Non-Price competition measures used by cocoa purchasing clerks in Ghana and their determining factors

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Abstract

The partial liberalization of Ghana's cocoa market in the 1990s led to the Cocoa Marketing Board (COCOBOD) granting licenses to private companies to partake in the domestic cocoa market alongside the state-owned Produce Buying Company (PBC) at predetermined prices while maintaining the right to export cocoa. After this partial liberalization, these Licensed Buying Companies (LBCs) have resorted to non-price measures to compete for larger market share due to their inability to pay cocoa farmers outside the set prices. This study investigates the factors that determine the choice of non-price competition measures used by cocoa Purchasing Clerks (PCs) to compete. The study used primary data collected from the Western North and Ashanti regions of Ghana. A multistage sampling technique was used to select a total of 150 cocoa PCs who work for LBCs. Also, 13 key informants including 11 cocoa District Officers (DO) and 2 Assemblymen were interviewed to get a general understanding of the cocoa marketing structure. The study adopted the binary logistic model to analyze the determinants of non-price competition measures. The results showed that certification, contract, experience, and region were the most determining factors of non-price competition measures used by cocoa PCs. Other socio-economic factors of PCs like income, gender, marital status, and age influenced the use of some of the non-price competition measures. We recommend that all (both local and foreign) LBCs operate certification programs as the benefits derived from such programs will boost the sustainability of the Ghana's cocoa market which intend improves cocoa farmers livelihoods.

Keywords

Partial Liberalization, Non-price competition measures, Determining factors, Purchasing clerks, Cocoa market

1. Introduction

Among the four west African cocoa-producing countries, Ghana has a unique marketing

system. This marketing system emanated from policy reforms made in the 1990s, and as a result cocoa traders now compete on a non-price basis using non-price measures. This study seeks to identify the factors that influence the use of non-price competition measures, by so doing, we first describe Ghana's domestic cocoa market before the policy reforms and after the reforms. Secondly, we describe the relationship that exists between actors in Ghana's cocoa market to get a broader understanding of how they relate to their operations and lastly, we examine the determining factors of the non-price competition measures used by cocoa traders.

1.1 Ghana's cocoa market before partial liberalization

Historically, cocoa producer prices, purchasing and marketing of cocoa in Ghana have been controlled by the Cocoa Marketing Board (CMB) which was established in 1947 due to concerns over market-sharing and price-fixing arrangements among foreign trading firms, and the desire to stabilize domestics prices to producers (Stryker, 1990; Brooks *et al.*, 2007) . During and after the Second World War, the CMB retained a monopoly over the export market while foreign firms, then known as Licensed Buying Agents (LBAs) handled the local purchase of cocoa beans. With time, the number of LBAs grew from two in 1966/67 to fourteen by 1971/72, largely because the CMB liberally extended credit for their operations (Kolavalli *et al.*, 2013). The year 1977 marked the withdrawal of licenses from many LBAs and eventually the abolishment of the multiple buyer system by CMB, as some of the LBAs it has trusted with funds failed to deliver cocoa beans they claimed to have purchased because of misappropriation of funds. Soon after the abolishment of the multiple-buyer system, the Produce Buying Company (PBC) was established within the CMB to function as the sole buyer in charge of all domestic cocoa purchases.

1.2 Introduction of Partial Liberalization in Ghana's cocoa market

As part of the Economic Reform Program (ERP) to reinstate economic growth and stability in the mid-1980s to early 1990s, the World Bank and International Monetary Fund (IMF) mounted pressure on commodity export markets to fully liberalize (Brooks *et al.*, 2007; Kolavalli *et al.*, 2013). However, the government of Ghana, following market research decided to adopt a partial liberalization instead of a full liberalization of the cocoa market by retaining control of the export market while liberalizing the domestic market. This led to the reintroduction of private buying of cocoa beans in 1992/93. The CMB (now COCOBOD) granted a license to private companies referred to as Licensed Buying Companies (LBCs) to partake in domestic cocoa marketing by purchasing cocoa beans from farmers at determined prices and selling back to COCOBOD for further distribution both locally and internationally.

1.3 Ghana's cocoa market after the introduction of partial liberalization

According to COCOBOD Annual reports, the number of registered and active LBCs in the cocoa marketing sector has increased over the years (Table 1). With more and more LBCs

