DOES LEARNING-BY-EXPORTING AFFECT MANUFACTURING COMPETITIVENESS OF FIRMS IN NIGERIA?

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Abstract
The unimpressive state of the Nigerian manufacturing sector underscores the need for policy actions to improve the performance of the sector. This is reflected by the harsh innovation environment which constrains learning and capability building in the sector. Using firm-level Enterprise Survey Panel Data for 2007, 2009, 2014 and 2015, the study profiles forms of learning available to firms by exporting and investigates manufacturing competitiveness in the sector. Data was analysed using descriptive statistics, Dynamic Panel Model (DPM) via Ordinary Least Squares (OLS) and General Method of Moments (GMM). A Manufacturing Competitiveness Index (MCI) was computed using Principal Component Analysis (PCA). The competitiveness priorities used to explain firms' competitiveness are firms' total costs, quality standards, and goods delivery time. The OLS and GMM estimations show that exporting lagged by one period (t-1) is positive and statistically significant in relationship with competitiveness. Learning-by-exporting is positively associated with competitive performance of firms and the lagged learning variables (skill, technology and training) were positive but not statistically significant for the OLS estimation. However, training was positive in the GMM estimates. These results imply that manufacturing firms in Nigeria are not competitive because they are not learning substantially. The findings also provide evidence that the sector is still less competitive in priority areas of quality, costs of operation, and delivery time.

Keywords: Learning-by-exporting; Competitiveness; Manufacturing; Nigeria

1. Introduction

The manufacturing sector of any economy plays a strategic role as a major contributor to economic growth and inclusiveness. The sector holds the key to employment, higher incomes and improved standards of living. Economic growth can be achieved with improved macroeconomic policies and the shift of factors of production into the industrial sector (Yua *et al*., 2017). Chete *et al* (2016) explained that the structure of the Nigerian economy to be one largely driven by the oil and gas sector which amounted to 95% of export earnings and 85% of government revenue between 2011 and 2012. This signifies a neglect of the manufacturing industry. The productive sectors such as manufacturing, construction and agro-processing only accounted for 15%

of overall growth in real GDP between 2000 and 2015 as compared to the service sector which contributed 61% to real GDP in the same period (NESG, 2018). Economic growth has thus not been broad-based in Nigeria. The growing service sector and rising unemployment rate suggests that value addition in the service sector is low, relative to the productive sector. Furthermore, the manufacturing GDP growth rate in Nigeria has been on a decline and in fact recorded negative growth as indicated in NBS (2018) and NESG (2018). The over reliance of the Country on the import of manufactured goods and low export of processed goods are evidence of the inherent weakness of the sector. This is also reflected in the low proportion of non-oil exports to total exports earnings as well as the high share of manufactured goods in total imports. The share of non-oil exports to total exports averaged at 7% between 2014 and 2017 while the proportion of manufactured and processed products as a share of total imports increased from 31% in 2014 to 38% in 2017 (NBS, 2018). The period between 2005 and 2014 revealed that the sector grew by an annual average of 12% as a result of increased consumer demand and the GDP rebasing exercise, which expanded the scope of manufacturing to include 13 subsectors. However, increases in non-oil/manufactured goods export were only marginal even as imports remained the dominant source of inputs into food, beverages and tobacco, which accounted for more than 70% of all raw materials (McCulloch *et al.*, 2017). In addition to the declining output of the sector, the structure of Nigeria's manufacturing sector is weak as revealed by the high Herfindahl-Hirschman Index (HHI) of 2.646 (NESG, 2018). This implies that the sector is highly concentrated and dominated by few subsectors, therefore confirming that the sector is less competitive. According to NBS (2018), only three out of thirteen sub-sectors contribute 76% to the overall output of the sector. These three sectors include Food, Beverage & Tobacco (45%), Textiles, Apparels and Footwear (23%) and Cement (9%). The remaining 26% is shared among ten major sectors including "other manufacturing".

