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Coffee Auction in Tanzania**

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Abstract

The role and functioning of farmer co-operatives in the coffee industry in Tanzania is examined with data from the coffee auction. It was found that private dealers colluded in the auction to lower the price of the coffee they purchased from farmers and repurchased in the auction. The resulting difference in prices is however not large. Co-operatives are too weak to perform effectively their role as a competitive yardstick. No evidence has been found to support the assertion that small-scale farmers, detached from clear market signals, produce lower quality coffee than estate growers.

Introduction

Farmer co-operatives have had a long history in Tanzania (Van Cranenburgh, 1990). The first co-operatives were established in the 1920s under the British colonial rule. They were set-up in a three layer structure: village level, primary societies; regional co-operative unions the members of which were the primary societies; and apex, national organisations comprising of regional unions. The co-operatives were often granted monopoly power as the sole providers of marketing services for cash crops in their villages or regions. After independence (1961), the official one-party policy was to strengthen co-operation, even to force it. However, as the one-party policy was further pursued, independent co-operatives were dissolved (in 1976) and their functions were turned over to crop authorities. Since the early 1980s Tanzania has followed a liberalisation policy: co-operatives were re-established in 1982, still with monopoly power and public support, but they lost these privileges in 1991 and are expected now to be “viable” financially and compete in free markets. One of these is the coffee market.

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Coffee is the single most important export product of Tanzania. It is grown in several regions and sold for export in an auction held twice a month by the Tanzania Coffee Board (TCB) in Moshi, northern Tanzania. This paper summarises statistical analysis of information gathered from six auctions of Mild Arabica coffee.¹ The analysis is part of a larger study aimed at finding how liberalisation affected farm co-operatives and their functioning.

Coffee and its Auction

Coffee is grown on smallholder farms and larger estates. The beans are collected from the farmers either by the primary co-operative society in the village or (since liberalisation) by private traders. Most primary societies transfer the coffee they collect to co-operative unions for further handling. The co-operatives accept the coffee on consignment, they pay the farmers an advance when the coffee is brought in and a second and third payment usually follow after the coffee has been auctioned and the co-operative coffee account realised. Private traders buy the coffee and, in general, the price they pay is final.

The harvested coffee beans are treated and dried on the farm and moved to curing plants where they are further treated, sorted into homogeneous lots and graded according to internationally accepted standards. Samples may then be examined by “liquering” and testing the brewed coffee for smell and taste.

The participants in the auction are owners (sellers) of the coffee lots and the buyers of coffee. They are private traders, co-operatives and estates. Most coffee is bought for processing or export by the private traders, some export is done by Tanzania Export Company (TEC), the export arm of TCB, and by Kilimanjaro Native Coffee Union (KNCU)—a secondary co-operative union the member of which are the village primary co-operative societies. To determine a price and collect a TCB levy of

¹ The first to collect detailed information on coffee auctions was Mr. L. N. Donge from Moshi Co-operative College. Mr. Donge let us have his data for the research reported here. The project he started was continued by Mr. Joseph Tesha and Ms Renalda Salum. The Excel data base and background calculations for this paper were prepared by Mr. Asangye Bangu. We are also indebted to many other people in the coffee sector, particularly in TCB, for detailed information and assistance. Auction data were also analysed by Temu (1999) in her study of the coffee market.

2% of its value, all the coffee sold as green beans (ready for processing or shipment overseas) moves through the auction. Some of the private traders (and also KNCU) may function in the auction both as owners and as buyers. In many cases they repossess their coffee; that is, they “purchase” the coffee they themselves offered in the auction.

Before the auction the buyers receive catalogues specifying, by lot, the source of the coffee, size and grade. Relying on Reuters most recent world price information, TCB’s sales committee set reservation prices. These prices are given to the auctioneer but are not revealed to the buyers.

Major Questions

Coffee is grown on a large number of farms, most of them of small size, and it is traded by a relatively small number of dealers. Hence conditions of perfect competition cannot be expected to prevail in the coffee economy. Private dealers may collude—explicitly or implicitly—to influence the market and lower the price of coffee (compared to perfectly competitive prices) in two of the stages of the marketing process: (a) when purchasing coffee beans from the farmers, (b) when repossessing their own coffee in the auction. The damage to the farmers is done in the first stage; repossessing at low prices “only” reduces the levies TCB collects with no direct cost to the growers. The behaviour of the private dealers in the auction is examined in this paper with the anticipation that it will be possible to deduce from this behaviour on their performance at the village level. The question is, then, do the data indicate collusion of private dealers in the auction?

The market role of the co-operatives—being the non-profit entities in the coffee sector—is to provide a competitive yardstick (Sexton and Iskow, 1993). In the village the co-operatives may take the coffee for its full worth and similarly at the auction, the co-operatives unions, if they also export coffee, may offer to purchase lots brought by private dealers at their full value. Do we learn from the auction that the co-operatives succeeded in their function as competitive yardsticks?

