Exports of Palm Oil from Ghana: A Demand Analysis

John K. M. Kuwornu, Francis A. Darko, Yaw B. Osei-Asare, Irene S. Egir

Studies have shown that the economy of Ghana cannot afford to rely solely on cocoa exports. It is imperative to diversify the export base of the Ghanaian economy. In this respect, the palm oil sub-sector of the agricultural sector, which until the mid-20th century was the major agricultural export commodity of Ghana, needs to be considered for promotion. Currently the palm oil industry faces the challenge of bleak export potential. This study examines trends in the quantity exported of Ghana's palm oil and quantifies the effects and magnitudes of the determinants of export demand. Empirical analysis of Ghana's palm oil exports from 1987 to 2006 reveals a general upward growth over the study period at an annual growth rate of 2.3 percent. This result can be attributed to the privatization of state-owned oil palm plantations in the 1980s and 1990s. The effects and magnitudes of the determinants of the demand for Ghana’s palm oil were achieved with ordinary least squares regression. The study identifies the following significant determinants of the demand for Ghana’s palm oil: real export price and real domestic price of Ghana’s palm oil, real export price of Malaysia’s palm oil (a competitor with Ghana’s palm oil exports), and real exchange rate in Ghana. A one-percent increase in the real domestic price of palm oil in Ghana will bring about an 11.5-percent increase in the quantity exported (demanded) of Ghana’s palm oil by her trading partners; a one-percent increase in the export price of Malaysia’s palm oil will increase the demand for Ghana’s palm oil by 2.1 percent; quantity demanded of Ghana’s palm oil increases by 0.4 percent for every one-percent decrease in the export price of Ghana’s palm oil; and a one-percent depreciation of the Ghana cedi against the U.S. dollar will bring about an 11.1-percent increase in the demand for Ghana’s palm oil by her trading partners, all other things being equal. This study recommends that a price support system (i.e., maximum price legislation) be instituted in the domestic palm oil market to minimize domestic price increases. Policy makers and stakeholders in the palm oil industry should consider the export price of Malaysia’s palm oil when pricing Ghana’s palm oil in the international market. Exchange-rate stabilization policies should be strengthened in order to promote mutually beneficial trade between Ghana and palm oil-importing countries.

Agriculture is the mainstay of the Ghanaian economy. The sector’s importance to the economy is apparent from its immense contribution to several important economic variables. Agriculture employs about 60 percent of the country’s active work force on formal and informal bases and accounts for about 36.5 percent of GDP per annum (ISSER 2007). There is a positive linkage between Ghana’s economic growth rate and the performance of the agricultural sector. Agriculture is also a major source of revenue and foreign exchange for the economy. Agriculture was the leading source of foreign exchange earnings in the country prior to 1992. Agriculture contributed an average of 62 percent of total annual export earnings during the 1970s and 1980s (Fosu 1987). From January to March 1996, non-traditional agricultural exports alone contributed US$ 43,707,820.31 to the foreign exchange earnings of the country, a 2.40-percent increase over that of the same period in 1995 (GEPC 2006). Because foreign-exchange earnings secure a country’s ability to meet demands for foreign commodities and to manage current-accounts deficits and the balance of payments, the importance of agricultural export to the economy of Ghana cannot be overemphasized.