Learning is dependent on skills and accumulated knowledge. According to Newman *et al*. (2016), the skills gap between Africa and the rest of the world is large and growing. This stems from low school enrolment and low expenditure on tertiary education by African governments including Nigeria. World Bank (2007) reported a strong relationship between export sophistication and the percentage of the labour force that has completed post primary schooling. Also, evidence suggests that enterprises managed by university graduates in Africa have a higher propensity to export (Wood and Jordan, 2002; Clarke, 2005); and firms owned by university-educated indigenous entrepreneurs tend to show higher growth rates (Ramachandran and Shah, 2007). Moreover, innovative firms, especially in manufacturing, are drivers of structural change and productivity enhancements at the national level. This is particularly true for developing countries which can potentially benefit from their technological distance to the frontier (Archibugi and Pietrobelli, 2003; Fagerberg *et al*., 2010; Szirmai, 2011). However, the innovation environment particularly in sub-Saharan Africa including Nigeria is usually harsh. Infrastructure, human capital and institutions required for learning and capability building are highly constrained (Egbetokun, 2015).

The over reliance of the Country on imported factor inputs and manufactured goods, crude oil exports and lack of skills have weakened the export potentials of the Country. Roberts and Tybout (1997) argued that participation in exporting activities by manufacturing firms is costly. The costs are often due to modification of domestic products for foreign consumption, market searches, new distribution networks, and transportation. Therefore, the costs outlay in exporting sometimes creates barriers to entry and discourages infant industries from participation. This suggests that participation in exporting activities require learning processes to enable firms compete effectively in the foreign market space. Furthermore, experience has shown that firm productivity tends to increase when it learns to participate in the export market because participation can help reduce inefficiencies through increased competition, access to new technology and economies of scale arising from competition in larger markets (Clerides *et al*., 1998).

The unimpressive performance of the manufacturing sector therefore calls for drastic policy actions. The concept of learning-to-compete as proposed by the collaborative research project of the Brookings Institution Africa Growth Initiative (AGI) and the United Nations University World Institute of Development Economics Research (WIDER) has been acknowledged to be helpful in understanding policy actions required for improving manufacturing performance and fostering manufacturing competitiveness in developing countries (Oyelaran-Oyeyinka, 2006; Shimeles *et al.*, 2016). Research on the concept of learning-to-compete is divided into four research themes by AGI/WIDER. These are: Learning-by-exporting and learning-to-export; Understanding agglomeration in low income countries; Foreign Direct Investment (FDI) and firm capabilities; and Implementing industrial policy. This study aligns with the first research theme and thus focuses on learning-by-exporting in Nigeria's manufacturing sector.

Learning-by-exporting refers to productivity improvements that firms achieve due to entry into foreign markets (Clerides *et al*., 1998 and Siba and Gebreyeesus, 2016). According to Altomonte *et al*. (2012), export performance/capacity is a measure of firm-level competitiveness. Also, Krugman (1997) argues that the export performance/capacity of firms is a consequence of their productivity and thus, competitiveness. In Porter's competitiveness framework (Porter, 1990; Porter, 1998), competitiveness essentially means productivity. Therefore, it can be said that the level of firm competitiveness is the level of productivity that firms achieve in a location given the full breadth of conditions that affect their activities there (Porter *et al*., 2008). Thus, this relates to the fact that there are learning effects that run from exporting to firm-level competitiveness. This arises from knowledge flows, access to technologies and exposure to competition in the international markets that helps firms improve post entry into export markets (Clerides *et al*., 1998; Siba and Gebreyeesus, 2016).

There have been several empirical studies that have provided evidence on the relationship between learning-by-exporting and firm level productivity in developing countries. Some of these studies include Bigsten *et al.* (2004), Van Biesebroeck (2005), Rankin *et al.* (2006), Bigsten and

Gebreeyesus (2009), and Siba and Gebreeyesus (2016). Although a few studies have investigated the relationship between manufacturing exports and economic growth in Nigeria (e.g., Onayemi and Ishola, 2009 and Adeoti, 2012), studies that explore learning by firms and its relationship with manufacturing competitiveness in Nigeria are rare. Adeoti (2012) focused on investment in technology and export potentials of firms in Southwest Nigeria. Oyelaran-Oyeyinka (2017) in a discourse of "from consumption to production" illustrates several failures in Nigeria's past development planning and draws attention to several pitfalls that has hindered technological learning and thereby delayed the achievement of national competitiveness. Literature is scarce with respect to learning-by-exporting in the manufacturing sector in Nigeria, and Chete *et al*. (2016) is perhaps the closest to this present study, but it examined the structure of the Nigerian economy and the state of industrial development based on secondary data without empirical evidence of the strategic role of learning in promoting manufacturing competitiveness. The present study intends to fill this knowledge gap by modelling the relationship between learning-by-exporting and competitiveness of manufacturing firms.

