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Impact of Trade Policy Reforms on Manufacturing Firms' Performance in Nigeria

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Abstract

Manufacturing continues to drive economic growth globally, developing countries including Nigeria have undertaken trade reforms to promote manufacturing industries. This paper investigates the impact of such reforms on the performance of manufacturing firms in Nigeria. Firm-level data for 57 quoted manufacturing firms on the Nigerian Stock Exchange for the period 1995 and 2018 were used. Hausman test preferred the random effects model, while the chow break-point test conducted reveals that there existed structural break in 2005, which was controlled for. The study reveals that trade reforms proxy by tariff significantly and negatively impacted manufacturing firms value added/performance in Nigeria, although the impact of reforms on manufacturing industries differ and depends on the nature of products and firms in Nigeria. The paper therefore recommends that tariff should be imposed on different products at different time, which should be combined with reforms targeted at specific industries. Moreover, the government should strengthen institutions responsible for implementing trade and other related policies for enhanced performance of manufacturing firms in the country.

Key words: Manufacturing; Trade policy reforms; Firms performance; Tariff; Nigeria

JEL Classification: O14, F13, L25, F19

Paper Classification: Research Paper

Introduction

Manufacturing sub-sector continues to propel economic growth in developed countries of the world accounting for 2.7 per cent of output growth and 7.4 per cent growth in emerging economies between 2000 and 2007. The manufacturing sector grew by 2 per cent in the world and grew by 1.9 per cent in high income countries in 2016, but grew by 1.6 per cent in Sub-Saharan Africa (SSA) in 2017 (World Bank, 2019). The demand for manufacturing products continued to be on the increase as the sector contributes about 18 per cent of the world's US$70 trillion global economy, and accounts for 70 per cent of the world trade in 2014 (Nigeria Industrial Revolution Plan, 2014).

Countries such as Brazil, China, Indonesia, Japan, the Republic of Korea, Malaysia, Singapore, Taiwan, and Thailand experienced more than 7 per cent Gross Domestic Product (GDP) growth annually for more than 25 years between the second world war and 2008 global economic crisis due to manufactured-led growth (Zalk, 2014). These successes were achieved through the deliberate policies implemented by the government, which encouraged the private sector to increase and diversify manufactured products, while the domestic markets were protected from foreign competition. Moreover, incentives were granted to exports and various forms of concessional finance were extended to the sector (Zalk, 2014).

Several trade policy reforms in form of changes made to tariff, quotas, outright ban on products or raw materials have been implemented in conjunction with other policies in order to promote manufactured exports, encourage domestic industries, discourage importation of foreign products, diversify the economy, create employment and promote economic growth in Nigeria. Also, several institutions such as Nigeria Investment Promotion Commission (NIPC), Nigerian Export Promotion Council (NEPC), Nigerian Export-Import Bank (NEXIM), and Nigerian Export Promotion Zones Authority (NEPZA) were established to promote trade and manufactured exports. Despite, these efforts, manufacturing sector performance in the country has been mixed.

The study is justified on the grounds that manufacturing role in promoting growth and diversifying the productive base of an economy have been affirmed by theory and practice in extant literature. Manufacturing is the key to economic growth. The growth rate of an economy is positively related to the growth rate of its manufacturing sector. The more rapid the growth rate of the sector, the faster the growth rate of GDP because manufacturing output constitutes the largest components of export-led growth and induces productivity growth inside and outside the sector; hence, the manufacturing sector has been described as the 'engine of growth' (Kaldor, 1967; Thirwall, 2015).

Also, the divergent and inconclusive views on the impact of trade policy reforms on manufacturing productivity in empirical studies call for further investigations. Thus, this paper intends to contribute to these discourses. Previous studies only considered selected manufacturing firms without covering all manufacturing firms in Nigeria, thus generalisation based on such results may not represent the true situation for all manufacturing firms in the country. This study is therefore justified in that all manufacturing firms quoted on the Nigerian Stock Exchange (NSE) were sampled except diversified industries with diverse products. The study therefore provides a true picture of the Nigerian manufacturing situation.

The paper investigates the impact of trade policy reforms on manufacturing firms' performance in Nigeria. The next section presents an overview of trade policy reforms and manufacturing performance in Nigeria, empirical review of relevant literature is presented in Section 3, followed by the description of the methodology employed, which are contained in Section 4. The empirical results and discussion are presented in Section 5, while summary, conclusion and policy relevance are contained in Section 6.

An Overview of Trade Policy Reforms and the Performance of Manufacturing Industry in Nigeria

Over the years, Nigeria has implemented different trade regimes ranging from restrictive, highly restrictive, liberal and highly liberal (Anyanwu, Oyefusi, Oaikhenan, & Dimowo, 1997). Prior to the SAP era, the country operated a trade regime that was highly restrictive and meant to promote domestic industry, employment and balance of payments objectives. The period witnessed quantitative import controls administered through import licensing system and relatively high tariff which were frequently reviewed on the basis of perceived needs of the economy (Ayorinde, Adenikinju & Adenikinju, 1998). Trade policies adopted relied on the use of customs tariff to control imports which was complemented by direct controls through foreign exchange controls (Analogbei, 2000).

