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9. ABSTRACT <p>The marketing policy for agricultural commodities has a key role in the transition from subsistence to market farming. Because cereals make up the bulk of the Ethiopian diet and production of the needed quantities lags with concomitant imports, the development policy of the government towards the agricultural sector is directed towards increasing production and gaining the participation of the subsistence farmers in the marketing process. Present prices for cereals are high and far above world market prices and increases in indigenous production have to be accompanied by decreasing prices over the long-run, a goal attainable through technological change in agriculture.</p> <p>This study attempts to analyze the present marketing situation of agricultural commodities in the Baco area of Ethiopia and to search for the reasons for the existing market imperfections.</p> <p>This study is based on the weekly price series of different markets in the Baco/Shoa region in Ethiopia and on the main demand centers for that area, Addis Ababa and Gimbi in western Ethiopia. Price series of cereals, red pepper (chili) and noog (nigerseed) were chosen because of their importance for the Baco area.</p> <p>The present marketing system of agricultural commodities are examined in this study with respect to the following questions:</p> <ol style="list-style-type: none"> 1. What are the reasons for the present high price fluctuations? 2. Do the spatial price differences exceed the shipping costs? 3. Does the present marketing system enable the merchants to make excessive profits? 		
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MARKETING OF SELECTED AGRICULTURAL COMMODITIES
IN THE BACO AREA, ETHIOPIA

By

Winfried Manig

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The collection of data for this study was done while the author was working in the Ethio-German Agricultural Research Station in Baco, Ethiopia. The assistance of the Ethiopian and expatriate staff of the station was greatly appreciated. I wish to express my thanks to the Deutsche Forschungsgemeinschaft, Bonn, Germany for its financial support and also to the Department of Agricultural Economics, Cornell University and its Chairman, Professor B. F. Stanton for generously permitting me the use of its research and computer facilities. I am also grateful for partial support at the writing stage from the USAID financed research contract on "The Impact of New Technology on Rural Employment and Income Distribution." The author is indebted to Mr. Joe Baldwin, who drew the numerous figures and to Mrs. Alice Wells, who did the editorial work. I am grateful to Professor John W. Mellor, Department of Agricultural Economics, Cornell University, for his valuable criticism and suggestions on earlier drafts of this study.

PREFACE

Over the past decade a growing literature has developed which has largely demolished the old, simplistic shibboleths of the rapacious middle man and has gradually led to recognition of the basic problems of marketing and the means to their solution. I am delighted that our USAID financed research, first on problems of agricultural prices and then on problems of income distribution, has facilitated some of the earliest and most perceptive studies in this area.

Uma Lele's work, first published as Occasional Paper Nos. 12 and 37, and then in an expanded form as Food Grain Marketing In India, Private Performance and Public Policy, Cornell University Press, 1968, presented an original approach to analysis of the competitiveness of markets and the role of price policy in the agricultural sector. This approach was modified and adapted to the conditions of Bangladesh in a major empirical effort by M. O. Farruk and published as Occasional Paper No. 31 and in a revised form as Cornell International Agricultural Development Bulletin No. 23 entitled The Structure and Performance of the Rice Marketing System in East Pakistan. Broadening these efforts to analysis of milk marketing is Ray Nightingale's work published as Occasional Paper No. 17, and in revised form as Cornell International Agricultural Development Bulletin No. 15, entitled The Modernization Decision in Indian Urban Fluid Milk Markets.

Winfried Manig now provides us with a major analysis of grain marketing systems in Ethiopia. The study grows from almost three years of residence in Baco/Shoa, Ethiopia, as a member of the Ethio-German Agricultural Research Station. During this period, not only were substantial data collected with respect to intermarket and interseasonal rice differentials but a perspective was obtained as to how markets actually work, what the functional relationships are and what types of efficiency increasing changes may be practical.

The findings of this study are in many respects consistent with some of our earlier studies. But they also raise a number of interesting questions about the special problems of areas with only rudimentary transport systems, substantial differences in size of farm and some tendency for bimodal distribution in farm size. While suggesting solutions to some of the marketing problems, Mr. Manig's work is also a fertile source for development of new research needs.

Mr. Manig was able to reside with us as a Visiting Fellow, and to devote time to analysis of the data and development of its implications, on a fellowship provided by Deutsche Forschungsgemeinschaft, Bonn, Germany. We are pleased to have been able to modestly supplement this effort to permit this publication and for fruitful interaction with our on-going research efforts was made possible by Mr. Manig's presence.

