Factors Influencing the Competitiveness of Cocoa Export of Ghana and Its Implication on Ghana's Economy

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Abstract
This study examines the competitiveness of Ghana's cocoa by assessing the performance and determinants of cocoa export from Ghana. Competitiveness of the country in cocoa exports was assessed using the Pearson's Correlation model and Linear Regression model using SPSS and STATA respectively. Time series data on Ghana's cocoa production and exports and GDP from 2000 to 2014 were collected and analyzed using Pearson Correlation Statistics that were adopted in SPSS. The first analysis was to find the relationship between total cocoa products exports in US$ (including raw cocoa beans and processed cocoa products) and factors such as the real world prices of cocoa (US$/MT) between 2000 and 2014, the gross domestic product of Ghana, the amount of Cocoa beans produced (in tonnes) and processed cocoa exports. The outcome of the analyses revealed that Ghana has comparative advantage in the exportation of cocoa, that Ghana is highly competitive in exports of cocoa beans, total cocoa products and processed cocoa exports. In spite of improvements observed in the country's export performance over the past three decades, there is potential for further improvement, based on the SPSS and STATA results. The study proceeds to propose measures eminent in ensuring robust cocoa production and consequential exports.
Keywords：Competitiveness, cocoa export, determinants, real world price, gross domestic price.
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1. Introduction
Until 2018 fiscal year, the performance of cocoa export from Ghana has narrowed in recent decades with slow and uneven progress. A study by Boansi (2013) however found that there is potential for further improvement to ensure a robust cocoa production in Ghana. This production setback may be due to lack of investment in productivity and enhanced innovations. Ghana could not really achieve this through efficiency; security and technology Efficiency and productivity go hand in hand. This implies that security measures must be implemented so as to affect workers as minimally as possible. Technology has great potential to boost the productivity of workforce. While technological upgrades might be more expensive investments to make, they're often the ones that will see the most reward in productivity and performance and enhance innovation. Cocoa belongs to the family *steruliacaca* and genus *theobroma*. It is a perennial tree crop grown in tropical climates, with 70 per cent produced by smallholder farmers in West Africa. One cannot think of Ghana without thinking of its cocoa sector, which offers livelihoods for over 700,000 farmers in the southern tropical belt of the country. Since the introduction of the crop into Ghana in about 1876, by Tetteh Quarshie, (Essegbey, and Ofori-Gyamfi 2012), it has grown to become a major export crop. Developing and sustaining subsectors on which a country's agriculture strongly depends have been the effects indicated by various regimes in most of the developing countries worldwide. Such effects are indicated in quest of elevating food security, minimizing poverty and earning foreign exchange through exports as against draining of it through imports. A very important subsector (and commodity) that holds much respect in this regard in Ghana is cocoa. Dramatic changes in the cocoa subsector prior to initiation of the Economic Recovery Program (ERP) and thereafter, have been the primary reasons underlying the declines and improvements observed in Ghana's agriculture sector for the past five decades (Sharma and Morrison 2011). The country had its biggest cocoa harvest in history, over 700,000 tonnes, in 2004. The record-setting yield was the result of the mass spraying and the introduction of high-tech in cocoa production policies of the Government. These, coupled with the upturn in the prices on the international commodity market, yielded the record 1.1 billion dollars in revenue and also the introduction of the new feature on the agricultural front the "Presidential Special Initiative", which was aimed at diversifying agriculture, increasing exports and generating employment. By virtue of its immense contribution to the agriculture sector and the economy as a whole, cocoa has been described as the backbone of Ghana's economy (Osei 2007), with Lundstedt and Pärssinen (2009) topping it up with the title "Cocoa is Ghana, Ghana is Cocoa". Beside its contribution to Ghana's agricultural gross domestic product and foreign exchange, cocoa has been and continues to be a major source of income to over 800,000 farmers and many others engaged in trade, transportation and processing of cocoa (World Bank, 2011). Beyond Ghana, cocoa provides livelihood for millions of smallholder farmers in over 50 countries across Africa, Latin America, the Caribbean and Asia (Kaplinsky, 2004; World Bank,

2011).