Although agricultural exports contribute significantly, they account for only 4 percent of GDP in the U.S., although in small quantities. Ghana is one of the West African countries in the actual African oil palm belt (Hartley 1988), so it is endowed with natural resources for the production of oil palms from which palm oil is produced. Currently, palm oil is the second most important cash crop, after cocoa. It contributes to GDP and foreign-exchange earnings and employs a significant fraction of the population—a majority of whom are smallholders and urban-industrial. Palm oil has both domestic and industrial uses. Still, in spite of the importance of the palm oil industry and the suitability of the typical Ghanaian environment to the production of the crop, the oil palm industry has underperformed since the latter part of the nineteenth century. This decline in performance has been attributed to the high cost of production and low profit (palm fruit) prices (Orto 1993) as well as to the bleak export potential of Ghana’s palm oil (Antwi-Asare and Laryea 2005). Over the years, strategic research have been taken to revive the industry, but most of these have been directed toward developing measures to curtail the cost of production in order to improve profitability. To adequately address the challenges of the oil palm industry, it is very prudent that attention also is given to the export demand of palm oil. In order to study the export demand for Ghana’s palm oil, the following questions become relevant: What has been the trend in the quantity exported of Ghana’s palm oil from 1987 to 2006? Where are the magnitudes of the determinants of the determinants of the export demand for Ghana’s palm oil? This study establishes reliable and adequate information about export demand for Ghana’s palm oil to help formulate appropriate policies for the oil palm industry. We describe the trend in the quantity exported and price of Ghana’s palm oil from 1987 to 2006, and identify the determinants of the export demand for Ghana’s palm oil, as well as their magnitudes and effects.

Methodology

Our first objective, which aims to describe the trend in quantity exported of Ghana’s palm, is addressed using trend analysis, and the patterns are described qualitatively. The graphical relationship is between quantity exported of Ghana’s palm oil and time during the period under consideration. The trend equation used to describe the growth in quantity exported is

\[ \log(y) = k + b \times t \],

where \( y \) represents quantity of Ghana’s palm oil exported, \( k \) is the intercept of the trend equation, the parameter \( k \) is the rate of growth, and \( T \) represents time. The magnitude of \( k \) indicates the growth rate of the quantity exported. The sign of the growth rate indicates whether trends have been upward (positive) or downward (negative).

The second objective will be achieved with OLS estimation of the parameters of a multiple linear regression. The analysis will be based on Ghana’s palm oil export demand.
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Although agricultural exports contribute significantly to the GDP of the U.S. and the U.S., although in small quantities. Ghana is one of the West African countries in the actual African oil palm belt (Harley 1988), so it is endowed with natural resources for the production of oil palms from which palm oil is produced. Currently, palm oil is the second most important cash crop, after cocoa. It contributes to GDP and foreign-exchange earnings and employs a significant fraction of the population—a majority of whom are rural, thus showing rural-urban drift. Palm oil has both household and industrial uses.

Still, in spite of the importance of the oil palm industry and the suitability of the typical Ghanaian environment to the production of the crop, the oil palm industry has underperformed since the latter part of the nineteen century. This decline in performance has been attributed to the high cost of production and low returns of palm oil prices (Oto 1993) as well as to the bleak export potential of Ghana’s palm oil (Antwi-Asare and Laryea 2005). Over the years, strategic research have been taken to revive the industry, but most of these have been directed toward developing measures to curtail the cost of production in order to improve profitability. To adequately address the challenges of the oil palm industry, it is very prudent that attention also is given to the export demand of palm oil. In order to study the export demand for Ghana’s palm oil, the following questions become relevant: What has been the trend in the quantity exported of Ghana’s palm oil from 1987 to 2006? What are the magnitudes and signs of the determinants of the export demand of Ghana’s palm oil? This study establishes reliable and adequate information about export demand for Ghana’s palm oil to help facilitate the formulation of appropriate policies for the palm oil industry. We describe the trend in the quantity exported and price of Ghana’s palm oil from 1987 to 2006, and identify the determinants of the export demand for Ghana’s palm oil, as well as their magnitudes and effects.

Methodology

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\[ \log(q) = \log(k) + k \cdot T \]

where \( \lambda \) represents quantity of Ghana’s palm oil exported, \( k \) is the intercept of the trend equation, the parameter \( k \) is the rate of growth, and \( T \) represents time. The magnitude of \( k \) indicates the growth rate of the quantity exported. The sign of the growth rate indicates whether trends have been upward (positive) or downward (negative).

