TRADE POLICY AND PERFORMANCE OF EXPORT MANUFACTURING INDUSTRIES

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ABSTRACT

This study examines the impact of trade policy and performance of export manufacturing industries. 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. The objectives are to (a) identify the major determinants of manufacture exports; and (b) determine the causal relationship existing between manufacture exports and trade policy - Openness, exchange rate, average tariff rates and capacity utilization. Empirical analysis of the data from 1970 to 2014 using Vector autoregressive (VAR) model and granger co-integration test have produced interesting results. Specifically, all the results have ultimately confirmed that there is, indeed a significant relationship among manufacture exports, trade openness, exchange rate, average tariff rates and capacity utilization. It is recommended that there should be urgent need to diversify the economy away from single commodity oil; given the uncertainties in the world oil market, adopt policies that ensure greater market access for the country's manufacture exports as well as boosting their competitiveness at the international market. These are 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.

Keywords: Manufacture exports, Trade Policy, Vector autoregressive (VAR) model and Granger Co-integration test.

1. INTRODUCTION

According to (Adewuyi, 2006), 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 % following liberalization. In comparison, non-African developing countries saw their exports as a share of GDP increase by 62 %. The increase in exports was also smaller than the increase in imports, leaving the trade balance in Africa in a worse situation after liberalization.

Econometric method and analysis undertaken to estimate the specific effect of liberalization on exports suggest that 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 points 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, proxies 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.

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.

The objectives of this study were 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.

2. LITERATURE REVIEW

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.

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. Olorunfemi et al. (2013) found out that there is a positive relationship between manufacturing and each 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 % 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 labor market constraints have reduced the responsiveness of firm's exports to the rand depreciation. Similarly, 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 has 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 remains 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 muted for manufacturing firms operating in sectors that use imported inputs intensively.

3. METHODOLOGY

The study employed secondary data, which was collected from Statistical Bulletin of the Central Bank of Nigeria. The data on manufacturing exports, exchange rate, capacity utilization and average tariff rate were extracted from CBN Statistical Bulletin, 2016 edition. These data were analyzed to examine the trend of manufacturing export and the determinant of manufacturing export performance in Nigeria. Model was formulated and analyzed with the use of linear regression method.
The model is specified below:

$$MEt = f(TOPt.EXRt.ATRt.CUt)$$
$$MEt = bo + b1TOP + b2EXRt + b3ATR + B4CU + Ui$$

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

4. INTERPRETATION OF RESULTS

4.1. 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.

4.2. 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 responds 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.

4.3. 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 Alkaike 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 1. VAR Lag Order Selection Criteria

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: Alkaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion
Source: Researcher (2017)

Given 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.

4.4. 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.

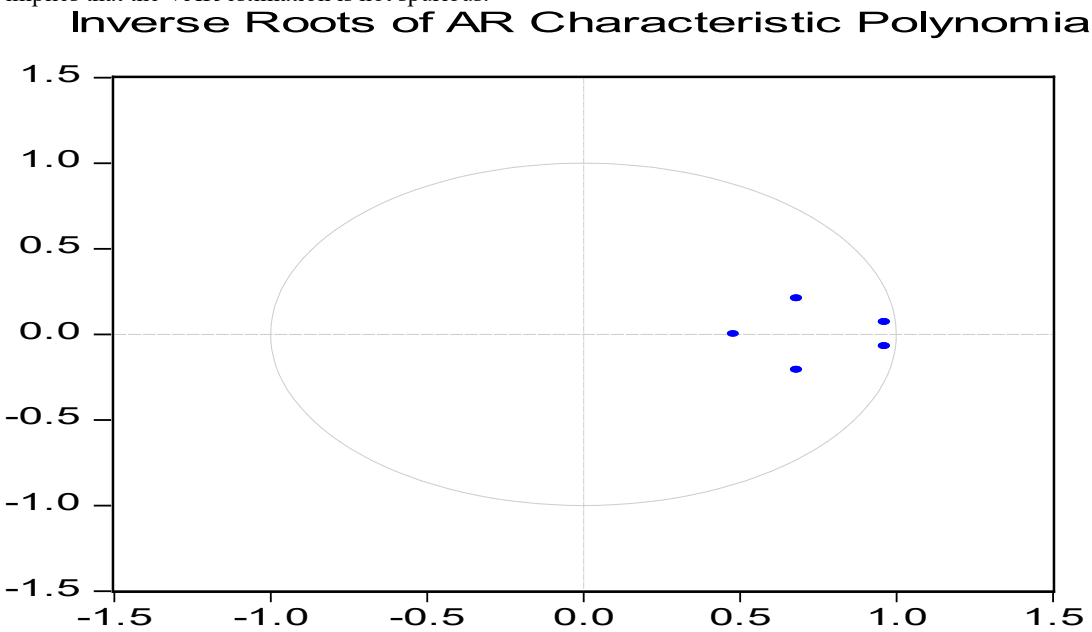

Figure 1. Inverse Roots of AR Characteristic Polynomial

4.5. 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 2. VAR Residual Correlation LM Tests

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.