entering the cocoa market, PBC has lost some of its market shares to private LBCs. As of the 2019/2020 cocoa year, Olam Ghana Limited was the leading LBCs in terms of market share (19.01%) followed by PBC (13.26%) which used to have the largest market share (Table 1). The growing number of LBCs participating in domestic cocoa marketing has resulted in competition among LBCs. LBCs were expected to compete for a larger market share by offering cocoa farmers higher than already determined prices, however, they are not able to compete on a price basis because cocoa producer prices are set administratively by the COCOBOD through the Producer Price Review Committee (PPRC). The PPRC is a representative body chaired by the Ministry of Finance and Economic Planning (MOFEP) and consisting of representatives of cocoa farmers, COCOBOD and LBCs (Kolavalli *et al.*, 2013). Also, COCOBOD sets LBCs margins at the beginning of each growing season as a share of the Free on Board (FOB) prices. LBCs claim that the margin they receive are so low that it will not make economic sense if they competed on a price basis. Therefore, LBCs have adopted measures other than price, to compete for a larger market share. Some of these non-price measures include prompt payment to farmers after purchase, social involvement with farmers' communities (i.e., attending funerals and other social events), provision of services like subsidized inputs, or credit to farmers (Laven, 2007). Our surveyed data collected in October 2022 confirms that non-price measures are used by purchasing clerks (PCs) to persuade farmers to sell to them preferentially (Table 2).

Table 1. Number of Engaged and Active LBCs in the cocoa market and market shares of leading LBCs.

Cocoa season	Registered LBCs	Active LBCs	Total cocoa beans purchased (tonnes)	Market share of leading LBCs (%)				
				PBC	Armajaro Ghana Limited (Now Agroecom Ghana Limited)	Akuafo Adamfo	Olam Ghana Ltd	Nyonkopa Community Buyers Ltd
2012/13	38	29	835,466	**35.34**	10.65	12.82	-	-
2013/14	41	32	896,220	**33.15**	10.94	13.13	-	-
2014/15	42	32	740,254	**31.2**	12.47	10.31	-	-
2015/16	46	40	778,043	**30.88**	13.43	-	11.79	
2016/17	49	44	969,540	**29.15**	14.01	-	10.66	
2017/18	51	43	904,740	**23.43**	12.45	-	11.65	11.58
2018/19	48	40	811,747	16.12	12.42		**16.74**	11.91
2019/20	48	41	766,977	13.26	13.06		**19.01**	11.67

Source: Author compiled from COCOBOD annual reports and COCOBOD website (2023)

1.3.1 Actors in Ghana's cocoa market and their roles

COCOBOD has subsidiaries and divisions that are responsible for specific tasks. These subsidiaries comprise; (1) The Quality Control Company Limited (QCC) which is responsible for all quality checks of cocoa beans, grading and sealing. (2) The Cocoa Marketing Company (CMC) is responsible for the export market and local supply of cocoa to local processors. (3) The Seed Production Division (SPD) is responsible for the production and distribution of improved planting material to cocoa farmers. (4) The Cocoa Health and Extension Division (CHED) provides extension services and training to cocoa farmers. (5) The Cocoa Research Institute of Ghana (CRIG) carries out all scientific research activities of the board.

The LBCs are licensed buyers who have the mandate to purchase cocoa beans from cocoa farmers and deliver them to CMC for further distribution and export. There are private LBCs, of which some are locally owned and foreign-owned and PBCs which used to be fully owned by the government but are now partly privatized with its shares traded on the stock market (Laven, 2007). Forty of the forty-eight LBCs engaged in the cocoa market actually purchase cocoa beans from farmers (COCOBOD, 2019). LBCs serve as a link between COCOBOD and cocoa farmers, they buy cocoa beans from farmers and deliver to CMC for further distribution.

Cocoa PCs are individuals who are recruited by the LBCs to buy cocoa beans from local cocoa farmers and in return are paid on a commission basis. These PCs are mostly natives of the communities within their catchment area. They are mostly cocoa farmers themselves or have other sources of income and do the cocoa purchasing alongside. How the PCs are recruited differs depending on the LBCs, from our in-depth interview with some of the District managers/District officers (DOs) of LBCs, the DO identifies the candidates for cocoa purchasing through recommendations from the community members. Background checks are done on the candidates and the candidates are then interviewed. The selected candidates are then asked to present a collateral or a guarantor after which, they enter into an agreement with the DOs. The PCs work directly with the DOs at the district level rather than the companies, which makes the DOs responsible for the PCs. The PCs assume a key position since they are in direct contact with farmers, mediating between them and LBCs.

Cocoa producers are the most important actors in the cocoa industry. About 800,000 farmers are involved in cocoa production in Ghana (World Bank, 2013). Smallholder farmers dominate the cocoa production sector in Ghana with an average cocoa farm size of 5 hectares according to (Hainmueller *et al*., 2011), while only about 10% of cocoa farmers operate on a large scale.

1.3.2 Relationship between Actors in the cocoa markets

At the beginning of each cocoa season, COCOBOD announces the cocoa producer price below which no buyer is allowed to purchase. COCOBOD raises funds from both locally issued cocoa bills and the international market through syndicated loans (Kolavalli *et al.*, 2013) and supplies seed funds to LBCs to cover their transaction costs at the beginning of each cocoa season. The amount is determined by the quantity of cocoa beans delivered to CMC during the previous cocoa season. Due to competition in the market, some LBCs find others means of raising their capital to avoid sole reliance on COCOBOD's funds which mostly delay.

