Impact of Cross-Border Digital Transmissions on MSMEs in Nigeria

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Executive Summary

This study describes how digital imports have enhanced the growth of Nigerian Micro, Small, and Medium-sized Enterprises (MSMEs). In particular, it provides strong evidence that such MSMEs have benefited from the World Trade Organization's (WTO) e-commerce moratorium. Our findings are based on a detailed analysis of time-series data at the sectoral level of Nigeria's MSMEs using data sources such as the MSME Survey Report of Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and National Bureau of Statistics, coupled with the data on imports of digital products from OECD Input-Output tables. This data-driven approach enabled us to pinpoint the precise contribution of digital imports. Following data collection, our analysis employed econometric panel regression techniques to assess the impact of imported digital transmissions on the productivity, employment, and output dynamics of Nigeria's SMEs over time. Our econometric regressions suggest that for every 1% increase in digital imported inputs by Nigerian SMEs:

1. SME GDP increases by 0.79%
2. SME Male Employment increases by 0.46%
3. SME Female Employment increases by 0.69%
4. Total Number of SMEs increases by 0.42%
5. SME E-commerce increases by 0.17%
6. SMEs with Exportable products increases by 0.90%
7. Male Labour productivity as defined by SME GDP per male employee increases by 0.61%
8. Female Labour productivity as defined by SME GDP per female employee increases by 0.89%
9. GDP per enterprise (size based on GDP) increases by 0.85%
10. Male Employees per SME (size based on male employment) increase by 0.59%
11. Female Employees per SME (size based on female employment) increase by 0.92%

The growing use of digital imports by Nigerian MSMEs has boosted labour productivity and economic growth, increased employment opportunities, and expanded the number of businesses. These findings have significant implications for policymaking to enhance business productivity and job creation. Summarily, the increase in digital imports has the potential to not only stimulate the GDP, employment rates, and the number of businesses among small enterprises, but also to elevate labour productivity and scalability.

As Nigeria's government continues to invest in promoting digital skills and infrastructure, policymakers should take note of the constructive role of the WTO e-commerce moratorium in contributing to SME growth and a thriving digital ecosystem.

As a further practical consideration, while outbound trade is beyond the scope of this study, it is worth noting that Nigerian exports also benefit from the maintenance of the moratorium. For example, Nigeria's vibrant media and entertainment industry, which already contributes substantially to economic growth, shows significant export potential. But the nation's fast-growing audio-visual sector would suffer if the e-commerce moratorium lapsed and trading partners were allowed to begin imposing duties on imported Nigerian movies and music. In short, the e-commerce moratorium also offers value in helping protect exports of strategically competitive Nigerian digital services.

Background

The WTO's moratorium on electronic transmissions, which has been in place since 1998, is a commitment among WTO members to refrain from imposing customs duties on electronic transmissions. This moratorium has played a vital role in fostering the growth of e-commerce globally, benefiting the overall global economy.

According to a study conducted by the European Centre for International Political Economy (ECIPE), terminating the moratorium would result in substantial negative effects on WTO member economies. In developing countries, the loss of GDP would amount to an estimated US$4.5 billion annually, accompanied by job losses and a decline in overall well-being. Indeed, developing countries such as Nigeria appear most vulnerable to the termination of the WTO moratorium because they rely more heavily on e-commerce than developed nations. Currently, Nigeria is the 38th largest market for e-commerce, with a projected increase of 14.6% in 2023. Based on the data analysis presented in this paper, it is evident that Nigerian SMEs have benefited substantially from the current moratorium. The country actively participates in the digital economy and relies heavily on digital imports and tools. As we discuss below, while noting the considerable analysis that has already been completed on costs and benefits of the moratorium, our research indicates that ending the WTO moratorium on electronic transmissions would have a disproportionate negative impact on Nigeria and other developing

countries. Such impacts include economic losses due to higher prices, reduced consumption, job cuts, and decreased well-being.

Importance of Digitalization to Nigerian Economy

Nigeria is particularly well positioned to reap the benefits of digitalization: Not only is it the most populous country in Africa, but it has one of the world's largest populations of young people, with a median age of 18.1 years. About 70 percent of the population is under age 30, and 42 percent are under the age of 15. Favorable demographics have fueled the rise of shopping malls, chain stores, and convenience stores across major cities such as Abuja, Lagos, and Port Harcourt. Many of the shops are MSMEs that rely on digital tools to minimize cost and maximize profit. Nigeria also has the largest mobile market in Sub-Saharan Africa, supported by strong mobile broadband infrastructure and improved international connectivity. Several concrete examples underscore how digitalization is already benefitting the Nigerian economy:

- Rapid Growth in E-commerce: The Nigerian e-commerce sector is experiencing rapid expansion. Nigeria is the 38th largest market for e-commerce, with revenue of US$7.6 billion in 2021, placing it ahead of Pakistan and behind Finland. Nigeria's e-commerce sector is projected to grow 14.6% in 2023 – well above the worldwide growth rate of 9.6% - with an expected average growth rate of 12 percent between 2021 and 2025.

