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Does Real Income and Population Matter in Evaluating Domestic Trade Performance? Evidence from Nigeria

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ABSTRACT

Domestic trade has been a key sector in the Nigerian economy in terms of economic sustainability, following its performance and resiliency in both tranquil and turbulent periods. Using Autoregressive Distributed Lag (ARDL) model for the period 2012Q3 to 2022Q3, this study examines the impact of factors driving trade growth in Nigeria. The findings show that growth in the country's population and per capita income are the major factors driving domestic trade growth in Nigeria in both short-run and long-run periods. Also, changes in exchange rates positively impact domestic trade growth in the long-run period; information technology, in terms of growth in numbers of internet subscriptions, as well as trade openness, do not have a significant impact on trade growth. We suggest that the government expand internet coverage across the country and intentionally deepen the awareness of growing trade globalisation and its benefits to citizens and the nation's economic growth.

Keywords: *domestic trade, economic growth, Nigeria, ARDL model*

JEL Classification: F10, F15, F40, F49

INTRODUCTION

This study examines the determinants of domestic trade performance in Nigeria given the rising contributions of the sector to the economy. Trade has contemporarily been one of the driving forces of Nigeria's economy in both tranquil and turbulent periods. From the last two recessions of 2016 and 2020, the Services Sector showed stronger resilience to external shocks, respectively, caused by the global crude oil market supply glut and the COVID-19 pandemic. Amidst the Services Sector, Trade and ICT subsectors have remained the intrinsic drivers of the sector's performance over the years. However, this study aims at examining the possible driving factors behind domestic trade performance in Nigeria. Currently, there is an increasing pursuit for trade expansion by the Nigerian government, following the signing of the African Intercontinental Free Trade Agreement (AfCFTA). With deliberate efforts towards the development of basic infrastructures such as railway system, inter-city road networks, seaports, and airports, the country aims at increasing government's generated revenues, creating more job opportunities and improving of citizens' welfare. Thus, this study will enlighten stakeholders on the performance of the domestic trade subsector and possible factors facilitating growth in the sector.

The Nigerian economy, like most emerging economies, has witnessed a continuous shift from a resource-oriented to a services-driven economy. Within the period of 1990 to 2000, the industry sector contributed about 46.5 percent share of the GDP, followed by the Services Sector with a

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share of 35.5 per cent while the Agricultural Sector share of the GDP averaged 18.1 percent. However, between 2001 and 2010, there were major changes in three sectoral contributions to the GDP. The Services sector surpassed the industry sector to become the largest, as its share of GDP grew to 43.1 percent. The industry sector had the second largest share of the GDP during this period (32.4 percent), while the agriculture sector improved further in the decade, having a share of 24.5 percent of the GDP. From 2011-2021, the services sector takes up over half of the share of real GDP (52.40 percent). The agriculture sector's share of the real GDP (24.46 percent) during this period inched up to being the second largest, away from the consistent third. The industry sector with a share of 23.14 percent, declined from a once dominating sector to less than half the share of the Services sector.

According to the country's National Bureau of Statistics (NBS) data, the size and value of domestic trade in the economy have continued to grow over the years. Slowed by the negative impact of the COVID-19 pandemic, the sector in 2020 plummeted to negative 8.49 percent growth, with a total value of ₦10.46 trillion and a 14.94 percent share of the GDP. However, the Sector's performance rebounded in 2021, following the government's interventions aimed at ameliorating the impact of the pandemic. Trade GDP recorded a value of ₦11.36 trillion, with a growth rate of 8.62 percent and a 15.69 percent share of the overall GDP in 2021. Subsequently, the Sector's GDP value stood at ₦11.94 trillion in 2022, with a growth of 4.54 percent and 16.00 percent share of the overall GDP.

