Coffee Market Liberalization And Private Sector Performance In Tanzania

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INTRODUCTION

Poor performance of agricultural marketing in Tanzania since independence in 1961 (Mwakaje, 1999; World Bank, 1984; Putterman, 1995) and the pressure received from the World Bank led to the change of agricultural marketing policies starting in 1980s. Tanzania seriously started implementing structural adjustment programmes (SAP) in the mid-1980s and for traditional export crops (TEC), market liberalization was effected in the 1994/95 marketing season. These included coffee, cotton, tea, cashew nuts, sisal and pyrethrum. The emphasis of the TEC marketing reforms was on improving agricultural marketing services by expanding the role of the private sector, by liberalizing commodity and factor markets, allowing greater competition, and placing a greater reliance upon market forces, rather than relying on administrative or political devices to direct production and trade decisions. Beyond such abstractions, however, what are the actual forms of marketing that are taking place in the rural areas of Tanzania? There are widespread complaints from producers about traders' market power and exploitation, and there is evidence that liberalization sometimes transfers market power from public marketing authorities to private intermediaries (Duncan and Howell, 1992). This study attempted to provide empirical evidence and explores theoretical explanations for the experienced outcomes of TEC marketing after its liberalization, focusing on the coffee subsector. The main focus of the study was to determine the market concentration, producer price and market share across 11 coffee companies that were involved in coffee marketing in 2008/09, and whether there was an evidence of the exploitation of farmers. Empirical investigation into these issues is based upon coffee marketing in Rungwe district in south-west of Tanzania. The coffee subsector was chosen due to the significant role it plays at the national level in terms of export earnings. Coffee represents about 5% of the total exports, 24% of traditional cash crops, and generating export earnings averaging US$ 100 million per annum over the last thirty years (TACRI, 2011). About 275,000 hectares are under coffee cultivation, supporting some 500,000 households (nation - wide). Coffee production is dominated by smallholder farmers, with an average area of 0.5 hectares, and these are responsible for over 90% of the country's production (Bradley et al., 2005). The Arabica coffee accounts for nearly 75% of the 50,000 tons of coffee that Tanzania produces every year. Coffee is now cultivated practically in all the highland regions of the country. According to the International Coffee Organization, the average year production of coffee over the past thirty years has stagnated at 47,000 metric tonnes, with a range between 33,000 and 68,000 metric tonnes. In the study area, coffee used to be a major source of farm income and a leading crop in influencing the social and economic status of most small holders in the years 1960s-1970s, although this role has diminished due to a number of factors, but mainly pests and diseases as well as the aging of the coffee trees (URT, 2010). In 2000, the yield was only 619.5 kgs per ha against the potential of 1250 (Mwakalobo, 2000).

OBJECTIVES OF THE STUDY

The main objective of this study was to come up with an understanding of the PT performance in marketing, focusing on market shares, producer price, market concentration and the implication of this on farmers' incomes.

Specific objectives were :

- To compare the coffee market share across coffee buying companies.
- To analyze relative efficiencies of the private traders in terms of gross margins and producer prices offered to the farmers.

The main questions that were to be answered by this study were:

- Whether there was any significant difference in the market share across coffee buying companies.
- Whether there was any significant difference in the marketing margins across contractual arrangements.

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The study also aimed to draw a conclusion on whether private traders, through an assessment of the producer price offered (after market liberalization), exploit farmers.

