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**Rural Markets, Food-Grain Prices and Famines:
A Study on Selected Regions in Ethiopia**

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(A Study on Selected Regions in Ethiopia)**

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Rural Markets, Food-Grain Prices and Famines (A Study on Selected Regions in Ethiopia)

1. Introduction

This study attempts to analyse an aspect of the behaviour of food-grain market prices in a mainly non-market economy under conditions of impending famine. Non-market because Ethiopian government policy, up until 1990, had suppressed private trade in food grains with the consequence that the primitive structures of rural markets have been retained more or less undeveloped over the last decade and half.¹ The study is therefore not concerned with attempts to address the behavioural patterns and market interactions of grain traders in rural grain markets since their role is considered to have been rudimentary at best. Furthermore in a policy environment that was openly opposed to a free enterprise market system, analysing grain market performance in terms of rational expectations equilibrium (REE), arbitrage, trade and storage, would be giving away to a line of analysis that would be inconsistent with those circumstances which have, in the first instance, generated the particular data being analyzed.² Instead the empirical analysis focuses on one aspect of the literature regarding market behaviour under famine conditions.

¹ The Marxist regime declared its move towards a mixed economy in March 1990. See CSO (1991). The transitional government that had replaced the Marxist regime in 1991 has declared its commitment to install a market based economic system. On this see Negarit Gazette 50th year-no.1 (1991).

² According to Ravalion, REE "...assumes that: (i) the economy is competitive in that spot prices adjust rapidly to clear markets at the notional demands of all the traders, conditional on their expectations of future prices (as well as other prices and endowments), and (ii) those expectations are 'rational' in the sense future markets will be found, on average, to clear at the expected prices. "

The literature on the behaviour of market prices during periods of famine, in the specific situation of the case-study country, is quite limited and widely divided in terms of perception. A number of studies that go back to the early 1980s have suggested, on the basis of (admittedly) limited data on the case study country, that exceptionally high food prices are characteristic of areas hard hit by drought.³ These studies tended to suggest that the Ethiopian peasant was not only heavily market dependent but that the increases in market prices during periods of drought were a reflection of the effective demand exercised by peasant farmers. Such approaches fail to provide adequate explanations for famine conditions developing with little or no increase in food grain prices. In sharp contrast was the view maintained by the *entitlements approach* which allows for the possibility that the purchasing power of peasant farmers could be severely diminished following the loss of their crop.⁴ As has been noted by Amarty Sen in his study of the 1972/74 Ethiopian famines, "...A remarkable feature of the Wello famine is that food prices in general rose very little, and people were dying of starvation even when food was selling at prices not very different from pre-drought levels."⁵

The aim of this study is therefore to examine whether or not severe droughts (famine threatening conditions) influence market prices of food grains in the affected localities. By testing the hypothesis of no relationship between drought condition (*ceteris paribus*) and market prices of food grains, we would be able to provide further evidence on the role of prices in the process leading to famines.⁶ More specifically the objectives of the study are:

³ See Seaman and Holt (1980); Cutler (1984); Baulch (1987).

⁴ See Sen (1981) pp. 86-112

⁵ Ibid., p.111

⁶ Drought here is a qualitative variable that includes all the adverse phenomenon that are associated with rain shortages such as pest infestation, and which have resulted in total or partial crop failure. The *ceteris paribus* assumption recognizes other influences on market prices of grain (due to secular factors) and which are assumed to be common to both the drought affected localities as well as localities with normal production.

1) to show, on the basis of empirical analysis, whether or not grain prices are reliable reflectors of the distress conditions of drought affected communities during an impending famine. Should it be shown that market prices are not invariably exceptionally high during such conditions, it would be further evidence in support of the hypothesis implied by an entitlements analysis of the situation, which is that *famines could develop without there being a significant increase in market price of food grains.*

2) To assess the implications to famine prevention policies?

1.1 The Theoretical Framework

In the case-study country the persistence of localized famine conditions is reflected in the various reports of the Relief and Rehabilitation Commission which keeps track of such developments through its early warning system.⁷ Localized famine conditions develop almost annually in the various regions of the country. These conditions are prevented from developing into actual famines through relief interventions both by the government and international relief organizations.

Market prices for food grains in the affected localities could be expected to reflect local circumstances for a variety of reasons. Beside the rugged terrain of rural Ethiopia, which is a deterrent to ready transportation between localities, the socio-economic and political circumstances that had prevailed throughout the 1980s and early 1990s, have also ensured that rural grain markets not only retained their backward and primitive structures but also remained largely fragmented. Markets

⁷ See for example RRC (1985a); (1985b); (1987); (1989); (1990); (1991a); (1991b); (1991c); and (1991d)

that are fragmented, as opposed to integrated, are largely disconnected from adjacent markets in that there is no free movement of goods and services. Socialist management of the economy had discouraged progress in private trade and entrepreneurship and enhanced the fragmented character of rural markets. Civil strife and absence of security have also contributed to limiting market integration through discouraging safe movements between regions.⁸

A fragmented market that has been isolated from neighbouring markets for the variety of reasons indicated above, would be expected to behave in predictable ways under different weather-induced food grain supply conditions. A good harvest, due to a favourable climate, could be expected to result in price decrease while drought induced supply shortages could be expected to have the opposite effect - high grain prices. A modification of these behaviour patterns would be in order if the assumptions of market fragmentation was relaxed. Then we could expect that the speculative activities of private traders would result in good-weather prices not falling by as much and drought induced prices not rising by as much. This could result from the activities of traders wishing to make gains through arbitrage - buying in the local market when prices are sufficiently low and selling in localities where prices are high enough to ensure a profit margin after allowing for transportation costs and vice versa when the grain prices in the neighbouring markets are sufficiently lower than the drought-induced high prices in the local market.