Various empirical studies have shown that trade can be determined by various factors which include household consumption expenditure, government expenditure, foreign income, money supply, exchange rate, trade liberalization, domestic income, GDP per capita, trade openness and population, among others. Such studies include Akototo & Sakyi (2019), He (2019), Alhanom (2016), Correia (2008), Keho, (2021), Nageri, Ajayi, Olodo & Abina (2013), Abdullahi & Suleiman (2008), Abasiakan, Sani & Obiezue (2021), Ganbaatar, Huang, Shuai, Nawaz & Ali (2021), Yasar, Akalin Erdogan & Sarkodie (2022), Taşseven & Yılmaz (2021), Márquez-Ramos (2007), Mbogela (2019), Van (2002), Edwards & Alves (2006), among others. Looking at the literature, Akototo & Sakyi (2019) find that foreign income and money supply are positive and significant determinants of trade in the short run. A study by He (2019) also finds that the real exchange rate has a positive effect on bilateral trade between China and US.

However, a study by Alhanom (2016) finds that real exchange is an insignificant determinant of trade balance in both the short and long run, while domestic income and foreign income appear to be important determinants of trade balance in the long run. Yasar, Akalin Erdogan & Sarkodie (2022) finds that the GDP per capita of partner countries has a positive impact on China's export. It is therefore evident that most reviewed studies have focused on the determinants of international trade – import and export. Also, reviewed studies have revealed that there is little empirical literature on the determinants of domestic trade in Nigeria. The objective of the study is therefore to examine the major factors driving domestic trade growth in Nigeria. This is because the focus of the study is on the determinants of domestic trade and not international trade. The study will then test the hypothesis of whether internet subscription, per capita income, trade liberalisation proxied by export minus import, an exchange rate (USD) and population affect domestic trade growth in Nigeria.

The remainder of the study is organised as follows. Section 2 describes factors driving the domestic trade performance in Nigeria. Section 3 contains data descriptions and estimation methods, while Section 4 contains the empirical results and analysis. Lastly, Section 5 is devoted to the study's conclusion and policy recommendations.

CONCEPT OF DOMESTIC TRADE

Domestic trade refers to the exchange of goods and services between the citizens of a country. It comprises all purchasing, selling, and trading activities of every kind carried out within a

specific nation, such as Nigeria. A domestic market is one where supply and demand for goods and services take place exclusively within one country. In this situation, the vendors and the main clients typically come from the same country and interact while exchanging goods and services. There are factors that might drive domestic trade as empirically verified by literature Akototo & Sakyi (2019), He (2019), Alhanom (2016), Correia (2008), Keho, (2021), Nageri, Ajayi, Olodo & Abina (2013).

Factors Driving Domestic Trade Performance in Nigeria

I. Technological Innovations

Advancement in technological innovations has continued to propagate the online trading marketplace. Traders now leverage various innovations and tools to carry out trading and make money online. Most major towns and cities all over the world make use of the Internet, and the rise in Internet penetration has been driven by technological innovations through the emergence of smartphones that has applications to facilitate trade. The major advantage of technological innovation is that it made trading more accessible. It is therefore significant to emphasise that online trading has gathered pace over the last few years. For instance, this innovation has brought about the online marketplace and malls such as Konga, Jumia, Amazon, Alibaba, etc. Studies by Freund & Weinhold (2004), Banerjee, Bhattacharya, Dave & Koner (2018) Haltenhof (2019), Bai (2019), Chen, Huang, Zheng, & Zhang (2019) and Rodriguez-Crespo, Marco & Billon (2021) stressed the positive impact of technological innovation on trade.

II. Trade Openness

Trade liberalisation through openness has contributed to domestic trade in Nigeria. Openness to trade helps in providing the domestic economy with the needed goods and services for human satisfaction and welfare. Ijirshar (2019) noted that trade liberalisation facilitates knowledge diffusion and competition in the domestic market, which leads to greater economic efficiency. Due to the link between trade and the overall economy, Fetahi-Vehapi, Sadiku & Petkovski (2015) and Fagbohun & Adekoya (2016) noted the positive impact of trade openness. However, studies by Fatima, Chen, Ramzan & Abbas (2020) stressed that trade openness may have a negative impact.

III. Population Growth

Growth in the population of a country affects the level of trade within an economy. An increasingly rising population results in a rise in consumer demand for goods and services, which affects the level of domestic trade. A study by Savaş (2008) supports the assertion that growth in population had a strong positive impact on the economy. However, a growing population exerts pressure on available existing resources within an economy. This assertion was supported by Peterson (2017).