The SAP era witnessed a radical shift in Nigerian trade regime from restrictive control to a more liberal one. The radical shift in trade regime was due to the inefficiencies associated with control system and the inability of the system to respond to adverse internal and external balances (Adenikinju, 2008). The exchange rate devaluation of the Naira was meant to make imports expensive and thus, discourage excessive importation and thereby reducing the pressure on the balances of payments (Analogbei, 2000).

The Post-SAP era witnessed further liberalisation of trade regime with some modifications. The country strengthened trade liberalisation through further deregulation of the exchange rate and pursued effective external debt management strategies. Moreover, import liberalisation was undertaken in 1995, which significantly reduced tariff rates and dependence on quantitative measures. Furthermore, the country adopted ECOWAS Common External Tariff era in 2008 with comparatively small import prohibition lists (25 items) and a smaller export prohibition lists (8 items) (Okogu, 2015).

Manufacturing sub-sector has been adjudged to have performed below expectation in terms of the value-added of firms operating in the country, partly due to the fact that Nigerian firms depended on imported raw materials for their operations. As from the “nineteenth century”, manufacturing firms in the country experienced relative stagnation as the sector value-added per capita lagged behind that of many comparator countries (Ehinomen & Oladipo, 2012). While, the contribution of manufacturing to GDP in China was 33 per cent in 2010, that of Nigeria was 4 per cent in 2010, which increased to 10 per cent annually between 2012 to 2014 (National Bureau of Statistics, 2014). The sector’s contribution to GDP in Nigeria marginally declined to 9.2 per cent in 2016 (National Bureau of Statistics, 2017).

In terms of competitiveness with other countries of similar socioeconomic characteristics such as China, Thailand, Indonesia, Brazil, Malaysia and South Africa, the Nigerian manufacturing sector is the least competitive. While, the average manufacturing contribution to GDP between 2001 and 2006 were 32.3 per cent, 34.4 per cent, 28.9 per cent, 18 per cent, 30.3 per cent, 19 per cent for China, Thailand, Indonesia, Brazil, Malaysia and South Africa respectively, Nigeria merely recorded an average contribution of 4.2 per cent for the period. Similarly, the share of manufacturing exports in total exports for South Africa in 2005 was 70.2 per cent while it was merely 2.5 per cent for Nigeria. The sector also recorded the least share in value added of 4.4 per cent in 2005, which is far lower than that of the comparator countries such as South Africa (16.3 per cent), Malaysia (32.2 per cent), Indonesia (28.1 per cent) and Thailand (36.1 per cent) (National Technical Working Group, 2009).

Also, in assessing Nigeria’s manufacturing sector competitiveness globally and regionally, Soludo (2003) used a benchmark of some selected African countries and discovered that while Nigeria is ranked 4th after South Africa, Egypt, and Algeria and ranged below the Africa average. He equally found that the sector has been endowed with negative and slow growth rates dominated by light assembly type consumer goods, low value-added production due to high import dependence for inputs and the accumulation of large inventory.

At the dis-aggregated level, the manufacturing industries responded differently to tariff reforms in Nigeria. For instance, the study by Adenikinju (2008) reveals that the higher protection on food products did not lead to remarkable increase in the output of the industry rather the industry remains stagnant between 1994 and 1999. Also, the case of the footwear industry is similar to that of the food products industry. A fall in tariff rates did not encourage growth in output of the industry. On the contrary, a fall in tariff rates is associated with the fall in output of the textile industry partly due to the inability of the industry to compete with imports of textile products. However, "the cases of chemicals and transport equipment sub-sectors seem to suggest that the tariff reforms have spurred some positive, though marginal impact on output in Nigeria" (p.120).

In order to discourage smuggling of textile, beverages, furniture, and vehicles that are imported into the country with more than 10 years old as well as raise revenue from import duties in 2010; Nigeria lifted ban on such items and replaced them with tariffs ranging from 10 to 20 per cent for such commodities. This led to the influx of imported textile materials into the Nigeria with negative consequences on employment generation, incomes and foreign reserves (National Bureau of Statistics, 2014).

Also, in an attempt at boosting the rubber and tyres industry, the government reduced the import duties on tyres from 40 per cent in 2006 to 10 percent in 2007. This consequently led to the influx of 'fake' and 'tokunbo' tyres into Nigeria with negative consequences on the operations of the tyres industries and coupled with the high cost of electricity supply, the two tyres manufacturing firms (i.e. Michelin Nigeria Plc. and Dunlop Nigeria Plc.) could not compete with foreign firms, resulting in losses and their relocation to neighbouring countries in order to avoid ruinous competition they faced from tyres "imports from Dubai, India, the Far East and China". Consequently, these resulted in the "loss of 30,000 jobs in Delta, Edo and Ogun and the loss of approximately $650 million on imports and the smuggling of over 2.5 million units of tyres at an average rate of $250 per unit" (Africa Business Pages, 2017, p.1).

Literature Review

The impact of trade policy reforms on manufacturing productivity/ performance continues to generate controversy in the literature: three discernable school of thoughts are drawn in this controversy. While some studies opined that increased trade openness have positive impact on the manufacturing productivity growth or output; others posited that trade openness have no impact on manufacturing productivity growth. Some studies even opined that there is a negative association between manufacturing productivity growth and trade openness.

