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### The Dynamics of Liberalization: Examining Trends and Growth in Nigeria's Cocoa Trade

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#### Abstract

This study presents an empirical analysis of the impact of trade liberalization on Nigeria's cocoa sector, focusing on changes in production levels and growth rates before and after liberalization periods, from 1980-1984 and 2016-2020, respectively. Utilizing time series data, descriptive statistics and linearized growth rate functions were adopted for the data analysis. The findings show a significant increase in mean cocoa output, from 156,760 tons pre-liberalization to 323,993.6 tons post-liberalization, highlighting enhanced sector productivity. The growth function analysis reveals a

shift from a negative growth rate of -1.193% during the pre-liberalization period to a positive rate of 2.634% post-liberalization. These results suggest that liberalization has fostered a more competitive and productive cocoa sector in Nigeria. Increased private sector involvement and improved market access were crucial factors contributing to this growth. The study underscores the importance of policy support and access to resources in maximizing the benefits of liberalization while addressing challenges such as market volatility and the need for sustainable practices.

**Keywords:** Cocoa, Growth Rate, Liberalization, Output, Production, Nigeria

#### 1. Introduction

Cocoa, as one of Nigeria's primary agricultural exports, has played a significant role in the country's economy historically, particularly in the southwestern region. Initially cultivated in the late 19th century, cocoa farming expanded during the colonial era when it became a major export crop. This agricultural commodity has significantly contributed to Nigeria's GDP and provided livelihoods for millions of rural households (Olagunju, 2016; Oseni *et al.*, 2018)<sup>[7, 11]</sup>. The economic relevance of cocoa in Nigeria cannot be understated. It is not only a vital source of foreign exchange but also a significant employment generator in the agricultural sector (Olutumise *et al.*, 2020)<sup>[8]</sup>. The liberalization of the cocoa trade was expected to catalyze further growth by increasing efficiency through market-driven practices and reducing government controls, which were thought to stifle innovation and investment in the sector (Obi-Egbedi, Hussayn, & Oluwatayo, 2021)<sup>[6]</sup>. Post-liberalization, the cocoa sector saw diverse changes, including fluctuations in production levels due to varying degrees of access to capital and technological advancements. Studies have noted that cooperative membership and access to credit were crucial in enabling farmers to adopt new technologies and enhance their production capabilities (Kolade & Harpham, 2014; Adebayo, 2019)<sup>[5, 1]</sup>. However, despite the potential benefits of liberalized trade policies, challenges such as inadequate access to modern farming techniques and sustainable practices have persisted, impacting overall productivity and growth (Fosu-Mensah, Okoffo, & Mensah, 2022)<sup>[4]</sup>. The shift towards a liberalized trade regime also invited increased investments and perhaps inadvertently, exposed farmers to global price fluctuations and trade dynamics, which have had mixed impacts on their economic stability and growth prospects. Nonetheless, the sector's integration into global markets has provided significant opportunities for economic expansion and improved livelihoods among cocoa farmers, albeit with notable challenges that need to be addressed to fully harness the benefits of globalization (Tsowou & Gayi, 2019; Oluwalade *et al.*, 2023)<sup>[12, 9]</sup>. Again, Nigeria's cocoa sector, once a cornerstone of the nation's agricultural exports, has experienced significant fluctuations in production and trade patterns over the decades. As the world's fourth-largest exporter of cocoa, the performance of this sector is crucial not only for the rural economies that depend heavily on cocoa farming but also for the national economy. The liberalization of cocoa trade, which has been ongoing since the late 20th century, was anticipated to enhance market efficiency and profitability by reducing state control and encouraging private sector engagement (Obi-Egbedi, Hussayn, & Oluwatayo, 2021)<sup>[6]</sup>. Despite these