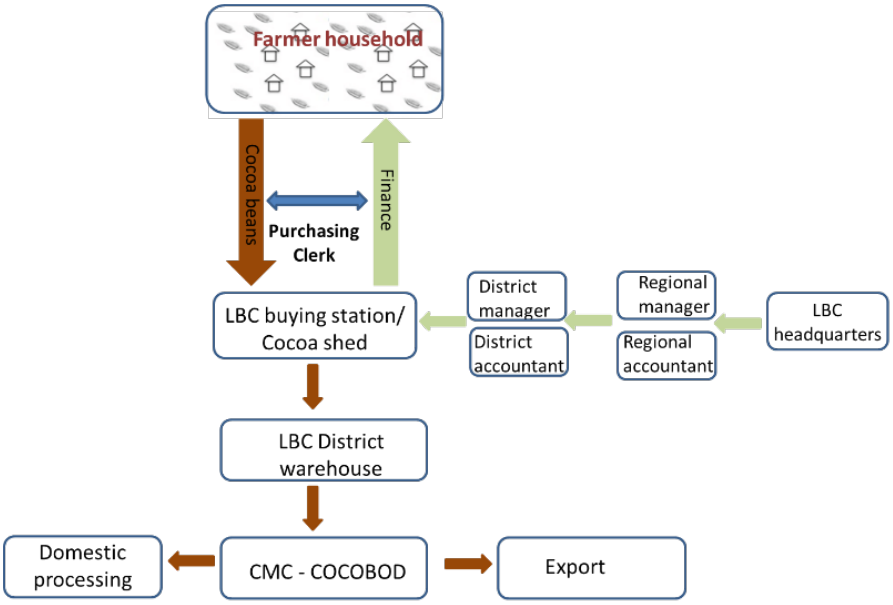

Figure 1. The operational flow of License Buying Companies in Ghana's Cocoa Market
Source: Author's construct with reference to (Ricketts, 2012)

After seed funds have been received by the LBCs at the head offices from COCOBOD, the funds are then distributed to regional managers and the from the regional level to district managers or DOs at the district level. The DOs after receiving the money also distribute it to their PCs who go around the communities within their defined operation areas to buy cocoa beans from farmers. Figure 1 shows the operation pattern of COCOBOD, LBCs and cocoa farmers.

Cocoa farmers are paid after their beans have been inspected and weighed at the cocoa shed by the PC. Due to high competition, some PCs even buy cocoa beans that are not well-dried to dry themselves at the cocoa shed. The reason they give is that if they don't buy the beans in semi-dried state, other PCs will buy. Nowadays, PCs pay farmers instantly with cash after accepting to buy their beans. This act of prompt payment is one of the competition measures PCs use to get farmers to sell cocoa beans to them. Most cocoa-producing households have been described as poor and fall below the poverty line (van Vliet *et al.*, 2021), therefore it is

logical that they would prefer to be paid promptly with cash to be able to attend to their urgent needs to cater for with their proceeds from selling their cocoa beans. Cocoa beans price as of 2021/2022 cocoa season when the survey was conducted was GH ¢660 for 64 Kg bag, thus GH ¢10.56 per kilogram of cocoa beans. It must be noted that the 64 Kg stated includes 62.5 Kg actual cocoa plus the weight of the standard cocoa sack.

PCs on the other hand, are paid by DOs on a commission basis, for every bag (64 kg) of cocoa beans purchased, the PC is paid a commission of GH ¢10.56 as of the 2021/2022 cocoa season. The DOs are responsible for conveying the cocoa beans from the local cocoa shed to the district Depot of the LBCs they work for. Officers from the QCC perform cocoa quality checks differently from what the PCs do before they purchase at the community level. At the Depot, QCC officers use the appropriate tools and follow the required protocol to check for the quality of the cocoa bean. For instance, they use a moisture meter to check the moisture content of the beans, bean count to determine the category, and cut test to determine the grade. After all the quality checks are done by QCC, cocoa beans are graded and sealed, certificate of inspection and Evacuation certificates are then issued ready for evacuation to the take-over centers. At the take-over centers, further quality checks are done, and then cocoa beans are delivered to CMC for shipment and further distribution.