The structure of the coffee economy poses a difficulty that would not have been resolved even if the market had been perfectly competitive. As many of the farmers produce small quantities, their coffee has to be collected into pools of relatively large size, whether by the co-operatives or by private traders. In this way the coffee is taken from the grower before it was sorted, graded and priced. Some attention is given to quality at the village level, but it is impossible to achieve an accurate transmission of the quality and value of the coffee as sold in the auction. Consequently, farmers, whose coffee is pooled, are not rewarded accurately for higher quality coffee and are not penalised for lower quality. Given the distorted incentives, do smallholder farmers produce and supply comparatively lower quality coffee?

Summary Statistics

Table 1 summarises the salient feature of the six auctions analysed in this report; they were (column 2) the first two auctions on which we have data (summer 1996), two auctions in October 1997, and the most recent auctions in our data set—from December 1998 and January 1999. The first two auctions were relatively small, less than 500 tons of coffee in each, the other four were larger with more than 1,000 tons per auction. All in all, 942 lots with upward of 6,000 tons of coffee were sold in the six auctions covered in this report.

The owners (sellers) of coffee in the auction were divided into four groups. By far, the largest quantities of coffee (90% of the total) were brought by private traders, the other owners were independent large growers (estates), KNCU and other co-operatives—both unions and primary societies. Close to three-quarters of the coffee in the auctions (74%, column 5) was repossessed, “purchased” by the owners.

The catalogues identified six regions in which the coffee originated, they will be included in the statistical analysis to follow but omitted from Table 1. The coffee lots were assigned 14 grades. Most of the coffee was in the best three grades AA, A, and B.

Column 6 reports average prices, in dollars per kg, for the categories in the table. We report separately the average prices of the highest three grades. The best,

TABLE 1:
Summary Statistics

		Lots	Weight (kg)	Share (%)	Average Price	
					Actual	Normal
1	2	3	4	5	6	7
Auctions	11.07.96	84	405,556	6	1.86	2.26
	22.08.96	68	382,779	6	2.52	3.07
	09.10.97	194	1,736,944	25	3.47	2.97
	23.10.97	158	1,450,675	21	3.15	3.04
	17.12.98	228	1,285,392	19	2.91	3.04
	07.01.99	210	1,551,467	23	2.65	2.96
Owner	Estates	42	234,572	3	3.79	3.08
	KNCU	39	226,342	3	3.70	3.09
	Other Co-ops	59	207,450	3	3.54	2.89
	Traders	802	6,135,786	90	2.88	2.95
Repossessed		629	5,018,102	74	2.89	3.01
Grade	AA	177	1,663,402	24	3.26	
	A	176	1,700,611	25	3.16	
	B	164	1,455,819	21	3.09	
	Other	425	1,992,981	30	2.46	
Total or average		942	6,812,813	100	2.96	2.96

Source: Auction data.

Notes: Column 5 is share by weight. Columns 6, 7, in US dollars per kg.

grade, AA, was sold for \$3.26 per kg. Other grades fetched lower prices. The overall sample average for the six auctions was \$2.96 per kg. The entries in column 6 indicate differences in average prices between groups in categories. Thus average auction price ranged from \$1.86 in the first auction to \$3.47 in the third. Among the owners, private traders received the lowest price (\$2.88 per kg) and—since most of the private coffee was repossessed—essentially the same average price was received for lots “purchased” by their owners.

Column 7 reports an attempt to gauge the quality of the coffee in the categories. The entries in the column were calculated by first assigning to each lot the average price for its grade and then taking the average on all the lots in the group. The result is termed “normalised price” and it is actually a quality index. Quality is here defined by average grade composition and measuring it in units of dollars per kg facilitates easy comparison with actual price. Thus the first auction, with quality

measure of \$2.26 per kg, had on average a lower quality coffee—as indicated by grade composition—than the other five auctions. The actual average price of the coffee in the first auction was even lower, \$1.86 per kg, probably reflecting comparatively lower world price at the time of that auction. Also, by our quality measure, estates and KNCU brought to the auction higher-grade coffee than the other co-operatives and private traders. We turn now to the statistical analysis.

Statistical Analysis

The tool of the statistical analysis is a regression explaining prices and quality by the attributes of the coffee. All the attributes entered the regressions as dummy variables and the procedure is therefore an analysis of variance. The observations were lots sold, and the dependent variables were the logarithm (natural) of the actual or the normalised price.

The dependent variable in regression 1 in Table 2 is the price by lot. The coefficients indicate relative differences from the omitted variables. Thus prices in the first auction, held in 11.07.96, were higher by 26.9% than those in the omitted auctions (17.12.98 and 07.01.99). Among the grades, the price of the omitted grade, A, was 1.4% lower than the price of the best grade, AA. Grade B's price was by 4.3% ($0.014+0.029$) lower than AA's. The other grades were of minor importance and lower prices. Clearly, grades do not tell the whole story, coffee prices differ significantly by region. Tanzania is particularly proud of coffee grown on the slopes of the Kilimanjaro mountain; and indeed Northern Coffees fetched the best price in the auctions, 7% higher than coffee from Mbeya in the south. It is however surprising that coffee from Moshi, also in the Kilimanjaro region, fared badly (some of it may have been assembled from outside the region).