expectations, the actual impact of trade liberalization on the cocoa sector in Nigeria has been a subject of considerable debate. While some stakeholders argue that liberalization has brought about increased investments and improvements in agricultural techniques (Adejumo & Adejumo, 2022) [3], others contend that it has led to market volatility and economic disparities among smallholder farmers (Tsouwou & Gayi, 2019) [12]. This study seeks to provide an empirical analysis of the trends and growth rates in Nigeria's liberalized cocoa sector, exploring how these dynamics have evolved. Therefore, this study rigorously examines trade volumes, and economic outputs before and after liberalization, aiming to offer a detailed overview of the sector's growth trajectory. The effects of liberalization have varied, with some researchers highlighting increased farmer access to capital and technological innovations as positive outcomes (Kolade & Harpham, 2014; Adebayo, 2019) [5, 1], while others note challenges in pesticide management and the adoption of sustainable practices (Fosu-Mensah, Okoffo, & Mensah, 2022) [4]. By evaluating the contrasting perspectives of increased economic opportunities, this analysis contributes to a nuanced understanding of the effects of trade liberalization policies in Nigeria, specifically within the context of agricultural commodities such as cocoa. The findings of this study are intended to inform future policy directions, ensuring that the benefits of liberalized trade are maximized while mitigating any adverse impacts on cocoa-producing areas (Osabuohien *et al.*, 2020) [10]. The study specifically examines the behaviours of cocoa output before and after the liberalized cocoa trade in Nigeria; graphically examines and compares the trend of cocoa in both periods; and estimates the growth rate of cocoa in both periods.

## 2. Materials and Methods

This study focuses on Nigeria's cocoa sector, with an emphasis on major cocoa-producing regions including Ondo, Cross River, and Osun states. These regions made significant contributions to national cocoa output and their diverse experiences with trade liberalization impacts. This study employs a mixed-methods approach to analyze the trends and growth rates in Nigeria's cocoa sector before and after liberalization. The analysis integrates quantitative data on economic output in the cocoa industry. Data were obtained for two distinct periods: 1980-1984 (pre-liberalization) and 2016-2020 (post-liberalization). The datasets include annual cocoa production volumes. These were sourced from the National Bureau of Statistics, and international trade databases from the Food and Agriculture Organization (FAO) and the International Cocoa Organization. This comprehensive collection provides a historical context and a current snapshot, enabling a comparative analysis of the sector's performance before and after liberalization. Descriptive statistics such as graphs, mean, and standard deviation, and inferential statistics such as a linearized form of the growth rate function.

**Growth Rate Function Model:** The growth function analytical technique was used to estimate the effect of liberalized cocoa trade in Nigeria on the cocoa sector before and after liberalization, for ten years (i.e. between 1980 - 1984 before cocoa trade liberalization, and 2016-2020 after cocoa trade liberalization).

$$Y = b_0 e^{b_1 t} \quad (1)$$

After linearizing in logarithm, equation 1 turns to:

$$\text{Log}Y = b_0 + b_1 t \quad (2)$$

Where:

Y = Cocoa Output (before and after liberalization)

b<sub>0</sub> = Intercept of the trend equation

b<sub>1</sub> = Slope (trend coefficient)

t = time trend variable

The growth rate (r) is given by

$$r = (e^{b_1} - 1) \times 100 \quad (3)$$

Where e is Euler's exponential constant (e = 2.7183)

## Ethical Considerations

The study adhered to ethical guidelines approved by the Institutional Review Board (IRB) of the Federal University of Technology, Akure, Ondo State, Nigeria.

## 3. Results and Discussion

### 3.1 Summary of the Liberalized Cocoa Trade in Nigeria's Cocoa Sector

From Table 1, the mean cocoa output increased significantly from 156,760.0 tons before liberalization to 323,993.6 tons after liberalization. Similarly, the median output increased from 156,000.0 tons to 324,458.0 tons. The maximum output before liberalization was 174,000.0 tons, whereas after liberalization it increased to 340,163.0 tons. The minimum output before liberalization was 140,000.0 tons, which increased to 298,029.0 tons after liberalization. The standard deviation increased from 12,340.50 to 15,935.72, indicating a higher variability in cocoa output after liberalization. Before liberalization, the skewness was slightly positive (0.063735), indicating a near-normal distribution of output. After liberalization, skewness turned negative (-0.867757), indicating that the distribution of cocoa output was skewed to the left. Kurtosis values before and after liberalization were close to 3, suggesting a normal distribution but with slightly flatter tails. The Jarque-Bera test values and associated probabilities indicate that the distribution of cocoa output was not significantly different from normal before and after liberalization. The result indicates that the liberalization of Nigeria's cocoa sector has had a positive impact on cocoa production. The increase in both mean and median output suggests that the sector has experienced substantial growth. The increased variability in output post-liberalization could be attributed to market fluctuations and other external factors affecting production. Adejumo and Adejumo (2018) highlighted that the liberalization of the cocoa sector in Nigeria has led to increased competitiveness and productivity. The shift from government-controlled prices to market-driven prices allowed farmers to earn better income and reinvest in their farms, leading to higher production levels (Adejumo and Adejumo, 2022; Fosu-Mensah *et al.*, 2022) [3, 4]. Also, Osabuohien *et al.* (2021) in their study on the effects of agricultural reforms in Nigeria indicated that liberalization positively affected cash crops like cocoa, leading to increased production and export volumes. They emphasized the role of policy support and access to agricultural inputs as crucial factors. Kolade and Harpham (2014) [5] also discussed the broader economic impact of agricultural liberalization in Nigeria, noting that cocoa farmers benefited

