	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 12
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RED1)
Method: Least Squares
Date: 01/06/16 Time: 04:35
Sample (adjusted): 1974 1985
Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RED1(-1)	-0.986342	0.478628	-2.060768	0.0733
D(RED1(-1))	0.992178	0.461642	2.149236	0.0639
D(RED1(-2))	-0.338067	0.368445	-0.917551	0.3857
D(RED1(-3))	0.828098	0.410836	2.015643	0.0786

R-squared	0.781753	Mean dependent var	-0.010848
Adjusted R-squared	0.699911	S.D. dependent var	0.365276
S.E. of regression	0.200100	Akaike info criterion	-0.118799
Sum squared resid	0.320320	Schwarz criterion	0.042837
Log likelihood	4.712792	Hannan-Quinn criter.	-0.178642
Durbin-Watson stat	1.903235		

JOHANSEN COINTEGRATION TEST

NOT IDEAL

POST-SAP 1986-2014

Null Hypothesis: ATRT has a unit root
Exogenous: None
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.938214	0.3014
Test critical values:	1% level	-2.653401	
	5% level	-1.953858	
	10% level	-1.609571	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ATRT)
Method: Least Squares
Date: 01/06/16 Time: 04:38
Sample (adjusted): 1988 2014
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATRT(-1)	-0.057488	0.061274	-0.938214	0.3571
D(ATRT(-1))	-0.113537	0.151255	-0.750636	0.4599

R-squared	0.052457	Mean dependent var	-0.001664
Adjusted R-squared	0.014555	S.D. dependent var	0.095303
S.E. of regression	0.094607	Akaike info criterion	-1.806985
Sum squared resid	0.223762	Schwarz criterion	-1.710997
Log likelihood	26.39430	Hannan-Quinn criter.	-1.778443
Durbin-Watson stat	2.157462		

Null Hypothesis: D(ATRT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.693110	0.0005
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ATRT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:39
Sample (adjusted): 1989 2014
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ATRT(-1))	-1.551503	0.272523	-5.693110	0.0000
D(ATRT(-1),2)	0.310823	0.158855	1.956638	0.0632
C	-0.046866	0.044417	-1.055116	0.3028
@TREND(1986)	0.002515	0.002551	0.985564	0.3351

R-squared	0.649393	Mean dependent var	-0.000315
Adjusted R-squared	0.601583	S.D. dependent var	0.148611

S.E. of regression	0.093804	Akaike info criterion	-1.754582
Sum squared resid	0.193582	Schwarz criterion	-1.561029
Log likelihood	26.80957	Hannan-Quinn criter.	-1.698846
F-statistic	13.58280	Durbin-Watson stat	2.364313
Prob(F-statistic)	0.000031		

Null Hypothesis: ATRT has a unit root
Exogenous: None
Bandwidth: 1 (Used-specified) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.268599	0.0249
Test critical values:	1% level	-2.650145	
	5% level	-1.953381	
	10% level	-1.609798	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.011765
HAC corrected variance (Bartlett kernel)	0.011421

Phillips-Perron Test Equation
Dependent Variable: D(ATRT)
Method: Least Squares
Date: 01/06/16 Time: 04:41
Sample (adjusted): 1987 2014
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATRT(-1)	-0.145407	0.064310	-2.261031	0.0320

R-squared	0.144139	Mean dependent var	-0.015691
Adjusted R-squared	0.144139	S.D. dependent var	0.119396
S.E. of regression	0.110457	Akaike info criterion	-1.533326
Sum squared resid	0.329418	Schwarz criterion	-1.485747
Log likelihood	22.46656	Hannan-Quinn criter.	-1.518780
Durbin-Watson stat	1.805579		

Null Hypothesis: D(ATRT) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Used-specified) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.140971	0.0000
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.008459
HAC corrected variance (Bartlett kernel)	0.007570

Phillips-Perron Test Equation
Dependent Variable: D(ATRT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:41
Sample (adjusted): 1988 2014
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ATRT(-1))	-1.135390	0.162824	-6.973095	0.0000
C	-0.024597	0.042562	-0.577912	0.5687
@TREND(1986)	0.001383	0.002495	0.554064	0.5847

