

# Economic Development, Technological Change, and Growth

# Impact of International Trade on Nigeria Economic Growth: Evidence on Trade Cost

# Babajide A. Ajayi<sup>1</sup>, Emmanuel Busuyi Oguntomi<sup>2</sup>

Abstract: This study investigated the impact of international trade on Nigerian economic growth, empirical evidence on trade cost. The ordinary least square technique was used to analyse data from 1960 to 2021. The study specifically focused on the impact of trade cost on economic growth in Nigeria, by grounding it on the Ricardian theory of comparative advantage. The econometric analyses of augmented dickey-fuller unit root test, error correction model, pair-wise granger causality test, and fully modified ordinary least square test were conducted. The FMOLS results showed that the consumer price index (CPI) and inflation consumer prices (ICP) have a significant negative effect on GDP. Thus, trade cost has adverse impact on Nigeria economic growth on the long run. On the short run, only consumer prices index (CPI) has positive impact on gross domestic product (GDP) while inflation consumer prices (ICP) has negative impact on gross domestic product (GDP), but the relationship is not statistically significant. It is recommended that there is need for the government to strengthen the monetary policy as to maintain price stability.

Keywords: International Trade; Trade Cost; Economic Growth; Nigeria

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mail: bajayi@aul.edu.ng.

Department of Economics, Faculty of Social and Management Sciences, Anchor University, Lagos State, Nigeria, Address: Ayobo Street, Ayobo Rd, Ipaja, Lagos, Nigeria, Tel.: +234 8168830090, E-

<sup>&</sup>lt;sup>2</sup> Department of Economics, Faculty of Social and Management Sciences, University of Benin, Benin-City, Edo State, Nigeria. Address: 1154, Main Gate, P.M.B, Benin -Ore Road, Benin City, Nigeria, Tel.: + 234 8062982070, Corresponding author: eoguntomi@gmail.com.

#### 1. Introduction

Trade is a major catalyst for growth (Busse & Koniger, 2012), a promoter of competitiveness and economic outcome (Organization of Exporting Countries and Development & World Trade Organization [OECD-WTO], 2015), and it fosters inclusive and sustainable growth among economies (World Bank, 2011). The cross-country pattern of trade and output is heavily influenced by trade costs. They influence industry specialisation and, as a result, earnings, poverty rates, and a variety of other key economic outcomes (OECD-WTO, 2015). For example, the integration of developing countries into world economy allows them to achieve higher expertise, technological improvement, and economies of scale. As a result, their economic growth and development, as well as poverty reduction, are aided (Teh et al., 2016).

Since the United Nations' Sustainable Development Goals (SDGs) were introduced in 2015, reducing trade costs have become a global strategy to trade. The World Trade Organization's (WTO) Fifth Global Review of Aid for Trade, published in July 2015, was a watershed moment in accomplishing this goal. The organization's policy activities were centered on lowering trade costs, such as the Trade Facilitation Agreement (TFA) among member nations. This resulted in the decrease of most-favored-nation trade tariffs to an average of 9% (almost a third lower than the level achieved in the previous two decades) in order to achieve equitable and sustainable global growth. TFA is expected to cut global trade costs by 14.3% on average once fully implemented (WTO, 2015a).

Despite policy efforts to reduce trade costs across countries, such as improving trade facilitation and logistics performance, increasing connectivity, and optimising operational environment (OECD-WTO, 2015), high trade costs have proven to be a major impediment to developing countries' integration into the global economy. This is especially true for LDCs, landlocked developing countries, and small economies that are geographically isolated (Teh et al., 2016). Trade tariffs, technological trade barriers, and inadequate trade regulations are all variables that lead considerably to high trade costs in these economies. According to Arvis et al. (2013), "trade costs are as high as 200 percent in *ad valorem* tariff equivalent terms for lower-middle-income countries and more than 250 per cent for low-income countries".

Similar predictions have been made that trade costs in developing countries will decline by 13-15 percent, while trade costs in least developed countries (LDCs) will fall by 17 percent, according to studies (Moise & Sorescu, 2013; OECD, 2015). According to additional evidence, the TFA could lead in an annual increase in world trade and GDP of over US\$1 trillion (Hufbauer & Schott, 2013; WTO, 2015a). The increase in the amount merchandise exports will primarily benefit developing countries, with a 9.9% increase in their trade and a 4.5 percent increase for developed countries (Hufbauer & Schott, 2013). However, lowering trade costs is an important

trade facilitation policy goal for major export diversification in emerging nations (Teh et al., 2016).

