MARKET ANALYSIS NOTE #2

Grain Market Research Project
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THE RESPONSE OF ETHIOPIAN CEREAL MARKETS TO LIBERALIZATION[1]

This Note assesses how liberalization of Ethiopia's grain marketing system in March 1990 has affected the level and volatility of wholesale prices and price spreads between major regional cereal markets. The paper also identifies issues and problems needing attention to guide future policy decisions with the aim of reducing marketing costs in the food system and thereby promoting the welfare of grain producers and consumers in Ethiopia.

The study focuses on three cereals (maize, white teff, and white wheat) and eight markets: Addis Ababa, Dire Dawa, Mekele, Bako, Shashemene, Jimma, Bahir Dar, and Hosaenna. Markets are chosen based on the availability of continuous time series price data covering at least three years before and after market liberalization.[2]

The major findings of the report are as follows:

- Cereal price spreads (the difference in wholesale prices) for major regional markets have generally declined since liberalization in 1990. In 24 market pairs covering maize, white teff, and white wheat, average price spreads declined in 23 cases after liberalization (Tables 1 and 2). Prices in the major surplus-producing areas for which data are available have risen by 12% to 48%, while prices in deficit regions have declined by 6% to 36% in eight of nine cases.

- The volatility of wholesale cereal prices has declined since liberalization in 11 of 16 cases for which data was available (Table 1). The volatility of cereal price spreads between different markets has also declined since liberalization in 23 of the 24 cases examined (Table 2). These declines are measured in terms of changes between the two periods in the standard deviations of monthly prices and price spreads.

- The general decline in the level of cereal price spreads is due not only to rainfall, seasonality, or other exogenous factors. Econometric results, which hold these factors constant, indicate that liberalization was associated with a decline in cereal price spreads in 16 of 19 cases, with the effect being statistically significant in 10 cases.

- The extent to which increased average wholesale prices in surplus areas have been passed along to farmers in the form of higher producer prices continues to be a major unknown. This is the subject of on-going analysis at GMRP. Yet to the extent that higher prices at wholesale level have been transmitted to producers, liberalization has positively affected cereal production growth and incentives to use fertilizer and other productivity-enhancing inputs.
- The correlation between wholesale market prices (extent to which price changes in one market are

associated with price changes in other markets) has risen in 17 of the 24 market pairs examined since liberalization in 1990. These results indicate that changes in wholesale grain prices in one market are transmitted to other markets more rapidly and to a greater extent since liberalization.

- Despite these tangible gains resulting from cereal market liberalization, there appears to be substantial opportunity to further reduce costs in the grain marketing system. One of the most prominent sources of potential cost reduction is the tariffs imposed on grain at road checkpoints ("kellas"). The conventional wisdom in Ethiopia is that these tariffs constitute a tax on traders. However, the magnitude of these checkpoint charges and their effects on prices received by producers and prices paid by consumers (i.e., who ultimately pays the tax) has been very unclear. To overcome this information gap, enumerators were hired to ride on trucks carrying grain across five major cereal trade routes: Addis to Harar; Addis to Mekele; Nekempt to Addis; Shashemene to Addis, and Jimma to Addis. Enumerators rode on five different trucks on each trade route during August 1996, and recorded information on the number of checkpoints encountered, time spent at each checkpoint, and the tariff charges incurred, both official (with receipts) and unofficial (without receipts).[3]

  Results of the survey are as follows: The number of checkpoints observed on each grain trading route varied from 8 to 18. At each checkpoint, transporters were delayed on average for about ten minutes. The total time taken for all checkpoint inspections from departure to destination varied from one to three hours. The average checkpoint tax paid by transporters was 7.2 birr per quintal. There was substantial variation in the magnitude of checkpoint taxes along different routes, being as low as 3.8 birr per quintal from Shashemene to Addis, and as high as 15.0 birr per quintal from Addis to Harar (including both official and unofficial charges). The checkpoint charges accounted for 20% to 33% of the average price spread observed on these major grain trading routes. The checkpoint charges are also considerable in terms of the prices received by farmers, accounting for roughly 10% of the producer price of maize in Shashamene, and about 5% and 6% of the producer price of white teff and white wheat in Dejene and Hosaenna, respectively, for the months of July and August 1996.