R-squared	0.676976	Mean dependent var	0.014541
Adjusted R-squared	0.650057	S.D. dependent var	0.164908
S.E. of regression	0.097553	Akaike info criterion	-1.712404
Sum squared resid	0.228398	Schwarz criterion	-1.568422
Log likelihood	26.11746	Hannan-Quinn criter.	-1.669591
F-statistic	25.14889	Durbin-Watson stat	2.206732
Prob(F-statistic)	0.000001		

Null Hypothesis: CUT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.091031	0.5274
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CUT)
Method: Least Squares
Date: 01/06/16 Time: 04:42
Sample (adjusted): 1988 2014
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CUT(-1)	-0.189271	0.090515	-2.091031	0.0478
D(CUT(-1))	0.397886	0.184305	2.158843	0.0415
C	5.411296	3.062587	1.766904	0.0905
@TREND(1986)	0.240355	0.115623	2.078793	0.0490

R-squared	0.271789	Mean dependent var	0.766667
Adjusted R-squared	0.176805	S.D. dependent var	3.407921
S.E. of regression	3.092009	Akaike info criterion	5.231473

Sum squared resid	219.8919	Schwarz criterion	5.423448
Log likelihood	-66.62488	Hannan-Quinn criter.	5.288557
F-statistic	2.861424	Durbin-Watson stat	2.211122
Prob(F-statistic)	0.058952		

Null Hypothesis: D(CUT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.530967	0.0148
Test critical values:	1% level	-3.699871	
	5% level	-2.976263	
	10% level	-2.627420	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CUT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:43
Sample (adjusted): 1988 2014
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CUT(-1))	-0.663326	0.187860	-3.530967	0.0016
C	0.498325	0.647179	0.769995	0.4485

R-squared	0.332759	Mean dependent var	-0.030370
Adjusted R-squared	0.306070	S.D. dependent var	3.927377
S.E. of regression	3.271603	Akaike info criterion	5.279624
Sum squared resid	267.5846	Schwarz criterion	5.375612
Log likelihood	-69.27493	Hannan-Quinn criter.	5.308166
F-statistic	12.46773	Durbin-Watson stat	2.038015
Prob(F-statistic)	0.001633		

Null Hypothesis: CUT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Used-specified) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.717039	0.7167
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	9.786038
HAC corrected variance (Bartlett kernel)	16.08647

Phillips-Perron Test Equation
Dependent Variable: D(CUT)
Method: Least Squares
Date: 01/06/16 Time: 04:43
Sample (adjusted): 1987 2014
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CUT(-1)	-0.131137	0.093106	-1.408464	0.1713
C	4.006142	3.205192	1.249891	0.2229
@TREND(1986)	0.186737	0.116153	1.607681	0.1205

R-squared	0.096958	Mean dependent var	0.810714
Adjusted R-squared	0.024714	S.D. dependent var	3.352328
S.E. of regression	3.310644	Akaike info criterion	5.333119
Sum squared resid	274.0091	Schwarz criterion	5.475856
Log likelihood	-71.66367	Hannan-Quinn criter.	5.376755
F-statistic	1.342097	Durbin-Watson stat	1.291292
Prob(F-statistic)	0.279481		

Null Hypothesis: D(CUT) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.570987	0.0517
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	9.692386
HAC corrected variance (Bartlett kernel)	9.692386

Phillips-Perron Test Equation
Dependent Variable: D(CUT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:44
Sample (adjusted): 1988 2014
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CUT(-1))	-0.686015	0.192108	-3.570987	0.0015
C	-0.394929	1.379772	-0.286227	0.7772
@TREND(1986)	0.060756	0.082664	0.734975	0.4695

R-squared	0.347447	Mean dependent var	-0.030370
Adjusted R-squared	0.293067	S.D. dependent var	3.927377
S.E. of regression	3.302111	Akaike info criterion	5.331440
Sum squared resid	261.6944	Schwarz criterion	5.475422

Log likelihood	-68.97444	Hannan-Quinn criter.	5.374253
F-statistic	6.389303	Durbin-Watson stat	2.036486
Prob(F-statistic)	0.005962		

Null Hypothesis: EXTT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.985909	0.5834
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXTT)
Method: Least Squares
Date: 01/06/16 Time: 04:44
Sample (adjusted): 1987 2014
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXTT(-1)	-0.269504	0.135708	-1.985909	0.0581
C	-1.437472	6.414740	-0.224089	0.8245
@TREND(1986)	1.910740	1.010182	1.891480	0.0702