The second objective will be achieved with OLS estimation of the parameters of a multiple linear regression. The analysis will be based on Ghana’s palm oil export demand.
Market demand for a commodity is determined by a number of factors: its own price, consumer income, prices of related commodities, consumer tastes, income distribution, population, consumer wealth, credit availability, government policies, past levels of demand and past levels of income, among others. The traditional theory of demand, however, considers only own price, other prices, and consumer income and tastes (Koutsoyi- annas 1970). The relevant determinants of the export demand for Ghana's palm oil have been identified to include own international and domestic market prices, real exchange rate in Ghana, per-capita in- come and population of the importing countries of Ghana's palm oil, and the previous year's quantity demanded of palm oil. Taste and preferences of the importing countries is yet another factor that affects the export demand for palm oil. Taste and preferences are captured by a trend term (e.g., Brew-Riverson 1999). The relevant export demand function for Ghana's palm oil is specified as

$$Q_d = aP + bP_d + cP_{M_{d}} + dP_{M_{p}} + eP_{M_{f}} + P_{E} + P_{Y} + P_{I_{d}} + P_{I_{p}}$$

where $Q_d$ is the quantity of Ghana's palm oil demanded by her major trading partners in year $t$, $P$ are semi-elasticities. However, to eliminate approximation error, Equation 3 has been employed to compute the semi-elasticities (S.E.) (e.g., Wooldridge 2003, p.187):

$$S.E. = \frac{\beta}{100(\beta-1)}$$

where $\beta$ is the coefficient of the independent variable.

The elasticities of the independent variables in the model were computed as

$$\eta = \frac{\partial Q}{\partial P}$$

where $\eta$, $\alpha$, and $x$ represent elasticity, coefficient of the independent variable, and mean of the independent variable, respectively.

Empirical Application

Annual time-series data from 1987 to 2006 on total quantity exported in tons and the total export value in U.S. dollars of Ghana's palm oil were obtained from the Ghana Export Promotion Council. The total export values were divided by the respective total quantities exported to obtain the per-ton ex- port value of Ghana's palm oil, which in turn was used to represent the international price of Ghana's palm oil. Data on yearly average wholesale price of palm oil in Ghana was obtained from the Ministry of Food and Agriculture and used as the domestic price of palm oil in Ghana. The international price of Malaysia's palm oil was computed as the ratio of value to quantity of Malaysia's palm oil exports. Data on the value and quantity of Malaysia's palm oil were obtained from the Food and Agricultural Organization (FAO) Statistical database. The real values of the above variables (domestic and interna- tional price of palm oil and international price of Malaysia's palm oil) were computed by deflating them with the respective country's CPI at constant 2000 prices. All prices except the domes- tic price of Ghana's palm oil were measured in U.S. dollars, so the domestic price of Ghana's palm oil also converted to from Ghanaian cedis to U.S. dollars using each year's approximate exchange rate. Trade-weighted average per-capita income of Ghana's trading partners was estimated as follows: the proportion of each of Ghana's trading par- tner's imports of the world's total palm oil imports was calculated for each year. The ratio of gross domestic product (GDP) of trading partners to their respective populations was calculated to determine the nominal per-capita income from which the real per-capita incomes were calculated using consumer price indexes at constant 2000 prices for the deflation over the study period. The product of the real per-capita income of each of trading partner and its proportions of world palm oil imports was computed. The values for each trading partner were summed across the countries for each year to obtain the total trade-weighted per-capita income, calculated in US dollars. Values were weighted to account for the fact that trading partners do not consume equal quantities of palm oil. Nominal per-capita GDPs of Ghana's trading partners in palm oil---France, Germany, the Netherlands, the UK, and the U.S., were reported in the respective local currencies; these were converted to U.S. dollars using the nominal exchange rate in those countries for each year before their inclusion in the calculations. Data on nominal per-capita GDP, world- and coun- try-level imports of palm oil, nominal exchange rates, and populations of the importing countries were obtained from the International Monetary Fund (IMF) world outlook database. The average of the population of the importing countries was computed for each year. The real exchange rate in Ghana was computed by adjusting the nominal exchange rate for inflation at constant 2000 prices. Data on the nominal exchange rate between Ghana and the rest of the world were obtained from the Bank of Ghana. The trend term ($T_e = t, 2, 3, 4, 5, 6, 7, 8, 9, 10$) served as a proxy for taste and preferences, and solved any spurious regression problem that may have occurred.