- Digital Banking Advancements: Nigeria is Africa's undisputed real-time payments and digital payments leader, recording 3.7 billion real-time transactions in 2021 and ranking 6th in the league table of the world's most developed real-time payments markets (ACI's Prime Time for Real-Time report). The widespread uptake of new digital and real-time payment services helped to unlock US$3.2 billion of additional economic output in 2021, representing 0.67% of the country's GDP – and this sum is forecast to rise to $6 billion in 2026 (amounting to approximately 1.01% of the country's GDP).

- Digitization in Agriculture: Digitalization of agriculture has reduced the role of middlemen in Nigeria, provided opportunities for farmers to expand their markets, and improved the linkage between extension and research centers and small-scale farmers.

As digital technologies continue to evolve, their potential for positive impact on the economy is bound to expand further. To take a few more examples, digitally-enabled services play a vital role in advancing clean economies and addressing climate change. Technologies such as satellite tracking and data analytics aid in weather forecasting and energy production

optimization. And in agriculture, sensor technologies combined with advanced computing minimize water usage and optimize land management.

Recognizing the pivotal role of digitalization in economic growth and social welfare, the Nigerian government has incorporated it into its development strategy. The government has focused on building out essential digital infrastructure, such as broadband internet, and has implemented policies to encourage the adoption of digital technologies among businesses and consumers. But in addition to these critical investments, the maintenance of the WTO e-commerce moratorium has also contributed to Nigeria's vibrant digital growth outlook, as we explain below.

In the following sections, we discuss the impact assessment of digital transmissions on the Nigerian economy. Additionally, we highlight the myriad challenges confronting MSMEs within Nigeria, as well as the strategic policies devised to mitigate these challenges and facilitate the seamless adoption of digital technologies among MSMEs.

Impact Assessment of Digital Transmissions on the Economy

Digital transmissions have exerted a profoundly positive influence on the Nigerian economy, bringing about tangible improvements in productivity, employment, and overall economic growth. A prime illustration is the burgeoning e-commerce sector, which has catalysed job creation across various domains such as logistics, marketing, and customer service. One of the key drivers behind this economic boost is the expansion of market reach facilitated by digital transmissions. Businesses now have the capacity to connect with a broader audience of potential customers both cross-border and domestically through online channels, resulting in increased sales and profits. This, in turn, has acted as a catalyst for further economic growth.

 Beyond the economic realm, digital transmissions have also contributed significantly to Nigerian society. They have played a pivotal role in improving access to education and healthcare services, making it easier for people, even in remote areas, to engage with the economy and connect with one another. In the following sub-sections, the negative impact of tariffication of cross-border transmissions on Nigeria's economy – both in terms of import and exports -- and the benefits of the duty free cross-border electronic transmissions are briefly described.

Negative Impact of Cross-Border Transmission Tariffication on Nigeria's Economy

The imposition of tariffs on cross-border transmissions would have detrimental consequences for Nigeria's economy, particularly within the importing sector. Several adverse outcomes can be anticipated:

1. Increased Prices for Imported Goods: Tariffs would elevate the cost of imported products, rendering them more expensive for both consumers and businesses. This would potentially dampen demand for imported goods and services, leading to adverse effects on import-focused enterprises and potentially resulting in job losses.

2. Supply Chain Disruption: Tariffs have the potential to disrupt the supply chains of imported goods and services, impeding businesses' access to necessary resources. This disruption could lead to shortages and increased prices.

3. Damage to Reputation: The imposition of tariffs might tarnish Nigeria's reputation as a business-friendly destination, possibly discouraging foreign investment and thereby hampering economic growth.

These potential negative consequences are not exhaustive and may vary in magnitude depending on the specific context.

Duty Free Cross-Border Electronic Transmissions Help Rather Than Hurt Nigeria's Economy

In contrast, duty-free cross-border electronic transmissions provide important benefits to Nigeria's economy:

1. Increased Competition: By allowing businesses in Nigeria to import goods and services without incurring import duties, duty-free transmissions grant them a competitive edge. This can translate into lower prices for consumers and businesses, driving economic competitiveness.