1.4 Competition in Ghana's Cocoa Market

As the number of LBCs in the Ghana's cocoa market keep increasing, LBCs are expected to compete for a larger market share by offering cocoa farmers higher than already determined prices, however, they are not able to compete on a price basis because cocoa producer prices are set administratively by the COCOBOD through the Producer Price Review Committee (PPRC). The PPRC is a representative body chaired by the Ministry of Finance and Economic Planning (MOFEP) and consisting of representatives of cocoa farmers, COCOBOD and LBCs (Kolavalli *et al.*, 2013). Also, COCOBOD sets LBCs margins at the beginning of each growing season as a share of the Free on Board (FOB) prices. LBCs claim that the margin they receive are so low that it will not make economic sense if they competed on a price basis. Therefore, LBCs have adopted measures other than price, to compete for a larger market share. Some of these non-price measures include prompt payment to farmers after purchase, provision of services like subsidized inputs, or credit to farmers and social involvement with farmers' communities (i.e., attending funerals and other social events) (Laven, 2007; Anang, 2011). Our surveyed data collected in October 2022 confirms that non-price measures are used by purchasing clerks to persuade farmers to sell to them preferentially (Table 2). In recent times, almost every PCs uses some form of non-price measure to persuade farmers to sell to them (Table 2). However, it can be hypothesized that the non-price competition measures used by PCs has been developed depending on two conditions: first is the

availability of financial resource (funds provided by LBCs to PCs through DOs and further to cocoa farmers) "Nowadays the LBCs whose money comes first get more cocoa beans to buy, it is a first come first serve business" one key informant narrated. Second is the degree of relationship (personal ties) between PCs and cocoa farmers, in-depth interviews with key respondents in the communities revealed that continuous use of non-price measures builds a good rapport between PCs and cocoa farmers. Considering this hypothesis, PCs are more likely to use finance-based measures when the first condition specified above is satisfied, otherwise they use the non-finance-based measures.

Table 2. Non-price measures used by Purchasing Clerks to compete among themselves.

	Frequency			Percent		
	Yes	No	Total	Yes	No	Total
Do you use non-price measures?	132	18	150	88.0	12.0	100
Non-price Competition Measures used by PC						
Finance-based measures						
Prompt payment after purchase	95	55	150	63.3	36.7	100
Provision of premium/bonus to farmers	69	81	150	46.0	54.0	100
Prefinance to cocoa farmer	133	17	150	88.7	11.3	100
Provision of farm inputs on credit	64	86	150	42.7	57.3	100
Non-finance-based measures						
Provision of extension service	102	48	150	68.0	32.0	100
Provision of training	105	45	150	70.0	30.0	100
Provision of free transport of cocoa beans from farmers' houses/farms to cocoa shed	111	39	150	74.0	26.0	100
Social Involvement in farmers' community like attending social invents.	45	105	150	30.0	70.0	100

Source: Field Survey (2022)

One recent development we observed in the field is that due to the intense competition at the community level, most farmers in the Western north region as compared to farmers in the Ashanti region no longer carry their cocoa beans to the cocoa shed by themselves. The PCs go to the farmers' homes/farms to convey cocoa beans to the shed by themselves either by using their motorcycles or paid transport.

1.5 Cocoa Certification and its influence on Competition in the Ghana's Cocoa Market

The sustainability of cocoa just like any other agri-food has received considerable attention over the past decades mostly due to global ethical concerns raised by consumers and other stake holders about supply chain issues which included cocoa induced deforestation, poverty,

poor labor conditions, gender inequalities and child labor. Studies have shown success in cocoa certification globally, with the proportion of certified cocoa beans sold worldwide increasing since its inception. According to Voora *et al.* (2019), voluntary sustainability standard complaints cocoa experienced a compound annual growth rate of 46% from 2008 to 2016 which accounted for 29% of the total cocoa production in 2016. (Eghbal, 2018; Bannor *et al.*, 2019) also reported that chocolate confectionery from sustainably farmed cocoa accounted for 8% of total global market in 2017. The mainstreaming of the cocoa sustainability certification in Ghana started around 2010 and was mainly run by lead firms from processing segment of the Global Cocoa Chocolate Chain (GCCC) with third-party certifiers like Fairtrade, Organic Cocoa, and UTZ/Rainforest Alliance as collaborative arrangement (Deans, Ros-Tonen and Derkyi, 2018). These transnational corporations mainly established certification projects through local LBCs (Ollendorf *et al*., 2023).

However, many if not all lead processors have now dislodged from the collaborative arrangement with local LBCs/ standard bodies to establish their own subsidiary LBCs in Ghana through which they now run the certification schemes leaving local LBCs out of the certification program due to their lack finance and logistics (Krauss and Barrientos, 2021; Amuzu, Neimark and Kull, 2022; Ollendorf, Sieber and Löhr, 2023). Mondelez exemplifies how global manufacturers are now setting their own ethical standards (Eghbal, 2018). Ollendorf *et al.* (2023) reported that most Rainforest cocoa certification projects are now implemented by subsidiary LBCs of transnational corporations.

Using Rainforest Alliance as case study, Ollendorf et al. (2023) described in detail the implementation process of the certification project. At the community level, every cocoa farmer who wishes to participate in the certification project needs to join the society of the LBC that runs the certification project. Contracts are then signed between the farmer and respective LBC, after which cocoa farmers are obliged to attend regular trainings on the standard requirements organized mostly by lead farmers who have received special trainings on standard requirements. Once the group has made a good progress in adopting requirements, an internal inspection is organized, flowed by the external audit. Consultants from the contracted Certification Body, UTZ/Rainforest Alliance, Fairtrade, or Organic Cocoa visit sampled farms and if most of the participants show good adaption, the whole group is certified, but the certificate is held by the LBC who acts as the group manager.