Empirical Results

The trend analysis of Ghana's palm oil exports from 1991 to 2006 reveals that there has been a general upward growth in export of Ghana's palm oil over the study period. The annual growth rate of 2.2 percent. Quantity exported remained fairly constant over the first four years (i.e., 1987-1991) of the study period; this resulted from the fact that production and domestic demand for palm oil also remained about constant over the period. Between 1994 and 1998, quantity exported increased at an annual rate of 8.7 percent. This sharp increase can be attributed to two issues: a 27.3-percent annual increase in the real international price and a 2.2-percent annual increase in the real domestic price of Ghana's palm oil over that period. This general rise in exports also can be attributed to the priva-
Market demand for a commodity is determined by a number of factors: its own price, consumer income, prices of related commodities, consumer tastes, income distribution, total population, consumer wealth, credit availability, government policies, past levels of demand and past levels of income, among others. The traditional theory of demand, however, considers only own price, other prices, and consumer income and tastes (Koutsoyiannis 1970). The relevant determinants of the export demand for Ghana's palm oil have been identified to include own international and domestic market prices, real exchange rate in Ghana, per-capita income and population of the importing countries of Ghana's palm oil, and the previous year's quantity demand for palm oil. Taste and preferences of the importing countries is yet another factor that affects the export demand for palm oil. Taste and preferences are captured by a trend term (e.g., Brew-Riverson 1999). The relevant export demand function for Ghana's palm oil is specified as

\[ Q_d = \beta_0 + \beta_1 P_d + \beta_2 P_m + \beta_3 P_s + \beta_4 P_c + \beta_5 P_e + \beta_6 P_s + \epsilon \]

where \( Q_d \) is the quantity of Ghana's palm oil demanded by its major trading partners in year \( t \), \( P_d \), \( P_m \), and \( P_s \) are domestic and international market prices of Ghana's palm oil in the current year and \( P_p \), \( P_c \), \( P_e \), and \( P_s \), are their respective previous-year values; \( P_m \) and \( P_s \) represent the international prices of Malaysia's Palm oil in the current and previous years, respectively. \( \epsilon \) is the quantity demanded in the previous year. \( T \) represents the average physical volume of exports of palm oil in the last twenty years. \( \epsilon \) is the stochastic error term. The model employed in this study is a semi-log model (i.e., log-linear model) (Gujaarti 1992, p.169); consequently, the coefficients in the model are multiplied by 100 and are semi-elasticities. However, to eliminate approximation error, Equation 3 has been employed to compute the semi-elasticities (S.E.) (e.g., Wooldridge 2003, p.187):

3 S.E. = 100*[(F - 1)/F],

where \( \eta \) is the coefficient of the independent variable.

The elasticities of the independent variables in the model were computed as

\[ \eta = \frac{\partial ln Q_d}{\partial ln X} \]

where \( \eta \), \( \alpha \), and \( x \) represent: elasticity, coefficient of the independent variable, and mean of the independent variable, respectively.