- Based on preliminary findings from the 1996 GMRP/CSA Rural Household Survey, the estimated marketed cereal output from the 1995/96 meher harvest is as follows: maize: 506,439 tons, or approximately 30% of total maize production; teff: 409,799 tons, or approximately 31% of total teff production; wheat: 233,904 tons, or approximately 28% of total wheat production; total cereals: 1,634,440 tons, or approximately 26% of total cereal production. These volumes and percentages clearly fluctuate from one year to the next as production fluctuates. However, these estimates provide an order of magnitude estimate of marketed cereal output in a good harvest year in Ethiopia. This information may be useful in deciding appropriate quantities of cereal to be purchased through support price operations, local purchase programs, and/or food aid releases to help stabilize prices at desired levels.

- The volume of imported food aid wheat since the mid-1980s has significantly affected cereal prices for wheat and teff in some areas, especially those where substantial food aid has been distributed (e.g., Mekele). The volume of imported food aid wheat has ranged from 0.3 to over 1.1 million tons annually since 1985, accounting for an estimated 20 to 50 percent of the national marketed cereal supply over the past decade. Econometric results indicate that food aid released in a particular region was associated with a decline in white teff and white wheat prices in six of 10 markets examined. In these cases, wholesale prices in a given region and a given month declined by 2 to 5 birr per quintal for every additional 3,000 tons of food aid released within that region over the prior three-month period. In some cases such as Tigray, the volume of food aid has at times been large enough

to depress wholesale prices of wheat and teff by 15% to 25%. By contrast, the importation of food aid wheat has not significantly affected maize prices in any of the markets examined, presumably due to less substitutability in consumption between maize and wheat. The welfare effects of lower grain prices (due to food aid) on food production incentives, input use, and

Table 1. Summary statistics of real prices of cereals for selected markets in Ethiopia*

Markets	Before market liberalization (Jan 85 - Mar 90)		After market liberalization (Apr 90 - Jun 96)		Change between the two periods	
	Mean	SD	Mean	SD	Mean	SD
Maize						
Surplus areas:						
Bako	61.18	20.79	90.14	31.95	28.96	11.16
Shashamane	66.29	13.89	97.79	22.17	31.50	8.28
Jimma	85.43	37.19	95.65	28.69	10.22	-8.50
Deficit areas:						
Addis	120.23	48.89	113.55	24.66	-6.68	-24.23
Dire Dawa	145.08	50.13	154.63	30.74	9.55	-19.40
Mekele	218.28	63.01	149.75	17.55	-68.53	-45.46
White Teff						
*Surplus areas:*Bako	142.34	22.10	173.82	25.55	31.48	3.45
Hosanna	155.34	22.97	189.65	23.93	33.94	0.96
Bahir Dar	158.16	15.77	207.63	25.55	49.47	9.78
Deficit areas:						
Addis	281.90	64.05	238.62	20.29	-43.28	-43.76
Dire Dawa	330.97	68.42	285.23	26.38	-45.74	-42.04
Mekele	422.32	73.26	270.94	15.12	-151.40	-58.14
White Wheat						
Surplus areas:						
Hosanna	110.96	20.40	136.07	16.18	25.11	-4.22
Deficit areas:						
Addis	183.49	55.40	169.21	20.68	-14.28	-34.72
Dire Dawa	238.97	49.34	225.70	22.60	-13.27	-26.74
Mekele	270.30	46.06	197.59	29.05	-72.71	-17.01

* Levels are reported in birr per quintal (100 kgs) in constant 1995 birr.

rural livelihoods are complex and clearly differ among different types of rural households. A large percentage of rural households are net buyers of cereal on an annual basis (in 1995/96 this percentage was

almost 50% nationwide); these households directly benefit from lower staple food prices (Daniel and Jayne 1996). However, lower prices due to food aid may impede input use and cereal production by rural households who grow certain cereals as a cash crop. Also, the potentially destabilizing effect of food aid on market prices may introduce additional risks and costs for private traders, who are likely to pass these costs onward to producers and consumers.

