REVIEW OF MARKETING BOARD POLICY: COMPARATIVE ANALYSIS OF COCOA PRICING ERAs IN NIGERIA

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Abstract

The study focuses on reviewing the marketing policies with the specific interest in comparing the price of cocoa during marketing board era with that of the post-marketing board era. The study objectives include examining the prevailing economic situations; comparing the producer and consumer prices during the two eras; and evaluate the effect of the two marketing board eras on cocoa production. Time series data for the period 1966 to 2009, were sourced from Cocoa Research Institute, Ibadan, FAOSTAT and Annual Bulletin of Statistics of the National Bureau of Statistics. Descriptive statistics, Trend analysis and Co-integration Analysis were used to analyse the data. The result revealed that that there is trend in the cocoa production during the marketing board era as compared to the post-marketing board era. This is attributed to the increase in the prices experienced in post marketing board era. The study also established that during the marketing board era, prices and marketing margins affected the production of cocoa. The marketing board era had positive impact on the cocoa production although the trend analysis revealed the post marketing era has higher production. Thus the study recommends that Government and cocoa farmers should learn from the price stabilization mechanism of marketing board era. The government should move away from direct involvement in running the economy such as the marketing of cocoa.

Keywords: Marketing Board, Cocoa, Price and Co-integration Analysis

Introduction

Nigeria though depends largely on the oil industry for its budgetary revenue, is still predominantly an agrarian society. The agricultural sector in periods immediately after the independence performed outstandingly these roles, to such an extent that the regional development witnessed during that period was attributed directly to the sector. During the early nineteen-seventies, Nigeria experienced growth rates of 8% -10% per annum, while the increase in agricultural production declined to around 4% per annum towards the end of the decade. The slow growth continued into the nineteen-eighties, with output rising by only 3.4% in 1981 and by 2.7% in 1982. The effects of drought and the government's austerity program resulted in severe 9.4% fall in agricultural output in 1983. However, a succession of good harvests, higher producer prices, reductions in cereal imports and a resurgence of public and private investment in crop production resulted in a sharp recovery in production (FAO, 2001). Prior to the oil boom of the mid- 70s, Cocoa was the highest foreign exchange earner

in Nigeria and according to Olatunbosun and Olayide (1972) and has remained a valuable crop among agricultural commodity of the country (ogunleye and Oladeji, 2007). In recent years, more and more of the raw beans are utilized within Nigeria for the manufacture of various chocolate and confectionery products, thus boosting industrial growth and generating employment and income (Awopetu, 2001). Cocoa exports have also been a significant contributor to economic growth of Nigeria and as at 1993, according to Titilola (1997), Nigeria was the fourth largest producer of Cocoa in the world, ranking after Ivory Coast, Brazil and Ghana. Cocoa accounted for over 90 percent of non-oil exports in 1985. Producers' price tripled between the 1985 and 1986 harvest and the 1986 main harvest after the Cocoa Board had previously set prices close to world prices at the official exchange rate. The reorganization of the marketing boards in 1976 gave rise to the creation of seven different commodity boards. They are cotton, grain, palm produce, groundnut, rubber, root and tuber crops boards (Idachaba and Ayoola, 1992). Until June 1986, when the commodity boards were scrapped, the marketing and exporting of agricultural produce Nigeria was mainly monopolized by the commodity boards. One of these boards is the Nigeria cocoa board for the cocoa produce in Nigeria. Prior to introduction of Structural Adjustment Programme (SAP) in 1986, Joshua (2001) specified that Nigerian cocoa beans were exported exclusively by Nigerian Cocoa Board (NCB). In terms of mode of operation, the board had the statutory responsibility to procure cocoa beans locally and export. In doing so, it created and maintained a structure of local buying agents (LBA) for the sole aim of aggregating cocoa beans from farmers in the producing areas .The boards appointed License Buying Agents (LBA) who could either be companies, individuals or cooperative societies to purchase, bag, store, grade and transport to the boards' port stores.