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Annual time-series data from 1987 to 2006 on total quantity exported in tons and the total export value in U.S. dollars of Ghana's palm oil were obtained from the Ghana Export Promotion Council. The total export values were divided by the respective total quantities exported to obtain the per-ton export value of Ghana's palm oil, which in turn was used to represent the international price of Ghana's palm oil. Data on yearly average wholesale price of palm oil in Ghana was obtained from the Ministry of Food and Agriculture and used as the domestic price of palm oil in Ghana. The international price of Malaysia's palm oil was computed as the ratio of value to quantity of Malaysia's palm oil exports. Data on the value and quantity of Malaysia's palm oil were obtained from the Food and Agricultural Organization (FAO) Statistical database. The real values of the above variables (domestic and international prices of Ghana's palm oil and international price of Malaysia's palm oil) were computed by deflating them with the respective country's CPI at constant 2000 prices. All prices except the domestic price of Ghana's palm oil were measured in U.S. dollars, so the domestic price of Ghana's palm oil also converted to Ghanaian cedis to U.S. dollars using each year's appropriate exchange rate. Trade-weighted average per-capita income of Ghana's trading partners was estimated as follows: the proportion of each of Ghana's trading partner's imports of the world's total palm oil imports was calculated for each year. The ratio of gross domestic product (GDP) of trading partners to their respective populations was calculated to determine the nominal per-capita incomes from which the real per-capita incomes were calculated using consumer price indexes at constant 2000 prices for the deflation over the study period. The product of the real per-capita income of each of trading partner and its proportions of world palm oil imports was computed. The values for each trading partner were summed across the countries for each year to obtain the total trade-weighted per-capita income, calculated in US dollars. Values were weighted to account for the fact that trading partners do not consume equal quantities of palm oil. Nominal per-capita GDP's of Ghana's trading partners in palm oil—France, Germany, the Netherlands, the UK, and the U.S.—were reported in the respective local currencies; these were converted to U.S. dollars using the nominal exchange rate in those countries for each year before their inclusion in the calculations. Data on nominal per-capita GDP, GDP, and country-level imports of palm oil, nominal exchange rates, and populations of the importing countries were obtained from the International Monetary Fund (IMF) world outlook database. The average of the population of the importing countries was computed for each year. The real exchange rate in Ghana was computed by adjusting the nominal exchange rate by the change in the consumer price index at constant 2000 prices. Data on the nominal exchange rate between Ghana and the rest of the world were obtained from the World Bank. The trend term \( T \) served as a proxy for taste and preferences, and solved any spurious regression problem that may have occurred.

Empirical Results

The trend analysis of Ghana's palm oil exports from 1991 to 2006 reveals that there has been a general upward growth in export of Ghana's palm oil over the study period, an annual growth rate of 2.2 percent. Quantity exported remained fairly constant over the first four years (i.e., 1987-1991) of the study period; this resulted from the fact that production and domestic demand for palm oil also remained about constant over the period. Between 1994 and 1998, quantity exported increased at an annual rate of 87 percent. This sharp increase can be attributed to two issues: a 27.3 percent annual increase in the real international price and a 2.2 percent increase in the real domestic price of Ghana's palm oil over that period. This general rise in exports can also be attributed to the privatization of state-owned oil palm plantations in the 1980s and 1990s (Laryea and Antwi-Asare 2005). The privatization was a strategy adopted to revive the deteriorating oil palm industry. It was implemented through the Structural Adjustment Program proposed by the IMF and the World Bank during the 1980s economic hardship in Ghana. The privatization of the state-owned plantations increased the oil production (through palm fruits) far above domestic demand. The surplus available for export thereby increased in the 1980s and 1990s. The use of improved varieties and improvement in farm-management practices following research developments at the Kuru GI palm Research Institute also might have contributed to the general rise in exports from 1987 to 1998. The general rise also might have resulted from the 4.84 percent annual decline in the domestic price of palm oil over the period. The sharp increase in exports between 1994 and 1998 was followed immediately by a sharp decline, from 29.770 tons in 1997 to 7,475.83 tons in 2001. This 74.5 percent decline in the total quantity of palm oil exported within the period can be attributed to the decline in the real international price of Ghana's palm oil, from US$94.2 per ton in 1998 to US$164.5 per ton in 2001. From 2001 to 2004 the quantity exported increased gradually from 7,475.83 to 11,095.7 tons, growth of 48.4 percent over the period. This may be due to the 52.8 percent increase in the real international price of Ghana's palm oil. The quantity exported increased in 2005 and decreased in 2006. These fluctuations in exports in 2005 and 2006 resulted from fluctuations in the real exchange rate in Ghana. An increase in the real exchange rate in Ghana depreciates the cedi against the U.S. dollar, thereby making exports more competitive to export more in order to maximize profits. Depreciation of domestic currency is a promoting factor of non-traditional exports (Bawwuah 2007; Stevens and McQueen 1991).