from improved market access and better pricing mechanisms, which incentivized higher production and investment in quality improvement.

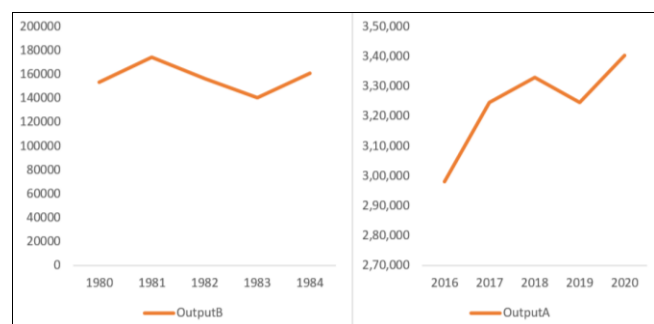
**Table 1:** Summary statistics of cocoa production before and after liberalization

Statistic	Cocoa Output Before Liberalization	Cocoa Output After Liberalization
Mean	156760.0	323993.6
Median	156000.0	324458.0
Maximum	174000.0	340163.0
Minimum	140000.0	298029.0
Std. Dev.	12340.50	15935.72
Skewness	0.063735	-0.867757
Kurtosis	2.259818	2.564465
Jarque-Bera	0.117525	0.667021
Probability	0.942931	0.716404
Sum	783800.0	1619968.
Sum Sq. Dev.	6.09E+08	1.02E+09
Observations	5	5

Source: Author’s Computation, 2024

### 3.2 Trend of the Liberalized Cocoa Trade in Nigeria’s Cocoa Sector

The graphical illustration of the trend in Fig 1 showed a fluctuating trend of cocoa with the highest production recorded in 1981 (174,000 tons) and the lowest in 1983 (140,000 tons) before the liberalization. The average production during this period was relatively stable but did not show significant growth, indicating stagnation in the sector. In post-liberalization, there is a clear upward trend in cocoa production. The output consistently increased from 298,029 tons in 2016 to 340,163 tons in 2020. The steady increase in output indicates that liberalization has positively impacted production capacity and efficiency. The comparison of cocoa output before and after liberalization shows a marked improvement in production levels after the sector was liberalized. This suggests that the reforms and policies implemented during liberalization have contributed significantly to enhancing the productivity of the cocoa sector in Nigeria. It can be deduced that liberalization allowed farmers to benefit from global market prices, which incentivized higher production levels. The results agree with the findings of Osabuohien *et al.* (2021), Adejumo and Adejumo (2022)<sup>[3]</sup>, and Fosu-Mensah *et al.* (2022)<sup>[4]</sup>.



Source: Author’s Computation, 202

**Fig 1:** Trend of Cocoa before and after Cocoa Liberalization

### 3.3 Growth Rate of the Liberalized Cocoa Trade in Nigeria’s Cocoa Sector

According to Table 2, the results before liberalization (1980 – 1984) showed that the constant ( $\beta_0$ ) was 35.341, and the