According to Kolawole (1971), the operations of the marketing board era were criticized on the grounds that the system had failed to provide incentives to farmers to increase production. The first progress report on the current 1970/1974 development plan indicates that the system (marketing board era) as presently operated discourage increase efforts and production by the farmers .The stagnation in the output and export of some cash crops is attributed to the marketing board system. As a result of the inefficiencies in the commodity boards system and following structural changes in the Nigeria economy in the mid-eighties, the marketing board structure was abolished by the Federal Government of Nigeria in 1986 and this gave rise to free market operations. Under the new marketing system, Farmers sell to private entrepreneurs who performed various marketing functions in the Nigeria cocoa economy. Consequently, the prices at which cocoa and other cash crops farmers in Nigeria are able to sell their produce to a large extent now depend on how they respond to both local and global demand in the cocoa industry (Olubanjo et al, 2009). The principal objective of the new policy (post marketing board era) which started form 1988 is to increase the production of agricultural exports .The purpose instrument for achieving this objective is an increase in the proportion of world price paid to producers. According to the federal government, the reasons for these changes is primarily to offer relatively high producer prices to our farmers and encourage them to increase their production of cocoa (Kolawole, 1971). Yet the production and export of cocoa is still stagnant and producer income is still relatively low, hence there is a need for the assessment of cocoa marketing. Considering the above, there is need to

compare the marketing board era and the post marketing board era. This study therefore examine the economic and the prevailing situations of both marketing board and post marketing board era, compare the producer price and the consumer price of marketing board era with the post-marketing board era and evaluate the effect of the marketing board eras on cocoa production.

Methodology

The study was conducted in the Federal Republic of Nigeria. The set of data for this study was time series data from secondary sources. The data collected were for the period of 1966 to 2009. This data were obtained from Cocoa Research Institute; Ibadan, FAOSTAT, annual bulletin of statistics on cocoa and relevant published materials such as journals, books e.t.c.

Three major tools of analysis were employed in this study. They are descriptive statistics, trend analysis and co-integration analysis.

Trend analysis was used to compare the producer price and the consumer price of marketing board era with the post-marketing board era. Estimation of the trend line used in this study involves the use of least square method used to decide whether there is a statistically significant trend in price over time in the two eras. The Ordinary Least Square (OLS) equation is;

$$Yt = \alpha + \beta t + et, \quad t = 1,2,\ldots,44$$

Where: t = time, Yt = trend values with respect to time (t), Et =error term, which is assumed to be identically and independently distributed with mean zero and constant variance, that is et ~ NIID ($0.\sigma^2$). The test statisticP_s is used as a measure of significance of trend. In fact, this test statistic is used to test the null hypothesis, H_0: There is no monotonic trend. P-value is the probability which determines the appropriateness of rejecting the null hypothesis in a hypothesis test. P-values range from 0 to 1. The commonly used significance level is $\alpha = 0.05$. If the P-value is less than the α, the null hypothesis is rejected. In this case, the null hypothesis is that there is no trend in the data. A p-value less than 0.05 shows that the trend is significant; the smaller the p, the more significant the trend.

Co-integration process evaluates the effect of marketing board eras on cocoa production. This process integrates short-run dynamic with long run equilibria (Maddala, 2001). Co-integration analysis as it was developed by Granger (1981), elaborated in Engle and Granger (1987), adapted and used by Obasi (2007) and Olubusoye and Oyeromade (2008) firstly involves the test for unit root or stationary test. The augmented Dickey-fuller (ADF) test was used for the test. The ADF F-ratio critical value was used to make decision on the stationary of the variables. The Johansen technique was used to test for co-integration in the model. Johansen technique was used not only because it is vector auto –regressive based but because it performs better in multivariate model. The model is shown as follows:

$$LY_t = \beta_0 + \beta_1 LX_{1t} + \beta_2 LX_{2t} + \beta 3 + LX_{3t} + e_t$$

Where;

Y_1 = output (cocoa production), X_1 = price, X_2 = export rate, X_3 = market margin, t = Time

e_t = error term .The error term was tested for unit root for reconfirmation of co-integration.

Result and Discussion

Descriptive Statistics:

Table 1 describes the producer price, the consumer price, export rate, output and market margin with their corresponding minimum, maximum, mean and the standard deviation values for the overall data. It shows the various levels of marketing board era and post marketing board era base on the producer and the consumer prices.