Despite the fact that developing nations have achieved significant progress in recent years in terms of their integration into the global commercial system, many poorer countries remain marginalised due to high trade costs (OECD-WTO, 2015). In 2010, the average trade cost in East Asia and the Pacific was 93 percent, compared to 82 percent in the high income group. Some developing countries have clearly made tremendous progress in lowering trade costs over time, and some are already at or close to the level of some developed countries, which is a remarkable milestone. Other developing regions have higher trade expenses. Europe and Central Asia, Latin America and the Caribbean, South Asia, the Middle East, North Africa, and Sub-Saharan Africa are among the regions affected. The most obvious distinction is between the last two regions, particularly between Sub-Saharan Africa and the rest of the world: in 2010, trade costs in Africa were more than 50 percent higher than in East Asia (OECD-WTO, 2015).

Reduced trade costs will boost economic growth by increasing total factor productivity, particularly in Africa (Ben Hammouda & Ali, 2009; Dennis & Shepherd, 2011). Nigeria, for example, is expected to see a 15.7 percent increase in the number of products shipped by destination and a 34.9 percent increase in the number of new markets per product. The number of items exported by destination is expected to increase by up to 12.2%, while the number of export destinations per product is expected to increase by up to 26.9% (Beverelli et al., 2015).

As of 2010, trade costs decrease as per capita income rises, according to the UNESCAP-World Bank trade costs database: trade costs are lowest in high-income nations and highest in low-income ones. For example, trade expenses in the manufacturing sector in high-income countries averaged 82 percent between 1996 and 2010, comparable to 98 percent in the upper medium income group, 125 percent in the lower middle income group, and 227 percent in the low-income group (OECD-WTO, 2015).

According to World Bank-ESCAP trade costs for 2019, African countries' trade costs are on average equivalent to a 304 percent tariff, with Nigeria slightly higher at 306 percent. Dr. Ngozi Okonjo-Iweala, Director-General of the World Trade Organization (WTO), stated that Nigeria's trade costs are excessively high (306%), one and a half times greater than those in high-income countries. Such high prices make building a regional value chain to boost commerce and spur economic growth difficult (Usigbe, 2021).

Meanwhile, the coronavirus epidemic in 2020 wreaked havoc on the worldwide economy. The economy of Nigeria shrunk by 1.8 percent, and it is the deepest recession in nearly two decades (1983). The economy was extremely susceptible to the global economic disruption caused by COVID-19, particularly due to the decline

in oil prices, shrinking foreign remittances, capital outflows, and increased risk aversion (World Bank, 2021). Despite this, the economy grew by 5% in the second quarter of 2021, compared to 0.51 percent in the previous quarter. This was the fastest growth rate since 2014, thanks to a 6.7 percent increase in the non-oil sector (Daniel, 2021). As a result, the apparent necessity in the above analysis is that Nigeria's economic growth and prospects may be hampered by high trade costs.

It is against this background that this study attempt to analyze the impact of high trade cost on economic growth in Nigeria. More so, while there are avalanche of literature on the dynamics of trade and economic growth (Obisike et al., 2020; Afolabi et al., 2017; Emehelu, 2021; Elias et al., 2018; Yusuf et al., 2020; Onuorah, 2018; George-Anokwuru, 2017), yet published research has not yet documented the impact of trade cost on economic growth in Nigeria. Thus, the goal of this study is to close the gap.

#### 2. Review of Related Literature

# 2.1. Theoretical Review

# 2.1.1. Ricardian Productivity-Based Comparative Advantage

According to OECD-WTO (2015), a country's productivity is competitive where its industries production is high in comparison to other countries. Competitiveness is viewed as a key driver of economic results, and countries all over the world are striving to improve their competitiveness and attract a larger proportion of economic activity, including trade and investment. Of fact, trade costs play a crucial role in determining productivity and outcomes. According to Ricardo's paradigm, in a world without trade costs, countries would specialise in the industries in which they are relatively more productive. Trade costs change the outcome, resulting in a new pattern of revealed competitiveness (Ricardo, 2004; Robinson, 1974, 1979).