Had not the government's socialist policies targeted and effectively curbed the activities of private traders, arbitrage through storage could also have played the role of stabilizing grain prices in a similar manner as above. When local grain prices are low due to a good harvest, traders purchase grain for storage, noting that prices are lower than normal and speculating that prices would be higher in subsequent periods.

⁸ A number of recent studies have also highlighted the adverse effects of policy on the performance on the nature of market integration. See: Webb, Braun, Yohannes, (1992); Waal, (1990).

Similarly when grain prices are higher than normal during drought-induced supply shortages, traders would release their stockpiles and thereby moderate the rise in market prices.⁹

Seen in the context of famines, these generally accepted behaviour patterns of markets make the unwarranted assumption that the drought affected populations have the required effective demands to affect significantly the market prices during times of drought. This assumption is not valid, particularly for the case-study country, where it has been shown for one famine that people starved to death without there being significant increases in food prices.¹⁰ It appears necessary therefore to identify the possible sources of effective demand in a typical local market.¹¹ The sources of effective demand would include: 1) the residents of rural towns in which the grain market are located and which are wholly market dependent, 2) pastoral communities in the neighbourhood of the local markets which are also mainly market dependent for their food grain requirements; 3) the drought affected peasant communities, who if endowed with sufficient purchasing power during famine threatening conditions, would be expected to enter the market and bid up prices of food grains.

To put the point more precisely, we define a functional relationship between local grain prices (GPI), local supply (L), purchasing power of the agriculturalist communities (W), and other market and non-market influences that can be regarded as common to all regions such as secular price movements, prices of other commodities, political instability, etc.,(S).¹²

⁹ See Ravalion(1987) for an account of market prices during famines under free market economic systems. The study is mainly based on an analysis of the 1974 famine in Bangladesh.

¹⁰ See Sen (1981)

¹¹ The markets being analyzed are rural markets at the awraja and wereda (sub regions) levels because the data pertains to such markets.

¹² The focus of our analysis is the agriculturalist community because the data canvassed in the study pertains to rural agricultural communities that are sedentary. Pastoralists are by and large nomadic. Furthermore pastoralists constitute less than 10 percent of the total population.

$$GPI = f(W, L, S,)$$

Since the subsistence rural society of the case study country is own-crop dependent during normal times, the incidence of severe drought can be expected to enhance its market dependency. The totality of purchasing power exercised (and hence increased market participation) by a rural community can therefore be taken to be directly related to drought conditions. Purchasing power is here used simply as a qualitative indicator of the amount of goods and services a rural household can command in the market place. Therefore, under *ceteris paribus* assumptions regarding other influences on purchasing power, we have:

$$W = g(D, \dots)$$

We can therefore use drought as a qualitative variable (representing an adverse shift in supply) and use the following relationship to test the influence of drought (*ceteris Paribus*) on the level of prices and thereby reach a conclusion regarding the purchasing power (or lack of it) of the affected population. Given the adverse shift in supply, the presence of significant purchasing power in the affected agriculturalist communities would be reflected in a higher price level than would prevail in communities that were not afflicted by similar adverse shifts in supply.

$$GPI = f(D, \dots)$$

To this end, the following model (analysis of variance) will be fitted to the price indices of five important grain crops from 46 localities which includes both drought affected as well as normal regions.¹³ The hypothesis of no relationship between the

¹³ The model is essentially an analysis of variance model. The important question addressed is whether or not categorizing the pooled data on food prices into normal region prices and drought

rise in grain prices in the local markets and the conditions of impending famine due to drought will be tested.

$$\text{GPI} = \beta_1 + \alpha_1 D1 + \alpha_2 D2 + \alpha_3 D3 + \mu$$

Where: GPI = Grain Prices Index (indices of price increase in 1990 over the preceding year)

D1 = Dummy variable for markets in drought affected regions (1 = Regions affected by drought in 1989; 0 = Normal regions in 1989)¹⁴

D2, D3 = Dummy variables for staples in affected regions (1 = if crop is first or second most important staple in the region; 0 = if otherwise).