Table 2. Summary statistics of monthly cereal price spreads between different markets*

Pair of markets	Before market liberalization (Jan 85 - Mar 90)		After market liberalization (Apr 90 - Jun 96)		Change between the two periods	
	Mean	SD	Mean	SD	Mean	SD
Maize						
Addis-Bako						
Addis-Dire Dawa	40.57	20.22	23.40	15.80	-17.17	-4.42
Addis-Jimma	35.05	32.46	41.08	22.33	6.03	-10.13
Addis-mekele	18.62	26.87	17.90	14.64	-0.72	-12.23
Addis-Shashamane	100.60	51.18	40.34	23.61	-60.26	-27.57
Dire Dawa-Bako	31.92	14.36	15.76	11.48	-16.16	-2.88
Dire Dawa-Jimma	76.19	44.17	64.49	23.51	-11.70	-20.66
Dire Dawa-Shashamane	54.82	34.75	58.98	28.39	4.16	-6.36
	58.37	19.29	56.84	23.25	-1.53	3.96
White Teff						
Addis-Bako						
Addis-Bahir Dar	116.46	41.16	65.40	19.98	-51.06	-21.18
Addis-Dire Dawa	93.93	22.23	28.33	18.07	-65.60	-4.16
Addis-Hosanna	59.01	32.13	47.72	18.57	-11.29	-13.56
Addis-Mekele	96.26	36.67	48.97	17.36	-47.29	-19.31
Dire Dawa-Bako	116.56	58.67	36.71	22.33	-79.85	-36.34
Dire Dawa-Bahir Dar	175.12	58.34	111.52	27.65	-63.60	-30.69
Dire Dawa-Hosanna	144.64	33.94	74.23	21.15	-70.41	-12.79
Mekele-Bako	146.60	36.19	95.68	25.52	-50.92	-10.67
Mekele-Bahir Dar	227.03	74.47	98.17	32.70	-128.86	-41.77
Mekele-Hosanna	224.23	45.29	63.38	32.23	-160.85	-13.06
	239.00	44.04	83.03	28.08	-155.97	-15.96
White Wheat						
Addis-Hosanna						
Addis-Dire Dawa	51.96	47.54	29.13	12.63	-22.83	-34.91
Addis-Mekele	71.62	35.79	56.49	26.01	-15.13	-9.78
Dire Dawa-Hosanna	87.17	75.13	33.12	32.56	-54.05	-42.57
Mekele-Hosanna	114.90	36.65	87.75	24.31	-27.15	-12.34
	150.10	164.93	62.67	27.54	-87.43	-137.39

* Levels are reported in birr per quintal (100 kgs) in constant 1995 birr.

In general, the performance of Ethiopia's grain marketing system has improved since liberalization. Wholesale prices in the major surplus-producing areas have risen while prices in the consumer markets have declined. Grain price spreads for the major wholesale markets in Ethiopia have generally declined since liberalization. The volatility of wholesale grain prices and price spreads also generally declined. The correlations between wholesale market prices has risen for most pairs of markets examined, providing an initial but very rough indication that grain markets have become more spatially integrated since liberalization. These findings provide some support to the notion that the removal of constraints on the private grain trade can bring tangible and broad-based benefits to both producers and consumers by reducing the wedge between the prices consumers pay for grain and the prices that producers receive. These price effects may also indirectly affect incentives to use productivity-enhancing inputs and nutritional status among poor households dependent on the market to procure food.

Policy Issues for Further Consideration

Despite the tangible gains resulting from grain market liberalization in Ethiopia, there remain major opportunities to further reduce costs in the grain marketing system:

- *Increased investment in market infrastructure.* Between 40-60% of the retail cost of staple food in Ethiopia is accounted for by marketing costs. A substantial portion of these costs are transport costs. Investment in market infrastructure reduces costs and risks across a broad range of commodities and inputs in contrast to expenditures confined to particular crops (e.g., support prices on maize). One of the reasons for the differential effects of market liberalization in different areas could be variations in the development of marketing infrastructure between surplus and deficit areas. The econometric results indicate that the benefits of liberalization to producers have been relatively lower in the more remote areas with poor roads and market infrastructure. Moreover, a considerable part of the food price instability problem in Ethiopia is related to the high cost of transportation, which creates a large wedge between import and export prices. For example, when areas of Southern Ethiopia are in grain surplus, prices are depressed by high transport costs that limit grain export opportunities. When these areas are in grain deficit, prices are driven upward by the high cost of transporting grain to these areas from other regions. Government and donor support for improved road infrastructure and lower transport costs (both within Ethiopia and between Ethiopia and its regional neighbors) would benefit both producers and consumers and further increase the benefits of market liberalization.