A competitive Nigerian manufacturing sector will produce quality goods and provide jobs and income for the benefit of the citizens and government. Enhancing manufacturing competitiveness was a major objective of the Nigerian Economic Recovery and Growth Plan (ERGP) and the National Industrial Revolution Plan (NIRP). Recently, it is espoused in the National Development Plan (NDP), 2021-2025. For the strategies and policies in the NDP to be effectively implemented, it is important to understand the critical role of manufacturing competitiveness and its links with learning-by-exporting. Globally, it is in consonance with Goal 9 of the Sustainable Development Goals (SDGs) since this goal focuses on building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation. Furthermore, this study will provide policy makers with knowledge and information to guide relevant policies to ensure a pathway for Nigeria to become a significant contributor to global manufacturing export activities. This study investigates firm level competitiveness based on the assumption that some kind of learning-by-exporting actually takes place in the Nigerian manufacturing sector. In view of the foregoing, the study answers the main research question; does learning-by-exporting advance the competitive performance of manufacturing firms in Nigeria? The main objective of this study is to examine whether firms in Nigeria's manufacturing sector learn by exporting or become more competitive as firms enter into the export market.

2. Literature Review

2.1. Learning-by-exporting and firm-level competitiveness

The learning-by-exporting hypothesis explains an improvement in productivity of firms following their entry into foreign markets. This is because entry into export markets improves access to information on the best managerial and marketing practices, new technologies and exposure to competition (Clerides *et al*., 1998). Siba and Gebreeyesus (2014) demonstrate that a relationship exists between export-orientation and economic performance. This is typical of the East Asia experience (World Bank, 1993). Furthermore, empirical

evidence exists on the positive relationship between aggregate export growth and real output growth (Greenaway and Sapsford, 1994). Also, studies have reported a positive association between exporting and firm performance (Roberts and Tybout 1997; Clerides *et al*., 1998; Bigsten *et al*., 2004).

From the firm point of view, the concept of competitiveness matters and relates to the firm's ability to win market share compared to its competitors in the domestic and international markets. The capacity of the firm to adapt to a specific competitive environment depends on structural competitiveness (i.e., the firm's ability to differ from others through product differentiation and upgrading of the quality of products or a monopolistic position) and price competitiveness (i.e., the firm's ability to respond to national and international competition by adjusting its prices) (Gaglio, 2015). Less competitive firms, that is, those unable to respond quickly to competitive pressure are consequently ousted from the market.

The learning-by-exporting hypothesis also suggests that skills and knowledge accumulation by firms determine their export capabilities. We follow the definition of "competitiveness priorities" of firms as presented by Ocampo *et al*. (2017). Competitiveness priorities of firms signify specific areas of focus which gives a firm competitive advantage over their competitors and enables the firm improve its export performance. Learning-by-exporting is associated with productivity gains experienced by firms by exporting. Such gains are often argued to be due to access to new knowledge and resources. In this study, variables that were used to capture firm level learning capabilities include skill, technology and training. Firm learning capabilities help in expressing the optimal utilization of available competitive priorities, and subsequently the export capabilities of firms.

In several studies, competitive priorities are listed in different categories. These include cost, quality, delivery, and flexibility (Phusavat and Kanchana, 2007; Rosenzweig and Easton, 2010). Lately, some studies have suggested three additional priorities to include innovation (Peng *et al*., 2011); after-sales services (Frohlich and Dixon, 2001), and sustainability (Johansson and Winroth, 2010). Based on the availability of data, the present study defines competitive priorities based on three categories, which are cost, quality and delivery time. Manufacturing competitiveness in this study is understood to be the outcome of learning-by-exporting.