β_1 = intercept term (base) giving normal region prices

The rationale for formulating the analysis in this manner is that the regions affected severely by drought during the production year of 1989 would suffer food supply shortages during 1990. Assuming subsistence production, which would overrule the possibility of sizable stocks of grain from 1988 production reaching 1990 at the household level, such a supply shortage (which has been assessed as critical by the Relief and Rehabilitation Commission/RRC) should be reflected in higher grain prices in the local markets during 1990. Moreover such price increases should persist over the first six months after harvest of the *Meher* (main) crop, i.e., before the harvest of the *Belge* (short season) crop comes to the market.

affected region prices is meaningful. This is established by the standard t-test on the dummy variable coefficients. Justification for the relative advantage of the dummy variable regression over the standard analysis of variance technique is provided in Kennedy, P. (1985), pp180-188. See also Koutsoyiannis, A. (1977), Johnston, J. (1984).

¹⁴ In this formulation D2 and D3, which divide the data sets according staple food types in the different regions, are assigned zero in order to derive price variation without the division (D1). Similarly, D1 is also suppressed when deriving D2 and D3.

It follows therefore that the six-month average price indices for each grain crop in the affected localities should be significantly greater than the corresponding indices in the normal localities if the effective demands of the affected localities is reflected in the market prices. If instead the estimated coefficient of the drought variable in the analysis fails to be significant it would be indicative of diminished purchasing power.

It should be noted, however, that while the absence of such significantly higher prices will provide the sufficient condition to reach the conclusion that low prices are indicative of the diminished purchasing power of the famine threatened peasant population, the converse is not necessarily true. That is, significantly higher prices are a necessary, but not sufficient, condition to conclude that the affected peasant population has adequate purchasing power. This is so because the increase in prices could be attributed to any one or a combination of the different sources of effective demand. The significant presence of market dependent communities in the markets being assessed are among the factors that could affect the effective demand in the region.

1.2 Source and Categorisation of Data

In accordance to the research design which involves the comparative assessment of food price movements in drought affected localities vis a vis those localities with normal production, the analysis included two sets of data - one for each category of region - with each set including monthly price of five main food crops. A total of 46 localities have been included of which 19 were drought affected while the remaining were localities with normal production. The localities share a common characteristic in that they are all dependent on the grain crops under study as their major sources of food. The group of interest in the analysis are taken to be the drought affected localities while the normal localities were included in order to provide a comparison group.

The data for the study was mainly obtained during the course of a field-trip to the case-study country. The grain price data was obtained from the archives (computerized data base) of the Relief and Rehabilitation Commission(RRC) which routinely collects grain prices from all regions in the country as part of the its early warning systems activity. The price data were maintained on a monthly basis for all grain crops as well as pulses.

The price data was categorized as between normal regions or drought affected regions depending on whether the regions were reported as drought affected or not. The information on the regions hard hit by drought during the 1989 crop season were reported in the various crop monitoring reports routinely provided as part of the early warning system of the RRC. The Researcher has also consulted with the Heads of the relevant units of the RRC.

2. Background on the Study Regions

There are two types of cropping seasons in Ethiopia. These are the *Meher* and the *Belge* seasons with the former being the main cropping season accounting for over 95 percent of the national annual grain production.¹⁵ Most *Meher* crops are harvested in November and December after a cropping period of about 6-7 months. *Belge* cropping, which is not common in all parts of the country, generally has a shorter cropping period and can account for a sizable proportion of the annual output of some regions. Similar types of crops are planted during both seasons with the exception that the longer maturing ones are confined to the meher season. The types

¹⁵ See RRC (1991b), Although the belge crop is a small proportion of the national average, it is significantly more important in those localities that rely on the short rains and also becomes even more important if the main rains fail.

of grain crops grown include teff (an indigenous staple grain), wheat, barley, soughum and maize. Leguminous plants like peas, beans, lentils are also widely cultivated.

In the January 1990 *Meher* season synoptic report of the Relief and Rehabilitation Commission (RRC), which operates an early warning system for the detection of emerging famine conditions, it was reported that various regions in the country had been hit by severe drought during the 1989 meher crop production season. This meant that food grain supply shortages could prevail during 1990 since for the peasant community one year's output is the following year's food supply. The regions identified as having been hit by the severe drought included Northern and Southern Wello, Eritrea, Tigray, Eastern and Western Hararge, Southern Gondar, some areas in Northern Shewa, and parts of Eastern Godjam, Northern Omo and parts of Wellega. All other areas were reported to have had normal production with adequate to surplus output. All in all poor crop production during the 1989 crop season was estimated to affect a total of 3,3383,760 people during 1990.¹⁶

In line with the design of the research, particularly the need to maintain broadly similar food production and consumption patterns among the regions being analysed, five administrative regions have been included in the study. Differing production and consumption patterns (i.e, heavy reliance on root crops and other sources of food) meant that regions in the southern and southwestern parts of the country as well as the lowlands had to be excluded from the sample. The selection was also dictated by data availability, as well as the need to maintain some balance, in terms of number of localities included, between the drought affected and normal regions. The five administrative regions from which the 46 localities were selected are Godjam, Shewa, Gondar, Wello, and Hararge (details are provided in the annex).