The first school of thought opines that trade policy reforms have positive impact on manufacturing sector productivity growth/output since firms have access to transferred technology and enjoys economies of scale (Bhagwatti, 1978; Nishimizu & Robinson, 1984; Goldar, 1986; Thomas & Nash, 1991; Chete & Adenikinju, 2002; Kim, 2000; Greenaway, Morgan & Wright, 2002; Lopez, 2005; Adewuyi, 2006; Onakoya, Fasanya & Babalola, 2012; Umoh & Effiong, 2013 among others). They held the views that outward-oriented trade policy encourages overall industrial efficiency in the economy by exposing local firms to competition thereby improving the allocation of resources across sectors. The access to transferred technology and the economies of scale enjoyed increased their scope of operations and enabled them achieve output growth.

The second school of thought posits that the impact of trade policy reforms on manufacturing productivity is negative and that liberalisation may in fact hamper industrial productivity by opening up the economy to superior foreign products compelling domestic industries to close-down (Ocampo & Taylor, 1998; Weisbrot & Baker, 2003; Kim, 2011; Musila & Yiheyis, 2015 among others). For example, the study by Weisbrot and Baker (2003) rejected the assertion that developing countries enjoys larger gains due to the removal of barriers to trade in agriculture and textiles, but rather majority of them were actually hurt as a result of the liberalisation in the agricultural sector. While, the study by Musila and Yiheyis (2015) on Kenya found that trade openness has a negative effect on economic growth and that the positive impact of trade openness on investment is not large enough to lead to higher economic growth in that country (as cited in Were, 2015, p.74).

The third school of thought argues that there is no evidence or strong correlation between trade policy reforms and manufacturing productivity and that factor productivity has not been linked with trade regime (Pack, 1988; Nishimizu & Page, 1990; Havrylshyn, 1990; Rodrik, 2000; Pulapre, Pushpangadan & Babu, 2000; Rodriquez & Rodrik, 2001). In fact, the study by Rodriquez and Rodrik (2001) reveals that there is little evidence that lower tariff and fewer non-tariff barriers to trade have strong correlation with economic growth. Moreover, their study reveals that empirical evidences do not support trade openness.

Other related studies on the impact of trade policy reforms on manufactured exports show contradictory results. Studies such as Roy (1991) on Bangladesh for 1976/77 and 1986/87, Weiss (1992) on Mexico for 1985 to 1989, and Jayanthankumaran (2002) on Sri Lanka for 1976 and 1990 found that trade policy reforms have positive impact on manufactured exports in those countries. While, studies by Sharma, Oczkowski and Jayasuriya (2001) on Nepal, Jenkins (1996) on Bolivia and Oshodi (2020) on Nigeria did not support the assertion that trade policy reforms promote manufactured exports. Even though, the recent study by Oshodi (2020) reveals that trade reforms have insignificant impact on the exports of manufacturing firms in Nigeria, it however, have significant impact on the performance of export-oriented manufacturing firms in the country.

Irwin (2019) provided answer to the question whether trade reform promote economic growth. The finding is consistent with previous studies, which found that trade reform has positive and significant impact on economic growth, since there appears to be a 1.0 per cent to 1.5 per cent point increase in growth after trade reform.

These divergent views can be attributed to the different methods of analysis used by the different authors, which ranges from the Ordinary Least Squares (OLS), Two Stage Least Squares (2SLS), and panel regression analysis. Also, the type of study embarked upon produces different findings; some studies are country-specific, while others are cross-country and some are firm-level. Moreover, the different measures of liberalisation used also led to the different results. Furthermore and more importantly, these studies have not given much attention to the presence of structural break in their data due to the impact of trade reform across manufacturing industries in Nigeria, which might affect the consistency of the estimated parameters of their studies. This lacuna in the extant literature call for further investigations, which this study seeks to address.

Research Methodology

Theoretical Framework

Solow model postulates that national output is produced with two factors of production, capital and labour. The Solow aggregate production function is given as:

$$Y_t = K^{\alpha}(A_t L_t)^{1-\alpha} \qquad (1)$$

Where: is AL is the effective labour, Y_t is Output per effective labour

$$\frac{Y_t}{A_t L_t} = \frac{K^{\alpha}(A_t L_t)^{1-\alpha}}{A_t L_t}$$

$$y_t = k^{\alpha} \tag{2}$$

Equation (2) states that output per effective labour is determined by capital per effective labour. The evaluation of k is what matters in driving growth in an economy. Therefore, the evaluation of k is given as:

$$\dot{k}_t = s y_t - (n + g + \delta)k_t \tag{3}$$

Where $\dot{k}_t$ is the rate of change in capital per effective labour over time, $s y_t$ is the proportion of output not consumed, $(n + g + \delta)k_t$ is break-even investment, n is the growth rate of labour, g is the growth rate of technology, δ is the rate of capital depreciation, and $sk^{\alpha}{}_t$ is actual investment.