We used ordinary least squares analysis to identify the determinants of the export demand for Ghana's palm oil and its magnitudes and effects. A log-linear functional form was employed in the estimation. The adjusted R-squared value of 0.941802 shows that the model explains 94.2 percent of the total variation in the quantity demanded of Ghana's palm oil over the study period. The F-statistic of 2.895 (p-value < 0.0000) shows that the
Independent variables in the model jointly explain the variations in the export demand for Ghana’s palm oil at the one-percent level of significance. The Jarque-Bera test statistic of 0.56 (p-value = 0.7542) shows that the error term is normally distributed, and the Breusch-Pagan test statistic of 13.34 (p-value = 0.7) is strong evidence for the null hypothesis of homoscedasticity in the error term at the ten-percent level of significance. The Engle’s LM test statistic of 0.026 (p-value = 0.87) rules out the presence of autoregressive conditional heteroscedasticity (ARCH) to the first order even at the ten-percent level of significance.

Real domestic price and the one-year lagged real domestic price of Ghana’s palm oil conform to their respective a priori expectations and significantly affect the export demand of Ghana’s palm oil at the one-percent level of significance. A one-percent fall in the real domestic price of Ghana’s palm oil will bring about an 11.94-percent increase in the quantity exported (demanded) of Ghana’s palm oil, all things being equal. A one-percent fall in the per-litre real one-year lagged domestic price of Ghana’s palm oil results in a 4.2-percent increase in the quantity exported (demanded) of Ghana’s palm oil. Real international price and the one-year lagged real international price of Ghana’s palm oil conform to their respective a priori expectations and significantly affect the quantity demanded of Ghana’s palm oil at the one-percent and ten-percent levels of significance, respectively. All other things being equal, the quantity demanded of Ghana’s palm oil will increase by 0.4 percent for every one-percent decrease in the per-litre international price of Ghana’s palm oil. The quantity demanded of Ghana’s palm oil will increase by 0.18 percent for every one-percent decrease in the per-ton one-year lagged real international price of Ghana’s palm oil.

Real international price and the one-year lagged real international price of Malaysia’s palm oil conform to their respective a priori expectations and significantly affect the export demand of Ghana’s palm oil at the one-percent level and five-percent levels of significance, respectively. A one-percent increase in the per-ton international price of Malaysia’s palm oil will cause the demand for Ghana’s palm oil by 2.5 percent, all other things being equal. The real exchange rate in Ghana (ERG) conforms to a priori expectation and significantly affects export demand of Ghana’s palm oil at the one-percent level. A one-percent depreciation of the cedi against the U.S. dollar will bring about an 11.14-percent increase in the demand for Ghana’s palm oil by real international price of Ghana’s palm oil, real international price of Malaysia’s palm oil, and the respective one-year lagged values of these factors. The real exchange rate in Ghana and the one-year lagged quantity demanded also significantly affected quantity demanded of Ghana’s palm oil over the study period. Although the effect of average trade-weighted per-capita income of the importing countries and the trend term are as expected, they do not significantly affect demand for Ghana’s palm oil exports. Likewise, average population of the importing countries does not significantly affect demand for Ghana’s palm oil. Quantity demanded of Ghana’s palm oil is domestic-price elastic. Quantity demanded of Ghana’s palm oil by her trading partners increases by 11.94 percent for every one-percent fall in the per-litre real price of Ghana’s palm oil, all other things being equal. There is the interaction of prices in the domestic palm oil market in general (i.e., not only palm oil from Ghana) to other vegetable oils as population increases. The trend term used as a proxy for taste and preferences does not significantly affect quantity demanded at even the ten-percent level but conforms to the a priori expectation. As the years pass, taste and preferences of the importing countries tend to move away from Ghana’s palm oil.