LITERATURE REVIEW

❁ Coffee Marketing Structure, Conduct And Performance : The market structure in the neo-classical model of perfect competition assumes large numbers of buyers and sellers, dealing in a standardized product, under conditions of free entry and complete and perfect knowledge about the market (supply, demand, price, attributes). However, according to Martin (1994), four major elements of the market structure may lead to a departure from the conditions described under perfect competition: the number and size of the distribution of sellers; the number and size of the distribution of buyers ; product differentiation and entry conditions. Bain (1959) elaborated further by describing the market structure as consisting of characteristics of the organization of a market, which seem to influence strategically the nature of competition and pricing within the market. Clodius and Muller (1967) added the issues of distribution of market information and its adequacy in sharpening price and quality comparisons and in reducing risks. It is argued that the market structure determines the behaviour of firms in the market, and the behaviour of the firms, in turn, determines the various aspects of market performance (Martin, 1994). Market conduct refers to firm behaviour in adapting or adjusting to the markets in which they buy or sell. It is a pattern of behavior that traders and other market participants adopt to adjust to the market in which they sell or buy. In a competitive market, forces of supply and demand are expected to determine the equilibrium price of a particular commodity. However, this is possible only when there are many buyers and sellers, no-one can influence price, and market information is perfectly accessed by all market actors. In a situation where information is imperfect and asymmetrically distributed, institutions may evolve to coordinate exchange in terms of buying and selling practices. These may include things like pricing and selling policies and tactics, inter-firm cooperation or rivalry (USAID, 2008). Market performance represents the economic results of structure and conduct (Bain, 1959). In particular, it provides the relationship between distributive margins and the costs of providing marketing services. Other yardsticks for market performance include production and allocative efficiency and equity (Scarborough and Kydd, 1992). The performance of any marketing is determined by the level of transaction costs.

The present study investigated the PT performance in coffee marketing based on market concentration, share and marketing costs across 11 trading companies involved in 2008/09 marketing season. It also determines market performance through the degree of integration and efficiency through net marketing margins (Aker, 2007). Parameters of market performance include price levels, profit levels, costs and the quantity and quality of the commodity sold (USAID, 2008).

MEASURING MARKET CONCENTRATION

❁ Concentration Ratio (CRn) : The *n* firm concentration ratio or *CRn* refers to the calculated market share of the *n* leading firms in the industry (Jacobson and O'Callaghan, 1996). Normally, *n* is between 4 and 8, but the four firm concentration ratio *CR4* is the most widely used (*ibid*).

$$CRn = \sum_{I=1}^{n} Si \quad \text{.....(1)}$$

with $i = 1,2,.....n$

where S is the share of firm *i* in the market.

Conversely, a value close to 1 denotes a high level of concentration. As a rule of thumb, a four enterprise concentration ratio of 50% or more is indicative of a strongly oligopolistic (oligopsonic) industry; of 33-50% weak oligopoly, and less than that, an unconcentrated industry (Khols and Uhl, 1986).

The concentration ratio is popular because of its limited data requirements. The main disadvantage of this method is its inability to show the relative importance of firms within a particular industry. In addition, *CRn* does not take into account product differentiation or other possible monopoly elements, and neither does it allow for the possibility of different degrees of oligopoly through time, space, market levels, functions and products (Scarborough and Kydd, 1992).

❁ **Herfindahl index (H-index) :** The H-index addresses some of the limitations of the concentration ratio technique. It is a measure of dispersion. It has the ability to determine both firm members and inequality (Scherer and Ross, 1990). As a result, the H-index has the merit of combining information about the market share of all firms in the market, not just the largest four or the largest eight firms. It is defined as the sum of the square of the market shares of the *n* firms in the industry (Martin 1994, p.115), that is:

$$H = \sum_{I=1}^{n} (Si)^2 \quad \text{.....(2)}$$

with I= 1,2...n

where *Si* is as defined for *CRn*

The H-index value can vary between 0 and 1. If H = 0, it suggests that there is a large number of equal-sized firms in the particular industry and that concentration is low. If H is close to 1, it implies that the market is dominated by 1 large firm. Stated otherwise, the value declines when the number of firms, *N* increases, and increases with rising inequalities among any given number of firms.

❁ **Marketing Margins :** Margins are often used in the analysis of the efficiency of the marketing systems. It is the percentage of the final weighted average selling price at each stage of the marketing chain. The margin must cover the costs involved in transferring the produce from one stage to the next and providing a reasonable return to those doing the marketing (FAO, 1997). FAO (1997) cautions that margins and changes in margins do not necessarily prove that there is a problem with a marketing system, but rather that there may be a problem which requires further investigation by studying the marketing costs.

METHODOLOGY

❁ **The Study Area :** Rungwe district lies between latitudes $8^0$30 E and $9^0$30 E and longitudes 33^0S and 34^0 S. It is one of the seven districts of Mbeya Region, in the Southern Highlands of Tanzania, about 1000km from Dar es Salaam, the country's main commercial city. Rungwe district has a total area of 2211 sq. km, of which 75% is arable land (URT, 1998). According to the national census of 2002 (URT 2002), the district had about 320,000 people, with 140 persons per sq. km. With 0.9% growth rate per annum, the district was estimated to have 348,800 people by the year 2010.