Substituting k_t for y_t in equation (3), yields:

$$\dot{k}_t = sk^{\alpha}{}_t - (n + g + \delta)k_t \tag{4}$$

Equation (4) is the key equation of the Solow model which states that the rate of change of the capital stock per unit of effective labour is the difference between $sk^{\alpha}{}_t$ actual investment and $(n + g + \delta)k_t$ break-even investment (Romer, 2012).

Solving for k_t at equilibrium since $\dot{k}_t = 0$ at steady state equilibrium. Then equation (4) gives:

$$0 = sk^{\alpha}{}_t - (n + g + \delta)k_t \tag{5}$$

Where:

$$(n + g + \delta)k_t = sk^{\alpha}{}_t \tag{6}$$

$$\frac{k_t}{k_t^{\alpha}} = \frac{s}{(n+g+\delta)} \tag{7}$$

$$k_t{}^{1-\alpha} = \frac{s}{n+g+\delta} \tag{8}$$

$$k_t = \left(\frac{s}{n+g+\delta}\right)^{1/1-\alpha} \tag{9}$$

Given output equation as $y_t = AK^{\alpha}$, substitute equation (9) into the output equation to get

$$y_t = A\left[\frac{s}{n+g+\delta}\right]^{\frac{\alpha}{1-\alpha}} \tag{10}$$

Taking the natural log of equation (10)

$$lny_t = lnA_t + \frac{\alpha}{1-\alpha} lnS_t - \frac{\alpha}{1-\alpha} ln(n + g + \delta) \tag{11}$$

Equation (11) presents the central position of the Solow growth model, which postulates that output growth in an economy is determined by the initial technology, the growth rate of savings, exogenous growth rate of the labour force, the growth rate of technology and capital depreciation.

Model Specification

Equation (11) is modified to get the estimable model for the study. y_t, Output per effective labour is replaced with VAD_{it} (Value Added) of each manufacturing firm in Naira at time t; S_t is replaced with k_t, which is capital stock (Investment). At firm level, FA_{it}, firms' Fixed Asset/plant and machinery is the proxy for capital formation in Naira at time t; n, which is growth rate of labour force is replaced by Emp_{it}, number of workers employed in each manufacturing firm at time t; A_{it} is defined to include tariff, rate of growth of sales turnover, cost of energy, cost of finance, real effective exchange rate, inflation and tax (variables that empirically influenced manufacturing performance in Nigeria, hence their inclusion).

Thus:

$$A_{it} = \beta_0 + \beta_1 rST_{it} + \beta_2 TARR_{it} + \beta_3 CE_{it} + \beta_4 CF_{it} + \beta_5 REER_{it} + \beta_6 INF_{it} + \beta_7 TAX_{it} + \beta_8 BREAK_{it} + U_{it} \quad (12)$$

Where:

rST_{it} represents rate of growth of sales turnover of each manufacturing firm in Naira at time t.

$TARR_{it}$ represents changes in tariff (trade reform) for each manufacturing firm's products/raw materials in percentage.

CE_{it} represents cost of energy of each manufacturing firm in Naira at time t.

CF_{it} represents cost of finance for the operation of each firm i at time t.

$REER_{it}$ represents real effective exchange rate in Naira in relations to US dollar as it affects firm i at time t.

INF_{it} represents inflation rate as it affects firm i at time t.

TAX_{it} represents the total tax paid by firm i at time t.

$BREAK_{it}$ represents the break-point date as it affects firm i at time t.

Combining all the variables with equation (12), the empirical model becomes:

$$VAD_{it} = \beta_0 + \beta_1 FA_{it} + \beta_2 EMP_{it} + \beta_3 rST_{it} + \beta_4 CE_{it} + \beta_5 CF_{it} + \beta_6 REER_{it} + \beta_7 INF$$
$$\beta_8 TAX_{it} + \beta_9 TARR_{it} + \beta_{10} BREAK_{it} + U_{it} \quad (13)$$

Where: $U_{it} = \gamma_i + V_{it}$, thus equation (13) becomes:

$$VAD_{it} = \beta_0 + \beta_1 FA_{it} + \beta_2 EMP_{it} + \beta_3 rST_{it} + \beta_4 CE_{it} + \beta_5 CF_{it} + \beta_6 REER_{it} + \beta_7 INF_{it} +$$
$$\beta_8 TAX_{it} + \beta_9 TARR_{it} + \beta_{10} BREAK_{it} + (\gamma_i + V_{it}) \quad (14)$$

Equation (14) is therefore a one-way error component regression model.

Thus, taking the natural logarithm of VAD, FA, EMP, CE, CF and TAX, the estimated model for the study is thus specified as:

$$lnVAD_{it} = \beta_0 + \beta_1 lnFA_{it} + \beta_2 lnEMP_{it} + \beta_3 rST_{it} + \beta_4 lnCE_{it} + \beta_5 lnCF_{it} + \beta_6 REER_{it} +$$
$$\beta_7 INF_{it} + \beta_8 lnTAX_{it} + \beta_9 TARR_{it} + \beta_{10} BREAK_{it} + (\gamma_i + V_{it}) \quad (15)$$

where: β_0 is the intercept, and $\beta_1 - \beta_{10}$ are the coefficients; VAD_{it} is Value Added of manufacturing firm in Naira at time t; FA_{it} is Fixed Asset (plant and machinery) of manufacturing firm in Naira at time t; Emp_{it}, number of workers employed in each manufacturing firm at time t; γ_i is the individual firm effect; which captures certain individual characteristics of firm which cannot be measured but is unique about the operations of each firm, and does affect its output and value added while V_{it} is the usual random error term. BREAK was included in the equation to control for structural break, as it was detected from the Chow break-point test that there exists the effect of structural break in 2005, when the Common External Tariff came into operation due to significant change in tariff policy.