IV. Per Capita Income

This is one of the indicators that may affect the level of domestic trade within an economy. It measures the level of output within an economy relative to the population and reflects the total wellbeing and welfare of a given population. This means that the ability of a county's population to share its total production is demonstrated by allocating the total production to each head of the population. The higher the per capita income, the higher the standard of living. In relation to trade, Fagbohun & Adekoya (2016) stated that per capita income is positively and significantly related to trade. However, Onyendi (2021) tried to stress a negative relationship between per capita income and trade in his study.

V. Exchange Rate

This is one of the factors that affect domestic trade within an economy. Changes in exchange rates have an impact on the cost and prices of imported products, services, and exports. Because imports and exports account for a sizable portion of the economy (CBN, 2016), an appreciation in the exchange rate may lead to improved domestic trade and a depreciation may lead to lower trade within the domestic economy. It is worth noting that the local demand for foreign currencies, the country's trade balance, and the health of the economy affect the exchange rate. Razak, N., & Masih, M. (2018) assert a long-run asymmetric relationship between exchange rate and trade. Yakubu, Sani, Obiezue, & Aliyu (2019) also found a long run relationship, however, a negative relationship in the short run.

DATA AND METHOD OF ESTIMATION

The steps taken to achieve the study's objective are outlined in this section. The data definitions, model specification, descriptive statistics and stationarity test results are explained in the first part. The methods of analysis are presented in the second part.

Model Specification and Data

To estimate the determinants of domestic trade performance in Nigeria, the study collates quarterly data on Nigeria's domestic trade, internet subscription, per capita income, trade liberalisation proxied by export minus import, an exchange rate (USD) and population from the National Bureau of Statistics (NBS) database. The choice of the variables was based on variables used from other empirical studies (Nuroglu, 2010, Alhanom, 2016, Yasar, Akalin, Erdogan & Sarkodie 2022 and Mbogela 2019) The data range and observations were limited to 2012Q3 to 2022Q3 because of available data on internet subscriptions in the country. The data was further converted to their growth rate before further analyses were carried out.The descriptive statistics for the set of variables are presented in Table 1, where: GTRADE denotes the growth rate of domestic trade; GISUB denotes the growth rate of internet subscription; GPCI denotes the growth rate of per capita income; GTLIB denotes the growth rate of trade liberalisation; GEXR denotes the growth rate of exchange rate; and GPOP represents the growth rate of population.

We assumed that there is a functional equation linking the trade growth with identified drivers in this study. This equation is specified below:

GTRADE = f(GISUB, GPCI, GTLIB,GEXP,GPOP) *(1)*

Table 1. Descriptive statistic

	GTRADE	GISUB	GPCI	GTLIB	GEXR	GPOP
Mean	0.748928	4.576010	0.264567	-45.46200	2.705499	0.626506
Median	1.561049	2.687445	2.879939	-18.58146	0.726718	0.651345
Maximum	22.16414	39.72413	15.03314	283.9531	31.41846	5.164787
Minimum	-15.68458	-6.060874	-15.45733	-1500.701	-19.31964	-3.443714
Std. Dev.	8.110612	7.554986	8.929318	266.5548	7.434767	0.999110
Skewness	-0.021437	2.614966	-0.602315	-4.157478	1.303455	0.670117
Kurtosis	3.186997	12.87316	2.041414	23.59055	8.980312	18.45066
Jarque-Bera	0.061343	208.0524	3.950031	821.8490	70.93352	400.8652
Probability	0.969794	0.000000	0.138759	0.000000	0.000000	0.000000
Sum	29.95710	183.0404	10.58266	-1818.480	108.2200	25.06026
Sum Sq. Dev.	2565.499	2226.035	3109.576	2771006.	2155.755	38.93060
Observations	40	40	40	40	40	40

UNIT ROOT TEST

To further ascertain the time series properties of the variables, the study conducts unit root test using the Augmented Dickey-Fuller approach as presented in Table 2. From the result, GTRADE and GPCI are stationary at the first difference, while the rest of the variables are stationary at level. The mixed order of integration among the variables underpins the use of the Autoregressive Distributed Lag model (ARDL)/bounds test technique in achieving the objective of the study.