¹⁶ See RRC (1990)

3. Food-Grain Price Behaviour

In order to examine the influence of severe drought condition on the behaviour of market price of food grains, we have analysed the prices of five different types of grain crops obtained from 46 local markets in different regions of the country. The analysis was based on the average, for each crop, of the prices that had prevailed during the first six month period of 1990, this being the period right after the *Meher* (main season) harvest of 1989 and before the *Beige*(small season) harvest of 1990 joined the market. The drought-affected localities in the sample had lost the 1989 *Meher* crop to severe drought.

The following table gives the results of the analysis:

Crop type	β_1	α_1	α_2	α_3
1) Teff	107.30 (48.09)	4.15 (1.18)	-2.18 (-0.52)	12.67 (2.45)
1) Wheat	106.33 (25.7)	4.19 (0.65)	-	-
3) Maize	96.96 (25.3)	24.9 (3.99)	16.04 (2.09)	17.63 (1.85)
4) sorghum	94.28 (25.28)	20.93 (3.69)	-	-
5) barley	102.78 (31.9)	-0.35 (-0.06)	-	-

Figures in brackets indicate the t- test

Where:

β_1 = The intercept term, which is our benchmark category reflecting the price indices of the normal regions.

α_1 = the coefficient of the dummy variable for the drought affected localities in general.

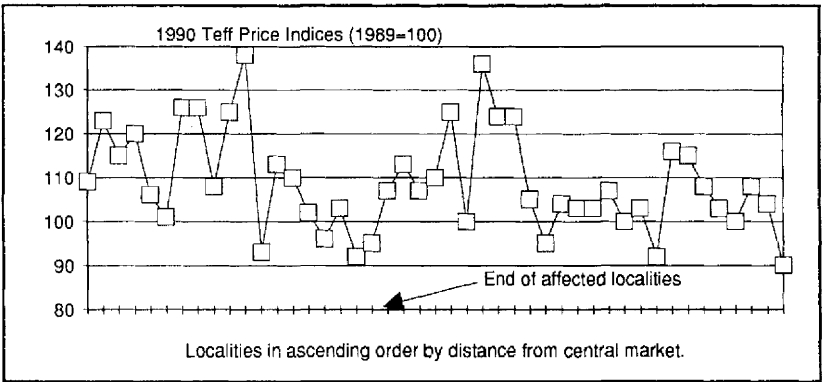
α_2 = the coefficient of the dummy variable for the regions where the particular crop is not the first or second most important staple crop.

α_3 = the coefficient of the dummy variable for the regions where the particular crop is the first or second most important crop.

a) Teff

This cereal crop, which is indigenous to the region, is an important food crop and generally higher priced than other grain crops. The graph below charts out the indices for the average prices of teff that prevailed in 1990 for a cross-section of local markets. The first series of indices up to the end marker pertain to localities that were severely affected by drought, arranged by *rankon* the basis of distance (and not by distance) from the central market (Addis Ababa) during the 1989 *Meher* crop i.e., the harvest accounting for the food-grain market supply during the succeeding 1990 season.

As can be observed from the chart, the movement of the indices in both groups is rather erratic. High indices approaching 140 are observed in both groups. Some indices also dip below the 100 level in both groups. A high level of market fragmentation is clearly implied by these movements. The secular and unspecified market influences that account for the price increases during the 1990 season in the normal region partly explain the increase in the prices observed in the drought-affected regions. But does drought figure as a significant explanatory factor for the observed behaviour of prices in the affected localities?



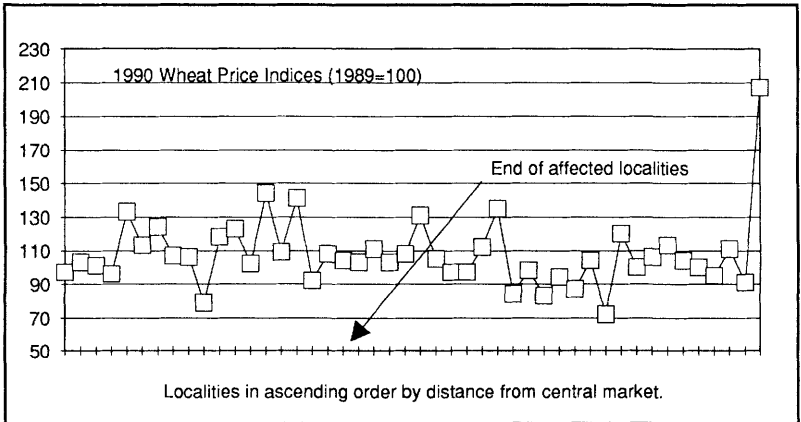
Note: In the graphs, the horizontal axis does not represent distance. It indicates *ranking* of localities (based on distance from central market)