John W. Mellor

Ithaca, New York
November 21, 1972



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I. Introduction

It is generally believed that the marketing system for agricultural commodities in developing countries is, in most cases, inefficient. The view is largely based on a perception of extreme price fluctuations and presumed exorbitant profits of merchants. It is a view rarely based on reliable data. A rational and realistic development policy requires data concerning the actual marketing conditions and the reasons for market imperfections. Only with this knowledge can the marketing systems be improved or changed.

Based mainly on data for a specific region in Ethiopia, the following study should be a further contribution toward a rational discussion of the present marketing system for agricultural commodities in developing countries.

Most of the farmers in Ethiopia are still producing at the subsistence level. Further economic development requires that these farmers participate in the complex economic process. Especially during the process of transition from subsistence to marketing farming, the market policy is of crucial importance. The agricultural sector must not only provide a growing population with food, but it is, in the beginning of economic development, often the only source of capital formation both for its own development and for the development of other sectors as well. It is also the main supplier of a labor force for the overall development of the economy (19, p. 156).

The population growth in Ethiopia joined by rapid increases in the market-dependent urban population and the rise in production of agricultural commodities for export has caused a relative lag in the production of food, especially for the main cereal diets. Ethiopia exported large quantities of cereals and pulses for several years after World War II (e.g. 1947/48 - 153,800 metric tons). Since then, exported quantities of cereals decreased rapidly, but pulses have risen. The low quality of Ethiopian cereal and the falling world market prices caused, in addition to rising consumption, the decline in exports (27, p. 46). Inland prices of cereals finally surpassed the world market prices, and in recent times Ethiopia has had to import cereals. The actual imported quantity depends directly on the annual output of cereals in Ethiopia. For example, Ethiopia imported 51,500 metric tons in 1966 (5, 1969, p. 34); and in 1969, only 25,400 metric tons of cereal and cereal products (5, 1970, p. 91). A part of the imported cereal is shipped to rural areas.

Regional differences in production, in population density and demand structure for food are large in Ethiopia, even over short distances. There exist only rough estimates, both regionally and countrywide, of the supply and demand for food. The demand for the main diet cereal is in the short-run relatively price inelastic but with a high cross price elasticity within the group of cereals. The income elasticity for food in Ethiopia was estimated at an average of about one, although there are large differences between the urban and rural population (for more details of the available data see 27, p. 35). These figures, given a rise in per capita income, indicate an increase in demand for food as well as for cereals. In order to become independent from further

imports, the Ethiopian government has given great emphasis in its development policy to increases in cereal production. Within the frame of that policy an effective marketing system is of great importance.

The present marketing system of agricultural commodities will be examined in this study with respect to the following questions:

1. What are the reasons for the present high price fluctuations?
2. Do the spatial price differences exceed the shipping costs?
3. Does the present marketing system enable the merchants to make excessive profits?

This study is based on the weekly price series of different markets in the Baco/Shoa region in Ethiopia and on the main demand centers for that area, Addis Ababa and Gimbi in western Ethiopia. Price series of cereals, red pepper (chilli) and noog (nigerseed) were chosen because of their importance for the Baco area.

II. Agricultural Structure of the Baco Area

1. Location

The town of Baco (Province Shoa), is located about 255 km. west of the Ethiopian capital, Addis Ababa, and has approximately 4100 inhabitants (5, 1970, p. 30). Baco is one of the more important markets in the center of a larger agricultural area which lies in the zone of mixed agriculture in Ethiopia (Figure 1).

In the following chapters, the term "Baco area" means a region of about 750 sq. kilometers which begins in Jaji (West Shoa) and extends to Sire (Eastern Wollega along the all-weather road (Figure 2). The altitude of this rather ecologically uniform region ranges from 1,600 to 2,000 meters above sea level (Woina Dega). The climate is mainly characterized by a rainy season, which normally occurs during the period of June to October, the rest of the year being dry and hot. The precipitation was 1260 mm. in an eleven year average. The average annual temperature is 20.2° C. (14, p. 5). Crops are cultivated only in the rainy season because of the lack of irrigation systems.

The all-weather road, linking Addis Ababa with Central Wollega (Gimbi), passes through the middle of the production area around Baco. Parts of the highlands north of Baco are now accessible due to the building of two new all-weather roads, one between Baco and Jere, and the other one going from Ghedo to Fincha-Dam (Figure 2). All other connections are restricted to pack animals or to trucks only in the dry season.