The benefits of cocoa sustainability certification program to the cocoa farmers cannot be overemphasized. According to Amuzu et al. (2022) farmers benefit in three main areas including, innovation, inputs, and technology. These benefits are provided to relieve farmers of burden of low productivity, unsustainable income, pest and diseases, and unreliable weather conditions. Under the certification program, cocoa farmers are supplied directly with

agricultural inputs like high yielding hybrid seedling which are tolerant to pest and diseases, agrochemicals, training, and extension services, and ultimately farmers under the certification program are paid premium in addition to cocoa producer prices.

Upon our review of the cocoa sustainability certification program, there seem to be possible correlation between the benefits farmers derive from the certification program and the non-price competition measures reported to be used by cocoa PCs to attract farmers to sell to them. If that is the case then there is a possibility that cocoa PCs may no longer be able to use some of the non-price measures (provision of agricultural inputs, training and premium) mentioned earlier as a competition tool as they become pre-requisite for the cocoa certification program. This study seeks to give more insight into this finding.

2. Methodology

2.1 Study Area

The survey was conducted in the Western North and Ashanti regions of Ghana (Figure 1). According to COCOBOD, the Western region is the largest producer of cocoa beans with cocoa beans purchase of 332,647 tonnes in the 2019/20 cocoa season followed by the Ashanti region with 165,830 tonnes of cocoa beans purchased in the same season. The two regions together produce over 65% of the cocoa beans produced in Ghana (COCOBOD, 2020). As confirmed by Zeitlin (2006) who found a positive correlation between the concentration of LBCs at the village level and cocoa production, it was expected that LBCs are concentrated in the Western North and Ashanti regions due to their high level of cocoa production. A total of 17 cocoa-growing communities were selected for this survey.

2.2 Data and Data Sampling

To identify the determining factors of non-price competition measures used by cocoa PCs, we carried out a survey in October 2022 using a digitalized questionnaire on tablets. The questionnaire was designed into five sections; (1) Socio-economic, (2) Social Network (relationship between LBCs and PCs and PCs and farmers, (3) Production (quantity of cocoa beans purchased in both minor (light crop) season and major (main crop) season in the 2021/2022 cocoa year, (4) Cocoa Quality specification and (5) Challenges. Relevant set of questions were asked under each of the sections and used for analysis. The main respondents of the survey were Cocoa purchasing clerks of LBCs both privately owned and government owned.

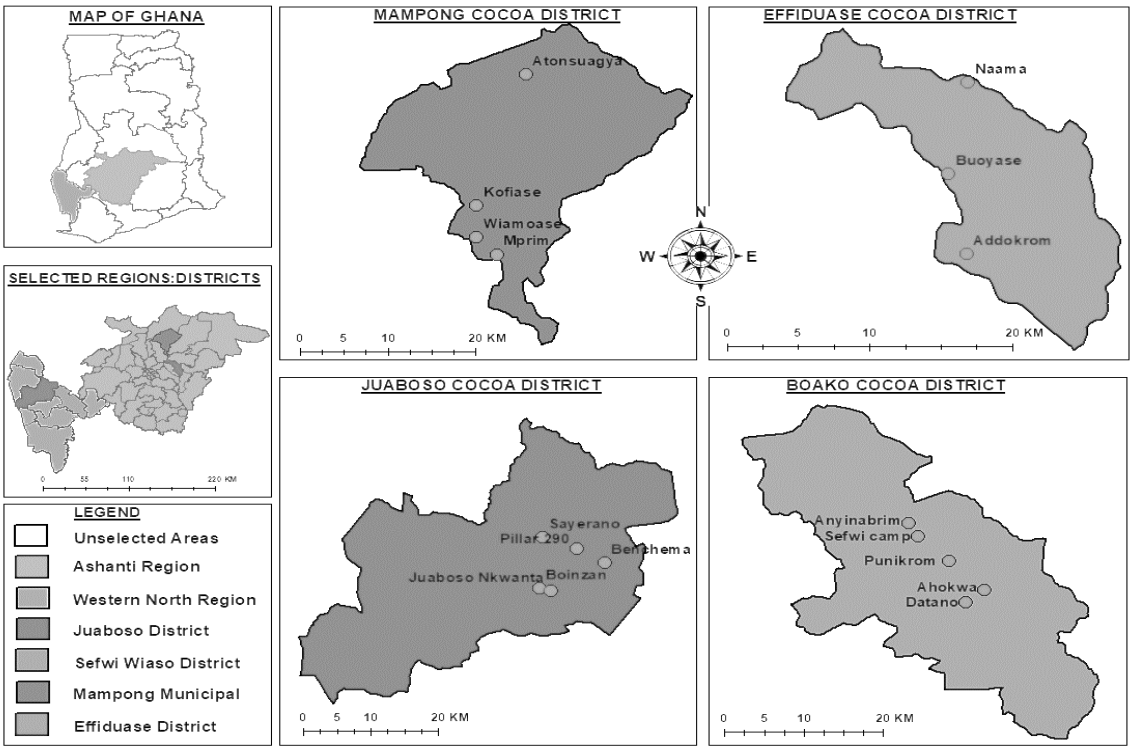

Figure 2: Map of Study Area
Source: Author's construct (2022)