Table 2. Augmented Dickey-Fuller unit root test

Variables	Level		First difference		Order of integration
	Intercept	Trend and intercept	Intercept	Trend and intercept	
GTRADE	-2.749	-2.695	-16.999***	-16.773***	I(1)
GISUB	-3.474**	-4.0316**			I(0)
GPCI	-2.290	-2.228	-37.236***	-36.706***	I(1)
GTLIB	-6.009***	-6.238***			I(0)
GEXR	-4.334***	-4.415***			I(0)
GPOP	-6.936***	-6.852***			I(0)

*Note: ** and *** represent statistical significance at 5% and 1%, respectively*

Method of Estimation

The ARDL technique applied in this study is as in Pesaran & Pesaran (1997) and Pesaran et al. (2001). The technique offers versatility irrespective of the level of integration of the variables and it is useful where the series are stationary at level, at first difference or mutually integrated. Following the objective of the study, we specify the ARDL model as shown in Equation 2.

$$\Delta GTRADE_t = \sigma_0 + \sum_{i=1}^{P} \varphi_i \Delta \mathrm{GTRADE}_{t-i} + \sum_{j=0}^{q1} \gamma_j \Delta \mathrm{GISUB}_{t-j} + \sum_{l=0}^{q2} \partial_l \Delta \mathrm{GPCI}_{t-l} + \sum_{m=0}^{q3} \omega_m \Delta \mathrm{GTLIB}_{t-m} + \sum_{n=0}^{q4} \rho_n \Delta \mathrm{GEXR}_{t-n} + \sum_{s=0}^{q5} \tau_s \Delta \mathrm{GPOP}_{t-s} + \sigma_1 \mathrm{GTRADE}_{t-1} + \sigma_2 \mathrm{GISUB}_{t-1} + \sigma_3 \mathrm{GPCI}_{t-1} + \sigma_4 \mathrm{GTLIB}_{t-1} + \sigma_5 \mathrm{GEXR}_{t-1} + \sigma_6 \mathrm{GPOP}_{t-1} + \varepsilon_t \quad (2)$$

Where GTRADE denotes the growth rate of domestic trade; GISUB denotes the growth rate of internet subscription; GPCI denotes the growth rate of per capita income; GTLIB denotes the growth rate of trade liberalisation; GEXR denotes the growth rate of exchange rate; and GPOP represents the growth rate of population. Δ is the difference operator, ε_t stands for the stochastic error term. σ_0 is the intercept term. φ, γ, ∂, ω, ρ and τ represent short-run parameters. σ_1- σ_6 are the long-run parameters. The optimum lags are represented by $q1, q2, q3, q4$ and $q5$. The optimum lag lengths for the study were automatically selected by the Eviews Statistical software before further analyses were conducted.

The study applies the bound test in equation 2 and upon the confirmation of a co-integration relationship among the variables, the study estimates the error correction form of the model as specified in equation 3.

$$\Delta GTRADE_t = \sigma_0 + \sum_{i=1}^{P} \varphi_i \Delta \mathrm{GTRADE}_{t-i} + \sum_{j=0}^{q1} \gamma_j \Delta \mathrm{GISUB}_{t-j} + \sum_{l=0}^{q2} \partial_l \Delta \mathrm{GPCI}_{t-l} + \sum_{m=0}^{q3} \omega_m \Delta \mathrm{GTLIB}_{t-m} + \sum_{n=0}^{q4} \rho_n \Delta \mathrm{GEXR}_{t-n} + \sum_{s=0}^{q5} \tau_s \Delta \mathrm{GPOP}_{t-s} + \lambda ECT_{t-1} + \varepsilon_t \quad (3)$$

Where ECT represents the Error Correction Term and λ denotes the parameter of the adjustment term. Finally, the study conducts post-estimation diagnostic tests to ensure that the fundamental assumptions of the Ordinary Least Squares (OLS) estimator are not violated.

RESULTS AND ANALYSIS

ARDL Bounds Test

The bounds test result presented in Table 3 indicates the existence of cointegration among the variables in the model. Comparing the computed F-statistic value (10.167) with the upper bound critical values, the study observes that the null hypothesis of no cointegration cannot be upheld. We conclude that there is cointegration among the variables in the model, hence the reason for the ARDL long-run estimation.