The district has 3 distinct agro-ecological zones - the highlands, the midland and the lowland zones. Coffee is grown in the highland and midland zones. Other crops grown in the three zones include potatoes, greens, cereals and pyrethrum. Dairy cattle are also kept by a high proportion of farmers, and are one of the main sources of income. The District has a relatively well-developed infrastructure linking it with other parts of the country, as well as with the bordering countries of Zambia and Malawi. However, the district's rural infrastructure is not well developed. Rungwe district has a total rural road network of 1033.3 km. Due to meagre budgets allocated by the government, few maintenance activities are done on a regular basis. Poor roads hinder smooth trading operations, and increase marketing costs, particularly transport and transaction costs.

Rungwe's supply of arabica coffee at the national level is less than 10%. However, the crop plays a significant role in the district's economy in terms of land allocation and income. It is a leading cash crop in the area (URT, 1998). About 20,741 households or 27.9% of the district households grow coffee with an average plot size of 0.5 ha each, and a total area of 10,960 ha. This is about 66% of the total land under cash crops in the district. Coffee in the district is intercropped together with banana. The system allows families to satisfy both their food needs and cash requirements from small areas of land. However, inter-planting coffee with banana reduces the yield of coffee. According to research findings, yield per ha in the intercropped system is only one-half of that obtained in pure stand (Carr, 1993). The current average yield is 200 kgs/ha (URT, 1998), which is far less than the agronomic standard of at least 1250 kgs/ha (Mwakaliobo, 2000). The low yield is said to be a result of intercropping, sub-optimal replacement of trees, lack of extension services, and lack of credit facilities, low producer prices and low application of inputs (URT, 1998). Furthermore, pests and diseases have contributed to this decline (URT, 2010). The low level of coffee production increases the cost of marketing in terms of transport, which reduces its profitability.

❁ **Data Collection:** Data for this study were generated from primary and secondary sources. A market survey was carried out in the June 2008/09 marketing season.

❁**Secondary Data:** Secondary data were important in getting general knowledge of private traders' performance in input and output market services in the district. Secondary data were obtained from various organizations involved directly or indirectly with the coffee trade. These included the District input stockists, the District and Regional Coffee Subject Matter specialists, the Coffee Management Unit (CMU) of the Ministry of Agriculture and Tanzania Coffee Board (TCB). The information collected was related to licensing and regulatory procedures, coffee price trends, production levels, input availability and prices.

❁**Primary Data :** The primary data were collected from all 11 companies which operated during the 2008/2009 marketing seasons. Companies were asked to explain their procedures for licensing, and the terms and costs involved in developing contractual arrangements. They were also asked to list facilities used in marketing, relative costs, duration, flexibility in use, quantity purchased, and price offered to farmers. The type of contractual arrangement developed by each company was described.

RESULTS AND DISCUSSION

❁ **Characteristics Of The Coffee-Buying Companies :** There were eleven coffee buying companies in the 2008/09 marketing season in the study area. Nine were PT, and two were Primary Cooperative Societies (PCS). Six out of the 9 PT companies were from other countries (mainly from the UK), while the other three were Tanzanians of Asian origin. All 9 PT participated both as domestic buyers and exporters, where six out of the 9 companies specialized in the coffee business world-wide. In the country, the six companies were represented by branches run by appointed, well trained managers. In Tanzania, they had in-country offices in Moshi, the base of the coffee auction and head office of the TCB. All 9 PTs had developed contracts with roasters abroad for quantity, quality and delivery dates. In purchasing coffee in Tanzania, they received funds from their headquarters, from contracted roasters, bank overdrafts, or their own savings. In the district, they purchased coffee through contractual arrangements developed with individual agents or PCS. On the other hand, two PCS had no funds for buying coffee. Members in these two PCS agreed voluntarily to collect their coffee for their respective PCS, auction it, and divide the benefit according to the quantity sold. Experience in the coffee business in the district of individual company managers ranged from 10 to 13 years, while it was many years for two PCS (Table 1).