The a-priori expectations with respect to equation (15) are given as:

$\beta_1, \beta_2, \beta_3 > 0$, and $\beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, < 0$

Equation (15) suggests that manufacturing firm's performance proxy by value-added depends on firm's fixed asset used in production, number of workers employed by the firm, rate of growth of sales turnover, tariff on raw materials (finished products), cost of energy, cost of finance, real effective exchange rate, inflation and tax.

Data and Estimation Method

Annual time series data from 1995 to 2018 were obtained from different sources on an unbalanced basis. Data on value-added, employment, sales turnover, fixed assets, cost of energy, cost of finance, and taxation were obtained from annual reports and statement of accounts of sampled (quoted) manufacturing firms and NSE fact books for several years, data on tariff on products and raw materials of firms were obtained from Nigeria Customs and Exercise Tariff books, while data on real effective exchange rate and inflation were obtained from National Bureau of Statistics.

Estimation of parameters of the model was done by both the fixed and random effects panel regression models. However, the analysis and conclusion were based on the random effects results, a decision backed by the Hausman test. Breakpoint test was conducted following the Chow (known date) break-point procedure at 2005 trade reform. Prior to the estimation of the parameters, unit root test was conducted to verify the stationarity of each variable, which follows the Fisher-type augmented Dickey-Fuller procedure because the data involved are unbalanced and there are relatively of shorter time periods with large number of units in the panel.

Results and Discussion

Prior to the presentation of the estimation results, the unit root test results obtained are presented in Table 1 for the stationarity of each variable. The results of the unit root test from Fisher-type (ADF) procedure shows that the null hypothesis which states that 'each of the variables are not stationary for all panel' is rejected, indicating that each of the variables are stationary for at least one panel. This is evident from each of their large test statistics and low p-values. Although, evidence from some of the statistics presented (i.e. Inverse chi-squared, Inverse normal, Inverse logit t and Modified inv. chi-squared) provides no evidence for stationarity in some of the variables. For instance, both Inverse normal and Inverse logit t provides insufficient evidence for stationarity in cases of fixed assets and employment and Inverse normal provides no evidence for stationarity in the case of cost of energy and cost of finance. However, the existence of stationarity, evident from other statistics reinforced the conclusion that all these variables are stationary for at least a panel.

Table 1: Unit Root Test (Fisher-Type with Augmented Dickey-Fuller Option)

Variables	P	Z	L*	Pm
VA	243.5***	-1.415*	-4.892***	8.574***
FA	174.28***	0.794	-0.926	3.992***
EMP	137.16*	2.907	1.088	1.534*
rST	549.71***	-16.27***	-19.68***	28.85***
CE	234.63***	0.127	-2.401***	7.989***
CF	223.68***	0.352	-2.579***	7.264***
REER	235.91***	-3.971***	-6.374***	8.073***
INF	2914.6***	-47.11***	-106.58***	185.47***
TAX	240.38***	-4.230***	-5.971***	8.577***
TARR	205.94***	0.408***	-3.807***	6.089***

*Note: *** p<0.01, ** p<0.05, * p<0.1; VA is value added; FA is fixed asset; EMP is employment; rST is growth of sales turnover; CE is cost of energy; CF is cost of finance; REER is real effective exchange rate; INF is inflation; TAX is tax and TARR is tariff.*

Table 2 presents four column which shows the results of fixed and random effects models for all sampled manufacturing firms in Nigeria. The results for all sampled manufacturing firms for which structural break was not controlled for and the results for which structural break was controlled for were presented in two columns each in Table 2, while Table 3 presents the random effect results for the sampled manufacturing industries in Nigeria. From the result diagnostics, the Hausman specification test prefers the random effects as more appropriate than the fixed effects for all sampled manufacturing firms and sampled manufacturing industries analysis, hence the random effects results were discussed in this paper.

The F-Statistics, which is a measure of the overall significance of the model is 122.69. This reveals that the model is statistically significant and is of good fit. The results revealed that the combined effects of the variables in the model is significant at 1 per cent. Also, the F- Statistics, for the sampled industries were significant for all the sampled industries except for flour mills and brewery. The reported R-squared also suggests that 64 per cent of variations in manufacturing firms' value added were explained by the model.