R-squared	0.136297	Mean dependent var	5.590429
Adjusted R-squared	0.067201	S.D. dependent var	14.41411
S.E. of regression	13.92137	Akaike info criterion	8.205684
Sum squared resid	4845.113	Schwarz criterion	8.348420
Log likelihood	-111.8796	Hannan-Quinn criter.	8.249320
F-statistic	1.972568	Durbin-Watson stat	1.773826
Prob(F-statistic)	0.160160		

Null Hypothesis: D(EXTT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.899989	0.0028
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXTT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:45

Sample (adjusted): 1988 2014
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTT(-1))	-1.001087	0.204304	-4.899989	0.0001
C	5.993201	6.457954	0.928034	0.3626
@TREND(1986)	-0.017563	0.377424	-0.046533	0.9633

R-squared	0.500440	Mean dependent var	-0.027996
Adjusted R-squared	0.458810	S.D. dependent var	20.75632
S.E. of regression	15.26951	Akaike info criterion	8.394033
Sum squared resid	5595.794	Schwarz criterion	8.538015
Log likelihood	-110.3194	Hannan-Quinn criter.	8.436846
F-statistic	12.02113	Durbin-Watson stat	1.999180
Prob(F-statistic)	0.000242		

Null Hypothesis: EXTT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.068770	0.5400
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	173.0397
HAC corrected variance (Bartlett kernel)	191.2641

Phillips-Perron Test Equation
Dependent Variable: D(EXTT)
Method: Least Squares
Date: 01/06/16 Time: 04:45
Sample (adjusted): 1987 2014
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXTT(-1)	-0.269504	0.135708	-1.985909	0.0581
C	-1.437472	6.414740	-0.224089	0.8245
@TREND(1986)	1.910740	1.010182	1.891480	0.0702

R-squared	0.136297	Mean dependent var	5.590429
Adjusted R-squared	0.067201	S.D. dependent var	14.41411
S.E. of regression	13.92137	Akaike info criterion	8.205684
Sum squared resid	4845.113	Schwarz criterion	8.348420
Log likelihood	-111.8796	Hannan-Quinn criter.	8.249320
F-statistic	1.972568	Durbin-Watson stat	1.773826
Prob(F-statistic)	0.160160		

Null Hypothesis: D(EXTT) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.899989	0.0028
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	207.2516
HAC corrected variance (Bartlett kernel)	207.2516

Phillips-Perron Test Equation
Dependent Variable: D(EXTT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:46
Sample (adjusted): 1988 2014
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTT(-1))	-1.001087	0.204304	-4.899989	0.0001
C	5.993201	6.457954	0.928034	0.3626
@TREND(1986)	-0.017563	0.377424	-0.046533	0.9633

R-squared	0.500440	Mean dependent var	-0.027996
Adjusted R-squared	0.458810	S.D. dependent var	20.75632
S.E. of regression	15.26951	Akaike info criterion	8.394033
Sum squared resid	5595.794	Schwarz criterion	8.538015
Log likelihood	-110.3194	Hannan-Quinn criter.	8.436846
F-statistic	12.02113	Durbin-Watson stat	1.999180
Prob(F-statistic)	0.000242		

Null Hypothesis: LMET has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.564248	0.2978
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LMET)
Method: Least Squares

Date: 01/06/16 Time: 04:46
Sample (adjusted): 1989 2014
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMET(-1)	-0.525195	0.204814	-2.564248	0.0181
D(LMET(-1))	-0.241310	0.198179	-1.217637	0.2369
D(LMET(-2))	-0.282954	0.125934	-2.246845	0.0355
C	3.831955	1.175965	3.258561	0.0038
@TREND(1986)	0.041377	0.034999	1.182227	0.2503

R-squared	0.477898	Mean dependent var	0.145339
Adjusted R-squared	0.378450	S.D. dependent var	0.685450
S.E. of regression	0.540398	Akaike info criterion	1.778020
Sum squared resid	6.132632	Schwarz criterion	2.019962
Log likelihood	-18.11426	Hannan-Quinn criter.	1.847690
F-statistic	4.805502	Durbin-Watson stat	1.866467
Prob(F-statistic)	0.006545		

Null Hypothesis: D(LMET) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.895605	0.0000
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LMET,2)
Method: Least Squares
Date: 01/06/16 Time: 04:47
Sample (adjusted): 1989 2014
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMET(-1))	-1.555012	0.263758	-5.895605	0.0000
D(LMET(-1),2)	0.168176	0.138503	1.214239	0.2370
C	0.254354	0.139719	1.820476	0.0817