Ghana is the second largest producer of cocoa in Africa, producing about 18 percent of the total world production behind Ivory Coast 35 percent (Tawiah 2015). In 2015, the production capacity of cocoa in Ghana had reached about 850,000 metric tons per annum, an increase of 110,000 metric tons from year 2014 production level. The cocoa sector in Ghana has not seen absolute success. After manifesting as one of the world's leading producers of cocoa, Ghana experienced a serious decline in production in the 1960s and 1970s, and the sector nearly subsided in the early 1980s. Production steadily convalesced in the mid-1980s after the introduction of economy wide reforms, and the 1990s marked the beginning of a revival, with production nearly doubling between 2001 and 2003.
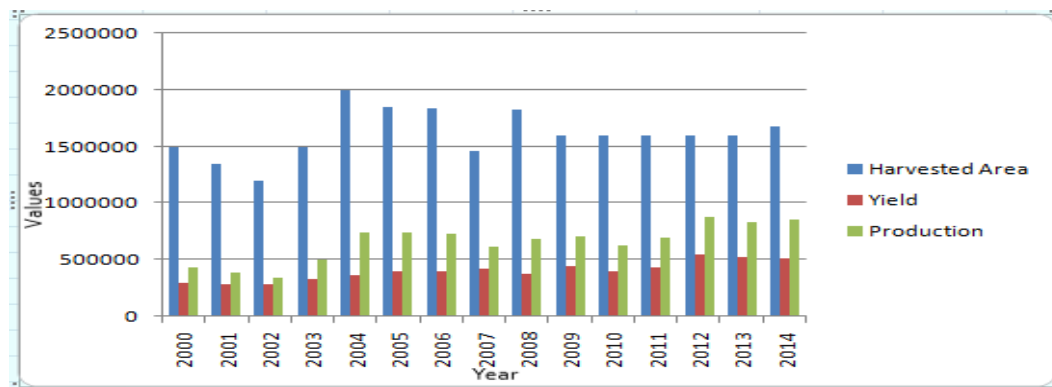

Figure 1. Trends in cocoa production, harvested area and yield)
Source: Author's construct with data from FAOSTAT.

Cocoa has long played a vital role in Ghana's economic development and remains an important source of employment to most folks in the rural community. Cocoa remains the country's most important agricultural export crop, accounting for approximately 23% of total export earnings (ICCO, 2012) and 11% of agricultural gross domestic product (GDP). The importance of the cocoa subsector to poverty reduction in the country cannot be underestimated.

In quest of improving the country's potential and competitiveness in export of cocoa, farmers are presently incentivized through increased share in export price (net f.o.b. price) among other bonuses, and measures are in place to help achieve the country's medium term objective of processing at least 40% of cocoa output locally (thus increasing value addition) (Sharma and Morrison 2011). To achieve these goals, there arises a need to analyze past and current performance of the country in export of cocoa and to identify and assess the magnitude and effects of key drivers of cocoa exports for the country. Identification of the magnitude and effects of such drivers would help optimize benefits from current boosters and mitigate adverse influences from inhibitors. Analyzing the export performance of the sub-sector would help provide information on how efficient and effective policies in relation to competitiveness have been so far. Findings from the current study could be useful to farmers as well as prospective investors for agribusiness planning.

2. Literature Review

Competitiveness can be defined as the ability to face competition and to be successful when facing competition (Latruffe 2010). By his definition, competitiveness is then the ability to sell products that meet demand requirements (price, quality, quantity) and, at the same time, ensure profits over time that enable the unit under study (Nation or firm) to thrive. Competition does occur either on the local markets (in the case of firms) or on the international market (if comparisons are made between countries). Competitiveness is a relative measure (Latruffe 2010). A nation's ability to compete with other nation is based on their merit when compared with the other nation, thus based on classical absolute advantage theory. The differences in every nation's resources and the cost of production encourage trading. A country trains its labor force to specialize in the production of a good if the country will yield benefits and profits. Europe, Asia, the USA, and Africa uses lots of the methods involved in competitive markets in their work force. Such methods include the real exchange rate and purchasing power parities. During the assessment of RCA for several food groups produced in Bulgaria and in the Czech Republic in comparison with the EU15 in 1997, (Gorton et al. 2000) discovered that none of the countries was competitive when it comes to most arable crops and dairy products, while niche products such as jams (Bulgaria) and beer made from malt (Czech Republic) were more competitive. This discovery was attributed by the authors to the use of domestic export impediments by the EU and may thus not reflect true competitiveness. In comparing the competitiveness of the agriculture and Agri-food sector for the Mercosur bloc and the EU between 1993 and 1999, focusing mostly on products that are highly protected by either region, (Mulder et al. 2004) using RCA measure found that, Mercosur bloc succeeded in exporting products in which it has high competitiveness, despite the