- *Removal of taxes on grain at regional road checkpoints:* While taxes on the movement of grain support fiscal objectives of the regional governments, they increase grain marketing costs and work against government efforts to stimulate incentives to use productivity-enhancing farm technology. Other research has shown the value-cost ratio of fertilizer use on maize could be increased by 8% in key producing regions if the elimination of checkpoint tariffs were half passed on to producer prices (Mulat, Ali, and Jayne 1996). Also, since the poor spend a comparatively large proportion of their income on food, the taxation of grain is likely to be regressive. As this note goes to print, it is noted that some regions (e.g., SNNPR) have recently reduced the number of checkpoints within their jurisdiction and other regions have announced intentions to do so.

- *Improved public market information systems* to accelerate both private and public response to supply gluts and shortages, and to identify potential regional export/import opportunities. In many cases, profitable trading opportunities such as the case of maize export to Kenya in 1996/97 depend on rapid assessment and response before market conditions change, highlighting the importance of timely and accurate market information, both in Ethiopia and throughout the region.

- Other research on the behavior of wholesale traders (Eleni, forthcoming) indicates the scope for reducing handling and transaction costs if improvements in cereal grading and standards could be achieved. For example, inadequate grading procedures cause grain to be un-bagged and re-bagged for quality inspection each time grain changes hands. These findings are indicative of an emerging body of empirical evidence on policy reform in Africa suggesting that, while some reforms have been critical to promote economic growth, they are insufficient by themselves to generate leaps in productivity growth and require associated improvements in key market institutions, contract enforcement, and broader nurturing of civil society.

Thus, while liberalization has reduced marketing costs related to policy restrictions, there may be substantial scope to further reduce costs in the cereal marketing system through strengthening of market institutions. This implies an important positive role for government. In a country such as Ethiopia, where many households are impoverished and live on the brink of subsistence, the effects of policy and institutional constraints that inflate costs in the food system are most likely to hurt them the most and exacerbate the country's food insecurity problem.

Notes

1. This Note is a synthesis of a Working Paper by the Grain Market Research Project: Asfaw Negassa and T.S. Jayne, 1997. "The Response of Ethiopian Grain Markets to Liberalization," Working Paper #6, Grain Market Research Project, Ministry of Economic Development and Cooperation, Addis Ababa. Readers interested in details as to method, model specification, and results are referred to this paper.

2. Results pertain to inflation-adjusted prices (deflated by the non-food consumer price index) in the private trading system. The private trade accounted for about 60-65% of total marketed cereal supply prior to liberalization in the 1980s, and about 90-95% in the post-liberalization period. This analysis does not address the effects of liberalization on changes in prices within the controlled marketing channel. Details as to the nature of the policy changes adopted as part of grain market liberalization in 1990 are contained in the main report (see footnote 1).

3. For earlier work on the problem of grain checkpoints, see Howard et al. 1995.

Selected References

Daniel Molla and Jayne, T.S. (1996) The Role of Food Aid in Ethiopia: Stabilization Objectives and Access to Food by Vulnerable Households, Note Presented to the First Discussion Forum of the Grain Market Research Project of the Ministry of Economic Development and Cooperation, 8 & 9 November 1996, Sodere.

Eleni Gebremedhin (forthcoming) Grain Market Performance and Transaction Costs in Ethiopia, Ph.D. Thesis, Stanford University, Palo Alto.

Julie Howard, Ali Said, Daniel Molla, Patrick Diskin, Seifu Bogale (1995) "Toward Increased Cereals Production in Ethiopia," Food Security Research Project Working Paper #3, Ministry of Economic Development and Cooperation, Addis Ababa.

Mulat Demeke, Ali Said, and Jayne, T.S. (1996) Interactions between Input Market and Grain Market Performance, Food Security Research Project Working Paper #5, Ministry of Economic Development and Cooperation, Addis Ababa.

The Grain Market Research Project (formerly known as Food Security Research Project) is a joint collaboration between the Ministry of Economic Development and Cooperation, USAID/Ethiopia, and Michigan State University. Please direct all inquiries to the In-Country Coordinator, Grain Market Research Project, Ministry of Economic Development and Cooperation, P.O. Box 1037, Addis Ababa, Ethiopia; Tel. 12-89-73; Fax 55-01-18; Internet: GRMP@DAI.COM.