# 2.2. Empirical Review

Emehelu (2021) investigated the impact of international trade on Nigeria's economic growth. The study analysed data from the Central Bank of Nigeria (CBN) statistical bulletin annual report and the National Bureau of Statistics for 37 years (1981–2018) using the Ordinary least square (OLS) technique. According to the study, the country's exchange rates have a negative and minor link with economic growth. Several trade policies in Nigeria, on the other hand, have been seen to stifle Nigeria's economic progress since their influence is negative and considerable on GDP growth.

The impact of international trade on Nigerian economic growth was investigated by Obisike et al. (2020). They used the ordinary least square (OLS) regression approach on secondary data gathered between 2010 and 2018. The estimated result demonstrated that oil commodity terms of trade (OCTOT) and non-oil commodity terms of trade (NOCTOT) had a beneficial impact on Nigeria's economic growth in the short run; however, the granger causality test shows that OCTOT, NOCTOT, and GDP are independent of one another.

Yusuf et al. (2020) investigated the impact of international trade on the Nigerian economy's growth. They estimated the data obtained via the Central Bank of Nigeria statistical bulletin from 1980 to 2018 using the Dynamic Ordinary Least Square (DOLS) multiple regression analysis technique. Except for the exchange rate, all of the explanatory variables were found to be positively related to economic growth. Furthermore, with the exception of net export, all explanatory factors were statistically significant with economic growth. The model's explanatory variables are not serially associated, according to the Durbin Watson statistics value of 1.81.

Elias et al. (2018) looked into the impact of foreign trade on Nigeria's economic growth. In order to estimate the various components of foreign trade, they used the multiple regression analysis technique. The study's data came from the 2012 issue of the CBN statistics bulletin, which covered the years 1980 to 2012. The study's findings revealed that export commerce has a substantial impact on Nigeria's economic growth. The study also found that import trade had no substantial impact on Nigerian economic growth.

In Nigeria, Onuorah (2018) looked into trade liberalization and economic growth. Over a 28-year period (1990–2017), secondary data was gathered from the CBN statistical bulletin and World Bank Development indicators. The independent variables in the study were Degree of Openness (DOP), Exchange Rate (EXR), Balance of Payments (BOP), Inflation rate (INF), Foreign Direct Investment (FDI), Balance of Trade (BOT), and Net Exports (NEXP), whereas the dependent variable was Gross Domestic Product (GDP). The independent variables DOP, INF, FDI, BOT, and NEXP have a positive significant impact on GDP, but EXR and BOP have a negative impact. The R-squared coefficient of 0.9896 indicates that all independent variables have a 99 percent positive impact on GDP, whilst the Adjusted Rsquared coefficient of 0.9858 indicates that 98 percent of all independent variables can be explained by changes in GDP.

Afolabi et al. (2017) investigated Nigeria's international commerce and economic growth. For the period 1981 to 2014, time series data were acquired from the Central Bank of Nigeria, the National Bureau of Statistics, and the International Financial Statistics. The dependent and independent variables were tested for a significant association using the Ordinary Least Square (OLS) approach. Government spending, interest rates, imports, and exports are all favorably relevant in the Nigerian

economy's growth process, whereas the exchange rate and foreign direct investment are adversely inconsequential.

George-Anokwuru (2017) investigated Nigeria's international trade and economic growth. To establish the long-term relationship between the variables, the researcher used cointegration and error correction techniques. The results revealed that the BOP and exchange rate are not significant, that the interest rate has a direct relationship with GDP, and that the degree of openness has a positive relationship with GDP. The link between FDI and GDP is inverse. The study suggests that international trade has not made a significant contribution to Nigeria's economic progress.

The impact of international commerce on Nigerian economic growth was investigated by Azeez et al. (2014). They analysed annual time series data from 2000 to 2012 using the ordinary least square (OLS) estimate approach. International commerce has been demonstrated to have a considerable positive impact on economic growth. The economy is influenced by imports, exports, and trade openness.

# 3. Methodology

Following Obinna, a linear regression model based on the ordinary least square (OLS) technique will be used to estimate the influence of trade costs on economic development in Nigeria (2020). Ordinary least square (OLS) is widely employed in regression analysis, according to Obinna (2020), partly because it is intuitively attractive and mathematically far simpler than any other econometric technique (Gujarati, 2004). The data were taken from the World Bank Development Indicator database and spans the years 1960 to 2020.