2. Enhanced Efficiency: Duty-free transmissions streamline the importation process, reducing operational costs for businesses. These cost savings can be passed on to consumers, resulting in more affordable goods and services.

3. Fostering Innovation: Access to new technologies and products from abroad, made possible by duty-free transmissions, can stimulate innovation and productivity.

4. Boosting Trade: Duty-free transmissions simplify trade between Nigerian businesses and their international counterparts, fostering increased exports and imports that can stimulate economic growth.

5. Employment Opportunities: The import sector stands to benefit from duty-free transmissions, potentially leading to job creation in areas such as logistics and customer service.

The societal benefits of duty-free cross-border electronic transmissions are equally noteworthy. They can improve access to goods and services, promote economic development in rural regions, and contribute to overall social progress.

Empowering Nigeria's MSMEs: Challenges, Policies, and the Digital Frontier

Micro, small, and medium-sized enterprises (MSMEs) are the backbone of the Nigerian economy. In 2022, MSMEs contributed 48 percent to Nigeria's gross domestic product (GDP), accounting for 96 percent of businesses and 84 percent of employment. However, MSMEs grapple with a host of challenges, including the following:

Electricity: Electricity accounts for the biggest costs to daily operations. Nigeria's power sector is overwhelmed by myriad challenges, ranging from operational inefficiencies to infrastructure deficiencies. The inadequate supply of electricity has had an adverse impact on the business environment in Nigeria, weighing on the growth of SMEs and the broader economy.

Access to Finance: Securing financial support proves to be a formidable task for MSMEs, often viewed as risky propositions by traditional banks. According to National Bureau of Statistics (NBS) 2020, the financing gap for Nigerian MSMEs to be about N617.3 billion annually (pre-COVID-19 pandemic). Based on analysis of data from the CBN annual statistical bulletin, small businesses accounted for less than 1% of total commercial banking credit in 2018.

Skills and Training Gap: A significant portion of Nigerian MSMEs lack the requisite skills and training to harness digital technologies effectively. This knowledge gap hinders them from seizing the opportunities presented by digitalization.

Regulatory Hurdles: Burdened by an array of regulations, MSMEs in Nigeria face cumbersome compliance processes that consume both time and resources, acting as a roadblock to their growth.

In response to these hurdles, the Nigerian government has implemented measures to support MSME that seek to leverage digital tools where possible. For example, the National Information Technology Development Agency (NITDA) is a public service institution established by NITDA Act 2007 as the ICT policy implementing arm of the Federal Ministry of Communication and Digital Economy.

1. The National Digital Economy Policy and Strategy is anchored on the 8 pillars of the 'DIGITAL NIGERIA' Roadmap of the Federal Ministry of Communications and Digital

Economy (FMoCDE). These pillars, listed below, acknowledge the importance of strengthening Nigeria's digital skills and infrastructure. 1. Developmental Regulation

2. Digital Literacy and Skills

3. Solid Infrastructure

4. Service Infrastructure

5. Soft Infrastructure

6. Digital Services Development and Promotion

7. Digital Society and Emerging Technologies

8. Indigenous Content Development and Adoption

Further digitalization will help provide greater opportunities for Nigerian MSMEs, including:

Heightened Productivity: Digital technologies empower MSMEs to automate tasks, enhance communication, and optimize operations, leading to substantial productivity gains.

Exploration of New Markets: The digital realm offers MSMEs the prospect of venturing into previously untapped markets, both domestically and internationally. This expansion can catalyse business growth and bolster profits.

Enhanced Customer Service: Leveraging digital technologies enables MSMEs to provide superiour customer service, encompassing features like online chat support. This enhances customer retention and attracts new clientele.

Cost Savings: Digital tools empower MSMEs to trim expenditures by automating operations and leveraging cost-effective solutions like cloud computing.

Impact of Moratorium Expiration on Nigerian Digital Exports:

The competitiveness and growth of Nigeria's burgeoning digital exports face a potential downturn if the moratorium ends, prompting neighbouring African nations and other countries to impose duties on e-commerce. A prime example is Nigeria's audio-visual sector, a significant exporter in its own right. According to the PwC Global Entertainment and Media Outlook for 2022-2026, Nigeria's media and entertainment industry stands out as one of the world's fastest-growing creative sectors. With a projected consumer growth rate of 8.8% annually (CAGR), it holds the potential to emerge as a major export for the country. Notably, PwC reports that in 2021, Nigeria's film industry contributed a substantial 2.3% ($660 million or 239 billion naira) to the GDP. The imposition of tariffs on digital products, which serve as critical enablers for vibrant sectors like Nigeria's audio-visual industry, could have a detrimental impact on the country's exports of digital content and, consequently, on the overall GDP. The need for

strategic considerations and potential countermeasures becomes evident in safeguarding the continued growth and global competitiveness of Nigeria's digital exports.