protection rates. This discovery was primarily for products that benefit from a high tariff and non-tariff protection from the EU. By these two works visited so far, it is noted that the RCA helps in measuring trade flows among countries/regions based on differences in cost advantage and the likely effect of trade policy measures on trade flows. The RCA measure according to Nwachukwu et al., (2010) could be made symmetric by obtaining an index called "Revealed Symmetric Comparative Advantage (RSCA)". This is computed as (RCA-1/RCA+1) and it varies from -1 to +1. In applying this measure to assess the competitiveness of cocoa exports from Nigeria, (Nwachuku et al. 2010) found that, Nigeria has been highly competitive in export of cocoa over the scope of their study. The level of competitiveness increased sharply between 1990 and 1995. This was attributed to the positive response with robust export policy of the country during that period, triggered by the Structural Adjustment Policy. There have been diverse suggestions on the determinants of exports (be it cocoa or other agricultural commodities) in terms of their magnitude and effects. Some of such suggestions have been complementing, while others are contrasting. For example, several cross-country studies found support for the hypothesis of a negative relationship between FDI and export (Jeon 1992), yet (Sharma 2000) does not see any statistical significant impact of FDI on Indian exports. Studies by Cabral (1995) and Blake and Pain (1994) contrastingly showed that, FDI actually has a positive effect on export performance of host countries. Pfaffermayr (1996) found a significant positive effect of FDI on export. However, in their studies on "Determinants of export structure of countries in Central and Eastern Europe", Hoekman and Djankov (1997) found an insignificant effect of FDI on export. The role of FDI on export promotion has in empirical literature therefore been found to be highly controversial. The role of FDI in export promotion in developing countries depends crucially on the motive for such investment (Majeed and Ahmad 2006). If the motive for such investment is to capture domestic market (tariff-jumping type of investment), it may not contribute to export growth, but if such investment is made with an export-oriented motive (due to comparative advantage of the recipient country), then it may contribute to export growth.

In their investigation of the determinants of cocoa, coffee and banana exports from Cameroon, (Gbetnkom and Khan 2002) found that the response of export supply of all the crops to relative price changes is positive, but fairly significant. This observation is attributed among other things to (Ngouhouo and Makolle, 2013) the price constraining nature of international markets for these commodities. Musila (2004) analyzed the impact of the common market for Eastern and Southern Africa on Kenya's export and found that, export is associated with high volume exported and not high price for the product. The price of exports on the international market has however been proven to be one of the main determinants of export growth, especially in countries whose economy is strongly founded on exportation of agricultural commodities. A fall in the relative domestic prices due to exchange rate depreciation makes exports cheaper   in international markets resulting in increased demand for exports (Majeed and Ahmad 2006). Sharma (2000) discovered that the demand for Indian exports increased when its export prices fell. On this, he argued that the appreciation of the Indian Rupee at one time adversely affected Indian exports. In studying "Manufactured export promotion in a semi industrialized economy" with Brazil as the case study country, Tyler (1973) suggested that the success of Brazilian industrial exports is a function of several independent variables including real exchange rate and tax incentives. In regressing export growth on real exchange rate, TOT and lagged export growth, (Musinguzi and Obwona 2000) found that export growth in Uganda is significantly and positively affected by its previous growth and terms of trade, but is not significantly affected by real exchange rate. Similarly, Ngeno (1996) using export growth function of output and real exchange rate found that both variables significantly affect export growth in Kenya. Fosu (1992) noted that the real exchange rate (RER) of a domestic currency does not influence the economy's agricultural exports directly, but instead influences agricultural exports through its effects on the incentive structure. In contrast to foreign demand, which is believed to stimulate export, a huge domestic demand impedes an increase in export of the related commodity. Ball et al., (1996) showed that at relatively high level of domestic demand, the quantity of resources devoted to export is lower, adding that, at lower domestic demand the surplus production leads to increased export volume. He further explained that higher level of production is the main cause of export expansion since the surplus output is what is exhausted on the international market. Nwaru and Imonikhe (2010) revealed in their study that the coefficients of total world volume, exchange rate of the Nigerian currency (Naira) against the dollar and Nigerian cocoa production (output) are statistically significant; thus explaining 70.3 percent of the variability in the export of cocoa from Nigeria as confirmed by the R2 estimate. This also means that they are the major determinants of cocoa export. By implication, any one percent increase in the total world export triggers an increase in Nigeria's cocoa export by 3.82 percent. This result is similar to that of Kumar et al (2008) in their study on determinants of cucumber and Gherkin export from India. In line with a prior expectation, Nigeria's output of cocoa was also highly significant, precisely at one percent risk level. This is not surprising given the fact that Nigeria occupies the fourth position in the world in terms of cocoa exportation. This confirms our earlier result that Nigeria has comparative and competitive advantage in cocoa production and export. Exchange rate though significant has a negative coefficient and thus reflects declining productivity of Nigerian economy within the period under study. Having observed a positive association between cocoa exports and increasing exchange rate, it is believed that devaluation or depreciation of the Ghana cedi against major currencies could further provide room for increasing