The dependent variable is Gross Domestic Product (Current LCU), while the independent variable was Consumer Price Index (2010 = 100). The study used Inflation, Consumer Prices (Annual %) (ICP), Imports of goods and services (% of GDP) (IMGS), as well as Merchandise imports (current US\$) (MIM), as associated control variables, in order to produce robust estimations. The linear regression model's generic functional form is given below.

## 3.1. Model Specification

$$GDP = f(CPI, ICP, IMGS, MIM)$$
(1)

Where:

GDP = Gross Domestic Product (Current LCU)

CPI = Consumer Price Index (2010 = 100)

ICP = Inflation, Consumer Prices (Annual %)

IMGS = Imports of goods and services (% of GDP)

MIM = Merchandise imports (current US\$)

The econometric form of equation (1) above is represented thus:

$$GDP = \alpha_0 + \beta_1 CPI + \beta_2 ICP + \beta_3 IMGS + \beta_4 MIM + \varepsilon$$
 (2)

Where:

 $\alpha_0$  = Intercept of relationship in the model/ constant;

 $\beta_1$ ,  $\beta_2$ ,  $\beta_3$ ,  $\beta_4$  = Coefficients of each independent or explanatory variable;

 $\varepsilon =$ Stochastic Error term

#### 4. Results Presentation

# 4.1. Descriptive Statistics

**Table 1. Descriptive Statistics** 

	GDP	CPI	ICP	IMGS	MIM
Mean	1.30E+11	39.98741	15.82741	14.44892	1.56E+10
Median	5.42E+10	2.331121	11.64540	14.41055	8.80E+09
Maximum	5.47E+11	267.5115	72.83550	23.92228	5.83E+10
Minimum	4.20E+09	0.065887	-3.726337	3.029761	5.40E+08
Std. Dev.	1.58E+11	65.58405	15.39819	5.171036	1.74E+10
Skewness	1.319690	1.882886	1.969337	-0.217662	1.270987
Kurtosis	3.293395	5.796471	6.568160	2.739527	3.272197
Jarque-Bera	17.63101	55.00322	70.61227	0.643383	16.33931
Probability	0.000148	0.000000	0.000000	0.724922	0.000283
Sum	7.79E+12	2399.245	949.6448	866.9354	9.38E+11
Sum Sq. Dev.	1.47E+24	253774.8	13989.16	1577.637	1.78E+22
Observations	60	60	60	60	60

Source: Author's computation (2021) using EViews 9

Table 1 above presents the summary descriptive statistics for the variables under study. Gross domestic product (current US \$) as the dependent variable, have a mean of 1.30, ranging from 4.20 to 5.47, and a standard deviation of 1.58. Consumer prices index (CPI) has a mean of 39.99 ranging from 0.07 to 267.51 and a standard deviation of 65.58. Inflation, consumer prices (ICP) has a mean value of 15.83, ranging from -3.73 to 72.84, and a standard deviation of 15.4. Imports of goods and services (IMSG) have a mean value of 14.45, ranging from 3.03 to 23.92 with a standard deviation of 5.17. Lastly, merchandise imports (MIM) have a mean value of 1.56, ranging from 5.40 to 5.83 and a standard deviation of 1.74.

#### 4.2. Test for Correlation

Table 2: Correlation Analysis (Pearson)

Variables	GDP	CPI	ICP	IMGS	MIM
GDP	1.000000	0.896204	-0.135792	0.002593	0.973597
CPI	0.896204	1.000000	-0.117195	0.116518	0.844641
ICP	-0.135792	-0.117195	1.000000	-0.100261	-0.107594
IMGS	0.002593	0.116518	-0.100261	1.000000	0.103791
MIM	0.973597	0.844641	-0.107594	0.103791	1.000000

Source: Author's computation (2021) using EViews 9

The table 2 above presents the results of preliminary correlation analyses among the variables using gross domestic product (current US \$) as the dependent variable. This exercise serves two important purposes. The major purpose is to determine whether there is a bivariate relationship between each pair of the dependent and independent variables. The second is to ensure that the correlations among the explanatory variables are not so high to the extent of posing multicollinearity problems. The result shows that there exists a weak negative correlation with inflation, consumer price (ICP), while consumer price index (CPI) and merchandise imports (MIM) has a very high positive correlation however, there exists a weak positive correlation with imports of goods and services (IMGS).