Data Sources and Methodology

Data Sources

This study uses data from many different sources. They include 1) the MSME Survey Report of Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) 2) National Bureau of Statistics A[i] 3) OECD's Inter-Country Input-Output (ICIO) tables[ii] and 4) World Development Indicators of the World Bank. The study includes a diverse set of variables, including MSME GDP, MSME employment, MSME number of enterprises, digital imports for MSMEs, MSME labour productivity, as well as additional size-related metrics like GDP per MSME and employee per MSME.

Methodology

This study undertakes panel data regression to assess the impact of SME digital imports on different variables such as GDP, employment, productivity and size variables pertaining to SMEs over the study period (2013, 2017, 2020). Panel regression is an econometric technique that is widely used to understand cross-sectional changes over time. Panel data models can be pooled, fixed, or random illustrating the assumptions behind each model (Colonescu, 2016).

The pooled model can be represented simply as

$$y_{it} = a_1 + a_2 x_{2it} + \cdots + a_k x_{kit} + e_{it}$$

where t is the time period, i is the individual cross-sectional observation, and a_k is the coefficient of the kth variable.

The fixed effects model can be represented as

$$y_{it} = a_{1i} + a_{2i} x_{2it} + \cdots + a_{ki} x_{kit} + e_{it}$$

Where t is the time period, i is the individual cross-sectional observation, and a_{ik} is the coefficient of the kth variable in the ith cross-section.

The random effects model can be represented as

$$a_{1i} = \bar{a}_1 + u_i$$

$$y_{it} = \bar{a}_1 + a_2 x_{2it} + \cdots + a_k x_{kit} + \epsilon_{it}$$
$$\epsilon_{it} = u_i + e_{it}$$

Where t is the time period, i is the individual cross-sectional observation, $\bar{a}_1$ is population average and u_i is individual cross section specific error term.

The following econometric equations (numbered 1-11) are estimated at a sectoral level as classified in the 2021 MSME Survey Report of Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and National Bureau of Statistics.

$$\ln(SMEAVGSALES_{it})$$
$$= a_0 + a_1 * \ln(Number\ of\ Enterprises_{it}) + a_2 * \ln(Digital\ Imports_{it})$$
$$+ a_3 * \ln(Digital\ Service\ Exports_{it}) + e_{it}$$
$$\dots (1)$$

The employment in different sectors is analysed with the specification as in eqn. (2) and (3)

$$\ln(Male\ Employment_{it})$$
$$= a_0 + a_1 * \ln(Digital\ Goods\ Imports_{it}) + a_2 * \ln(ECommerce_{it}) + e_{it}$$
$$\dots (2)$$

$$\ln(Female\ Employment_{it})$$
$$= a_0 + a_1 * \ln(Digital\ Services\ Exports_{it})$$
$$+ a_2 * \ln(Number\ of\ Enterprises_{it}) + a_3 * \ln(Digital\ Goods\ Imports_{it})$$
$$+ a_3 * \ln(Digital\ Goods\ Exports_{it}) + e_{it} \dots (3)$$

The SME number of enterprises in different sectors is analysed with the specification as in eqn. (4)

$$\ln(Number\ of\ SMEs_{it}) = a_0 + a_1 * \ln(Digital\ Imports_{it}) + e_{it}$$
$$\dots (4)$$

The SME e-commerce in different sectors is analysed with the specification as in eqn. (5)

$$\ln(\text{SME ECommerce}_{it})$$
$$= a_0 + a_1 * \ln(\text{Digital Goods Imports}_{it})$$
$$+ a_2 * \ln(\text{Number of Enterprises}_{it}) + a_3 * \ln(\text{SME Avg Sales}_{it})$$
$$+ a_3 * \ln(\text{Digital Services Exports}_{it}) + e_{it} \dots (5)$$