export. This could however have adverse effect on sectors that depend mostly on imports for operation (such measures should therefore be meted out with caution) and also implementation of such policies if recommended will improve the performance of cocoa export of Ghana.

3. Data and Methodology.

3.1 Source of Data

Data were obtained from secondary sources. They include the agricultural production database of FAO (FAOSTAT), the International Cocoa Organization (ICCO; for stock/grindings ratio and real world price), the United Nations Conference on Trade and Development (UNCTAD; for exchange rate and Foreign Direct Investment), data from the IMF's data world hub (www.imfdata.org) and the UN's UNDSTAT data hub, data from Ghana production of cocoa beans and cocoa products were obtained from the Ghana Investment Promotion Centre (GICP).

3.2 Model

The first analysis was to find the relationship between total cocoa products exports in US$ (including raw cocoa beans and processed cocoa products) and factors such as the real world prices of cocoa (US$/MT) from 2000 to 2014, the Gross domestic product of Ghana, the amount of Cocoa beans produced (in tonnes) and processed cocoa exports. The Pearson bivariate correlation analysis was suitable due to the small quantity of our observations, and moreover, since the data are all scale in nature, comparing their respective relationship would give a clear indication of the extent to which a change in one variable results in the other. The correlation coefficient expresses the strength of the relationship on a scale, ranging from -1 to $+1$. A positive value close to $+1$ indicates a strong positive relationship, in which an increase in one variable implies an increase in the value of the second variables; while a strong negative relationship close to -1 indicates that an increase in one variable leads to a decrease in the other. The extent of correlation is considered at 0.01 levels of significance. The null hypotheses were tested at 5% level of significance in all cases.

This study however proceeded to analyze the congruent effect of the changes in total cocoa product exports and the changes in real world prices of cocoa, changes in cocoa beans production as well as the percentage of processed cocoa exports on the GDP of Ghana. Thus to say, to what extend does a change in any of the above mentioned economic factors influence the GDP of Ghana. We adopted the linear regression model of STATA(11) by setting up our equation, dependent and independent variables as follows;

$$\mathbb{Y} = \alpha_0 + \beta_1 + \beta_2 + \varepsilon \tag{1}$$

Where Y is the dependent variable, α is a constant term, β is the coefficient of the dependent variables (1 and 2), whereas ε is the error term. Adopting this equation for our specific analysis, the equation is transformed as;

$$Ln\_gdp = \alpha_0 + \beta_{Ln\_tce} + \beta_{Ln\_rwp} + \beta_{pva} + \beta_{Ln\_pcb} + \varepsilon \tag{2}$$

Where Ln_gdp (dependent variable) represents the gross domestic product of Ghana used as the fitting proxy for the economic growth of Ghana; Ln_tce is the total cocoa products exports of Ghana (in its natural log form); Ln_rwp is the Real world price of cocoa beans per metric tonnes (also its natural log form), pva is the percentage of value added to the raw cocoa beans before export, put differently, how much of the total cocoa products exported were processed; whereas Ln_pcb is the total produced cocoa beans in Ghana in metric tonnes.