## 4.3. Test of Stationarity

**Table 3. Unit Root Test (Augmented Dickey-Fuller Test)** 

Variables		t- statistics	P- values
GDP	Level	-0.0980	0.9444
	First Diff	-5.1578	0.0001***
	Second Diff	-10.01227	0.0000***
CPI	Level	6.0888	1.0000
	First Diff	3.3103	1.0000
	Second Diff	-6.542054	0.0000***
ICP	Level	-4.0626	0.0023***
	First Diff	-6.0278	0.0000***
	Second Diff	-7.168018	0.0000***
IMGS	Level	-3.0717	0.0344**
	First Diff	-9.0069	0.0000***
	Second Diff	-16.33713	0.0000***
MIM	Level	-0.2381	0.9271
	First Diff	6.8339	0.0000***
	Second Diff	-9.789005	0.0000***

a: (\*)Significant at the 10%; (\*\*)Significant at the 5%; (\*\*\*) Significant at the 1% and (no) Not Significant

b: Lag Length based on AIC

c: Probability based on MacKinnon (1996) one-sided p-values.

Table 3 reports the Augmented Dickey and Fuller (ADF) results of the unit root test with constant only. The ADF test shows that most of the variables are non-stationary at levels and first differences, but they are stationary at their second differences at a 1% of significance, and hence the time series are integrated of order two, I(2). The optimal lag length is determined by the minimum value of the AIC criterion.

# 4.4. Test for Co-integration

Table 4. Co-integration test based on Trace of the Stochastic Matrix

Hypothesize d No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.531067	106.9254	69.81889	0.0000
At most 1 *	0.382364	63.00227	47.85613	0.0010
At most 2 *	0.246048	35.05458	29.79707	0.0113
At most 3 *	0.171511	18.67387	15.49471	0.0160
At most 4 *	0.125245	7.761068	3.841466	0.0053

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level

The cointegration test based on the trace of the stochastic matrix in the table 4 above shows that the trace statistic is greater than the 0.05 critical value with probability values of less than 5% level of significance, implying that all four explanatory variables are cointegrated and can be represented equivalently in terms of a long-run fully modified ordinary least squares regression (FMOLS).

# 4.5. The Fully Modified Ordinary Least Square (FMOLS)

**Table 5. Fully Modified Ordinary Least Square (FMOLS)** 

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	5.70E+08	95745603	5.951699	0.0000
CPI	-4.49E+08	2.21E+08	-2.028715	0.0474
ICP	-2.90E+09	6.57E+08	-4.422475	0.0000
IMGS	7.101715	0.361919	19.62240	0.0000
MIM	4.48E+10	1.12E+10	3.990560	0.0002
R-squared	0.978689			
Adjusted R-squared	0.977110			

Source: Author's computation (2021) EViews 9

Fully modified ordinary least squares (FM-OLS) regression was originally designed to provide optimal estimates of cointegrating regressions. The FMOLS results show

<sup>\*</sup> denotes rejection of the hypothesis at the 0.05 level

<sup>\*\*</sup>MacKinnon-Haug-Michelis (1999) p-values

that the consumer price index (CPI) and inflation consumer prices (ICP) have a significant negative effect on GDP, whereas imports of goods and services (IMGS) and merchandise imports (MIM) have a significant positive effect on GDP. The R-square of 97.9 indicates high explanatory power, and all explanatory variables are significant at the 5% level.

#### 4.6. Error Correction Estimates

Table 6. Error Correction Model (GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.67E+09	2.48E+09	1.077005	0.2864
D(CPI)	3.07E+08	3.02E+08	1.015081	0.3147
D(ICP)	-2.24E+08	1.60E+08	-1.397022	0.1682
D(IMGS)	-2.68E+09	5.59E+08	-4.802899	0.0000
D(MIM)	4.538553	0.397729	11.41116	0.0000
ECM(-1)	-0.415446	0.110586	-3.756751	0.0004
R-squared	0.746719	N/A	N/A	N/A
F-	31.25069	N/A	N/A	N/A
statistic/Prob	(0.000000)			