Table 1: Descriptive statistics of marketing board era and post marketing board era

Source: Calculated result from secondary data from FAOSTAT, 2012 and Annual Bulletin of

	N	Minimum	Maximum	Sum	Mean	Std. deviation
Model	22	120	7500	26357	1198.05	1602.782
Model	22	1100	2431785	4717519	214432.70	504237.530
Model	22	1	75	348	15.82 348	17.248
Model	22	85	3558.96	31874.72	1448.8509	1062.27845
Model	22	119	7425	26009	1182.23	1585.905
Model	22	1015	2429091	4685645	212983.85	503781.001
Model	22	60964	159503	2312179	105099.05	23333.119
Export rate for post marketing board era	22	108773	310176	4258802	193581.91	48195.665
Output for marketing board era	22	1299519	1638372	33983474	1544703.36	88401.645
Output for post marketing board era	22	1643378	1713787	37006104	1682095.64	21915.086
Valid N (list wise)	22					

Statistics on Cocoa, Coffee and Tea, 1984

Trend Analysis of Cocoa Prices

Figure 1 shows that prices of cocoa stabilized for the years 1971, 1972 and 1973 at ₦297. It is also stabilized for the years 1977, 1978, 1980, 1981and 1982 at ₦1300. From 1982 to 1987, the stability begins to reduce and the prices increases drastically. The price peaked around 1973 to 1985.

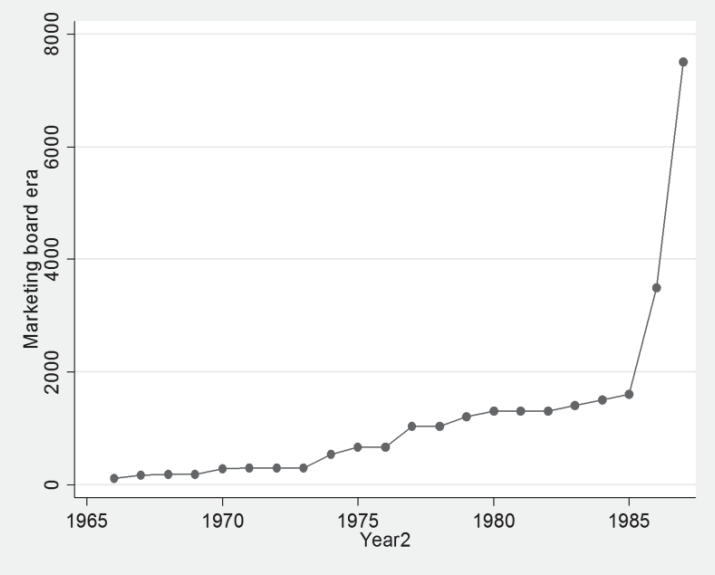

Figure 1: Price of cocoa during the marketing board era

The figure shows that prices of cocoa stabilized for the years 1971, 1972 and 1973 at ₦297. It is also stabilized for the years 1977, 1978, 1980, 1981and 1982 at ₦1300. From 1982 to 1987, the stability begins to reduce and the prices increases drastically. The price peaked around 1973 to 1985.