Table 2: Fixed and Random Effects on Full Sampled Manufacturing Firms in Nigeria

	Without Controlling for Structural Break		Controlling for Structural Break	
VARIABLES	Fixed Effects	Random Effects	Fixed Effects	Random Effects
FA	0.184	0.370***	0.167	0.356***
	(0.139)	(0.108)	(0.152)	(0.118)
EMP	0.490	1.159***	0.510	1.171***
	(0.311)	(0.192)	(0.320)	(0.197)
rST	0.174	0.345	0.177	0.348
	(0.291)	(0.284)	(0.291)	(0.285)
CE	-0.0136	0.101	-0.0138	0.0997
	(0.0739)	(0.0677)	(0.0740)	(0.0678)
CF	0.00267	-0.00271	0.00353	-0.00156

	(0.0231)	(0.0220)	(0.0233)	(0.0223)
REER	-0.00120	0.00192	-0.00148	0.00164
	(0.00484)	(0.00478)	(0.00494)	(0.00486)
INF	-0.0496	-0.0588*	-0.0477	-0.0565
	(0.0333)	(0.0336)	(0.0340)	(0.0344)
TAX	0.00642	-0.0112	0.00589	-0.0116
	(0.0161)	(0.0153)	(0.0162)	(0.0155)
TARR	-0.0309***	-0.0253**	-0.0291**	-0.0235**
	(0.0112)	(0.0101)	(0.0130)	(0.0117)
BREAK			0.137	0.144
			(0.497)	(0.474)
Constant	9.045***	0.727	9.017***	0.703
	(3.010)	(1.583)	(3.013)	(1.595)
Observations	841	841	841	841
R-squared	0.025	0.641	0.025	0.640
F/Chi-squared stat.	2.22**	123.97***	2.0**	122.69***
Hausman spec. test	1.04			
Wooldridge test	0.250			
Chow break-point test	8.30***			

*Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; FA is fixed asset; EMP is employment; rST is growth of sales turnover; CE is cost of energy; CF is cost of finance; REER is real effective exchange rate; INF is inflation; TAX is tax and TARR is tariff.*

Tariff has a significant negative coefficient, which implies that tariff negatively affected all sampled manufacturing firms' value-added (performance) in Nigeria. Its coefficient of (-0.023) indicates that a 1 per cent increase in tariff induced a (-0.023) point decrease in value added of all sampled manufacturing firms in Nigeria. This result is attributable to the fact that the Nigerian manufacturing sector is highly dependent on imported raw materials for production. It also means that the industries operated in a non-conducive environment with high cost of production, which makes their products uncompetitive with products from other countries. This finding that the impact of tariff on manufacturing firms' performance is negative and significant concurs with our a-priori expectations. As tariff increases, manufacturing firms performance proxy by value added worsen and as tariff reduces, firms performance improves. By implications, tariff can be used to influence specific industries in the country.

Fixed assets and employment impact on full sampled manufacturing firms' performance in Nigeria are statistically significant. The impact of fixed assets on the performance of manufacturing firms in Nigeria is positive and significantly. A 1 per cent increase in fixed assets induced a 0.356 per cent increase in value added, which indicates that manufacturing firms in the country now use modern plant and machinery which enhanced their performance. Similarly, employment has significant positive coefficients for the full sampled manufacturing firms in Nigeria. A percent increase in employment of worker induced 1.171 per cent increase in value added of manufacturing firms in Nigeria. Thus, increase in the number of workers engaged by manufacturing firms improved their performance in Nigeria and this conformed to a-priori expectations that as more workers are engaged in production, manufacturing firms becomes more efficient in Nigeria.

To obtain industry level insight, this study further estimated the model for each of the industries. The results for industry-specific analysis for food and beverages, flour mills, cement, paints, pharmaceuticals, soft drinks, foam, printing and publishing, wire, aluminum and sugar industries are presented in Table 3. Trade policy reforms proxy by tariff has negative significant impact on printing and publishing and aluminum industries in Nigeria. A 1 per cent increase in tariff induced a (-0.200) point decrease in value added of firms in the printing and publishing industry; and a (-0.100) point decline in value added of firms in aluminum industry. This is consistent with our priori expectations that as tariff increases, manufacturing performance declines and as tariff reduces, manufacturing performance improves.

On the contrary, tariff has an insignificant impact on manufacturing firms' performance in food and beverages, flour mills, pharmaceuticals, cement, paints, foam, wire and sugar industries in Nigeria. Specifically, tariff is ineffective in improving the performance of firms in pharmaceutical industry in Nigeria due to the influx of fake and adulterated drugs imported into the country which are often sold at cheaper prices below Nigeria's drugs. Over 50 per cent of the raw materials used for producing drugs were imported and as such the ban on some drugs or tariff placed on their products could not be effective. This explains why the cost of production of drugs remains high and pharmaceutical firms could not compete with firms from other countries.

Tariff is ineffectiveness in enhancing manufacturing firms' performance in food and beverages, flour mills, cement, paint, foam, wire and sugar industries due to the following reasons: Firstly, tariff is one out of the numerous supply constraints affecting manufacturing firms' performance in the country. The other supply-side constraints like cost of electricity and cost of finance and non-conducive business environment have not been adequately addressed in Nigeria. This finding is in agreement with the finding of Organisation for Europeans Co-operation and Development (OECD) (2013), which opined that trade performance depend less on customs tariff but on other supply-side constraints such as electricity or access to credit. Secondly, the smuggling of substandard products into the country through Nigeria's borders which are often sold at cheaper prices than made-in-Nigeria products makes Nigeria's products uncompetitive with foreign products thereby making the protection of our local industries difficult.