The SME number of enterprises with exportable products in different sectors is analysed with the specification as in eqn. (6)

$$\ln(\text{No. of SME with Exportable Products}_{it})$$
$$= a_0 + a_1 * \ln(\text{Digital Goods Imports}_{it})$$
$$+ a_2 * \ln(\text{Number of Enterprises}_{it}) + a_3 * \ln(\text{SME Ecommerce}_{it})$$
$$+ a_4 * \ln(\text{Digital Avg Sales}_{it}) + e_{it} \dots (6)$$

The productivity and size in a sector is analysed with the specification as in equations below:
$$\ln(\text{LaborProductivity\_Male}_{it})$$
$$= a_0 + a_1 * \ln(\text{Digital Goods Imports}_{it}) + a_2 * \ln(\text{Digital Goods Exports}_{it})$$
$$+ a_3 * \ln(\text{Digital Services Export}_{it}) + e_{it}$$
$$(7)$$

$$\ln(\text{LaborProductivity\_Female}_{it})$$
$$= a_0 + a_1 * \ln(\text{Digital Goods Imports}_{it}) + a_2 * \ln(\text{SME Ecommerce})$$
$$+ a_3 * \ln(\text{Number of SMEs}_{it}) + a_4 * \ln(\text{Digital Goods Export}_{it})$$
$$+ a_5 * \ln(\text{Digital Services Export}_{it}) \ e_{it} \dots (8)$$

$$\ln(\text{GDP Per SME}_{it})$$
$$= a_0 + a_1 * \ln(\text{Digital Goods Imports}_{it}) + a_2 * \ln(\text{SME Ecommerce}_{it})$$
$$+ a_3 * \ln(\text{No of SMEs with Exportable Products}_{it})$$
$$+ a_4 * \ln(\text{Digital Services Exports}_{it}) + e_{it}$$
$$\dots (9)$$

$$\ln(\text{Male Employees Per SME}_{it})$$
$$= a_0 + a_1 * \ln(\text{Digital Goods Imports}_{it}) + a_2 * \ln(\text{SME Ecommerce}_{it})$$
$$+ \ a_3 * \ln(\text{Digital Services Exports}_{it}) + \ e_{it} \dots (10)$$

$$\ln(\text{Female Employees Per SME}_{it})$$
$$= a_0 + a_1 * \ln(\text{Digital Goods Imports}_{it}) + a_2 * \ln(\text{SME Avg Sales}_{it})$$
$$+ \ a_3 * \ln(\text{No. of Enterprises}_{it}) + \ e_{it} \dots (11)$$

Results

Data Analysis

Figure 1-4 provide an overview of MSMES' key performance indicators including e-commerce adoption and employment generation and the number of MSMEs, within sixteen major economics sectors.

Fig. 1 shows the number of MSME adopting e-commerce in each sector between the 2017 and 2020. From the figure, it is observable that more firms adopted e-commerce between the two periods in absolute terms across sectors. However, manufacturing and wholesale/retail trade demonstrate the most significant increase between the two periods. This generally indicate that more firms are adopting and they stand to benefit more from digital transmissions. Despite the seeming progress in e-commerce adoption by MSMEs in the country based on absolute number, the evidence in fig.2 which shows the percentage increase in e-commence adoption did not progress between the two periods. This is an indication that more awareness about the inherent benefits of digitization for MSME in Nigeria may be required.

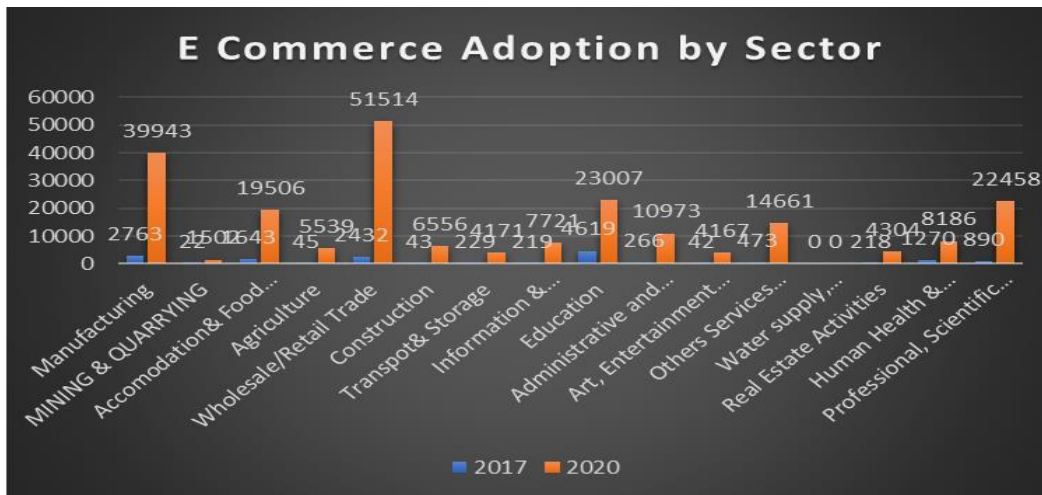Fig. 1. MSME E-commerce Adoption by Sector