Table 1: Characteristics Of The Coffee Buying Companies For The Marketing Season Of 2008/09

	Type of contractual arrangement	Country of origin of managers	Education of managers	Is it an exporter too?	Has it developed a contract with roasters?	Time in business (Years) for managers
1	Private traders	United Kingdom	Masters	Yes	Yes	13
	Private traders	Switzerland	1st degree	Yes	Yes	13
2	Private traders	Germany	Masters	Yes	Yes	13
	Private traders	Singapore	1st degree	Yes	Yes	13
3	Private traders	Tanzanian of Asian origin	Diploma	Yes	Yes	13
	Private traders	United Kingdom	Diploma	Yes	Yes	10
	Private traders	Tanzanian of Asian Origin	Diploma	Yes	Yes	10
4	Private traders	United Kingdom	Diploma	Yes	Yes	10
	Private traders	Tanzanian of Asian Origin	Diploma	Yes	Yes	10
5	Primary Cooperative Society-Ukukwe	Tanzania	Masters	No	No	More than 20
	Private traders -Ipenja	Tanzania	Form Four	No	No	More than 20

Source: Survey data 2009

COFFEE MARKET CONCENTRATION

❁**Concentration Ratio (CRn) :** The concentration ratio for the first four big buyers (CR4) was calculated to be 71%, sharing the market with 7 other small companies with varying percentages of share. This suggests a high market concentration in only a few companies.

❁ Herfindahl Index (H-index) : Using the H-index, the results show the index to be 0.1793 (Table 2). This is about 1.7 times bigger than 0.1; the index which should have had been, if the 11 companies were having equal shares of coffee marketing in the District. The H-index reveals a great inequality in the market share of companies involved in coffee marketing in the district. To find the equivalent number of companies to the calculated H-index, the following formula was employed $1/N^1 = H$; $1/0.1793 = 5.6$, i. e. approximately 6 companies. The results show that, although there were 11 coffee-buying companies in Rungwe district in the 2008/09 marketing season, the calculated H-index implies that the industry is about as concentrated as an industry with 6 equal-sized companies. Based on the two indices calculated, it can be concluded that coffee marketing in Rungwe district in the 2008/09 marketing season was highly concentrated, and was dominated by a few companies, despite the 11 companies taking place in the marketing.

Table 2: The H-index Calculated From The 11 Coffee Buying Companies In Rungwe District

	1	2	3	4	5	6	7	8	9	10	11
Quantity purchased'000'	633	603	450	222	204	31	95	109	71	132	139
Company market share	0.24	0.22	0.17	0.08	0.08	0.11	0.04	0.04	0.05	0.05	0.052
H-index $(1/q)^2$	0.06	0.05	0.03	0.0081	0.01	0.01	0.001	0.001	0.002	0.007	0.0002
Overall H-index											
N ΣS_i^2 I=1	0.1793										
Source: Survey data 2009											

Generally, marketing costs was high for all companies ranging from 83% to 94% of the auction price. These findings contradict those by Mohan (2007), who reported that the costs are relatively low. Nevertheless, there were positive returns for each company, suggesting that costs are outweighed by the benefits for most producers.

❁ Types Of Contractual Arrangements : In order to minimize the perceived marketing and transaction costs, five types of contractual arrangements were developed by the 11 coffee buying companies: they included *commission agency* (2), where agents in these two companies were paid based on each kilogram of coffee purchased; *commission+wage agency* (2), where the companies used both employee and commission agents; *the PCS and wage agency* (3), where the companies entered a contract with the PCS, but also employed coffee buyers; *the wage agency* (2), where the companies employed agents for coffee buying and were paid on a monthly basis and finally, *the vertically coordinated PCS* (2). In the Ukukwe and Ipenja Primary Cooperative Societies, PCS members in each of the two PCS voluntarily agreed to collect their coffee without being paid, processed it and then auctioned it in Moshi. After deduction of marketing costs, the balance was distributed among the members according to the quantity of coffee sold. This bold decision came as a result of dissatisfaction with the prices paid by the PT. For many companies, the main reasons for adopting a respective

