Market Structure and Competition in the Ghanaian Cocoa Sector after Partial Liberalization

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Abstract: The study looked at market structure and competition in Ghana’s cocoa sector after the introduction of partial reforms in cocoa marketing. The study involved 80 randomly selected cocoa farmers from four communities in Bibiani-Anhwiaso-Bekwai District, Western Region, Ghana. Secondary data were collected from the Head Office of Ghana Cocoa Board, Accra. Results showed that more firms have entered the industry since the introduction of competition resulting in an increase in industry competition and a loss of market share of the top buyers. The cocoa sector experienced a gradual decrease in market concentration. The concentration ratios revealed that a few large firms continue to dominate the market. However, there are no monopolistic tendencies in the Ghanaian cocoa sector and firms are free to compete with each other for market shares. The absence of price competition has resulted in an interesting marketing scenario with producer-buyer loyalty playing a key role in gaining market share. Licensed Buying Companies have found ways to ensure that farmers sell to them alone and these include prompt payments, social involvement in farmers communities, and provision of services, incentives, subsidized inputs and credit. Farmers in turn maintain loyalty to buyers who provide certain incentives and cash rewards. More benefits accrue to farmers now than the period before the reforms. It was concluded that the market structure in Ghana’s cocoa sector will remain unchanged for some time if the government of Ghana maintains its partial liberalization policy.

Key words: Cocoa, competition, Ghana, liberalization, licensed buying companies, market structure

INTRODUCTION

Ghana is the world’s second largest producer of cocoa after Cote d’Ivoire (Vigneri, 2007; Vigneri and Santos, 2007), producing nearly a fifth of the world’s total output (Laven, 2007). Cocoa plays a strategic and critical role in Ghana’s economy (Bulif, 2003; Dormon et al., 2004; Tutu, 2011). Smallholder farmers in the forest regions of Ghana have traditionally depended on cocoa production as a major source of livelihood and export earnings from cocoa have supported Ghana’s socio-economic growth for so many decades. A combination of favorable external conditions and internal reforms has made cocoa the driver of growth and poverty reduction in Ghana (Breisinger et al., 2008). Ghana’s major export commodities are minerals, cocoa and timber, which together accounted for almost 76% of total export revenue in 2007 (ISSER 2008). Cocoa has been identified as the only commodity with environmental, social and economic sustainability (Tutu, 2011), underscoring the importance of the crop to the country.

Ghana remains the only major cocoa producing country without a fully liberalized marketing system (Vigneri and Santos, 2007; Laven, 2007). The country has adopted a partially liberalized marketing system whereby Licensed Buying Companies (LBCs) are allowed to compete for market share with each other but without price competition (Vigneri and Santos, 2007; Laven, 2007). Prior to the introduction of partial liberalization, the Produce Buying Company, a subsidiary of the Ghana Cocoa Board (Cocobod), held a monopoly in cocoa marketing in Ghana. Structural reforms of the cocoa sector in Ghana began in the early 1990s, with the privatization of input supply and the introduction of competition in the internal marketing of cocoa. Since the 1992/93 cocoa season, LBCs began to compete for market share in the purchase of cocoa from farmers.

The introduction of private buyers, among other things, was intended to improve efficiency in the marketing of cocoa through additional competition in the market, guarantee farmers ready market and cash payment, as well as enhance cocoa production in general. The objective of bringing competition to the internal market was to improve the operational and financial performance of Ghana’s marketing system to enable higher and competitive producer prices (Laven, 2007). The deregulation of Ghana’s domestic cocoa supply chain was expected to bring competition among different private buyers and to generate a number of production incentives to the farmers (Vigneri and Santos, 2009). It is
argued that market structure, and in particular, the degree of
competition among licensed buying companies, is an
important determinant of productivity in the Ghanaian
cocoa industry (Zeitlin, 2005). Competitive cocoa-
purchasing markets stimulate efficiency and reduce the
cost of delivery to port, leading to higher price for
producers (Varangis and Schreiber, 2001).

The study sought to answer the following research
questions: what market structure has evolved in the
Ghanaian cocoa sector after partial liberalization, and
what is the nature of the competition between buyers in
the market? The aims of the study were to measure
market structure in the Ghanaian cocoa sector using
concentration ratios and the Herfindahl index, and to
determine the nature of competition among buyers and the
likely effects on the cocoa industry.