The answer is indicated in Table 1 above. On the basis of the t-test, the null hypothesis of no relationship between droughts and the price levels cannot be rejected (α_1). Drought as a qualitative variable is not a significant explanatory factor for the behaviour of market prices in the drought affected regions vis a vis the normal regions. However this result applies only when the price indices of all the affected regions are grouped together. When we disaggregate the data on the basis of whether or not the markets were in major teff producing regions or not, we find that the results become different. For the markets in major teff producing areas, the prices of teff in drought affected regions, showed significant increases as compared with normal regions (α_3). Prices have in fact tended to reduce (though not statistically significant) in drought affected regions where teff production is not a major activity (α_2). This would suggest that the effective demand for the relatively high valued teff diminishes during drought.

b) Wheat

Wheat is also an important food crop grown in the regions being analyzed and can be considered second to teff in terms of value on the basis of prices that had prevailed

during 1990. The erratic pattern of grain prices among the different localities being canvassed and noted in the case of teff also seems evident in the chart for the wheat crop. In both the drought affected localities as well as the normal once there are price indices that fall below 100 showing a decline in average prices vis a vis the preceding year, while other localities have shown significant price increases.

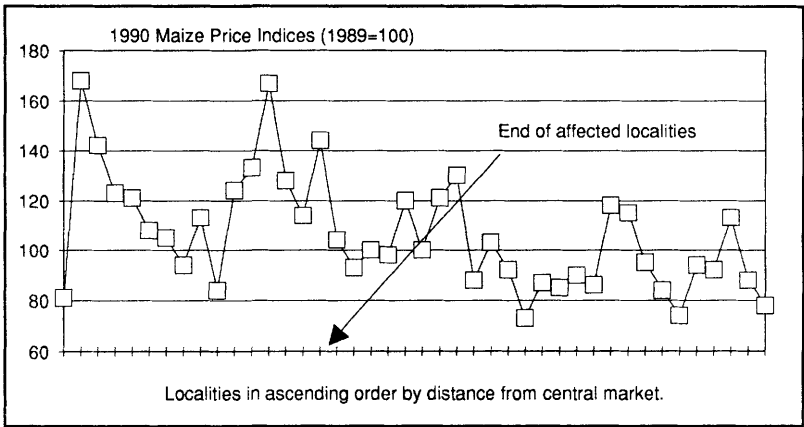


To establish whether or not the drought factor, which applies to only a sub-set of the localities, makes any difference on the average prices of grain crops, similar procedures as for teff were followed and the results, as indicated in table 1, show that the drought variable does not make a statistically significant difference to the average price of wheat.

c) Maize

Maize is the lowest priced among the grain crops being analyzed and is a very important food source in many parts of the country. The chart showing the variation in the average price indices among localities suggests a marked difference from the

two crops seen so far. The difference is evident in the pattern which is more pronounced for the drought localities than for the normal localities. In particular some of the localities in the drought affected group have registered price indices as high as 170 whereas such extremes were not present in the normal regions.

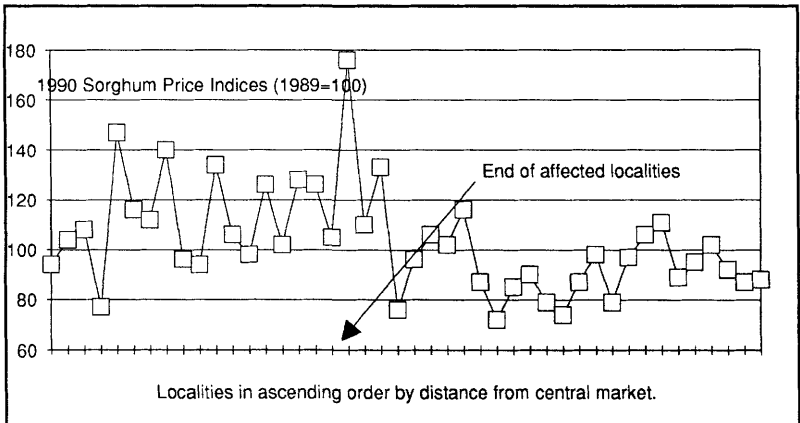


We apply the same procedures in order to establish whether drought, as a qualitative explanatory variable, makes a difference to the average price indices for the localities being analysed. As shown in Table 1, the t-test confirms the dummy variable coefficient (α_1) as statistically significant. It is implied therefore that significant effective demand for maize has been exerted in the drought affected regions.

However this result must be interpreted with care. A closer look at the data will reveal that those localities that have registered high price increases include those that are known to have significant pastoral populations in the surrounding regions. The effective demands as reflected in the higher average prices of these regions could well have originated from the increased market participation of the pastoral populations rather than the agriculturalists whose market behaviour we are assessing.

d) Sorghum

This crop which is generally more expensive than maize is lower in value than the other crops in the study. The pattern of price indices although not as pronounced as in the case of maize, does show high price rises in various localities within the drought affected group. But even in this group a number of localities have registered declines in prices over the preceding year although such declines are far more noticeable in the normal regions.