Cost

A firm's capacity to produce and distribute comparable goods and services in such a way as to enable customers pay less while still making profit is referred to as cost competitiveness (Peng *et al.,* 2011; Drohomeretski *et al.,* 2014). Bulak and Turkyilmaz (2014) posited that the capacity of firms to reduce costs is critical for long-term performance. Furthermore, Den Hertog (2014) and Rosenzweig *et al.* (2003) added that manufacturers who prioritize cost leadership in the manufacturing sector are better equipped to respond to price changes than their rivals and, as a result, have larger margins. Therefore, even when cost is not the top priority, it is crucial to reduce expenses to a minimal. Making sure that manufacturing processes generate as little waste as possible and achieving economies of scale are two suggested

tactics to assure cost-competitiveness in the manufacturing sector (Longoni and Cagliano, 2015). Another is generating a large volume of items at lower unit costs (Boyer, 1998; Cai and Yang 2014).

Quality

In a highly competitive global environment, quality is crucial (Zhao *et al*., 2002; Alsmadi *et al*., 2011). It has become imperative for firms to prioritize quality as they do not want to run the risk of losing market share, which will lower their earnings. The term "quality priority" has multiple different definitions. It is described as providing goods that adhere to predetermined product criteria and fulfill high performance standards (Drohomeretski *et al*., 2014). The capacity of a business to provide goods and services that meet or surpass the expectations of customers is another definition of quality that is more customer-focused (Koufteros *et al*., 2002; Drake *et al*., 2013). According to Devaraj *et al*. (2004), quality is determined by the dependability, toughness, and conformance of the product. Some authors define it in terms of characteristics like toughness, dependability, performance, compliance and design (Zhao *et al*., 2002; Avella and Vázquez-Bustelo, 2010). Performance quality, compliance quality, dependability, durability, serviceability, features, aesthetics, and perceived quality are some examples of the skills that some people characterize as quality (Alsmadi *et al*., 2011; Bulak and Turkyilmaz, 2014).

Delivery

Authors have provided several explanations for this competitive priority in terms of delivery reliability (Drohomeretski *et al*., 2014), delivery fulfilment (Cruz and Rodrguez, 2008), delivery fulfilment speed (Flynn and Flynn, 2004; Chan, 2005), delivery dependability (Amoako-Gyampah, 2003; Cai and Yang 2014; González-Benito and Suárez-González, 2010), and time (Drake et al., 2013). Delivery dependability refers to a firm's capacity to provide goods or services in accordance with deadlines, schedules, or desired and promised times (Alsmadi *et al*., 2011; Nand *et al*., 2013). The ability to deliver goods on time, especially for dates far in the future, even if a company doesn't have the lowest costs or the best quality, is more important (Ward *et al*., 1996; Oltra and Flor, 2010).

2.2. Review of empirical studies on learning-by-exporting

Empirical studies on learning-by-exporting in developing countries have demonstrated that productivity increases are major outcomes of learning in a competitive environment. Using panel data from Ghana, Kenya and Tanzania, Esaku and Nsia (2020) revealed that productivity differs by export status, with higher productivity among exporters. The study also provided that learning is important during the infant years of exporting for large firms, but declines when there are no more learning platforms. Kinuthia (2020) employed firm-level panel data to analyse the occurrence of export spillovers in Kenya from 2000 to 2005. The author examined export spillovers in the manufacturing industry, as well as the methods via which they are transmitted. The results of a linear probability fixed effects model suggest that through demonstration effects, foreign-owned enterprises can positively influence domestic firms' decision to export. FDI, on the other hand, may have negative spillover effects due to the impact of competition. Self-selection is also evident, with only the most productive enterprises venturing into the export market.

For a sample of Indian manufacturing firms, Chandan (2017) attempted to test the effects of export destination on productivity and innovation. The study's findings show that exporting to developed countries has a positive learning effect on Indian firms' productivity and innovation. However, minimal or negative effects are shown when exporting to emerging countries, such as China. Furthermore, the findings imply that in-house R&D and foreign technology improve firms' absorption capability, which helps firms learn and gain by exporting to technologically sophisticated countries. Haidar (2012) examines the link between business productivity and export market participation from 1991 to 2004 using data from Indian manufacturing firms. While the data support the self-selection theory by demonstrating that more productive enterprises become exporters, they do not prove that entering export markets boosts productivity. The key finding of the research is that more productive firms become exporters, but that learning-by-exporting is not a pathway fuelling growth in Indian manufacturing, as predicted by heterogeneous firm models of international trade.