R-squared	0.686604	Mean dependent var	-0.008549
Adjusted R-squared	0.659352	S.D. dependent var	1.119001
S.E. of regression	0.653105	Akaike info criterion	2.094010
Sum squared resid	9.810573	Schwarz criterion	2.239175
Log likelihood	-24.22214	Hannan-Quinn criter.	2.135813
F-statistic	25.19476	Durbin-Watson stat	1.991032
Prob(F-statistic)	0.000002		

Null Hypothesis: LMET has a unit root
Exogenous: None
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		0.762019	0.8728
Test critical values:	1% level	-2.650145	
	5% level	-1.953381	
	10% level	-1.609798	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.901419
HAC corrected variance (Bartlett kernel)	0.780510

Phillips-Perron Test Equation
Dependent Variable: D(LMET)
Method: Least Squares
Date: 01/06/16 Time: 04:48
Sample (adjusted): 1987 2014
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMET(-1)	0.015464	0.023209	0.666276	0.5109

R-squared	-0.071060	Mean dependent var	0.273177
Adjusted R-squared	-0.071060	S.D. dependent var	0.934230
S.E. of regression	0.966853	Akaike info criterion	2.805521
Sum squared resid	25.23974	Schwarz criterion	2.853099
Log likelihood	-38.27729	Hannan-Quinn criter.	2.820066
Durbin-Watson stat	1.740296		

Null Hypothesis: D(LMET) has a unit root
Exogenous: Constant
Bandwidth: 26 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-11.24797	0.0000
Test critical values:	1% level	-3.699871	
	5% level	-2.976263	
	10% level	-2.627420	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.414155
HAC corrected variance (Bartlett kernel)	0.176700

Phillips-Perron Test Equation
Dependent Variable: D(LMET,2)
Method: Least Squares

Date: 01/06/16 Time: 04:48
Sample (adjusted): 1988 2014
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMET(-1))	-1.155713	0.137998	-8.374829	0.0000
C	0.192287	0.134517	1.429465	0.1652

R-squared	0.737223	Mean dependent var	-0.135140
Adjusted R-squared	0.726712	S.D. dependent var	1.279331
S.E. of regression	0.668795	Akaike info criterion	2.104509
Sum squared resid	11.18217	Schwarz criterion	2.200497
Log likelihood	-26.41087	Hannan-Quinn criter.	2.133051
F-statistic	70.13776	Durbin-Watson stat	2.424828
Prob(F-statistic)	0.000000		

Null Hypothesis: TOPT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.991972	0.5803
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TOPT)
Method: Least Squares
Date: 01/06/16 Time: 04:49
Sample (adjusted): 1987 2014
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOPT(-1)	-0.301769	0.151493	-1.991972	0.0574
C	0.144498	0.056709	2.548055	0.0174
@TREND(1986)	-0.000867	0.002576	-0.336421	0.7394

R-squared	0.210856	Mean dependent var	0.005471
Adjusted R-squared	0.147724	S.D. dependent var	0.101034
S.E. of regression	0.093273	Akaike info criterion	-1.805617
Sum squared resid	0.217496	Schwarz criterion	-1.662881
Log likelihood	28.27864	Hannan-Quinn criter.	-1.761982
F-statistic	3.339948	Durbin-Watson stat	2.304974
Prob(F-statistic)	0.051815		

Null Hypothesis: D(TOPT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.967541	0.0000
Test critical values:	1% level	-3.699871	
	5% level	-2.976263	
	10% level	-2.627420	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TOPT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:50
Sample (adjusted): 1988 2014
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TOPT(-1))	-1.290388	0.185200	-6.967541	0.0000
C	0.002653	0.018673	0.142066	0.8882

R-squared	0.660080	Mean dependent var	-0.006795
Adjusted R-squared	0.646483	S.D. dependent var	0.162754
S.E. of regression	0.096769	Akaike info criterion	-1.761784
Sum squared resid	0.234108	Schwarz criterion	-1.665797
Log likelihood	25.78409	Hannan-Quinn criter.	-1.733242
F-statistic	48.54662	Durbin-Watson stat	1.976795
Prob(F-statistic)	0.000000		

Null Hypothesis: TOPT has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.567487	0.1114
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.007803
HAC corrected variance (Bartlett kernel)	0.006988