4.6. 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.

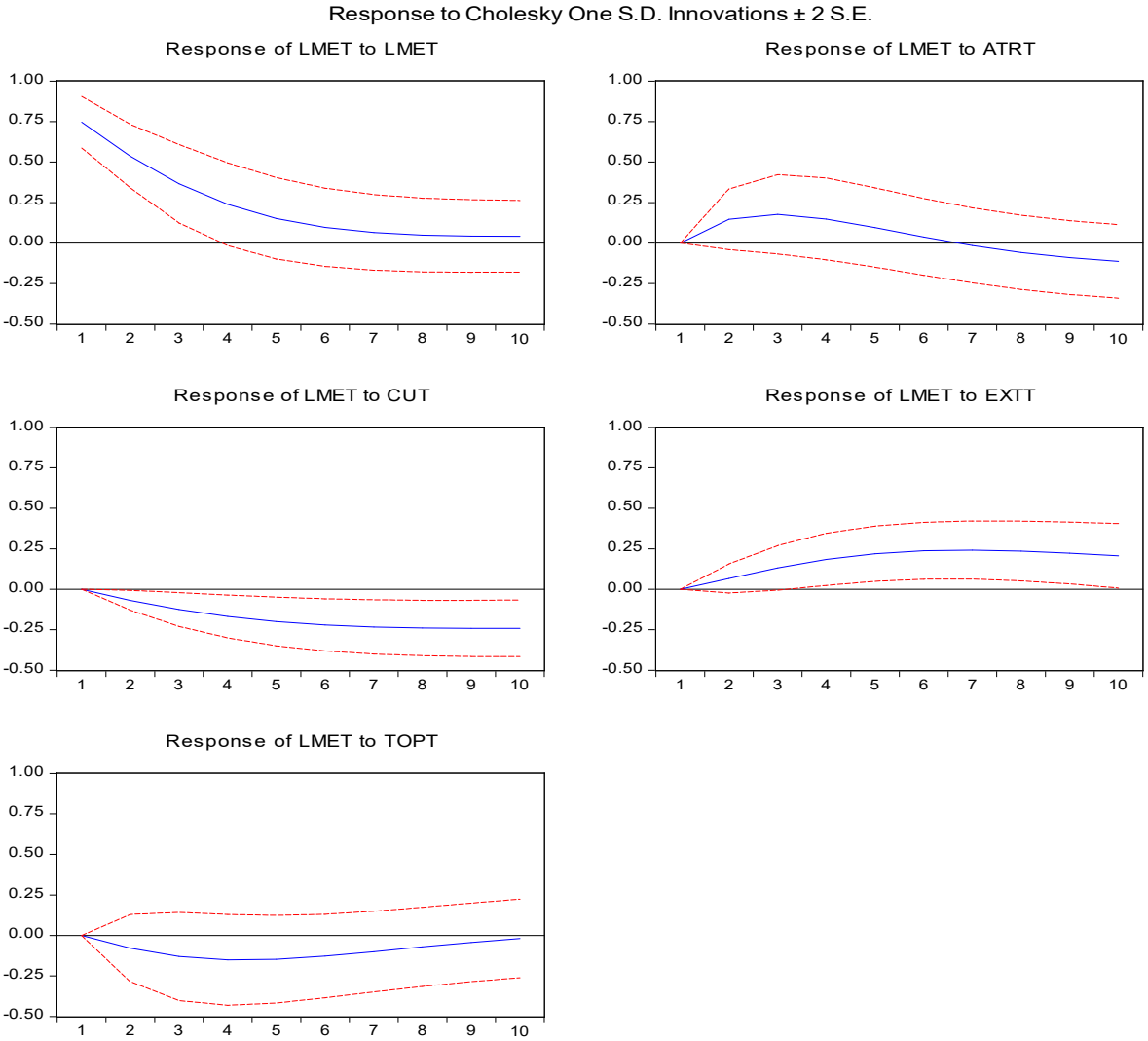

Figure 2. Impulse Response Function

The impulse response functions show 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.

4.7 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 3. 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

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.

4.8 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. 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	-

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.

5. DISCUSSION OF FINDINGS

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.

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