3.3 Hypothesis

Two hypotheses were set, two null hypotheses and their respective alternative hypothesis as follows;

1st hypothesis

Null hypothesis;

$H0_1$ There is no significant relationship between real world price of cocoa, total cocoa beans produced in Ghana, processed cocoa exports and the total cocoa product exports of Ghana.

Alternative Hypothesis;

$H1_1$ There is a significant relationship between Real World price of cocoa, total cocoa beans produced in Ghana, processed cocoa exports and the total cocoa product exports of Ghana.

2nd Hypothesis;

$H0_2$; The is no significant relationship between the independent variables (ln_tce, ln_rwp,pva ,pcb) and the GDP of Ghana (dependent variable).

Alternative hypothesis;

$H1_2$ There is a significant relationship between the dependent variable (Ln_gdp) and the independent variables (ln_tce, ln_rwp, pva ,pcb)

The null hypothesis proposes that, the coefficients of the independent variables are equal to zero (0) or the P-value of the regression analysis is more than 10% (for the 90% confidence interval), more than 5% (for the 95% confidence interval) and more than 1% for the (99% confidence interval). Basing our analysis on the 90% confidence interval, the Null hypothesis can only be rejected if the P-value is more than (0.10).

4. Results and Discussion

4.1 Pearson Correlation

The table below shows the bivariate correlation results of the relationships between Real World price of cocoa, total cocoa beans produced in Ghana, processed cocoa exports and the total cocoa product exports of Ghana.

Table 1. Results of Pearson Correlation.

	Ln_tce	Ln_rwp	Ln_pcb	Ln_gdp
Ln_tce				
Pearson corre.	1	.078	.664	.351
Sig(2-tailed)		.781	.007	.200
N	15	15	15	15
Ln_rwp				
Pearson Corre.	.078	1	.408	.558
Sig(2.tailed)	.781		.131	.031
N	15	15	15	15
Ln_pcb				
Pearson corre.	.664	.408	1	.488
Sig(2-tailed)	.007	.131		.065
N	15	15	15	15
Ln_gdp				
Pearson Corre.	.351	.558	.488	1
Sig(2-tailed)	.200	.031	.065	
N	15	15	15	15

Authors calculation with SPSS

The value of significance (2-tailed), which ranges between 1 and 0 is the P-value predicting the level of significance of the resulting coefficient. The coefficient of the correlation between a variable and itself would display a positive (1) showing a perfect correlation. Thus, the closer the coefficient is to either negative (-1) or positive (+1) the stronger the correlation. It is evident in our analysis that, there is a 35% correlation of total cocoa products and the GDP of Ghana, however since the P-value is 20%, we cannot reject the null hypothesis. Thus, the coefficient of the correlation is not significant within the 90%, 95% and the 99% confidence interval. Similar non-significant coefficient was realized between the total cocoa product exports and the real world prices of cocoa beans. There is however a significant positive relationship between total cocoa product exports and value cocoa beans production in Ghana; with a 66.4% coefficient value within the 99% confidence interval. There also a positive correlation between the GDP of Ghana and the real world prices of cocoa beans, with significant coefficient of 55.8% within the 90% and 95% confidence interval. A positive correlation between the value of cocoa beans produced in Ghana and the GDP of Ghana is also realized. However the 48.8% coefficient only managed to cross the 90% confidence interval. The 16 results boxes all showed a positive correlation between the variables within the 90%, 95% and 99% confidence interval; though some results were insignificant, we can still proceed to reject the null hypothesis

4.2 Regression Analysis

Table 2. Results of regression Analysis.

ln_gdp	ln_tce _cons
Coef.	1.514507 -17.76068
Robust Std. Err.	0.3612837 4.939477
T	4.19 -3.60
P > |t|	0.001 0.003
95% Conf.	0.7340013 -28.43177
Interval	2.295013 -7.089591

Table 2 above shows the STATA correlation between the total exports of Ghana's cocoa product and its congruent effect on the GDP of Ghana. The results show a positive coefficient of 1.515 which implies that, an

upward surge in the total amount of exports of Ghana's Cocoa product results in a positive surge in Ghana's GDP. Moreover, a P-value of 0.0011 implies that the coefficient is significant within the 95% confidence interval. However, and R-squared value of .359 implies that, only 35% of the changes in the GDP of Ghana is caused by Ghana's cocoa product exports.