Table 3. Bounds Test Result

Sign. Level	Upper bound	Lower bound
10%	3	2.08
5%	3.38	2.39
2.5%	3.73	2.7
1%	4.15	3.06
F-Stat.	10.167	

ARDL long-run estimates

The result of the ARDL long-run model is presented in Table 4. The result indicates that growth in per capita income (GPCI), the rising exchange rate (GEXR), and growth in the country's population (GPOP) have a significant influence on domestic trade growth in the long run period. This is because as the income of individuals increases, they tend to increase their demand for the consumption of domestic goods, which influences trade. The result is in line with the study by Yasar, et al. (2022) whose findings show that GDP per capita of partner countries has a positive impact on China's trade. Also, a rise in population has a potential influence on domestic trade in Nigeria. A study by Nuroglu (2010) finds a positive impact of population on trade for exporter countries. At the same time, growth in internet subscription (GISUB) and trade liberalization (GTLIB) do not have a significant influence.

Table 4. ARDL long-run estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GISUB	-0.033416	0.055051	-0.606989	0.5507
GPCI	2.223111	0.394191	5.639685	0.0000
GTLIB	-0.000424	0.001587	-0.267034	0.7922
GEXR	0.110867	0.040338	2.748420	0.0124
GPOP	4.845203	1.629187	2.974001	0.0075
C	-3.146608	1.136740	-2.768099	0.0119

Note: D(GTRADE) is the dependent variable

ARDL short-run estimates

The result of the ARDL short-run estimation in Table 5 shows that growth in domestic trade is significant in the previous one, two and three quarters, however, the outcome is negative in the latter two quarters. The short-run result also shows that growth in per capita income and population are positive and significant in the current quarter but negative and significant in the previous quarter. Furthermore, the error correction coefficient which measures the speed of adjustment from short-run disequilibrium to long-run equilibrium shows a slow adjustment speed of about 35.73 percent per quarter (142.9/4%).

Table 5. ARDL short-run estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GTRADE(-1))	0.370677	0.130267	2.845513	0.0100
D(GTRADE(-2))	-0.237605	0.088174	-2.694715	0.0139
D(GTRADE(-3))	-0.366800	0.072184	-5.081450	0.0001
D(GPCI)	1.928713	0.129186	14.92975	0.0000
D(GPCI(-1))	-0.802557	0.252383	-3.179921	0.0047
D(GPCI(-2))	0.248251	0.175557	1.414080	0.1727
D(GPCI(-3))	0.750625	0.121873	6.159065	0.0000
D(GPOP)	4.903263	0.288786	16.97890	0.0000
D(GPOP(-1))	-1.504431	0.435217	-3.456733	0.0025
CointEq(-1)*	-1.429306	0.148597	-9.618668	0.0000

Note: D(GTRADE) is the dependent variable

Diagnostic Tests

The study subjects the estimated ARDL model to some diagnostic tests to ensure that the estimates conform with the assumptions of the Ordinary Least Squares (OLS) estimator. The diagnostic tests result is presented in Table 6. The study observes the absence of serial correlation and establishes that the residuals are homoscedastic and normally distributed. Finally, the Ramsey reset test result indicates that the model has been correctly specified.

Table 6. Diagnostic tests

Test	Test type	Test statistic	P-value
Serial correlation	Breusch-Godfrey Serial Correlation LM Test	1.246	0.331
Heteroscedasticity	Breusch-Pagan-Godfrey	0.446	0.943
Normality	Jarque-Bera test	0.456	0.796
Specification	Ramsey RESET test	2.371	0.140

Stability Tests

To ensure that the parameter estimates are not susceptible to gradual or sudden structural instability, the study subjects the model to a stability test which guarantees the policy relevance of the estimates. The CUSUM and CUSUM of Squares tests for gradual and sudden parameter instability presented in Figures 1 and 2 show that the parameters of the estimated model are stable and there is no evidence of structural breaks since the CUSUM blue lines in the graphs lie in between the significant red lines.