Phillips-Perron Test Equation
Dependent Variable: D(TOPT)
Method: Least Squares
Date: 01/06/16 Time: 04:50
Sample (adjusted): 1987 2014
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOPT(-1)	-0.328854	0.126123	-2.607414	0.0149

C	0.143282	0.055620	2.576074	0.0160

R-squared	0.207283	Mean dependent var	0.005471
Adjusted R-squared	0.176794	S.D. dependent var	0.101034
S.E. of regression	0.091668	Akaike info criterion	-1.872529
Sum squared resid	0.218480	Schwarz criterion	-1.777372
Log likelihood	28.21541	Hannan-Quinn criter.	-1.843438
F-statistic	6.798607	Durbin-Watson stat	2.229251
Prob(F-statistic)	0.014913		

Null Hypothesis: D(TOPT) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.962424	0.0000
Test critical values:	1% level	-3.699871	
	5% level	-2.976263	
	10% level	-2.627420	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.008671
HAC corrected variance (Bartlett kernel)	0.008712

Phillips-Perron Test Equation
Dependent Variable: D(TOPT,2)
Method: Least Squares
Date: 01/06/16 Time: 04:51
Sample (adjusted): 1988 2014
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TOPT(-1))	-1.290388	0.185200	-6.967541	0.0000
C	0.002653	0.018673	0.142066	0.8882

R-squared	0.660080	Mean dependent var	-0.006795
Adjusted R-squared	0.646483	S.D. dependent var	0.162754
S.E. of regression	0.096769	Akaike info criterion	-1.761784
Sum squared resid	0.234108	Schwarz criterion	-1.665797
Log likelihood	25.78409	Hannan-Quinn criter.	-1.733242
F-statistic	48.54662	Durbin-Watson stat	1.976795
Prob(F-statistic)	0.000000		

OLS ESTIMATION

Dependent Variable: LMET
Method: Least Squares
Date: 01/06/16 Time: 04:52

Sample: 1986 2014
Included observations: 29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.831481	1.227462	5.565534	0.0000
ATRT	-4.593138	1.377501	-3.334399	0.0028
CUT	-0.014469	0.027652	-0.523258	0.6056
EXTT	0.020124	0.005010	4.016335	0.0005
TOPT	3.184019	1.322866	2.406910	0.0241

R-squared	0.846450	Mean dependent var	7.713023
Adjusted R-squared	0.820858	S.D. dependent var	1.806365
S.E. of regression	0.764547	Akaike info criterion	2.456519
Sum squared resid	14.02877	Schwarz criterion	2.692260
Log likelihood	-30.61953	Hannan-Quinn criter.	2.530350
F-statistic	33.07517	Durbin-Watson stat	1.243489
Prob(F-statistic)	0.000000		

RESID OLS FOR 1986-2014

Null Hypothesis: RED2 has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.581634	0.0011
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RED2)
Method: Least Squares
Date: 01/06/16 Time: 04:53
Sample (adjusted): 1987 2014
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RED2(-1)	-0.746973	0.163036	-4.581634	0.0001
C	0.070710	0.114538	0.617347	0.5424

R-squared	0.446707	Mean dependent var	0.082916
Adjusted R-squared	0.425426	S.D. dependent var	0.799354
S.E. of regression	0.605916	Akaike info criterion	1.904597
Sum squared resid	9.545476	Schwarz criterion	1.999755
Log likelihood	-24.66436	Hannan-Quinn criter.	1.933688
F-statistic	20.99137	Durbin-Watson stat	1.855678
Prob(F-statistic)	0.000101		

Appendix 2: Proposed Budget

Particular	**Quantity**	**Amount**
Stationary	Paper 10 Reams Ink 2 Cartridge Binding materials 10	620,000/= 80,000/= 100,000/=
Transport costs		3,000,000/=
Data Analysis		1,000,000/=
Up keep		500,000/=
Miscellaneous		500,000/=
	Total	**5,800,000**

Appendix 3: Time Frame

Year	**2015**	**2016**			
Month(s)	May2014-Sept 2014	Sept 2014	0ct 2014	Nov. 2015	Feb. 2016
Proposal Development					
Proposal defense					
Allocation of supervisors					
Letter to the field					
Data collection					
Data analysis					
Dissertation writing					