The Western North and Ashanti regions were purposely selected because of their high cocoa production levels. From consultations with COCOBOD at the local levels, four cocoa districts were selected from which communities were sampled. Juaboso cocoa district and Boako cocoa district for the Western North region and Mampong cocoa district and Effiduase cocoa district for the Ashanti region. In all, 17 cocoa-growing communities were sampled, 10 from the Western north region and 7 from the Ashanti region following directives from COCOBOD at the local levels see figure 2. At the community level, PCs were randomly selected and interviewed depending on their availability. A total of 150 PCs were interviewed using structured questionnaires. At least 3 key informants (comprising Assemblymen, District managers of LBCs, and Depo officers) in each cocoa district were interviewed to get a general understanding of the cocoa marketing structure in the districts.

2.3 Method of Data Analysis

Descriptive statistics such as frequencies and percentages were used to analyze the socio-economic data and presented in tables. Also, the binary logistic regression model was employed to estimate the factors determining the choice of non-price competition measures. The empirical model is specified below.

$$log\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 Cert + \beta_2 Contract + \beta_3 Leader + \beta_4 Exper + \beta_5 Male + \beta_6 Age + \beta_7 Edu + \beta_8 Origin + \beta_9 Income + \beta_{10} Married + \beta_{11} Religion + \beta_{12} Language + e_i$$

Where P_i measures the probability of using a non-price competition measure; X_{ki} are the covariates determining the choice of a measure in the model; and e_i is the disturbance term following a logistic cumulative distribution function. The dependent variable is dichotomous, taking a value of 1 if the respondent uses that measure, otherwise (Table 3). Hence, the logistic model is preferred over the ordinary least squares (OLS) as it restricts the predicted probabilities between the boundaries of zero and one (Greene, 2018).

Table 3: Description of the variables used in the logit model.

Variable	Description	Measurement
Dependent variables		
Prompt payment	Payment of cocoa within the same day after purchase	Yes = 1, No = 0
Premium/bonus	Premium/bonus to farmers after purchase	Yes = 1, No = 0
Prefinance	Giving cocoa farmers money before harvest time	Yes = 1, No = 0
Farm inputs	Provision of farm inputs on credit	Yes = 1, No = 0
Extension service	Provision of extension service for free	Yes = 1, No = 0
Training	Training services to farmers	Yes = 1, No = 0
Free transport	Free transport of cocoa beans from farmer's house/farm to cocoa shed	Yes = 1, No = 0
Social Involvement	Social Involvement in farmers' community.	Yes = 1, No = 0
Independent variables		
Certification	Sustainability certification of LBC	Yes = 1, No = 0
Contract	Contract between PC and farmer	Yes = 1, No = 0
Leadership	Leadership position in the community	Yes = 1, No = 0
Experience	Years of working as a cocoa PC	Years
PC Income	Income received from working as a PC	Gh¢
Gender	Sex of PC	Male =1, female = 0
Age	Age of PC	Years
Education	Highest level of education	Secondary/ Tertiary = 1, otherwise = 0
Origin	Place of origin	Native = 1, Migrant = 0
PC as main income source	Is being a PC your main source of income	Yes = 1, No = 0
Marital status	Marital status of PC	Married = 1, otherwise = 0
Religion	Religious affiliation	Christian =1, Otherwise = 0
language	Main language of operation as a PC	Akan/Sefwi =1, otherwise = 0
Region	Region dummies	Western North =1, Ashanti = 0

Source: Field Survey (2022)

3. Results and Discussion

3.1 Socioeconomic characteristics of cocoa purchasing clerks.

Table 4 presents the Socio-economic characteristics of respondents and some LBC characteristics. PCs that worked for certified LBCs accounted for 82.7% of the sample. And about a quarter (25.3%) of the PCs sampled had some form of contract (either written or verbal) with cocoa farmers they bought cocoa beans from. PCs that held leadership positions at the community level aside from their PC job accounted for 50%, some leadership positions included chief farmer, opinion leader, and religious leader. The average years of experience working as a cocoa PC were 11 years, meaning that PCs in the study area have much experience in cocoa purchasing. Most of the PCs (88%) were males and in their youthful age, with the average age being 44 years. Almost half (49.3%) of the PCs had attained a secondary or tertiary level of education, this indicates a high level of literacy among cocoa PCs. Most of the cocoa PCs (72.7%) were natives of the communities in which they operate. This is one advantage of being selected as a cocoa PC because DOs always prefer to work with indigenes of the community for easy traceability. Even though PCs have multiple sources of income, the majority (58%) of them had their main source of income be PC, thus they did other jobs, but cocoa PC was their main job. Those married accounted for 82% of the sample and Christians were the majority (87%). The main languages spoken in the two regions were Sefwi and Akan for the Western North region and Ashanti region respectively.