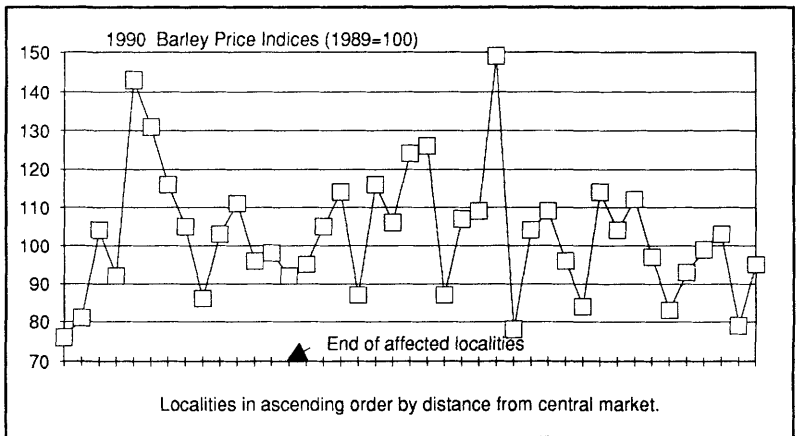


Following similar lines, it can be seen that the dummy variable coefficient (α_1) is statistically significant according to the t-test. Increased effective demand seems to have affected the price level of sorghum just like in the case of maize. However the comments made there regarding the interpretations also apply here. This is so because the regions that account for the sharp increases in the price of sorghum were

those same localities that cater for the pastoral population. A case in point is the grain market at Jijiga, which is responsible for the highest price peak observed in the chart on soughum, and which is one of the localities found on the outskirts of the Ogaden lowlands which provide the habitat for a sizeable pastoral population.

e) Barley

This crop is the third expensive crop, coming after teff and wheat, in terms of the 1989 prices. It is an important food crop particularly in the central highland regions. The pattern of the price indices, as can be observed on the chart below, is such that some high peaks are attained both within the drought affected localities as well as by the normal localities. Prices in some localities within both regions have also registered indices below 100 implying lower prices than the preceding year



Applying the same procedure to barley as was done to the other crops indicates that the coefficient (α_1) is not significant on the basis of the t-test. It follows therefore

that the drought variable has not significantly contributed to the behaviour of the market price of barley.

4. The Summary of Findings and Implications to the Early Warning System

Our analysis appears to indicate the following:

1) For three of the five crops analysed, i.e., for teff (overall), wheat, and barley, drought does not appear to have significantly influenced the market prices of these crops vis a vis the normal regions. In the case of teff, however, this finding applies only when the data on all the affected regions are taken together. When the regions are categorized according to whether or not the particular crop was either the first or second most important staple crop in the region, we find significant price increases in those regions where it is an important staple crop. These localities being teff producing areas, are also the sources of supply of the grain crop to the urbanized centres and larger cities. Teff, being by far the more expensive crop, is generally produced by farmers for the market rather than for own consumption. It follows therefore that a price increase due to a drought induced shift in the supply of the crop would be expected to reflect the response of the market dependent sectors of the population rather than the increased market participation of the rural agriculturalists. That the relatively higher value of teff would inhibit market participation by the affected agriculturalists is also suggested by the average decline in prices (although not statistically significant) for those affected regions where the teff is not the first or second most important grain crop.

If it can further be accepted that these collection of grain crops (teff, wheat, and barley) can together constitute the bigger share in the cropping patterns of particular localities, as is the case in some regions of the sample area, then it could be concluded

that famines can develop without there being a significant increase in the level of such prices.

It could, of course, be argued that the absence of significant differential increase in the prices of food grains in the drought affected regions as compared to the normal regions, could have been due to the activity of traders in the market. The speculative action of traders, who during periods of good harvest, would buy grains at the lower than normal prices prevailing during such times, and sell during lean periods when prices would be higher than normal, can be expected to have the obvious effect of smoothing the fluctuation in prices. When the affected regions were hit by poor harvest traders could have unloaded their inventories and this action could have prevented prices from rising by as much as they could have done otherwise.

Such explanations of smoothly functioning free-markets are however flawed on at least two counts which relate to the specific circumstances of the case study country. The first is the restrictive government policies regarding private trade in food grain. These included, in line with the socialist policies prevalent throughout the period, the creation of a government marketing organization (AMC) whose main function was the purchase of grain from the rural areas for supply to the urban population at subsidized prices. Effective operation of this corporation had necessitated policy measures directed at curbing competition from private traders. This often meant that the activities of private traders were severely restricted and occasionally outlawed depending on whether or not the particular region had fulfilled its quota of grain delivery to the AMC. Beside the adverse policy environment which had smothered private trade in food grain, the poorly developed transport network, the inadequate marketing infrastructure in the private sector, the constant civil strife and absence of security have all contributed to the fragmentation and malfunctioning of the local markets.

The second reason for the inadequacy of the argument relates to the food requirement assessments on the affected localities conducted by the RRC. These assessments, which take into account the total food prospects of the particular localities affected by the drought, have estimated sizable food deficits for the regions.¹⁷ Inventory in private storage large enough to have resulted in the stabilization of grain prices in the affected regions appears to be highly unlikely.

It therefore follows that an adequate explanation for the phenomenon must be associated with the diminished purchasing power of the affected population.