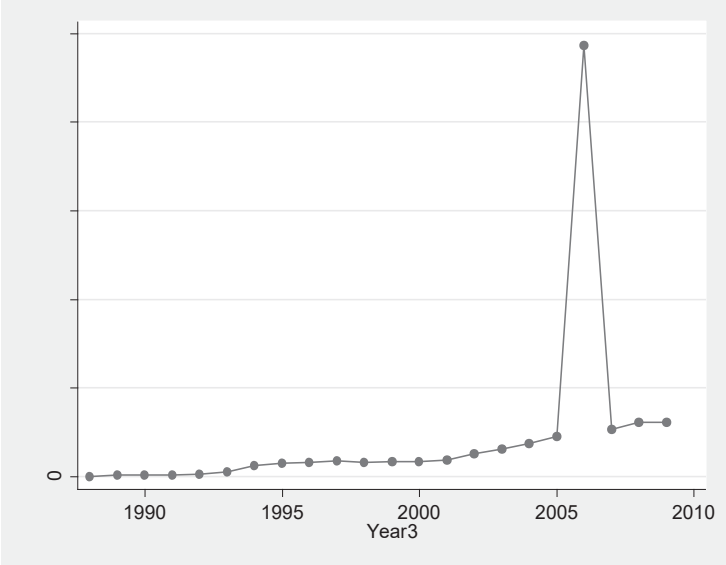

Figure 2: Price of cocoa during Post-marketing board era

Prices here are not stable in between years but the price reached the peak in 2006 at the rate of ₦2, 431,785. This may be due to political changes because the government as at that time introduced SAP and the exchange rate changed which led to the high value of dollar and thus has a nominal high increase in the price of cocoa.

Table 2 Producer Trend Analysis

Coefficients (a)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta	B	Std. Error
(Constant)	-146837.614	105094.745		-1.397	.170
Year	11317.911	4067.760	.395	2.782	.008

a Dependent Variable: Producer price

$Y_t = \alpha + \beta t + e_t$,

$\hat{Y}_t$ = -146837.614 + 11317.911t (trend line)

Hypotheses:

H_0: No trend in the data versus H_1: Not H_0 (there is trend in the data)

Decision rule: reject H_0 if p-value is less than 0.05, otherwise do not reject.

Decision: since the p-value is less than 0.05 we reject H_0.

We therefore conclude that there is linear relationship between the producer price and the period of occurrence. This means there is trend relationship in the data.

Table 3: Consumer Price Trend Analysis

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	-778.519	178.984		-4.350	.001
	Year	67.149	6.928	.831	9.693	.001

a Dependent Variable: Consumer price

$Y_t = \alpha + \beta t + e_t$,

$\hat{Y}_t$ = -778.519 + 67.149t (trend line)

Hypotheses:

H_0: No trend in the data versus H_1: Not H_0 (there is trend in the data)

Decision rule: reject H_0 if p-value is less than 0.05, otherwise do not reject.

Decision: since the p-values are less than 0.05 we reject H_0 and accept H_1.

We therefore conclude that there exist a linear relationship between the Consumer price and the period of occurrence. This means there is trend

Table 4: Marketing board trend analysis

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	-804.571	513.718		-1.566	.133
	Time2	174.141	39.114	.706	4.452	.001

a Dependent Variable: Marketing board era

$Y_t = \alpha + \beta t + e_t$,

$\hat{Y}_t$ = -804.571+ 174.141t (trend line)

Hypotheses

H_0: No trend in the data versus H_1: Not H_1 (there is trend in the data)

Decision rule: reject H_0 if p-value is less than 0.05, otherwise do not reject.

Decision: since the p-values is less than 0.05 we reject H_0.

Conclusion; it is therefore concluded that there exist a linear relationship between the marketing board and the period of occurrence. This then means there is trend

Table 5: Post marketing board trend analysis

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	-156263.236	207472.709		-.753	.460
	Time2	32234.429	15796.702	.415	2.041	.055

a Dependent Variable: Post marketing board era(Producer)

$Y_t = \alpha + \beta t + e_t$,

$\hat{Y}_t$ = 156263.236 +32234t (trend line)

Hypotheses

H_0: No trend in the data versus H_1: Not H_0 (there is trend in the data)

Decision rule: reject H_0 if p-value is less than 0.05, otherwise do not reject.

Decision: since the p-values (0.055) is not less than 0.05 we accept H_0.

We therefore conclude that there is no trend under the post marketing board era.

Comparing the two trends; Marketing and post marketing board era, it was discovered that there is no trend in the post marketing board era and there exist trend in the marketing board era. This is due to increase in the price of post marketing era over the years.