Table 4: Socioeconomic Characteristics of Cocoa PCs and LBC characteristics

Variable	Frequency			Percentage			Max	Min	Mean	SD
	Yes	No	Total	Yes	No	Total				
LBC Characteristics										
Certification	124	26	150	82.7	17.3	100	1	0	0.83	0.38
PC characteristics										
Contract	38	112	150	25.3	74.7	100	1	0	0.25	0.44
Leadership position	75	75	150	50.0	50.0	100	1	0	0.5	0.5
Experience	-	-	-	-	-	-	53	1	11.33	8.82
PC Income	-	-	-	-	-	-	26188	0	4768.8	4541.4
Gender (male)	132	18	150	88.0	12.0	100	1	0	0.88	0.33
Age	-	-	-	-	-	-	89	21	44.31	13.13
Education	74	76	150	49.3	50.7	100	1	0	0.49	0.5
Origin (Native)	109	41	150	72.7	27.3	100	1	0	0.73	0.45
PC as main income source	87	63	150	58.0	42.0	100	1	0	0.58	0.5
Marital status (Married)	123	27	150	82.0	18.0	100	1	0	0.82	0.39
Religion (Christian)	131	19	150	87.3	12.7	100	1	0	0.87	0.33
Language (Sefwi/Akan)	148	2	150	98.7	1.3	100	1	0	0.99	0.12
Region (Western North)	97	53	150	64.7	35.3	100	1	0	0.65	0.48

Source: Field Survey (2022)

Because the Western region is the highest producer of cocoa beans in Ghana, there is much concentration of LBCs and the majority (64.7%) of our respondents were from the Western North region.

3.2 Factors that determine the use of non-price competition measures by cocoa purchasing clerks.

3.2.1 Finance-based measures

Note: Finance-based measures are the non-price competition measures that require finances to be implemented.

The results show that **certification** significantly influenced three out of the four finance-based competition measures used by PCs. PCs who work for LBCs that operate a certification scheme are 22.8% more likely to use prompt payment, 43.7% more likely to use provision of premium/bonus and 22.1% more likely to use provision of inputs on credit as a competition measure compared to PCs who work for LBCs that do not operate certification schemes. This can be attributed to the fact that certification programs as part of the reward to farmers who comply to their sustainability regulations provide premium, inputs, training and extension services to farmers (Amuzu *et al*., 2022). Also, income from PC job, years of experience, origin of PC, marital status, region of operation significantly influenced the use of finance-based competition measures (Table 5). PCs who are indigenes and have more years of experience are much able to monitor farmers they provide funds to ensures they sell their beans to them after harvest. Hence it is less risky for such PCs to use pre-finance as a competition compared to PCs who are migrant and with less years of experience. Also, the married PCs may be more sensitive to the financial difficulties of farmers, as more of the pre-financing required by these farmers are to settle family financial difficulties.

3.2.2 Non-finance-based measures

Note: non-financed-based measures are the non-price competition measures that do not require finance for its implementation.

Such measures include the provision of extension services (influenced by certification-37.8%), training (influenced by certification- 30.56%, gender- 18.3% and PC income-0.002%), transport (influenced age-0.84% and influenced region-16.2%) and social involvement (influenced by certification-24.6%, gender-21.4% and region-20.4% (Table 5). The best way to explain this result is to use the behavioral characteristics of the people in the two regions. Majority of the people in the Ashanti region are Asantes by tribe as compared to Sefwi people in the Western North region. Unlike the Sefwi people, the Asantes are known to have a flamboyant way of celebrating social events like funerals and they place much importance to them (Addai, 2016). This explains why PCs in the Western north region are less likely to involve themselves in social events of farmers as compared to PCs working in the Ashanti region.

Finance-based measures may be determined mainly by the LBCs or their DOs but not the PCs themselves, because PCs may not be able to afford to choose such instruments with their own finance. On the other hand, non-finance-based measures may be controlled by PCs, they would be made possible through the PCs' negotiation with their DOs or by themselves. For instance, PCs can personally deal with provision of free transport from farmers' houses/farms to cocoa shed and social involvement in farmers' community.

Table 5: Determining factors of non-price measures used by cocoa purchasing clerks.