Fatou and Choi (2013) examined the link between exporting and productivity in Senegal's manufacturing industries. Using simultaneous functions based on Bigsten *et al* (2004), the authors calculated productivity and exporting dynamics using a unique firm-level panel data set for the 1998 to 2011 period. Their findings provide evidence of both self-selections of the most efficient firms entering the export market and the impact of learning on the export market. Fatou and Choi (2013) report that worker qualifications and access to patents and licenses have a favorable impact on the learning process and small businesses, in particular, benefit from exporting.

Crespi *et al.* (2006) analysed firm-level panel data in the United Kingdom to demonstrate the links between learning, exporting and productivity. The authors discovered that; firms that have previously exported are more likely to learn more from clients (than from other sources); and firms that have previously learned from clients are more likely to have faster productivity growth. However, past productivity growth is not associated with more learning from clients, and past learning from clients is not associated with more exporting. These findings support the learning-by-exporting concept.

Meanwhile, while learning through exporting has a simple theoretical representation, some empirical studies produced mixed results. While the majority of research suggests that the learning-by-exporting mechanism exists, Keller (2004) and Wagner (2007) provide evidence that it does not. Studies such as Yashiro and Hirano (2009), Damijan and Kostevc (2010), and Ito and Lechevalier (2010) provide mixed evidence. These papers primarily aim to identify the conditions under which learning-by-exporting can be clearly observed, and they discovered that the effectiveness of the learning-by-exporting mechanism is influenced by pre-exporting, R&D intensity, firm size, and export destination characteristics.

3. Methodology

3.1. Data sources and description

Data was sourced from the Enterprise Survey Database (ESD) for 2007, 2009, 2014 and 2015 collected by the World Bank

(World Bank, 2014). The study utilized specific data on manufacturing competitiveness, learning, productivity, export participation and firm characteristics for Nigerian manufacturing firms from ESD database. The choice of a panel data from ESD was premised on the fact that cross-sectional data make it difficult to investigate any learning effect since learning requires a longer period of adjustment in technology and productivity (Siba and Gebreeyesus, 2016).

3.2. Analytical techniques

Following Siba and Gebreeyesus (2016), a dynamic panel model (DPM) was used in order to determine the effect of learning-by-exporting on the competitive performance of Nigerian manufacturing firms. The rationale behind the adoption of DPM estimation model is that it incorporates the lag of the dependent variable and can also include the lag of independent variable where appropriate. In line with this study, learning variables (independent variables) were lagged because it is past learning from exporting over time that determines the competitive capability of firms. The other independent variables were lag of competitive index, productivity, export dummy and control variables that include firm characteristics (firm location, firm size, firm ownership, and year of establishment). Also following Siba and Gebreeyesus (2016), the dynamic panel model was estimated via ordinary least square (OLS) and General Method of Moments (GMM) techniques. A typical dynamic panel model is characterized by two sources of persistence (Baltagi 2008). These are autocorrelation resulting from inclusion of a lagged dependent variable among the explanatory variables and the unobserved main effects and interaction effects characterizing the heterogeneity among the units. Therefore, applying an OLS estimator may render the estimates biased and inconsistent. In order to account for the unobserved heterogeneity and endogeneity bias in the DPM, the GMM technique was estimated.

The econometric model is accordingly structured as follows:

$$MCI_{it} = \alpha E_{it-1} + \beta T_{it-1} + \phi S_{it-1} + \gamma TR_{it-1} + \pi P_{it} + MCI_{it-1} + \sum_{c=1}^{d} \lambda_c Z_{it} + \mu_{it}$$

….. (1)

Where MCI_{it} = current manufacturing competitiveness index; E_{it-1} = one year lagged export participation dummy of 0 and 1, where 1 stands for participation in exporting market and 0 stands for otherwise; T_{it-1} = one year lagged technology S_{it-1} = one year lagged skill; TR_{it-1} = one year lagged training; P_{it} = Productivity; MCI_{it-1} = one year lagged manufacturing competitive index; Z = Control variables which are firm characteristics such as firm size (number of persons employed), location, ownership status and years of participation in exporting; μ = An error term that captures unobserved characteristics and/or measurement errors and/or idiosyncratic shocks;