Source: Author's computation (2021) EViews 9

The error correction model's outcome is shown in the table 6 above. According to the findings, consumer prices index (CPI), merchandise imports (MIM) are positively related to gross domestic product (GDP) while inflation consumer prices (ICP) and imports of goods and services (IMGS) are negatively to gross domestic product (GDP). However, only imports of goods and services (IMGS) and merchandise imports (MIM) has a statistically significant impact at the 5% level of significant in explaining the variation in gross domestic product (GDP). The R-square of 0.747 indicates that consumer prices index, inflation consumer prices, imports of goods and services and merchandise imports account for 74.7 percent of the systematic variation in gross domestic product (GDP). The F-statistic value of 31.25069 with an estimated probability value of (0.000000) indicates that the overall model is statistically significant and thus can be used for forecasting, while the error correction mechanism (ECM) value of -0.415 indicates a 41.5 percent speed of adjustment to equilibrium in the long run.

# 4.7. Pair-Wise Granger Causality Test

Table 7. Pair-Wise Granger Causality Test

Sample: 1960 2019

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
CPI does not Granger Cause GDP	58	3.74480	0.0301
GDP does not Granger Cause CPI		10.3019	0.0002
ICP does not Granger Cause GDP	58	0.06421	0.9379
GDP does not Granger Cause ICP		0.60657	0.5490
IMGS does not Granger Cause GDP	58	3.42870	0.0398
GDP does not Granger Cause IMGS		0.06944	0.9330
MIM does not Granger Cause GDP	58	0.96132	0.3890
GDP does not Granger Cause MIM		1.59909	0.2117
ICP does not Granger Cause CPI	58	1.22958	0.3006
CPI does not Granger Cause ICP		0.39559	0.6753
IMGS does not Granger Cause CPI	58	0.22809	0.7968
CPI does not Granger Cause IMGS		1.39500	0.2568
MIM does not Granger Cause CPI	58	3.92560	0.0257
CPI does not Granger Cause MIM		4.35783	0.0177
IMGS does not Granger Cause ICP	58	0.58000	0.5634
ICP does not Granger Cause IMGS		1.50695	0.2309
MIM does not Granger Cause ICP	58	0.20268	0.8172
ICP does not Granger Cause MIM		0.88866	0.4172
MIM does not Granger Cause IMGS	58	0.14318	0.8669
IMGS does not Granger Cause MIM		1.07524	0.3485

Source: Author's computation (2021) EViews 9

The table 7 above presents the Pair-Wise Granger causality test. The probability value lesser than 5% level of significant implies an existence of a multidirectional relationship between CPI and GDP as well as between MIM and CPI thus we rejected the null hypothesis and accept the alternative that they both Granger Cause each other whereas there is a unidirectional relationship between IMGS and GDP.

Given that the probability values of the other variables are not significant at 5% level we accept the null hypothesis that they do not Granger Cause each other.

## 5. Conclusion

This study attempted to determine the impact of international trade on Nigeria economic growth, empirical evidence on trade cost. The study employed times series data from the World Bank (World Development Indicators) for the period 1960 to 2020. The ordinary least square technique was used. The model was statistically significant at 1% since F-statistic/Probability value was 31.25069 (0.000000). The R-squared was 0.746719 or 74.6719% which is a high regression line that fits well in the error correction model with most variation explained inside the model. Also, the FMOLS revealed that the R-squared was 0.978689 or 97.8689% and Adjusted R-squared was 0.977110 or 97.7110%.

The short run estimates revealed that merchandise imports (MIM) has a statistically significant (positive) impact at the 5% level of significant on gross domestic product (GDP), and imports of goods and services (IMGS) has a statistically significant (negative) impact at the 5% level of significant on gross domestic product (GDP). But the long run estimates revealed that both merchandise imports (MIM) and imports of goods and services (IMGS) have a significant positive effect on GDP.

The FMOLS results show further that the consumer price index (CPI) and inflation consumer prices (ICP) have a significant negative effect on GDP. Thus, it could be obtained that trade cost has adverse impact on Nigeria economic growth. On the short run, only consumer prices index (CPI) has positive impact on gross domestic product (GDP) while inflation consumer prices (ICP) has negative impact on gross domestic product (GDP), but the relationship is not statistically significant.

## 6. Recommendation

There is need for the government to strengthen the monetary policy as to maintain price stability. There is need to remove all barriers that restrict free flow of trade. There is need to diversify the economy to reduce over reliance on imported capital goods

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