**Market structure and competition**: The structure of a
market refers to the number and characteristics of the
firms in it. The internal market for cocoa beans in Ghana
is made up of a number of licensed buying companies
(LBCs) who engage in non-price competition with each
other for market share. The structure of a market may be
centrated or unconcentrated. For the cocoa sector, the
market is said to be concentrated when it consists of just
a few buyers, and unconcentrated when it consists of
many buyers. Market structure is linked to the conduct
behavior) and performance of the firms in the market.

A unique feature about primary commodity markets
is the large number of producers relative to buying
companies which makes most primary commodity
markets an oligopsony. Oligopsony refers to a market
-dominated by many sellers and a few buyers. It is a form
of imperfect competition and contrasts with oligopoly
where there are many buyers and a few sellers.

**Measuring market structure**: 

**Concentration ratios**: A common measure of market
structure is the N-firm concentration ratio. This is the
market share of the N largest firms in the industry. From
the N-firm concentration ratio, market structure depends
on the characteristics of the largest firms in the industry.
Common measures of the N-firm concentration ratio are
the three-firm and four-firm concentration ratios. The
-four firm concentration ratio measures the percentage of
total industry output attributable to the top four firms. The
market is concentrated when a large percentage of the
total industry output is attributable to a few large firms.

The Concentration ratio is computed as follows:

\[ C(N) = \left( \frac{P(N)}{P} \right) \times 100 \]  

where \( C(N) \) is the concentration ratio for the N largest
firms; \( P(N) \) is the total purchases by the N largest firms;
\( P \) is the total purchases by all firms in the market.

**Herfindahl index (Herfindahl-Hirschman index)**: 

Another measure of market structure is the Herfindahl
index (HI). The Herfindahl index which shows the
concentration of the market and the market power in the
industry is the sum of the squared market shares of all
firms in the market and is computed as:

\[ S = \left( \frac{S_1}{T} \right)^2 + \left( \frac{S_2}{T} \right)^2 + \ldots + \left( \frac{S_n}{T} \right)^2 \]  

where, \( S_1, S_2, S_n \) represent market share of buyer 1, 2 and
n, respectively (n is the number of companies). T is the
total market share. \( S \) ranges between 1 and 0, so that a
monopoly receives a value of 1, and as average market
shares decrease, the value approaches 0 in the limit.

**METHODOLOGY**

The study was conducted at Bibiani-Anhwiaso-
Bekwai District in the Western Region, the highest cocoa
producing region in Ghana. The District lies in the forest
belt and has an average annual rainfall between 1200 mm
and 1500 mm. The rainfall pattern is bimodal.

Primary data were collected from 80 randomly
selected farmers in four communities in the Bibiani-
Anhwiaso-Bekwai District. Demographic, socio-
-economic and production data were collected. Secondary
data were also collected from the Ghana Cocoa Board
(Cocobod) office in Accra. Data were collected on
number of Licensed Buying Companies (LBCs) and
quantities of cocoa they purchased between the 1993/94
crop season and the 2008/09 crop season. Market
structure and competition were analyzed using
concentration ratios and the Herfindahl index. The three-
firm and four-firm concentration ratios were measured to
determine the nature of competition in the Ghanaian
cocoa sector.

**RESULTS**

Table 1 shows the 3-firm and 4-firm concentration
ratios for the period 1993/94 - 2008/09. This shows a
decrease in concentration ratio in the Ghanaian cocoa
sector as more firms enter the industry and compete for
market share. This is in line with the general expectation
of the liberalization process. With liberalization, more
firms, including opportunistic firms seeking to take
advantage of the liberalized market, were expected to
enter the market. With time, some of these firms exit in
the face of competition. The Ghanaian cocoa sector
remained concentrated in the early years of liberalization
but has seen a gradual decrease in industry concentration
with time.