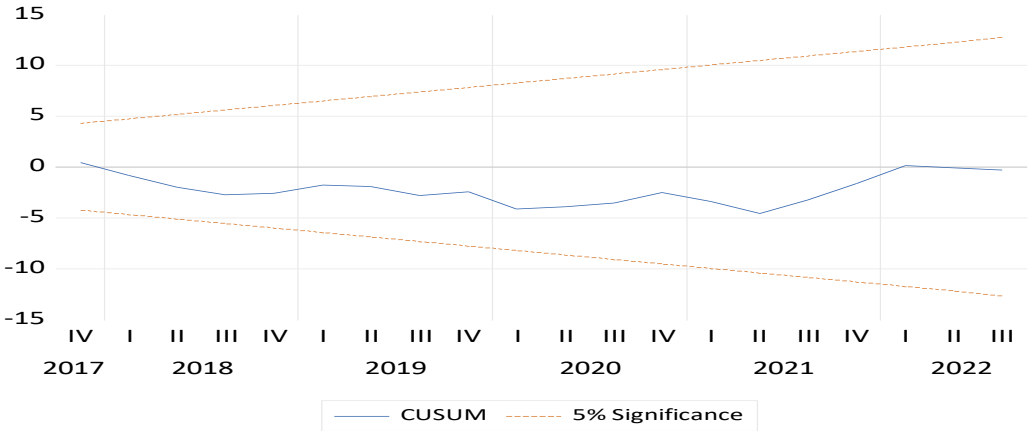

Figure 1. CUSUM test

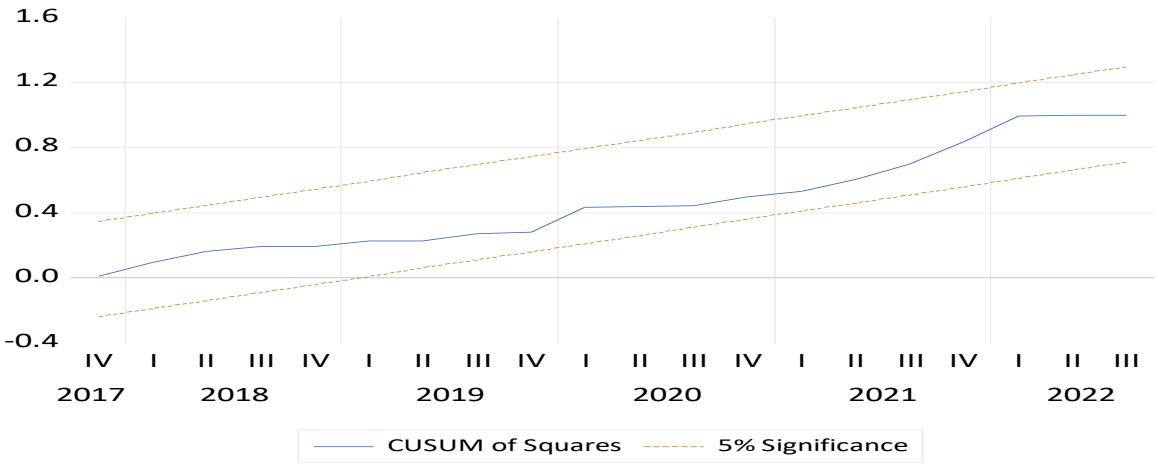

Figure 2. CUSUM of Squares test

CONCLUSION AND POLICY RECOMMENDATION

This study explains the contributions of domestic trade to Nigeria's economic growth and growth sustainability. Developments in Information technology, in the form of increased internet subscriptions; per capita income; trade openness; changes in the exchange rate (Naira per US Dollar); and growth in population were identified as possible influencers of domestic trade performance in Nigeria. The findings of the study show that growth in the country's population and per capita income are among the major factors driving trade growth in Nigeria in short-run and long-run periods. Also, changes in exchange rates positively impact domestic trade growth in the long-run period. Therefore, empirical analysis conducted using the ARDL technique shows that changes in per capita income and population are among the major drivers of trade performance in Nigeria.

Following the results of this study and a review of other countries experiences, the study recommends the following policy actions to help expand domestic trade performance in the country.

i. Improve internet penetration and usage in the country's hinterlands.
ii. Increase awareness through formal/informal education on the benefits of trade networking that accompanies innovations in ICT.
iii. Sustain development trade-enhancing infrastructures across the country; and
iv. For optimal benefits from domestic and international trade to be realised in the economy, the banking sector should take advantage of advancement in information technology in providing adequate online banking services across the country.

However, the study was limited by the availability of data for the period covered.

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