Thirdly, Nigerians' preferences for imported products to buying made-in-Nigeria products (demand side). The low income of Nigerians, the elites' tastes and the perceived feelings of being superior for using foreign products led to the continuous patronage of foreign products to the detriment of Nigerian products resulting in job losses and a manufacturing sector that has been unable to help diversify the economy. Fourthly, the result could be an evidence that the country had weak institutions in Nigeria Customs Service (NCS), Nigerian Port Authority (NPA), Standards Organisation of Nigeria (SON), and National Agency for Food, Drugs and Administration Control (NAFDAC)). This finding is in tandem with the findings of Briggs (2007) and Hoekman, Michalopoulos, Schiff, and Tarr (2001), which opined that the success of trade policy reform depends on implementing sound macroeconomic policy and a variety of institutions.

The results for other variables differs from industry to industry depending on the nature of products. The impact of fixed assets on food and beverages, soft drinks and aluminum industries is positive and significant. Increasing fixed assets by 1 per cent would yield an increase of 0.670 per cent in manufacturing value-added of food and beverages industry, 0.780 per cent increase in value added of soft drinks industry, and a 0.348 per cent increase in value added of aluminum industry. While fixed assets have negative and significantly impact on the value added of cement and foam industries. This suggests that a 1 per cent increase in fixed assets led to a (-1.760) per cent decline in value added of cement industry, and a (-1.650) per cent decline in value added of foam industry. This finding does not agree with a-priori expectations as a result of the fact that increasing capital stocks reduces the working capital available for these firms' operations.

The impact of employment on manufacturing firms differ from industry to industry in Nigeria. While employment had positive and significant impact on the value added and performance of firms in the flour mills, pharmaceuticals, printing and publishing, aluminum and sugar; it had negative and significant impact on the value added and performance of firms in paints, foam and wire industries. This suggests that a 1 per cent increase in employment of workers induce a 2.871 per cent increase in value added of flour mills industry; a 4.430 per cent increase in value added of pharmaceutical industry; a 4.230 per cent increase in printing and publishing industry's value added; a 1.644 per cent increase in value added of firms in aluminum industry; and a 6.886 per cent increase in value added of firms in the sugar industry.

The result for employment which reveals that it has negative but significant impact on value added of firms, indicates that a per cent increase in employment of worker induced a (-1.951) per cent decline in value added of paints industry; a (-5.412) per cent decrease in value added of foam industry and a (-9.140) per cent decline in value added of firms in the wire industry. These findings did not conform to a-priori expectations and could be attributed to the inefficient use of workers in production in these industries.

Cost of energy had negative significant impact on the sugar industry while it had positive significant impact on the paints industry. A 1 per cent increase in cost of energy induces a (-1.740) per cent decrease in value added of sugar industry and 1.428 per cent increase in value added of paints industry. Cost of energy had an insignificant impact on the other industries due to energy cost underestimation either as a result of methods of estimation or leakages. It was also observed that there was no uniformity in the reportage of cost of energy in the financial statements of most sampled firms in Nigeria.

Cost of finance negatively significantly affected flour mills and printing and publishing industries at 10 per cent significant level while it positively significantly affected the sugar industry at 10 per cent significant level. A percent increase in cost of finance induces a reduction in the value added of firms in the flour mill industry by (-0.210) per cent and reduction in the value added of firms in the printing and publishing industry by (-0.165) per cent. On the contrary, a per cent increase in cost of finance induced a 0.226 per cent increase in the value added of sugar industry at 10 per cent significant level. Cost of finance do not have significant impact on the other industries.

Table 3: The Impact of Tariff Across Different Manufacturing Industries in Nigeria

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Variable	FD	FM	CM	PT	PH	SD	FO	PR	WR	AL	SG
FA	0.67***	-0.119	-1.76***	0.482	-0.343	0.78**	-1.65***	0.860	2.578	0.348*	0.234
	(0.0943)	(1.268)	(0.452)	(0.597)	(0.611)	(0.310)	(0.609)	(1.069)	(1.978)	(0.192)	(0.199)
EMP	-0.187	2.871*	-0.411	-1.951*	4.43***	-0.173	-5.412**	4.23***	-9.14**	1.644**	6.886*
	(0.130)	(1.554)	(0.975)	(1.085)	(1.491)	(0.945)	(2.220)	(1.371)	(3.931)	(0.748)	(3.382)
rST	0.64***	1.024	-0.129	3.913**	2.234*	0.0980	-6.64***	0.302	0.358	-0.0027	-0.135
	(0.224)	(1.625)	(0.929)	(1.839)	(1.238)	(1.233)	(1.708)	(1.313)	(1.795)	(0.682)	(0.197)
CE	-0.0936	1.918	0.0228	1.428*	-0.843	-0.0989	0.591	-0.133	0.578	-0.0500	-1.74**