E Commerce Adoption by Sector

Fig. 2 Percentage of MSME E-commerce Adoption per Sector

Percentage of Firms adopting E-commerce per Sector

Fig 3. shows the employment generation by MSME in each sector between the 2017 and 2020 across sixteen sectors. Manufacturing, wholesale/Retail trade and education employ more labour than any other sector across the two periods while transport and storage, information and communication are the least employing sector. However, there is a noticeable improvement between 2017 and 2020. Fig.4 shows the total employment generated by MSME in Nigeria and this clearly show remarkable progress in the level of employment generated by MSME across the periods.

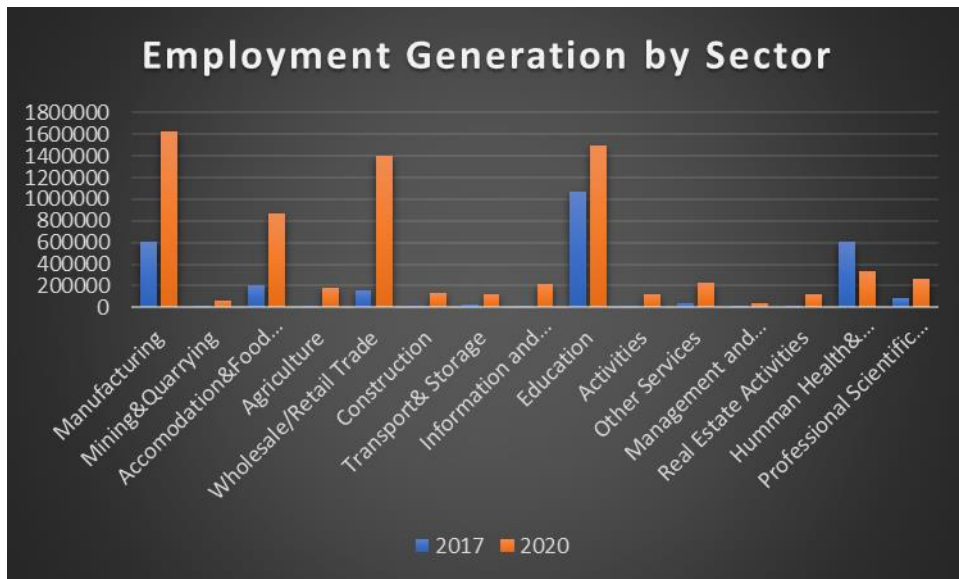Fig.3. Employment generation by MSME by sector

Fig.4 Total MSME Employment
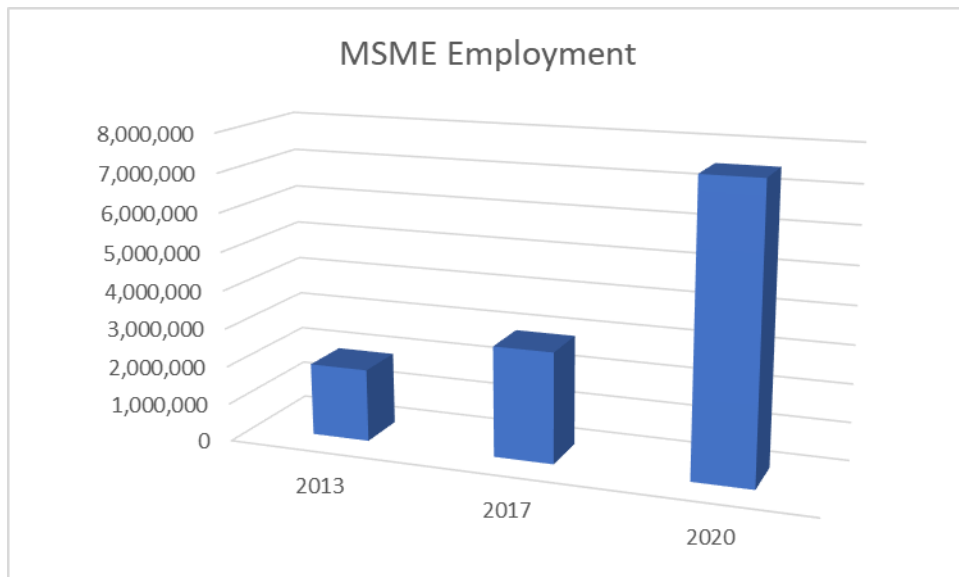
Panel Data Regressions