An indicator of local LBC concentration is given by
the Herfindahl index (Zeitlin, 2005). Table 2 shows the
Table 1: The three and four-firm concentration ratios for the period 1993/94-2008/09

<table>
<thead>
<tr>
<th>Crop year</th>
<th>3 top buyers</th>
<th>4 top buyers</th>
<th>Total number of buyers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993/94</td>
<td>98.5</td>
<td>98.3</td>
<td>7</td>
</tr>
<tr>
<td>1994/95</td>
<td>94.5</td>
<td>96.4</td>
<td>8</td>
</tr>
<tr>
<td>1995/96</td>
<td>93.2</td>
<td>96.1</td>
<td>10</td>
</tr>
<tr>
<td>1996/97</td>
<td>91.5</td>
<td>96.1</td>
<td>10</td>
</tr>
<tr>
<td>1997/98</td>
<td>88.6</td>
<td>92.7</td>
<td>12</td>
</tr>
<tr>
<td>1998/99</td>
<td>81.3</td>
<td>88.1</td>
<td>14</td>
</tr>
<tr>
<td>1999/00</td>
<td>66.6</td>
<td>73.8</td>
<td>15</td>
</tr>
<tr>
<td>2000/01</td>
<td>56.9</td>
<td>66.3</td>
<td>15</td>
</tr>
<tr>
<td>2001/02</td>
<td>61.1</td>
<td>71.3</td>
<td>17</td>
</tr>
<tr>
<td>2002/03</td>
<td>55.5</td>
<td>63.9</td>
<td>21</td>
</tr>
<tr>
<td>2003/04</td>
<td>55.4</td>
<td>65.8</td>
<td>19</td>
</tr>
<tr>
<td>2004/05</td>
<td>63.9</td>
<td>71.1</td>
<td>19</td>
</tr>
<tr>
<td>2005/06</td>
<td>58.0</td>
<td>66.9</td>
<td>18</td>
</tr>
<tr>
<td>2006/07</td>
<td>51.3</td>
<td>60.8</td>
<td>18</td>
</tr>
<tr>
<td>2007/08</td>
<td>52.3</td>
<td>60.2</td>
<td>21</td>
</tr>
<tr>
<td>2008/09</td>
<td>56.2</td>
<td>63.3</td>
<td>26</td>
</tr>
<tr>
<td>Average</td>
<td>93.3</td>
<td>96.1</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Table 2: Herfindahl index showing market concentration in the Ghanaian cocoa sector

<table>
<thead>
<tr>
<th>Crop year</th>
<th>Herfindahl index</th>
<th>Crop year</th>
<th>Herfindahl index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993/94</td>
<td>0.66</td>
<td>2001/02</td>
<td>0.21</td>
</tr>
<tr>
<td>1994/95</td>
<td>0.62</td>
<td>2002/03</td>
<td>0.17</td>
</tr>
<tr>
<td>1995/96</td>
<td>0.59</td>
<td>2003/04</td>
<td>0.17</td>
</tr>
<tr>
<td>1996/97</td>
<td>0.50</td>
<td>2004/05</td>
<td>0.19</td>
</tr>
<tr>
<td>1997/98</td>
<td>0.50</td>
<td>2005/06</td>
<td>0.16</td>
</tr>
<tr>
<td>1998/99</td>
<td>0.37</td>
<td>2006/07</td>
<td>0.14</td>
</tr>
<tr>
<td>1999/00</td>
<td>0.24</td>
<td>2007/08</td>
<td>0.14</td>
</tr>
<tr>
<td>2000/01</td>
<td>0.19</td>
<td>2008/09</td>
<td>0.17</td>
</tr>
</tbody>
</table>

Table 3: Change in market share of the Produce Buying Company (PBC) after privatization

<table>
<thead>
<tr>
<th>Year</th>
<th>PBC market share (%)</th>
<th>Year</th>
<th>PBC market share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993/94</td>
<td>79.9</td>
<td>2001/02</td>
<td>40.2</td>
</tr>
<tr>
<td>1994/95</td>
<td>77.2</td>
<td>2002/03</td>
<td>33.8</td>
</tr>
<tr>
<td>1995/96</td>
<td>75.1</td>
<td>2003/04</td>
<td>33.2</td>
</tr>
<tr>
<td>1996/97</td>
<td>68.3</td>
<td>2004/05</td>
<td>37.6</td>
</tr>
<tr>
<td>1997/98</td>
<td>68.3</td>
<td>2005/06</td>
<td>32.8</td>
</tr>
<tr>
<td>1998/99</td>
<td>58.2</td>
<td>2006/07</td>
<td>30.3</td>
</tr>
<tr>
<td>1999/00</td>
<td>43.5</td>
<td>2007/08</td>
<td>30.6</td>
</tr>
<tr>
<td>2000/01</td>
<td>37.0</td>
<td>2008/09</td>
<td>34.9</td>
</tr>
</tbody>
</table>

Fig. 1: Distribution of buyers in the main and minor seasons privatization. The emergence of competition in the Ghanaian cocoa sector has resulted in a loss of PBC market share to other competitors.