2) For two of the five crops analyzed, i.e., for maize and sorghum, drought did seem to have significantly affected the market prices of these crops. Because these two crops are relatively cheaper than the others, it would appear that demand for the cheaper crops had risen. However this does not lead us to conclude that the effective demand of the affected peasant population was accountable for the observed rise in prices. As indicated earlier, and upon closer observation of the localities that had registered such high prices, the large pastoral population dependent on those particular localities could well have been the source of the excess effective demand responsible for the sharp rise in prices. Moreover, in these localities maize and sorghum are not consumed because they are cheaper but rather because they are the staple crop in those regions. We may therefore not be able to sustain, on the basis of the available data only, that the demand for cheap crops has risen, as the cropping patterns prevalent in the localities where these two crops have shown sharp increases happen to be dominated by these crops. Since this particular study was designed to shed some light on the market behaviour of the agriculturalist communities rather than the pastoralist and other market-dependent sectors of the rural community, more data

¹⁷ See RRC (1990)

needs to be canvassed in order to establish what portion of the increased demand can be attributed to the agriculturalists.

3) It therefore follows from the above that grain prices are not reliable reflectors of the distress conditions of drought affected communities during an impending famine. While teff, the more high-valued crop of the group, has shown a sharp rise in those localities whose cropping patterns it dominates, it has failed to show statistically significant increase when considered overall. On the other hand, relatively lower-valued crops than teff, like barley and wheat, have failed to register significant increase in prices over the normal regions. While maize and sorghum, also low-valued, have shown significant increase, it was unclear whether such increases were due to the increased market participation of the pastoral community depending on these crops, or to the crops being lower-valued (cheaper).

Moreover, in the specific case of the localities analysed, market prices do not appear to move in correspondence with each other in that the pattern of price behaviour among the cross-section of localities appeared to be erratic. Contrary to expectations, declines in average prices below that of the preceding year were also noted in the drought affected localities while some localities in the normal regions displayed price hikes. While the detailed analysis of the individual local markets (beyond the scope of this paper) could reveal more tangible causal factors, it appears appropriate to attribute such diverse movements of prices across the localities to the low degree of market integration. Local markets appear to be functioning in isolation.

What then are the implications to famine prevention policy? Probably the most important implication to policy relates to the use of prices in early warning systems. In an attempt to avoid the repeat of the major droughts in the 1970s, the Ethiopian government had established such a system within the Relief and Rehabilitation Commission. Market prices of grain crops are an important component in the system

and are monitored on a monthly basis from a large network of rural markets.¹⁸ The price data analysed under this study were obtained from markets which are part of the network.

An underlying assumption in the design of the system appears to be that famine distress would inevitably lead to sharp increases in the prices of food grains. In the light of the findings of these study such an assumption does not seem to be warranted. Prices may or may not rise depending on the purchasing power available in the affected community. As has been shown in the analysis, such purchasing power may not be available in some localities. Even when prices rise sharply in response to severe drought as was also seen for some localities in the analysis, there still is no way of attributing the price rise to the distress conditions of the affected rural population, if the idea is to monitor the condition of this group. This is so because the observed price increases could have been due to the increased purchasing by the town residents, who faced with the prospect of reduced supply in the immediate future, may have decided to increase their holdings of food stocks. Alternatively it could have been a reflection of the increased purchasing by the affected pastoral population.

Discussions with the concerned unit of the Early Warning System Division of the RRC appeared to indicate that various anomalies encountered from time to time with regard to the market prices have led to the use of different indicators in combination with prices signals. However, this study suggests that the price monitoring activity of the Early Warning System may be playing no useful role for early detection of famine conditions. Significant market reform by way of encouraging private trade through appropriate policy reforms; the effective integration of the rural population within the market system; as well as the evolution of strategies for the maintenance of

¹⁸ According to computer print-out obtained from the RRC office, a total of 102 rural market appear on the code list. Beside grain crops, the prices of other pulses and farm animals are also monitored regularly.

purchasing power during periods of distress may be some of the necessary antecedents for market prices to have a wholesome early warning function.

5. Summary and Conclusions

The study has attempted to find out whether drought, as a qualitative variable, had any influence on the level of grain market prices under conditions of threatening famine. Forty nine local markets, divided into two categories - drought affected areas and normal areas - were used for the analysis. The drought-affected localities in the sample had lost the 1989 *Meher* (main season) crop to severe drought with well over three million people threatened by famine during 1990. The prices used in the analysis were those of 1990 as compared with the levels that had prevailed during the preceding year. All of the five important grain crops were included in the analysis.

The views in the literature regarding the behaviour of market prices during famines in the specific context of the case study country, are somewhat divided. One view maintains that exceptionally high prices are typical of regions severely hit by drought while the *entitlements approach* allows for the possibility that this may not always hold true due to the diminished purchasing power of the affected population.