Following Ocampo *et al*. (2017), the competitiveness of the manufacturing sector was represented by a manufacturing competitive index (MCI). MCI is defined as the weighted mean of manufacturing competitive priorities such as cost, quality, delivery, time and innovation and is computed using the principal component analysis (PCA). Thus, the higher the MCI, the more competitive the manufacturing firms are regarded. This allows a firm to benchmark its current capabilities in contrast

to the strategic focus of the industry. The econometric model (i.e., DPM) that analysed the effect of learning-by-exporting on the competitive performance of Nigerian manufacturing firms is thus specified by MCI as a function of learning variables, productivity, and control variables such as firm characteristics and an export dummy. The description of variables that was used is presented in Table 1.

4. Results and Discussion

4.1. Firms in the Nigerian manufacturing sector

The characteristics of firms in Nigeria's manufacturing sector are presented in Table 2. The results show that the Nigeria's manufacturing sector is dominated by private individuals, companies or organizations, which accounted for 98.4 percent of the sampled firms. The ownership structure is an important determinant of firm performance (Dewenter and Malatesta, 2001; Bellak, 2004) and firms associated with foreign ownership are more likely to be profitable and productive than their domestic counterparts (Halkos and Tzeremes, 2007). From our data, the distribution of industries within the sector revealed that it is dominated by the wood & furniture (22.01 percent); food (20.37 percent); garment (15.87 percent) and metals and machinery (15.1 percent) sectors. Furthermore, the sector is dominated by small firms which comprise about 71% of the sampled firms.

Table 1: Description of Variables

Learning Variables	**Variable description**
Skills	Basic computer skills
Technology	Communication with clients and suppliers via email. Ownership of web site. Borrowed technology from foreign companies.
Training program	Formal training program for permanent full-time employees in the last 3 years.
Competitive priorities' Variables	
Cost	Total cost of operation
Quality	Internationally recognized quality certification
Delivery	Average number of days for exported goods to clear custom
Productivity Variable	Total annual sales in last three years per worker
Control Variables (Firm Characteristics)	Type of establishment. Ownership status. Year of establishment. Number of full-time employees. Year of direct or indirect exporting.

4.2. Productivity and export characteristics

Table 3 presents the results of the analysis on productivity and export characteristics of the firms. As earlier indicated, the average number of years that the firms have been in existence was about 19.6 years. The average number of 25 full time permanent employees is about 25, and the average number of years of firms' experience in direct or indirect exporting was 0.61 (about

seven months). This implies that on the average, most of these firms just entered the export market as at the time of the ESD survey. Therefore, the manufacturing firms despite about two decades of establishment are still at infant stage in exporting. This might be a reason for the less competitive nature of the manufacturing sector in Nigeria, though the ESD is panel data for 2007, 2009, 2014 and 2015. Average annual sale per full time employee was used as an indicator of productivity, and it was reported to be ₦1,783,322 annually. Studies have reported a positive relationship between labour productivity and export participation. Cruz *et al*. (2016) in the case of manufacturing firms in Mozambique reported that exporting firms have higher labour productivity growth than non-exporting firms, even when controlling for changes in firm size and intensity of intermediates and capital. De Loecker (2007) also found similar results in Slovenia that exporting firms are on the average more productive (labour productivity was used as measure productivity). As reported, only 2.19 percent of firms export directly or indirectly. It thus appears that there is a large gap between the performance of the research sample firms and their export participation. The results suggest that the vast majority of the firms either lack capacity for export participation or simply focused on satisfying the relatively large local market that still enjoy appreciable protection from foreign competitors.