For the purpose of the present analysis, the most interesting coefficient in Regression 1 is the last in the column. Repossessed coffee was “sold” for a price that was on average 2.4% lower than alienated coffee. A lower price for repossessed coffee indicates possible collusion of buyers, but the effect of the collusion is not large.

We turn now to quality. By Regression 2, in which the dependent variable was the normalised price, the fourth auction, held on 23.10.97, had the best grades, 79.4% better than the omitted auctions. Moshi region had the lowest quality coffee, as well as the lowest price (Regression1); but for the other regions, grade composition and prices did not go hand in hand. Turning to owner (seller) groups, estate coffee was better by 4.1% and KNCU's coffee was 14.7% better than coffee purchased by private traders (the omitted group).

Discussion

Before we turn to the major questions posed earlier, note the differences in prices between the auctions. These differences probably reflect changes in world prices (not included explicitly in our analysis). Historical data seems to indicate a ten-year cycle of coffee prices on the world market. Most recently prices peaked at the beginning of 1997 and have been falling for the last couple of years (a good source is Best Investment Coffee Newsletter, <http://binews.com>). It is only since liberalisation that domestic prices of coffee reflect world prices; in earlier periods local prices were isolated from international changes (Lofchie, 1994). Needless to say, auction prices are not necessarily the prices paid to producers. The transmission of world signals to the farm gate has still to be analysed.

Collusion of private dealers in the auction will show up in lower prices for repossessed coffee relative to alienated lots. As we have seen repossessed coffee fetched in the auction prices that were on average lower by 2.4% than coffee bought from others. This is an indication of collusion, but not a strong indication. It shows, by the way, that TCB is acting effectively in setting reservation prices that prevent substantial under-pricing of repossessed coffee. Auction data do not explicitly show collusion at the procurement stage but, as indicated earlier, if the traders collude in the auction, they may also collude in other segments of the market.

As for the yardstick function, KNCU purchased in the six auctions 5 lots (including 3 it repossessed), less than 30 tons of coffee, against 39 lots and 226 tons that it brought to the auctions. KNCU is clearly a small "player" in the coffee economy, particularly in export. It can hardly function as an effective competitive yardstick.

TABLE 2:
Statistical Analysis

	Variable	Regression 1		Regression 2	
		Coeff.	t-Stat.	Coeff.	t-Stat.
Auction	Intercept	1.177	62.846	0.898	29.575
	11.07.96	0.269	2.795	0.371	1.726
	22.08.96	0.396	22.568	-0.010	-0.267
	09.10.97	0.238	14.047	0.021	0.542
Grade	23.10.97	0.344	3.468	0.794	3.662
	F	-0.449	-22.559		
	PB	-0.066	-3.292		
	E	-0.448	-7.313		
	CB	-2.523	-30.774		
	UG	-0.558	-16.450		
	HP	-0.731	-4.609		
	C	-0.258	-11.118		
	TT	-0.324	-11.603		
	AF	-0.313	-11.498		
	TEX	-3.475	-52.283		
	B	-0.029	-1.719		
	AASP	-0.186	-4.786		
	AA	0.014	0.812		
Region	Moshi	-0.532	-5.448	-0.574	-2.694
	Mbozi	-0.212	-8.595	0.120	2.150
	Makambako	-0.227	-12.383	0.141	3.443
	Northern	0.070	3.960	0.189	4.837
	Coffee				
	Dar es	-0.485	-6.223	-0.581	-3.913
	Salaam				
Coffee	Reposs'd	-0.024	-1.940		
Owners	Estates			0.041	0.704
	KNCU			0.147	2.409
	Co-ops			-0.028	-0.538
Adjusted R ²		0.117			

Notes:

Dependent variables: Regression 1: Natural logarithm of price;

Regression 2: Natural logarithm of normalised prices.

Number of observations 942.

Omitted variables: Auctions 17.12.98, 07.01.99; Grade A; Coffee alienated; Region Mbeya; Owner group Private traders.

As for the price transmission and its behavioural implications, one would have expected estates, bringing their coffee to the auction and being fully aware of its grades and prices, to have the best coffee and co-operatives to suffer from free rider problem and deliver relatively lower grade coffee. The finding of our analysis do not support fully these hypotheses; KNCU's coffee had the best grade composition and

estate coffee was not significantly better than coffee brought by private dealers and mostly bought from small producers in the villages.

In conclusion: the regional union KNCU collected 17,000 tons of coffee in 1993, in 1997 it got only a fifth of this quantity. It is losing its market share, mostly to private traders. Our analysis seems to indicate that co-operatives may have a vital service to provide when parties to the market are not equal but it seems that liberalisation created an impossible environment for the established, formerly supported, co-operatives. A detailed analysis of this assertion, and assessment of possible remedies, are beyond the scope of this paper.

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