Table 3: Type And Reasons For The Opted Contractual Arrangements By Companies

Type	Contractual Arrangement	Number of Companies	Reason for choosing the contractual arrangements
Private trader	Commission agency	1&2	Security for the advance money, obtain high quality and quantity of coffee.
Private trader	Commission + wage	3+4	Security for the advance money, high quality and high volume of coffee.
Private trader	Primary Cooperative Societies + wage	5,6,+7	Security for the advance money, obtain high quality and volume of coffee.
Private trader	Employee agency	8+9	Security for the advance money and high quality coffee.
Primary Cooperative Societies	Primary Cooperative Societies	10+11	To win high quality and price per kg of coffee sold.
Source: Survey data 2009			

[1] This formula is applied on the assumption that all companies have an equal market share.

contractual arrangement were reported to be purchase of big quantity of coffee, achieve quality control, and reduce risks (Table 3). However, as will be seen later, not many of the purchasing companies succeeded in this respect, especially regarding the quantity that was purchased.

❁ **Marketing Costs :** An analysis of the total marketing costs reveals that the marketing costs were generally high for all companies. The average marketing costs was T.shs 1152.6. This is about 34.6% of the auction price. Overall marketing costs ranged from 29- 40 % of the auction price by the companies for that marketing season. Companies which purchased high quantity of coffee had relatively low marketing costs per unit weight as compared to those which purchased low quantity of coffee. A point to note is that although PCS purchased low quantity of coffee, it had relatively low marketing cost (29%) as compared to all other 10 companies. The PCS also paid higher producer prices to farmers, as compared to all other buying companies. The findings suggest that contractual arrangements between PT and PCS may result in a more efficient and equitable outcome of coffee marketing. Such contractual arrangements will also raise farmers' bargaining power, and enable them access to credit from PT, thereby overcoming the main challenge facing cooperative societies after market liberalization. On the other hand, the transaction costs of traders for searching, bargaining and enforcing contracts will be reduced due to dealing with a large group of farmers in cooperative societies. This may lead to a win-win situation. Furthermore, such contractual arrangements may enhance the quality of production and quantity of coffee produced.

MARKETING MARGIN ACROSS CONTRACTUAL ARRANGEMENTS

❁ **One-way Analysis of Variance :** One-way analysis of variance was used to test whether there was any significant difference of margins by coffee traders across contractual arrangements. In this analysis, the margin of each player was the dependent variable, and the group of other players in contractual arrangements were the factors. The ANOVA was run at $p = 0.05$ level of significance.

The results show a significant difference ($p < 0.05$) of margin for contractual arrangements under *commission agency* and *wage agency*. In the literature, most of the principal-agent models assume that the principal is risk neutral and the agent is risk averse. To get the agent to sign the contract and work hard for the company requires that the principal transfers some of its risks to the agent. The aim of the principal is to get an agent who will sign the contract and who is ready to work hard. In these contractual arrangements, the average *commission* paid was T.shs 139.5/kg. This was assumed to meet the agent's *reservation utility* and ,therefore, the agent signed the contract. In order to induce him to work harder (purchase more coffee and of good quality), the company transferred some risks to the agents by paying them large sums of money and allowing them to purchase coffee at any price, provided they could produce evidence (receipts). On the other hand, in order to get advance money from the principal, the agents were required to offer down payments or equity and to submit collateral (e.g. houses) as security to the contract. These were sufficient incentives for the agents to work hard for quality, quantity and security of the procured coffee. As a result, the contractual arrangement managed to design an *incentive compatible* contract for both the agents and the principal (the company). In addition, discussion with respondents from these two contractual arrangements revealed that their agents were already known to the companies' management through other business relations. This helped to build trust between the two sides and as a result, reduced the transaction costs for the principal. These findings partly tally with the observations made by Aleem (1990). In his study on rural credit in Pakistan, the author observed that lenders generally did not entertain loan requests from farmers who have not had previous dealings with them, for example, in the sale of harvested crop (Aleem, 1990). Personalized relationship is also common in Haiti and Nigeria (Mintz, 1960). On the other hand, the *Commission/wage* contractual arrangements paid the least price for its agents of only T.shs 31.4/kg, followed by *wage only* contractual arrangements (T.shs 80.5). In the principal-agent theory, it is argued that in order for the principal to be efficient, they need to be risk neutral by taking all the risks and offering the agent a risk-free wage. The implication, however, is that because the agent has a risk-free wage, he will not have the incentive to work hard. This seems to be exactly what happened in these two types of contractual arrangements. These companies decided to recruit coffee buyers seasonally, paying them a fixed wage per month of about T.shs 120,000. Hence, agents were certain to get their wages every month, plus a daily allowance, while on the field, and transport to and from the buying posts. The principal (companies) also provided them with accommodation. As a result, agents were putting little effort as the wages were in their *reservation utility*, and they had no risk of losing such an income, provided they meet a minimum quantity set by the principal. The results also show a significant difference ($P<0.05$) in margins