Conclusion

This study examines the export demand for Ghana’s palm oil from 1987 to 2006 using a demand analysis. We estimated the trend and growth rates of export demand and specified the demand function, which we estimated using ordinary least squares regression. The empirical results reveal that the quantity exported of Ghana’s palm oil experienced an upward annual growth rate of 23.2 percent. Exports remained almost unchanged for the first four years and rose thereafter until 1993, when some fluctuations were observed for the following two years. A sharp rise followed, reaching its peak in 1997 in response to changes in the exchange rate in Ghana. A one-percent depreciation of the cedi against the U.S. dollar will bring about an 11.14-percent increase in the demand for Ghana’s palm oil by her trading partners, all other things being equal. This means that a reduction in the value of the cedi in relation to other currencies cheaper Ghana’s palm oil in the international market, bringing about increases in foreign consumption. Following this development, we recommend exchange-rate stabilization policies that would result in the creation of a favorable international trade environment which would eventually ensure a mutually beneficial trade between Ghana and her palm oil trading partners.

References

1989. The Real Exchange Rate and Ghana’s Agricultural Exports, University of Oxford.
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Real international price and the one-year lagged real international price of Malaysia’s palm oil conform to their respective a priori expectations and significantly affect the export demand of Ghana’s palm oil at the ten-percent and five-percent levels of significance, respectively. A one-percent increase in the per-ton international price of Malaysia’s palm oil will, all other things being equal, increase the demand for Ghana’s palm oil by 2.1 percent. Likewise, a one-percent increase in the per-ton one-year lagged international price of Malaysia’s palm oil will increase the demand for Ghana’s palm oil by 2.5 percent, all other things being equal. The real exchange rate in Ghana (ERE) conforms to a priori expectation and significantly affects export demand of Ghana’s palm oil at the one-percent level. A one-percent depreciation of the cedi against the U.S. dollar will bring about an 11.14-percent increase in the demand for Ghana’s palm oil by her trading partners, all other things being equal. This means that a reduction in the value of the cedi in relation to other currencies cheapens Ghana’s palm oil in the international market, bringing about increases in foreign consumption. Following this development, we recommend exchange-rate stabilization policies that would result in the creation of a favorable international trade environment which would eventually ensure a mutually beneficial trade between Ghana and her palm oil trading partners.

References


This study had a secondary objective of identifying the factors influencing demand for Ghana’s palm oil and quantifying the effects of these factors. The factors that significantly influence export demand for Ghana’s palm oil have been identified in indigenous local demand of Ghana’s palm oil, real international price of Ghana’s palm oil, real international price of Malaysia’s palm oil, and the respective one-year lagged values of these factors. The real exchange rate in Ghana and the one-year lagged quantity demanded also significantly affected quantity demanded of Ghana’s palm oil over the study period. Although the effect of average traded-weighted-per-capita income of the importing countries and the trend term are as expected, they do not significantly affect demand for Ghana’s palm oil exports. Likewise, average population of the importing countries does not significantly affect demand for Ghana’s palm oil. Quantity demanded of Ghana’s palm oil is domestic-price elastic. Quantity demanded of Ghana’s palm oil by her trading partners increases by 11.94 percent for every one-percent fall in the per-litre real domestic price of Ghana’s palm oil, all other thing being equal. There is the tendency of prices in the domestic palm oil market to rise very high (especially during the lean season), thus retarding palm oil exports. In view of this, government intervention in the domestic palm oil market is strongly recommended. The government should frequently intervene in the local palm oil market with favourable price-support systems in order to promote international demand for Ghana’s palm oil by curtailing unprecedented price increases in the local market.