The empirical analysis of this study has mixed results. It has been shown that for the drought affected regions, significantly higher prices than in the normal regions are possible for some crops, while the reverse appears to be true for others. The absence of significantly higher prices as compared with normal regions, even if for some of the crops only, does provide further evidence in support of the latter view that famines could develop without there being significant increases in the level of food grain prices. This was on the basis of price behaviour in the teff (overall), wheat, and barley markets where the influence of drought on market prices was statistically

insignificant as compared to the price levels prevailing in the normal regions. The absence of significant increases in prices in the affected localities therefore suggests the diminished purchasing power of the vulnerable groups.

Similar conclusion could not be reached on the basis of maize and sorghum which had tested significant. The excess effective demand behind the price increase of these two crops could not be attributed, on the basis of the available data, to the drought affected rural agriculturalist communities whose market responses the study was designed to analyse. This follows from the observation that the particular localities registering the high prices also catered for the food requirements of a sizable pastoral population.

The study has also highlighted that the behaviour of grain prices in rural local markets has been conditioned by the adverse policy environment over the last decade which had, in line with the government's ideological alignments, discouraged private trade in food grains. Unreliability of food grain prices has implications to the early warning system in which grain price monitoring is a major component. Future policy must be redirected towards removing the various constraints to the smooth operation of the grain markets if market prices are to be reliable components of an early warning system for famine prevention.

6. Appendix

The Grain Markets Covered By the Study.

Sr. No.	Markets	category	Distance	Sr. No.	Markets	category	Distance
1	Haik	1	5.6	24	Dejen	0	2.8
2	Kombolcha	1	5	25	Debre Markos	0	3.5
3	Bati	1	5.5	26	Gondar	0	8.6
4	Bichena	1	3.5	27	Kolla Dibba	0	9
5	Addis Zemen	1	7.4	28	Aykel	0	9
6	Debre Tabour	1	6.5	29	Alem ketema	0	2.7
7	Assebe Teferi	1	4.3	30	Debre Berhan	0	2.7
8	Hirna	1	5	31	Sheno	0	2.9
9	Dire Dawa	1	6.7	32	Nathret	0	1.5
10	Deder	1	5.8	33	Modjo	0	1.1
11	Fitche	1	1.8	34	Debre Zeit	0	0.9
12	Debre Sina	1	2.9	35	Shashemene	0	4.2
13	Kara Kore	1	4.5	36	kulito	0	4
14	Gebre Guracha	1	1.6	37	Butagira	0	2.2
15	Alemaya	1	6.5	38	Hosaena	0	3.9
16	Jijiga	1	8.6	39	Woliso	0	2.9
17	Funanbira	1	4	40	Sendafa(AA)	0	0.5
18	Girawa	1	6.7	41	Beseka	0	0.5
19	Harar	1	7.3	42	Addis Alem	0	0.8
20	Dessie	0	5.1	43	Ambo	0	2.6
21	Bahr dar	0	6.2	44	Zwai	0	2.2
22	Dangila	0	5.9	45	Fenote Selam	0	4.8
23	Motta(E. Gojam)	0	5.1	46	Mehal Meda	0	2.9

Source: The selection of the markets was made on the basis of RRC archives.

Note: 1) Regions categorized as 1 are drought affected, otherwise they are not.

2) Distance (used for ranking of localities in the graphs) is scaled (1:50km) linear distance from Addis Ababa computed from "The Times, Atlas of The World".

1990 Price Indices of Grain Crops (1989=100)

Sr. No.	TA	WA	BA	MZ	SA	Sr. No.	TA	WA	BA	MZ	SA
1	138	118	103	94	134	24	95	98	149	73	90
2	126	107	116	121	140	25	107	104	96	90	98
3	125	79	86	105	94	26	108	111	103	113	92
4	120	96	92	168	77	27	104	91	79	88	87
5	103	108	92	114	105	28	90	207	95	78	88
6	113	102	96	84	98	29	124	135	107	103	72
7	101	113	143	123	116	30	105	84	109	92	85
8	108	106	105	108	96	31	104	83	78	87	79
9	110	109	98	133	102	32	125	105	106	100	102
10	93	123	111	113	106	33	110	131	116	120	106
11	123	103	81	-	104	34	107	108	87	98	96
12	115	101	104	-	108	35	92	100	104	115	106
13	126	124	131	-	112	36	103	120	114	118	97
14	109	97	76	81	94	37	100	97	124	121	116
15	-	144	-	124	126	38	100	72	84	86	79
16	92	104	-	144	176	39	103	94	104	85	74
17	106	133	-	142	147	40	95	103	95	104	110
18	102	141	-	167	128	41	107	111	105	93	133
19	96	92	-	128	126	42	113	103	114	100	76
20	115	113	97	84	111	43	124	112	87	88	87
21	100	95	99	92	102	44	136	97	126	130	-
22	103	100	93	94	95	45	116	106	112	95	-
23	108	104	83	74	89	46	103	87	109	-	87

Source: Computed on the basis of monthly data from the RRC (Relief and Rehabilitation Commission)

Note: TA = Teff (average). Average indicates that there are different kinds of the crop (e.g., red, white etc).

WA = wheat (average)

BA = Barley (average)

MA = Maize (average)

SA = Sorghum (average)

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