between the contractual arrangements that involved *PCS/wage* and *Wage Agency* alone. The margin was relatively higher for the former contractual arrangement than the latter. This further underpins the observation that PTs who form contractual arrangements with PCS are likely to reduce their transaction costs of searching and bargaining, ending up with high marketing margins and high producer prices.

Generally, there has been superior performance by the two PCS *vertically coordinated* contractual arrangements in terms of producer price paid and level of marketing costs, which were relatively low. This seems to be a result of contractual arrangements that evolved within the society itself. Unlike the other CU in the country, which were developed through a top-down approach, these PCS were grassroots initiatives. Because farmers perceived PTs to be exploiters, they were determined to make a difference. This was specifically done by ensuring coffee quality and good security for their coffee and, due to guaranteed security, their coffee was taken to the curing plant when enough had been accumulated, which reduced transport costs. Furthermore, being a localized contract, it reduced searching, screening and monitoring costs for the member farmers, and it paid its farmers the highest price among the 5 contractual arrangements during that marketing season. Cooperative selling institutions are potential catalysts for mitigating costs, stimulating entry into the market, and promoting growth in rural communities (Holloway et. al., 2008). However, the major problem that threatens the sustainability of such organizations is the lack of funds and knowledge gap on co-operative and accounting techniques. It is unlikely that farmers will always be collecting their coffee without payments until auction prices have been realized. Policies that could stimulate the development of indigenous organizations and provide credit and co-operative as well as book-keeping education may have a positive impact in reducing transaction costs, improving bargaining power, and thus bringing a more equitable outcome in the coffee trade.

Table 4: Results From ANOVA Across Contractual Arrangements

Contractual arrangements	Other contractual arrangements	Mean Gross Margin/kg	SD	Calculated F-Value
Commission agency	Commission +wage agency	199	67	2.0
	PCS + wage agency	194	15	40.1**
	Wage agency	125	55	3.0
	Primary cooperative society	153.8	68	2.0
Commission + wage	Commission agency	371.2	95	0.5
	Primary cooperative society + Wage agency	194.0	15	20.0**
	Wage agency	125.0	55	1.5
	Primary cooperative society	153.8	68	1.0
PSC + Wage	Commission agency	371.2	95	0.02
	Commission + wage agency	199.0	67	0.05
	Wage agency	125.0	55	0.07
	Primary cooperative society	153.8	68	0.05
Wage agency	Commission agency	371.2	95	0.33
	Commission + wage	199.0	67	0.67
	Primary cooperative society + Wage agency	194.0	15	13.4
	Primary cooperative society	153.8	68	0.65
PCS	Commission agency	371.2	95	0.51
	Primary cooperative society + Wage agency	199.0	67	1.03
	Wage agency	194.0	15	20.6**
	Commission + wage	125.0	55	1.52

Source: Survey data 2009

CONCLUSION

This paper examined the performance of private traders in coffee marketing across 11 coffee buying companies for the marketing season of 2008/09 in Tanzania. Using concentration ratio and H-index, the results show an indication of high market concentration in the hands of a few companies. Despite this, there is no strong evidence to suggest that traders had market power to exploit farmers and agents, as the gross margins were modest by almost all companies. It seems that high marketing costs resulting from expensive, bureaucratic and time-consuming licensing, poor infrastructure, small-scale production and geographically scattered farmers increased marketing costs (and transaction) that eroded the coffee profitability of all actors.

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