Viva voice and Dissemination of findings					

Appendix 4: Curriculum Vitae

OSINUSI, KUNLE BANKOLE

CURRICULUM VITAE

A. PERSONAL DATA

(i)	Names:	OSINUSI, Kunle Bankole
(ii)	Place and Date of Birth:	Ijebu-Ode, 1st February, 1977
(iii)	Nationality:	Nigerian
(iv)	State of Origin:	Ogun – State.
(v)	Home Address:	1, Adelaja Street, Imepe, Ijebu-Ode, Ogun – State.
	Office/Postal Address:	Department of Economics College Of Social and Management Sciences, Tai Solarin University Of

Education, P.M.B 2118, Ijagun,

Ijebu – Ode, Ogun – State.

Telephone Numbers: Home: Nil

Uganda mobile number +256755576362

Mobile: 08034742233

E-mail Address: bank_kunle77@yahoo.com

(vi) Marital Status: Married

(vii) Number Of Children: Two

(viii) Next Of Kin:

Name: Mrs. Temitope Osinusi.

Relationship: Wife

Address: 1, Adelaja Street, Imepe, Ijebu – Ode, Ogun – State.

Telephone: 0755576362, +2348052078373

B WORKING STATUS IN TASUED

(i) Date of First Appointment and Post: 1^{st} Feb., 2006 – Assistant Lecturer

(ii) Date Of Confirmation: 1^{st} February, 2008.

(iii) Present Status and Salary: UASS 4: 3

(iv) Date of Last Promotion/Present Status: 01/10/2012 – Lecturer I

C EDUCATIONAL HISTORY WITH DATES

(i) Institutions Attended Date

Kampala International University, Kampala, Uganda.	2012 till date.
University Of Ibadan, Ibadan	2004 - 2005
Olabisi Onabanjo University, Ago-Iwoye, Ogun State	1998 - 2001
Tai Solarin College of Education, Ijagun, I-Ode	1994 - 1997
Adeola Odutola College, Ijebu – Ode.	1988 - 1993

(ii) Academic Qualifications — Date

Ph.D Economics	In View
M.Sc. Economics	2005
B.Sc. Economics (Second Class Upper Division)	2001
National Certificate of Education (NCE)	1996

D EMPLOYMENT HISTORY WITH DATES — DATE

Bugema University Kampala, Uganda. (Part Time)	2012 Till Date.
Tai Solarin University of Education	2006– Till Date
The Polytechnic Ibadan, Ibadan (part-time)	2003 - 2005
Nigeria Police College, Ikeja, Lagos (NYSC)	2002.

E MEMBERSHIP OF LEARNED SOCIETIES

Associate Member – Nigerian Economics Society (NES)

F PUBLICATION AND RESEARCH

(i) Publication In Learned Journals

- Osinusi K.B, Oduntan K.O, and Sokoya E.O (2006) Interest rate Policy: The Nigerian Experience. *OOU Journal of Educational Studies, Vol. 6, No. 1, Pg 173 – 182*.

- Osinusi, KB, Oduntan, K.O, and Sokoya E.O (2008) Influence of Export

Diversification on the Nigerian Economy, *Journal of Applied Education and Vocational Research (Published by College of Education & Vocational Studies, TASUED,) Vol.5. No.2, Pg 130 – 138*.

- Osinusi, K.B, Sokoya, O.E and Oduntan, Kemi Olalekan. (2008), The Informal Sector and Employment Generation: (A case study of the Communication Sector in Lagos and Ogun State, *Journal of Arts and Social Sciences; Tai Solarin University of Education, Ijebu Ode, Ogun State, Vol. 10(pg 73-pg82)*

- *Oduntan K. O, Osinusi, K., and Sokoya, O.E (2008)* Impact of Trade Policy on Manufactured Export Performance, *African Journal For The Study of Educational Issues, Accra New Town Ghana, Vol. 4(1).*

- Osinusi, K. B. and JaJi, K.A, (2013), Interest rate and the Manufacturing Sector Performance in Nigeria, *Journal of Computing and Business Administration, A Publication of Bugema University, Kampala, Uganda, Vol. 1 (1) Pg 72 – 81.*

- Osinusi, K. B and Jaji, K. A (2015), Government Spending and Health Sector in Nigeria, *Academic Journal of the School of Graduate Studies, Bugema University, Kampala, Uganda,* Vol. 6, pg 27 – 42.

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Signature Date