	(0.120)	(1.273)	(0.121)	(0.803)	(0.572)	(0.249)	(1.298)	(0.200)	(0.711)	(0.165)	(0.670)
CF	-0.0075	-0.21*	-0.0825	0.0767	0.0791	0.00297	0.0469	-0.165*	-0.790	0.312	0.226*
	(0.0088)	(0.110)	(0.0910)	(0.0740)	(0.060)	(0.323)	(0.080)	(0.092)	(0.486)	(0.376)	(0.125)
REER	0.00127	0.104*	0.00198	0.0168	0.0166	-0.0002	-0.09***	0.0241	-0.0525	-0.0019	-0.0011
	(0.0025)	(0.055)	(0.0210)	(0.0184)	(0.026)	(0.0046)	(0.0232)	(0.021)	(0.068)	(0.0053)	(0.020)
INF	0.0237	0.207	0.157	-0.199***	0.0437	0.0264	0.163	0.0127	-0.344	0.0291	-0.0291
	(0.0145)	(0.210)	(0.133)	(0.0643)	(0.102)	(0.0347)	(0.140)	(0.162)	(0.334)	(0.0275)	(0.121)
TAX	-0.009*	0.21**	-0.00035	0.0123	-0.0075	-0.0060	-0.177	0.0643	-0.102	0.00236	0.32***
	(0.0049)	(0.083)	(0.0739)	(0.0539)	(0.039)	(0.0138)	(0.182)	(0.060)	(0.212)	(0.0212)	(0.056)
TARR	0.00802	1.043	-0.313	0.0482	-0.0883	0.0143	1.039	-0.2***	-0.0705	-0.1***	-0.0156
	(0.0154)	(0.835)	(0.256)	(0.182)	(0.096)	(0.0303)	(0.820)	(0.066)	(0.564)	(0.0354)	(0.076)
BREAK	-0.137	32.61	0.649	0.0614	-0.495	1.139	-0.215	-1.109	-3.342	0.203	-
	(0.245)	(26.25)	(5.262)	(5.237)	(1.670)	(2.551)	(1.438)	(1.653)	(8.154)	(0.362)	-
Cons	6.99***	-86.5*	47.09***	-0.918	0.651	4.136	43.35	-17.61	32.60	-1.641	-0.191
	(1.606)	(47.20)	(15.02)	(13.83)	(10.50)	(10.85)	(27.91)	(14.35)	(38.12)	(5.276)	(20.86)
R-sq	0.694	0.237	0.453	0.212	0.181	0.754	0.574	0.343	0.453	0.649	0.865
Chi-sq	18.3***	1.49	4.88***	2.96***	2.23**	6.76***	5.54***	3.50***	2.40**	3.51***	7.83***

*Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; FD is Food; FM is Flour Mills; CM is Cement; PT is Paint; PH is Pharmaceutical; SD is Soft Drinks; FO is Foam; PR is Printing and Publishing; WR is Wire; AL is Aluminum and SG is Sugar.*

Real effective exchange rate statistically negatively influenced the value added of foam industry while it positively significantly influenced the value added of flour mills industry. Inflation negatively significantly affected paints industry value added /performance in Nigeria at 1 per cent significant level.

Tax statistically and significantly impacted on food and beverages, flour mills and sugar. Tax negatively significantly affected food and beverages industry at 10 per cent significant level, while it positively significantly affected the flour mills at 5 per cent significant level and sugar industries at 10 per cent significant level. A 1 per cent increase in tax induced a reduction in the value added of food and beverages industry by (-0.009) percent. On the contrary, a percent increase in tax induced a 0.210 per cent increase in the value added of firms in flour mills and 0.320 per cent increase in value added of firms in sugar industry. This is because flour and sugar are necessities being consumed in Nigeria, which makes it easier for firms in these industries to transfer the tax burden to the consumers.

Summary, Conclusion and Policy Relevance

The impact of trade policy reforms on manufacturing firms' performance in Nigeria from 1995 to 2018 has been examined. By employing panel data analysis, we find that trade policy reforms proxy by changes in tariff had negative significant impact on all sampled manufacturing firms in Nigeria. However, when dis-aggregated into sub-sectors/industries, we find contradictory results, which reveals that the impact of trade policy reforms on manufacturing performance depends on the nature of products and firms. While, tariff impact on value added of firms in printing and publishing, and aluminum industries is significant and negative,, it has no statistically significant impact on value added of firms in food and beverages, flour mills, cement, paints, pharmaceutical, foam, wire and sugar industries. Similarly, we find that employment, fixed assets, cost of energy, cost of finance and tax have different significant impact on the value added of manufacturing firms and industries in Nigeria.

The different impact of tariff and other variables across manufacturing firms in Nigeria makes it imperatives that policy measures be targeted at specific manufacturing industries/sub-sector to achieve desirable results. Thus, tariff and trade policy reforms could be used in conjunction with other policies to influence specific manufacturing industries/ sub-sectors in Nigeria.

Based on these findings, we recommend the implementation of tariff on different products at different time which should be combined with specific reforms targeted at specific industry in Nigeria. Moreover, institutions charged with the responsibility of implementing trade policy reforms and other policies affecting manufacturing performance should be strengthening in order to make such policies effective in promoting their performance and achieving sustainable economic growth. Finally, the government should create a more conducive business environment for business to thrive, which would lead to improved manufacturing performance in the Nigeria.

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