Pooled, Fixed, and Random effects regressions are estimated for each of the model specifications. These are done in order to analyse the different characteristics of the variables under different assumptions. The best regression model is determined based on F test, Hausman Test and LM test. All the regression variables are in natural logarithms. R software has been used to run these models. The results of panel regression models (eqn. 1-11) are presented in the following tables.

The highlights presented in Table 1 show the significance of digital imports across all the panel regression models (eqn. 1-3) at a 5% level or lower. In each of the three panel models, the positive coefficient of digital goods imports stands out, highlighting its direct association with increased SME sales, male employment, and female employment. Specifically, a 1 per cent increase in SME digital imports is associated with a 0.79 per cent surge in SME sales, a 0.46 per cent rise in SME male employment, and a 0.69 per cent rise in SME female employment.

It's worth noting the variance in the most suitable regression model for each equation. The pooled model demonstrates an excellent fit for eqns. (1) and (2), showcasing its compatibility with the data. Conversely, the fixed effects model is deemed more fitting for eqn. (3). This disparity emphasizes the importance of selecting an appropriate regression model to accurately depict the dynamics of the relationship between digital imports and SME variables across different scenarios.

Table 1: Panel Regressions determining SMEs' Sales, Male Employment and Female Employment

	SME AVG Sales		SME Male Employment		SME Female Employment	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept			1.863	0.516		
SME Employment						
SME E- commerce			0.41	0.000***		
Number of SMEs	-0.15	0.000***				
Digital Goods Imports	0.79	0.000***	0.46	0.019*	0.69	0.0498.
Digital Goods Exports					0.32	0.0020**
Digital Services Exports	0.17	0.000***			-0.36	0.0098**
No. of SMEs with Exportable Products					0.01	0.9390
Adj. R Square	0.84		0.35		0.45	
Best Model	Pooled Model		Pooled Model		Fixed Effect	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Digital goods imports exhibit a significant and positive correlation with the number of SMEs with exportable products, as indicated in Table 2. An increase of 1 per cent in digital goods imports corresponds to approximately a 0.91 per cent rise in the number of SMEs with exportable products. Moreover, it's noteworthy that digital goods imports positively and significantly impact SME e-commerce. A 1 per cent increase in digital goods imports leads to an approximate 0.17 percent increase in SMEs engaged in e-commerce activities. Similarly, digital goods imports positively affect the number of SMEs, proving to be statistically significant. Specifically, a 1 per cent rise in digital goods imports corresponds to an estimated increase of about 0.42 percent in the number of SMEs.

Table 2: Panel Regressions determining Number of Enterprises, SME E-commerce and SMEs with Exportable Products

	Number of SMEs		SME Ecommerce		SMEs with Exportable Products	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept	2.112	'0.630'	-0.748	'0.355'	-1.787	'0.453'
SME E- commerce					0.023	'0.961'
Number of SMEs			0.940	0.000***	0.809	0.079.
Digital Goods Imports	0.42	'0.158'	0.170	'0.102'	0.909	0.004**
Digital Services Exports			0.020	0.594		
SME Avg Sales			-0.196	'0.099'	-0.852	0.006*
Adj. R Square	0.02		0.98		0.84	
Best Model	Pooled Model		Pooled Model		Pooled Model	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table 3 presents the results of panel regressions aimed at determining labour productivity and size variables for SMEs (Small and Medium-sized Enterprises) in Nigeria. Notably, 'Digital Goods Imports' (coef. 0.61, p = 0.002**) and 'Digital Services Exports' (coef. 0.37, p = 0.000***) exhibit positive and statistically significant correlations with male labour productivity, while 'Digital Goods Exports' show a negative correlation (coef. -0.52, p = 0.000***). Specifically, a 1 per cent increment in SME digital imports corresponds to a 0.61 per cent increase in male labour productivity. Similarly, 'Digital Goods Imports' (coef. 0.89, p = 0.000***) and 'Digital Services Exports' (coef. 0.41, p = 0.001**) demonstrate positive and

statistically significant associations with female labour productivity, while 'Digital Goods Exports' show a negative impact (coef. -0.48, p = 0.000***). Consequently, a 1 per cent increase in SME digital imports leads to an 0.89 percent increase in female labour productivity. In addition, 'Digital Goods Imports' (coef. 0.85, p = 0.000***), 'Digital Services Exports' (coef. 0.12, p = 0.016*), and the 'Number of SMEs with Exportable Products' (coef. -0.21, p = 0.008**) demonstrate substantial associations with GDP per SME. Notably, a 1 per cent increase in SME digital imports corresponds to an 0.85 per cent surge in GDP per SME.