The introduction of competition has affected the market share (market power) of the former monopolist buyer, the Produce Buying Company. Table 3 shows the change in PBC market share after the introduction of privatization. The emergence of competition in the Ghanaian cocoa sector has resulted in a loss of PBC market share to other competitors.

Figure 1 shows the distribution of buyers in the main crop (major season) and light crop (minor season). The major season is associated with greater harvest and hence there is more cocoa for buyers to compete for. More buying companies purchase cocoa during the major season compared to the minor season. It can also be observed that not all registered LBCs buy cocoa in a given year. For example, in 2002/03, 2004/05 and 2007/08, there were more registered LBCs than the number that bought cocoa in the major and minor seasons.

Farmers’s marketing behavior in a liberalized marketing system: Table 4 shows the number of buyers farmer sell their produce to.
**Table 4: Number of buyers farmers sell their produce to**

<table>
<thead>
<tr>
<th>Number of buyers</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>44.0</td>
<td>55.0</td>
</tr>
<tr>
<td>Two</td>
<td>24.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Three</td>
<td>9.0</td>
<td>11.2</td>
</tr>
<tr>
<td>Four and above</td>
<td>3.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Total</td>
<td>80.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Farmers have responded to the changes in the marketing arrangement and are exhibiting some strategic behavior in marketing. Prior to privatization, farmers only sold to one monopolistic buyer, that is, the PBC. The introduction of competitors has resulted in some strategic behaviors among producers with a view to deriving maximum benefit from the marketing system. Fifty percent of farmers sell to a single buyer while 85% sell their produce to one or two buyers. The results show a strong buyer loyalty, with producers preferring to sell to those buyers who provide certain incentives and cash rewards. Table 5 shows the benefits farmers derive from the introduction of internal competition in marketing.

**DISCUSSION**

**Market structure and competition in the cocoa sector:**

The concentration ratios show an increase in competition in the Ghanaian cocoa sector. The number of buying companies participating in the domestic marketing of cocoa has increased (Table 2) and the largest buyers are consistently losing market share indicating a loss of market power. However, the market is still dominated by few big buyers as shown by the 3-firm and 4-firm concentration ratios. The three largest firms control over 50% of the market, while the four largest LBCs control over 60% of the market. There are however no monopolistic tendencies in the Ghanaian cocoa sector as no single firm holds a market share large enough to induce monopolistic practices. The absence of monopolistic tendencies could also be explained in terms of the absence of price competition. What is interesting, however, is that the Cocobod only sets a floor price, which means that technically, buying companies could pay farmers prices higher than the producer price (Vigneri and Santos, 2007). But firms rarely paid farmers a price above the floor price. They however compete through non-price mechanisms like the provision of incentives, input subsidies, and cash rewards to farmers.

The Produce Buying Company (PBC) which enjoyed a complete monopoly in the marketing of cocoa in Ghana prior to the introduction of internal competition in 1993/94 cropping season has consistently lost market share after privatization. This shows that firms are free to compete for market shares in the cocoa sector. From a 100% market share before privatization, PBC market share has dropped to a little over 30% between 2002/03 and 2008/09, showing the growing competition in the Ghanaian cocoa sector.

The fact that PBC has lost market share to competitors and the country still produces and sells premium cocoa is an indication that it is possible to liberalize the Ghanaian cocoa sector and still maintain quality, which has been the concern of anti-liberalists when it comes to the full liberalization of Ghana’s cocoa sector. However an important condition necessary to ensure that quality is maintained is to retain the quality control and regulatory role of Cocobod. Some researchers support the notion that Ghana’s cocoa marketing has been characterized by effective product quality control and efficient export marketing, both coordinated by the state (Williams, 2009). Hence retaining Cocobod’s regulatory role is a good policy option.

**Number of buyers in the major and minor seasons:**

The number of registered LBCs often exceeded the number that actually bought cocoa in a particularly season indicating that not all companies which register to buy cocoa do so in a particular year. It was reported that although the total number of LBCs that have a license to operate in the internal market is relatively large, the number of companies that are active players in the local market remains much smaller (Vigneri and Santos, 2009). Some companies never bought cocoa in a single year after they were listed as buying companies. The study also showed less number of buyers in the minor season compared to the major season. Some LBCs thus prefer not to compete for market shares during the light crop when the volume of purchase is lower. Competition for market share is thus affected by the volume of cocoa available for purchase.