Table 3. Results of linear regression.

ln_gdp	ln_tce	ln_rwp	pcb	Val_Added	_cons
Coef.	1.235589	0.9946925	0.1246612	-0.0251869	-21.5853
Robust Std.Err.	0.7277777	0.4398516	0.4217943	0.0450116	9.887641
T	1.70	2.26	0.30	-0.56	-2.18
P > |t|	0.120	0.047	0.774	0.588	0.054
95% Conf.	-0.3860004	0.146421	-0.8151552	-0.1254791	-43.61634
Interval	2.857179	1.974743	1.064478	0.0751053	0.4457334

Source; Author's computation.

Table 3 above shows the second regression analysis conducted to determine the combined effect of all our independent variables on the GDP of Ghana. The results show that, all the independent variables congruently explain 52% of the changes in GDP within a 99% confidence interval. However, even though all but the percentage of value added to Ghana's cocoa showed a positive correlation with Ghana's GDP, the only significant factor that influences Ghana's GDP within the 95% confidence interval is the real world price of cocoa.

5. Conclusions and Recommendation

The study employed data on Ghana's cocoa production, cocoa exports and GDP from 2000 to 2014 to analyze factors that influences Ghana's cocoa exports and its congruent effect on Ghana's GDP. The results shows that Ghana has a comparative advantage and is highly competitive in exports of cocoa beans, processed cocoa and in aggregate cocoa exports. Cocoa is and has always been the backbone of Ghana's economy mainly through the exportations of its beans overseas. It has remained a vital source of employment for citizens in the country. The country's performance is however higher in exports of the raw cocoa beans. The results revealed there is however a significant positive relationship between total cocoa product exports and value cocoa beans production in Ghana. There is also a positive correlation between the GDP of Ghana and the real world prices of Cocoa beans. From the factors found in this study, the following recommendations are made. The government of Ghana and its policy makers should place more emphasis on the importance of improving the country's export performance, anticipated increases in global demand and world price of cocoa, wide yield gap of Ghana, positive attitude of farmers in the supply of cocoa and intensification of competition on the domestic market indicate potential for further improvement in Ghana's performance in cocoa exports. Having observed a positive association between cocoa exports and increasing exchange rate, it is believed that devaluation or depreciation of the Ghana cedi against major currencies could further provide room for increasing export. This could however have adverse effect on sectors that depend mostly on imports for operation (such measures should therefore be meted out with caution) and also implementation of such policies as recommended will continually reduce and help improve the performance of cocoa export of Ghana.

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Appendix

Year	tce	cbe	pce	gdp	Pcb	rwp	val_added
2000	454,967	404,200	50,767	4.983	50,767	2,000	11
2001	425,423	396,000	29,423	5.315	29,423	1,789	7
2002	557,242	480,964	76,278	6.616	76,278	1,238	14
2003	797,900	676,090	121,810	7.632	121,810	1,789	15
2004	984,034	850,000	134,034	8.881	134,034	2,568	14
2005	914,605	792,151	122,454	10.732	122,454	2,421	13
2006	1,224,309	1,060,000	164,309	20.409	164,309	1,530	13
2007	1,048,383	895,703	152,680	24.759	152,680	1,510	15
2008	1,045,148	979,098	66,050	28.527	66,050	1,509	6
2009	1,156,557	1,090,910	65,647	25.978	65,647	2,220	6
2010	970,154	847,395	122,763	32.175	12,2763	2,625	13
2011	935,234	823,000	56,780	39.566	56,780	3,000	11
2012	910,154	780,111	64,982	41.94	64,982	3,226	8
2013	775,318	623,597	131,098	47.805	131,098	2,295	14
2014	656,987	567,398	132,609	38.617	132,609	2,819	13