Table 2: Characteristics of Firms

Characteristics	Frequency (N = 2376)	Percentage (%)
Ownership		
Private domestic individuals, companies or organizations	2338	98.4
Private foreign	30	1.3
Government	8	0.3
Industry		
Textiles	23	0.97
Garments	377	15.87
Food	484	20.37
Metals and machinery	359	15.11
Electronics	10	0.42
Chemicals and pharmaceuticals	60	2.53
Wood and furniture	523	22.01
Non-metallic and plastic materials	216	9.09
Other manufacturing	324	13.64
Size of firm		
Small	1676	70.54
Medium	605	25.46
Large	95	4.00
Export participation		
Exporter	52	2.19
Non-exporter	2324	97.81

Table 3: Productivity and Exporting Characteristics

	Mean	Standard deviation
Duration of enterprise existence (years)	19.61	9.30
Number of full-time permanent employees	24.625	108.18

No of years involved in direct or indirect exporting	0.607	4.23
Productivity (annual sales per full-time employee in Naira)	1,783,322	4924298

4.3. Learning-by-exporting and competitiveness of firms

Manufacturing competitiveness index and learning variables

The competitiveness of firms in this study is explained by the manufacturing competitiveness index (MCI). Table 4 shows the descriptive statistics of the MCI, competitiveness priorities and the learning variables used in estimating a dynamic panel model in order to determine the effect of learning-by-exporting on the competitive performance of the Nigerian manufacturing firms. The MCI was computed by PCA using only three manufacturing competitiveness priorities for which data was available in the ESPD. These manufacturing competitiveness priorities are firm's total costs, quality standard represented by a dummy (0-1) as an indication of a firm' possession of internationally recognized quality certification, and goods delivery time indicated by average number of days for exported goods to clear customs. The proxies for technology were *communication with clients and suppliers via email*, *ownership of web site*, and *borrowed technology from foreign companies*; while the proxies for training and skills were *formal training program for permanent full-time employees in the last 3 years* and *basic computer skill rate* respectively. It should be noted that the proxy for training is a binary variable with 1 representing a situation where the fulltime employees of a firm went for formal training in the last three years and zero otherwise.

Table 4: Descriptive statistics of MCI and learning variables

Variable	Mean	Median	Minimum	Maximum	Std deviation
MCI	0.491	0.269	0.269	3.708	0.845
Delivery	0.177	0	0	35	1.481
Quality	0.064	0	0	1	0.245
Total Cost	65612296	5298000	200000	2.28E+10	7.20E+08
Technology	0.373	0	0	3	0.712
Training	0.261	0	0	1	0.414
Skill	0.58	0.65	0.013	1	0.243

Effect of learning-by-exporting on competitive performance

Table 5 reports the dynamic panel model estimation results used to determine the effect of learning-by-exporting on competitive performance of the Nigerian manufacturing firms. In the econometric equation estimated, current manufacturing competitive index is a function of previous export status, one-year lagged value of productivity per worker, skill, technology, training and other control variables such as firm age, ownership, and number of years in export (experience). A positive and statistically significant coefficient of the lagged export status is considered as supporting evidence for the learning-by-exporting hypothesis. The DPM analysis accordingly estimated whether firms exporting lagged one period (t-1) affect MCI over time.

The OLS and GMM estimation results show that the coefficient of the key explanatory variable in the estimates, that is, exporting lagged one period (t-1), is positive and

statistically significant at 1 percent. This result revealed that learning-by-exporting is positively associated with competitive performance of firms in the enterprise survey data. Specifically, this implies that the more Nigerian manufacturing firms are exposed to the international market, the higher the tendency for them to learn international best practices and better ways of doing business. This finding is consistent with Siba and Gebreeyesus (2016) and Crespi *et al*. (2008).

Table 5: Effect of learning-by-exporting on competitive performance

	OLS		GMM			
Variable	**Coefficient**	**Standard error**	**Coefficient**	**Standard error**		
MCI (-1)	0.343**	0.161	0.0780***	0.016268		
Experience	0.004	0.231	0.0095	0.009771		
Training (-1)	0.029	0.112	0.0730*	0.042821		
Firm size	0.002***	0.000	0.0010	0.001227		
Product (-1)	0.326***	0.001	0.0159	0.020047		
Ownership	0.024***	0.000	1.8841*	1.063612		
Exporting (-1)	4.848***	0.005	5.0505**	2.029764		
Technology (-1)	0.146	0.211	0.0683	0.051186		
Skill (-1)	0.321	0.432	0.0043	0.077685		
R-squared	0.53			Prob(J-statistic)	0.308462	
F-Stat	63.89			Number of instruments	91	
Log likelihood	-2904.62					
Durbin-Watson stat	1.98					
AIC	2.56					