Co-Integration Test:

Table 6: Result of stationary test from Augmented Dickey-Fuller Test

Variables	Level	1st difference	2nd difference	Order of integration	Decision
LY	-1.962753	-3.600987***	-3.605593***	I (1)	Non-stationary
LX_1	-0.976467	-3.596616***	-3.605593***	I (1)	Non-stationary
L X_2	-5.338928	-3.605593***	-3.610453***	I (0)	Stationary
L X_3	-1.528066	-3.596616***	-3.610453***	I (1)	Non-stationary
LX_4	-5.351415	-3.605593***	-3.610453***	I (0)	Stationary

Note: L denotes log; critical value: 1% = -3.601081, denotes by ***

Variables Y, X_1 and X_3 exhibit unit root at the level that is they are non-stationary. But at first differencing, they all became stationary at 1%. The differencing is needed in order to avoid having a spurious regression. Since the differenced variables are stationary, there is co-integration between the variables; this means that there is a long run relationship between the output, era and export rate.

The other two variables that does not exhibit unit root at the level that it that are stationary are therefore lagged to also avoid spurious regression. After lagging the lagged values of price and market margin positively affect the output of cocoa over the marketing board eras.

Table 7: Johansen Co-integration result

Hypothesized No. of CE(s)	Egien value	Trace statistics	0.05 critical value	Prob.**
None *	0.550473	70.66466	69.81889	0.0427
At most 1	0.432474	37.08314	47.85613	0.3436
At most 2	0.172179	13.29146	29.79707	0.8778
At most 3	0.104300	5.355220	15.49471	0.7700
At most 4	0.017206	0.728930	3.841466	0.3932

Trace test indicates 1 co-integration equation(s) at the 0.05 level. *denotes rejection of the hypothesis at the 0.05 level

There are four co-integrating (CI) equations in the analysis. Only one of the CI equations was chosen. The CI equation chosen was based on the conformity of the coefficients with the economic theory and its statistical significance. From the equation all the independent variables are significant in determining output (cocoa production) in Nigeria during the period studied. X_1 is significant at 1%, X_2 is significant at 10%, X_3 is significant at 1% and X_4 is significant at 5%. Therefore, the variables are positively co-integrated because the independent variables determine the output of cocoa production at different percentages as mentioned above respectively. The marketing board eras therefore have positive effect on cocoa production.

Table 8: Co-Integration Regression Result

Variables	Coefficient	Standard error	t-statistics	Probability
ERA(-1)	1232251.	204561.6	6.023865	0.0001
PRICE	-305.4267	86.95481	-3.512476	0.0011
EXPORT RATE(-1)	-0.700788	1.797778	-0.389808	0.6988
MARKET MARGIN	305.5214	87.04421	3.509956	0.0011

R-squared=-16.992722; Adjusted R-squared =-18.376777; S.E of regression=404255.6

Lagged value of era, price and market margin affect the output rate of cocoa. That is the previous rate has positive impact on the present rate. The lagged change in export rate has negative effect on the output rate. The era of the marketing board, price and market margin are all significant also1%. The implication of this is that the marketing board era has positive impact on the output of cocoa than the post marketing board era. Although from the descriptive statistics the maximum output of the marketing board era is lower than that of the post marketing board era, it still does not mean that post marketing board era is better than the marketing board era. The standard deviation of the marketing board era is more than that of the post marketing board era. This shows that the marketing board era determines cocoa output positively.

Conclusion and Recommendations

The study also establishes that marketing board era, prices and marketing margins affect the production of cocoa production. It was also discovered that though not significant, export rate affects the output of cocoa negatively. The marketing board era has positive impact on the cocoa production although the trend analysis revealed the post marketing era has higher production. Based on the analysis of this study, there are opportunities to be developed as a nation if the cocoa farmer focuses on maintaining a relatively increasing cocoa production as cocoa is one of the non-oil export commodity in Nigeria. Cocoa production (output) can be increased if there is stability of prices. Cocoa production can also be affected by the export rate and market margin. Thus the study recommends that Government and cocoa farmers should learn from the price stabilization mechanism of marketing board era but that the exploitative factors of its should not be emulated to allow the farmers to experience and reap the benefit of higher output. The government should move away from direct involvement in running the economy such as the marketing of cocoa. To this end, programs and policies that will help to increase cocoa production should be incorporated, well organized and monitored. Likewise, programs and policies that will help to check and stabilize the price of cocoa output should be employed.

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