coefficient ( $\beta_1$ ) was -0.012, indicating a negative growth rate. The  $R^2$  value of 0.056 implies that only 5.6% of the variation in cocoa output can be explained by the model during this period. The F-ratio was 0.178, showing that the model was not statistically significant. The growth rate was -1.193%, indicating a decline in cocoa production during this period. After liberalization (2016 – 2020), the constant ( $\beta_0$ ) was -40.724, and the coefficient ( $\beta_1$ ) was 0.026, indicating a positive growth rate. The  $R^2$  value of 0.694 implies that 69.4% of the variation in cocoa output can be explained by the model during this period. The F-ratio was 6.817, showing that the model was statistically significant. The growth rate was 2.634%, indicating an increase in cocoa production during this period. The results highlight the stark contrast between the growth rates of cocoa production in Nigeria before and after the liberalization of the sector. The negative growth rate of -1.193% during this period before liberalization suggests that cocoa production was on the decline. This can be attributed to several factors, including government control over the pricing and marketing of cocoa, lack of investment in the sector, and poor access to inputs and technology. In the case of after liberalization (2016 – 2020), the cocoa sector experienced a significant turnaround with a positive growth rate of 2.634%. This improvement can be linked to the liberalization policies that encouraged private sector participation, improved market access, and better pricing mechanisms. The liberalization of the cocoa sector in Nigeria led to increased productivity and competitiveness, which are reflected in the positive growth rates observed post-liberalization (Olagun, 2016; Obi-Egbedi *et al.*, 2021)<sup>[7, 6]</sup>. The study of Tsowou and Gayi (2019)<sup>[12]</sup> noted that market liberalization provided cocoa farmers with better access to inputs and international markets, significantly boosting production and growth rates. Adebayo (2019)<sup>[11]</sup> and Adetarami *et al.* (2022)<sup>[2]</sup> emphasized the role of liberalization in enhancing the efficiency and productivity of the cocoa sector in Nigeria, leading to sustainable growth and development. In conclusion, the liberalization policies implemented have fostered a more competitive and productive environment. By enabling private sector participation and providing farmers with better access to resources and markets, these reforms have played a crucial role in reviving Nigeria's cocoa sector.

**Table 2:** Results of Growth Rate Function before and after Cocoa Liberalization

Variable	Constant ( $\beta_0$ )	Coefficient ( $\beta_1$ )	$R^2$	F-ratio	Growth rate (%)
Before Liberalization (1980 – 1984)	35.341	-0.012	0.056	0.178	-1.193
After Liberalization (2016 – 2020)	-40.724	0.026	0.694	6.817	2.634

Source: Author’s Computation, 2023

### 4. Conclusion and Recommendations

The empirical analysis conducted on the liberalization of Nigeria's cocoa trade from 1980-1984 and 2016-2020 has demonstrated significant changes in the sector's dynamics. The transition from government-controlled to market-driven practices has markedly increased cocoa production, with output rising from an average of 156,760 tons before liberalization to 323,993.6 tons afterward. The growth function analysis highlighted a transformative shift in

growth rates, from a negative -1.193% before liberalization to a positive 2.634% afterward. This improvement indicates that liberalization has successfully enhanced the competitiveness and productivity of the cocoa sector. The increased variability in output and the shift from slightly positive to negative skewness in distribution post-liberalization suggest that while the average production has increased, so has the unpredictability of year-to-year output. This variability could reflect the sector's heightened exposure to global market forces, which, while beneficial in good years, can pose risks during market downturns. Based on this, the government should sustain and build upon the gains from liberalization, and policymakers must implement supportive measures that can mitigate the risks associated with market volatility. This includes establishing price stabilization funds and offering crop insurance to protect farmers against unforeseen downturns in the global market. Also, the study has shown that access to capital and modern agricultural technologies are pivotal for cocoa farmers to increase productivity and maintain competitiveness. Government and financial institutions should provide more accessible loan facilities and subsidies for advanced farming equipment and high-quality seeds. With the shift towards market-driven practices, there is a need to ensure that cocoa production remains sustainable. This involves promoting environmentally friendly farming techniques and better pest management practices, as highlighted by the persisting challenges in pesticide management (Fosu-Mensah, Okoffo, & Mensah, 2022)<sup>[4]</sup>. Educating farmers about best practices in cocoa cultivation and market dynamics is essential. Further development of farmer cooperatives could also help in pooling resources, sharing knowledge, and negotiating better terms in the marketplace, thereby enhancing the collective bargaining power of cocoa producers. Lastly, to adapt to the ever-changing global market conditions, continuous monitoring and evaluation of the cocoa sector's performance post-liberalization are necessary. This will help in understanding the long-term impacts of liberalization and adjusting policies accordingly.

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