*** p<0.01; **p<0.05; *p<0.1. Dependent variable: MCI

Both studies upheld the learning-by-exporting hypothesis and thus concluded that there exists a positive relationship between exporting and learning. The results also reveal that the more productive a firm is, the more competitive the firm will be. This is signified by the statistically significant coefficient of log of productivity. Furthermore, the coefficients of the lagged value of skill, technology and training were positive but not statistically significant for the OLS estimation implying that manufacturing firms in Nigeria may not be competitive probably because they are not learning substantially. However, training was positive in the GMM estimation result which implies that the more workers are sent for training; the more likely the manufacturing firm will become competitive. Generally, the positive relationship between these learning variables and competitiveness signifies that the more a firm learns, the more competitive the firm will be. The coefficients of the control variables, firm size and ownership were positive and statistically significant revealing that the larger the size of a firm, the more competitive the firm will be. In addition, ownership was a dummy variable where 1 represented foreign owned manufacturing firm while 0 represented domestic owned manufacturing firms. The result showed that foreign owned manufacturing firms are more competitive than domestic owned manufacturing firms. This finding is consistent with Rehman (2016) that reported that foreign owned firms are more productive and innovative and have a greater tendency to export than domestic owned firms. In addition, the coefficient for experience was positive but not statistically significant which means that though the more experienced a firm is, the

more competitive a firm can be but for Nigerian manufacturing firms in the ESD sample, experience does not substantially determine how competitive the firm will be. This is may be why the coefficient for experience is not statistically significant. A plausible explanation for this is that overtime, manufacturing firms have faced the same constraints such as poor power supply so the experience of a firm might not really count substantially because irrespective of the period the firm enters the manufacturing sector, the firm will still be less competitive as result of the inherent constraints.

5. Conclusion and Policy Recommendation

The unimpressive performance of the manufacturing sector can be attributed to the structural imbalance in the Nigerian economy, which has remained a natural resource-driven economy. The economic structure of Nigeria is still predominantly dominated by the agricultural sector in terms of contribution to GDP of the economy. The country needs to move to a producer economy and reduce the excessive importation of foreign manufactured goods. The prevailing macroeconomic atmosphere in the country denies a favorable environment for the growth and survival of the majority of the existing manufacturing firms and FDI. The marginal propensity to import is very high in Nigeria which leads to influx of sophisticated foreign manufactured goods which consequently kills infant manufacturing firms. The sector is still less competitive in priority areas of quality, costs of operation and delivery time.

The study provides evidence to infer that the STI mode of learning in Nigerian manufacturing firm is not deep enough, and as such domestic firms are less competitive, relative to foreign firms. Our results also conclude that experience in the manufacturing industry does not matter for competitiveness.

6. Policy Recommendations

The following are the main policy recommendations emanating from the findings of the study:

a) Small-sized firms dominate the Nigerian manufacturing industry and are mostly owned by private domestic investors. Economic and industrial policies should aim at removing the constraints on competitiveness. For example, poor tax administration and poor infrastructure challenges must be frontally addressed to unlock the competitive potentials of small-sized firms. This will not only encourage domestic investors, but also attract foreign investors with new and superior technologies that can foster learning to compete among firms.

b) The estimation results revealed that learning-by-exporting is positively associated with competitive performance of firms. Manufacturing competitiveness is also positively associated with firm size and foreign ownership. It thus appears that largeness and foreign ownership are basic firm characteristics that enhance firm competitiveness. Large firms often emerge from FDI, and since manufacturing competitiveness are associated with large size, both firms that organically became large and large firms based on FDI are laden with learning opportunities which can be harnessed for improving the competitiveness of the Nigerian manufacturing sector. Efforts should therefore be made to specifically isolate

these learning opportunities in the Nigerian manufacturing sector.

c) The results also showed that manufacturing competitiveness is not affected by experience (duration of years of existence) in manufacturing. This implies that newer firms with new and superior technologies might be more competitive than older and less technologically-endowed firm. Since firms learn to compete through learning-by-exporting, it is thus good and more helpful for manufacturing competitiveness if economic and industrial policies are aimed at attracting new and technologically-advanced manufacturing investments.

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