	Prompt payment	Provision of premium	Pre-finance	Provision of inputs on credit	Provision of extension services	Provision of Training services	Provision of transport	Social involvement
LBC characteristics								
Certification	0.228**	0.437***	-0.0345	0.221*	0.378***	0.305***	0.0395	0.246**
	(0.102)	(0.121)	(0.0689)	(0.116)	(0.0843)	(0.0806)	(0.0882)	(0.115)
PC characteristic								
Leadership position	-0.0155	0.0284	-0.0449	-0.0759	0.0506	0.0307	0.0438	0.0377
	(0.0838)	(0.0862)	(0.0660)	(0.0870)	(0.0818)	(0.0805)	(0.0795)	(0.0846)
Experience	0.00216	0.00158	0.0123**	0.000546	0.00799	-0.00189	0.00880*	0.00116
	(0.00542)	(0.00602)	(0.00483)	(0.00609)	(0.00503)	(0.00509)	(0.00475)	(0.00542)
PC income	0.0000160*	0.0000148*	0.00000128	0.00000787	0.0000123*	0.0000209***	0.000000970	-0.00000972
	(0.00000941)	(0.00000765)	(0.00000573)	(0.00000776)	(0.00000742)	(0.00000741)	(0.00000651)	(0.00000823)
Gender(male)	-0.0142	0.0675	-0.0363	-0.0662	-0.0101	0.183*	0.0842	-0.214**
	(0.119)	(0.124)	(0.0833)	(0.127)	(0.115)	(0.0978)	(0.105)	(0.105)
Age	-0.00538	-0.00296	-0.00388	-0.00446	-0.00436	0.00560	-0.00843**	-0.00434
	(0.00436)	(0.00457)	(0.00294)	(0.00467)	(0.00404)	(0.00409)	(0.00369)	(0.00425)
Education	-0.0715	-0.0821	0.0169	0.0396	0.0466	0.0415	-0.1000	-0.00395
	(0.0844)	(0.0859)	(0.0591)	(0.0883)	(0.0802)	(0.0778)	(0.0756)	(0.0812)
Origin(native)	-0.145	-0.190**	0.105*	-0.0974	-0.125	-0.0655	0.00568	-0.0294
	(0.0967)	(0.0956)	(0.0579)	(0.0966)	(0.0930)	(0.0893)	(0.0813)	(0.0889)
PC as main income source	0.0361	0.0198	-0.0670	0.0220	0.118	0.0766	-0.0937	-0.0723
	(0.0788)	(0.0811)	(0.0624)	(0.0840)	(0.0758)	(0.0749)	(0.0751)	(0.0765)
Marital status	-0.0229	0.0167	0.125*	0.173	0.0843	-0.0564	-0.0378	-0.0462
	(0.106)	(0.112)	(0.0657)	(0.112)	(0.101)	(0.0996)	(0.102)	(0.101)
Religion	-0.190	-0.0116	-0.0865	-0.0152	-0.0368	0.0310	-0.0101	-0.0685
	(0.127)	(0.119)	(0.0998)	(0.121)	(0.111)	(0.107)	(0.105)	(0.112)
Language	0.395	0.197	0	0.0250	0	0	0	0
	(0.309)	(0.348)	(.)	(0.340)	(.)	(.)	(.)	(.)
Region	-0.228**	0.139	0.0365	0.0172	0.0671	0.192**	0.162**	-0.204**
	(0.0928)	(0.0928)	(0.0594)	(0.0977)	(0.0867)	(0.0831)	(0.0789)	(0.0847)
N	150	150	148	150	148	148	148	148

Notes: table 5 reports Average Marginal Effects, standard errors are in parentheses; * p < .10, ** p < .05, *** p < .01

Source: Field survey (2022)

4. Concluding Remarks

The non-price competition measures were categorized into finance-based (measures that require money to implement) and non-finance-based measures. The results showed that LBC certification, income from PC job, origin of PC, marital status and region of operation significantly influenced the finance-based competition measure used by PCs. On the other hand, for the non-finance-based competition measure were mainly influenced by LBC certification, income derived from PC job, age, gender and region of operation.

Among the determining factors of non-price competition measures used by cocoa PCs, certification stands out. Certification positively influenced six out of the eight non-price competition measures used by cocoa PCs. This is mainly because under the certification programs, the firms supply cocoa farmers with agricultural inputs like improved seedlings and agrochemicals, training and extension services are also provided on regular basis through technical experts and in addition, cocoa farmers are paid premium/bonus on each bag of cocoa beans produced. These incentives entice farmers to join the certification schemes and so LBCs with such certification schemes are at advantage of using non-price competition measures thereby increasing their market share.

It was not surprising that certification dominates as a determinant of non-price competition measures (both finance-based and non-financed-based) used by cocoa PCs. With the rise in global concern about agri-food sustainability, regulatory mechanisms must be put in place to govern the food value chain. Such a regulatory mechanism is the cocoa certification program.

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