The study reveals that palm oil exported by Malaysia and Ghana compete for demand in the international market, as demonstrated by the negative cross-price elasticity of demand with respect to Malaysia’s palm oil exports. To promote Ghana’s palm oil exports, therefore, stakeholders should price Ghana’s palm oil in line with that of Malaysia in the international market. The importing countries of Ghana’s palm oil also import palm oil from countries other than Malaysia, so the international price of palm oil from those countries should be considered as well when pricing Ghana’s palm oil in the international market. The export demand of Ghana’s palm oil is very responsive to changes in the exchange rate in Ghana. A one-percent depreciation of the cedi against the U.S. dollar will bring about an 11.14-percent increase in the demand for Ghana’s palm oil by her trading partners, all other things being equal. This means that a reduction in the value of the cedi in relation to other currencies cheapens Ghana’s palm oil in the international market, bringing about increases in foreign consumption. Following this development, we recommend exchange-rate stabilization policies that would result in the creation of a favorable international trade environment which would eventually ensure a mutually beneficial trade between Ghana and her palm oil trading partners.
Assessing the Dimensions of Transaction Cost in the Poultry Industry: The Case of the Ashanti Region of Ghana

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This paper analyzes the dimensions of transaction cost in the poultry industry. We analyze asset specificity, frequency, uncertainty, and opportunism in the poultry industry in the Ashanti Region of Ghana. We examine these dimensions for all firms in the production chain: input suppliers, producers, wholesalers, and retailers. The empirical analyses for this industry consisting of 128 firms (18 input suppliers, 50 farmers, 20 wholesalers, and 40 retailers) reveal that retailers’ assets are specific and cannot be redeployed for other purposes; retailers experience some opportunistic (self-seeking) behavior from trading partners (i.e., producers, wholesalers, or both), and wholesalers also experience opportunism from their trading partners (i.e., producers, retailers, or both). The assets of input suppliers and producers are not specific and can be redeployed for other purposes. Transaction was frequent and certain for all the firms in the industry. Based on these results we recommend that retailers should have market-contract relationships with both wholesalers and farmers to safeguard themselves against the hazards of opportunistic behavior, as their assets are specific. Furthermore, wholesalers should also have some market-contract relationship with farmers to protect them from farmers’ opportunistic behavior.

Agriculture remains the largest contributor to Ghana’s GDP with a 39.3-percent share in 2006; the remaining 32.9 percent and 27.8 percent are for the services and industrial sectors, respectively (ISSER 2007). The agricultural sector in Ghana consists of the crop, livestock, fishery and forestry sub-sectors. The livestock and fisheries sub-sectors produce animal products to satisfy the protein needs of the people. Traditionally, cattle, sheep, goat, pig, and poultry industries are under the livestock sub-sector but it extends to the raising of other non-traditional domesticated animals such as grass cutter and guinea pig. 

Conclusion

Since the implementation of the structural adjustment program (SAP) in the early 1980s, local production of meat has not been able to meet the demand of the growing population. This has resulted in the importation of meat products to supplement local production. In 2002, for instance, the country imported 31,837.7 tons of meat and meat products. About 65 percent of the total imports were poultry products including whole chicken, chicken parts, wings, and feet (MoFA 2003). Darko (1994) reported a high preference for imported frozen poultry products at the expense of those produced locally. This is due to the high cost of the locally produced birds (i.e., high cost of feeding and labor cost) compared to those imported. In December 2007, a 2-kilogram fully dressed chicken produced locally sold for an average GH¢8.00 farm-gate price while the imported equivalent sold between GH¢4.00 and GH¢5.00.

In an attempt to increase agricultural production, the government of Ghana in collaboration with the World Bank initiated the Medium Term Agricultural Program (MTADP) in 1992, with the National Livestock Service Project (NLSP) as a component. The aim of the NLSP is to increase meat, egg, and milk production in Ghana by 50 percent by the year 2020 (Adams 1999). Despite efforts by the government to improve the performance of the agricultural sector, farmers are faced with many problems that hinder productivity: input cost, lack of credit, disease conditions, and competition.

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