**Farmers’ marketing behavior in a competitive (liberalized) market:**

Despite the increase in number of buyers at the village level, farmers’ choice of buyer seems to be increasingly restricted to only one buyer (Vigneri and Santos, 2009). Fifty five percent of the respondents sold their produce to only one buyer. In 2003, the main reason given by farmers for their choice of LBCs was prompt payment, followed by social relationship with the purchasing clerk and the provision of credit (Laven, 2007). Eighty-five percent of farmers sold their produce to one or two buyers with the rest selling to 3 or more buyers (Table 4).

The absence of price competition between buyers has meant that selection of LBCs by farmers is based on a variety of non-price factors including the mode of payment and the provision of other services (Vigneri and Santos, 2009). In spite of the fixed purchasing price, it is argued that, competition for producers’ output by LBCs...
Table 5: Benefits of competition to farmers

<table>
<thead>
<tr>
<th>Before introduction of competition</th>
<th>After introduction of competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scholarships for farmer’s wards</td>
<td>Prompt payment</td>
</tr>
<tr>
<td>Provision of inputs to farmer’s</td>
<td>Provision of inputs on credit to farmers</td>
</tr>
<tr>
<td>Bonuses to farmers</td>
<td>Provision of bonuses to farmers</td>
</tr>
<tr>
<td></td>
<td>Provision of loans to farmers by LBCs</td>
</tr>
<tr>
<td></td>
<td>Provision of incentives to farmers</td>
</tr>
<tr>
<td></td>
<td>Shorter distance to sell produce</td>
</tr>
<tr>
<td></td>
<td>Scholarships for farmer’s wards</td>
</tr>
<tr>
<td></td>
<td>Education on how to produce by LBCs</td>
</tr>
<tr>
<td></td>
<td>Provision of social services to community</td>
</tr>
<tr>
<td></td>
<td>Help in transporting beans from farms</td>
</tr>
<tr>
<td></td>
<td>Help in spraying farmer’s fields</td>
</tr>
</tbody>
</table>

remains an important institutional feature, driving productivity growth in the Ghanaian cocoa sector (Zeitlin, 2005). The choice of LBCs is largely driven by the offer of prompt cash by any LBC, with credit supply reported as the second reason for choosing a buyer. Cash-constrained farmers may choose buyers based on their ability to get a full cash payment for their produce and, possibly, some loan to finance productive activities (Vigneri and Santos, 2009). Thus, the introduction of competition in internal marketing and the multiplicity of buyers offer the option to choose among those that can provide cash as well as credit. Analysis of farmers choice of LBC has shown that non-cash constrained farmers do not seem to benefit from selling to different buyers while the provision of additional resources to farmers seems to matter to cash-constrained farmers in their choice of LBCs (Vigneri and Santos, 2009). Hence access to full payment and possibly credit advances enhances the production potential of those who are financially constrained. Competition therefore offers some benefits to resource-constrained farmers.

The introduction of internal competition has led to several benefits to farmers attesting that privatization is beneficial to farmers (Akiyama et al., 2001; Akayima et al., 2003; Gilbert, 2009). Private competition has benefitted farmers because LBCs have sought to win producer loyalty by providing services such as inputs on credit, subsidies for inputs as well as the provision of loans (Varangis and Schreiber, 2001).

CONCLUSION

Liberalization of internal marketing of cocoa in Ghana has opened the door for more firms to enter the industry resulting in an increase in industry competition and a loss of market share of the top buyers. There is a decrease in concentration of the market and a decrease in market power in the cocoa industry in Ghana after privatization. The introduction of liberalization of internal marketing has not led to any one firm dominating or monopolizing the market, even though a few top firms hold a large market share. The absence of monopolistic tendencies may be attributable to the absence of price competition or unwillingness of buying companies to pay a price higher than the official producer price which is a floor price. In the absence of price competition, buyers have found ways to ensure that farmers sell to them, while farmers in turn maintain loyalty to buyers who provide certain incentives and cash rewards. Internal competition has brought benefits to producers including prompt payment, provision of incentives and cash rewards. Market concentration has remained steady in the cocoa sector for the last ten years and it is expected that the market structure in the Ghanaian cocoa sector will remain unchanged for some time if there are no policy changes in the sector.

ACKNOWLEDGMENT

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