For equations (8) and (9), the 'Pooled Model' seems to be the best fit overall with higher Adj. R Square values. Conversely, equation (7) demonstrates a better fit with the 'Fixed Effects' Model. Thus, it can be inferred that digital goods imports and digital services exports significantly enhance labour productivity for both male and female employees within SMEs.

Table 3: Panel regressions determining labour productivity and size variables

	SME GDP Per Employee (labour productivity, male)		SME GDP Per Employee (labour productivity, female)		GDP per SME (size based on GDP)	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Intercept	-5.14	0.0612	-6.13	0.047	0.95	0.388
SME E- commerce			0.14	0.825	-0.97	0.000***
Number of SMEs			-0.56	0.348		
Digital Goods Imports	0.61	0.002**	0.89	0.000***	0.85	0.000***
Digital Goods Exports	-0.52	0.000***	-0.48	0.000***		
Digital Services Exports	0.37	0.000***	0.41	0.001**	0.12	0.016*
No. of SMEs with Exportable Products					-0.21	0.008**
Adj. R Square	0.66		0.69		0.97	
Best Model	Random effect		Pooled Model		Pooled Model	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table 4 presents the panel regression outcomes focused on examining employment per SME based on male and female employment. Notably, the 'Number of SMEs' (coef. -0.57, p = 0.000***) and 'Digital Goods Imports' (coef. 0.59, p = 0.006**) exhibit significant associations with male-based employment per SME. Specifically, a 1 per cent increase in digital goods imports correlates with an approximate 0.59 per cent rise in male employment per SME.

Moreover, digital goods imports demonstrate a potential positive impact on female employment per SME. For every 1 per cent increase in digital goods imports, there is an estimated 0.92 per cent increase in female-based employment per SME. In terms of regression models, the 'Pooled Model' is found to provide a better fit for the size variable based on male and female employment both.

Table 4: Panel Regressions determining labour productivity and size variables

	Employee per SME (Size based on male employment)		Employee per SME (Size based on female employment)	
	Coeff.	p-value	Coeff.	p-value
Intercept	0.74	0.795	2.42	0.475
SME E- commerce	-0.59	0.000		
Number of SMEs			-0.57	0.000***
SME Avg Sales			-0.56	'0.219'
Digital Goods Imports	0.59	0.006**	0.92	0.052.
Digital Services Exports	-0.19	0.143		
GDP Per MSME				
Adj. R Square	0.49		0.32	
Best Model	Pooled Model		Pooled Model	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Conclusion

Digital transmissions have been a boon to Nigeria's economy, fostering productivity, job creation, economic growth, and social advancement. The promotion of duty-free cross-border electronic transmissions has played a pivotal role in driving economic growth, achieving cost efficiencies, fostering innovation, expanding trade, and creating employment opportunities. The potential imposition of tariffs on cross-border transmissions poses significant risks, particularly for the importing sector. The empirical analysis results unequivocally highlight the substantial contribution of digital trade to the employment of MSMEs, especially in male-based employment. Considering the prevailing youth unemployment rate of 53.40% based on NBS

data in 2022, lifting the moratorium on duties on digital transmissions could exacerbate the unemployment situation in the country.

Furthermore, the analysis establishes a clear link between digital goods imports and labour productivity, underscoring the widespread adoption of ICT products for cost minimization in various MSMEs. Thus, digital trade emerges as a critical driver for the growth of the Nigerian economy and enhances its global competitiveness. As part of broader efforts to enhance the export intensity of MSMEs in Nigeria, digital trade has proven to be a potent tool. It significantly contributes to the capacity of MSMEs to engage in exportable products, thereby positively impacting the country's balance of payment position. In conclusion, digital trade has not only benefited MSMEs in the country but has also made a substantial contribution to the overall Nigerian economy.

[i] https://data.adb.org/dataset/2022-adb-asia-small-and-medium-sized-enterprise-monitor-volume-1-country-and-regional

[ii] https://www.oecd.org/industry/input-output-tables.htm