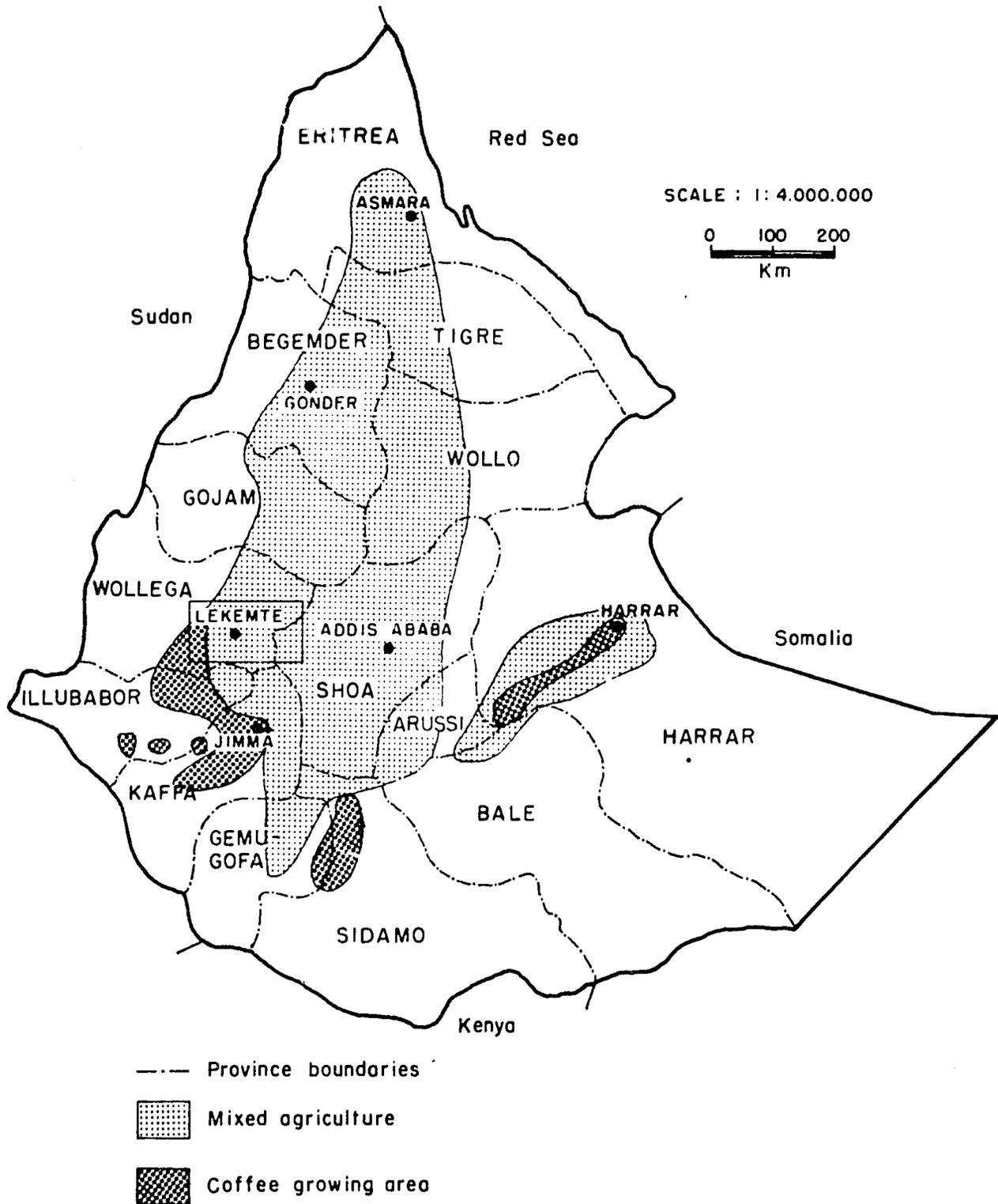
2. Agricultural Structure

A. Land Tenure System

The Baco area, as in many other parts of Ethiopia, is characterized by peasant agriculture with a large proportion being tenant farmers. The percentage of farmers using their own land in the Baco area is estimated at 20 percent, the rest of the holdings are either partly owned/rented or rented (Table 1). In both subprovinces (Arajas) in which the Baco area is situated, the percentage of owner-operators is significantly higher. Land is rented from both small and large landowners. Most of the smaller landowners and the tenant farmers have holdings of about the same size and with the same capital endowment (17, p. 17). The larger landowners do not always live in the rural area (absentee).

In the Baco area there are two land tenure systems: Cash tenancy and share cropping. About one-half of the tenant farms are rented under each system (Table 1). There also exists a variety of forms of share cropping systems. The different share cropping systems are distinguished by the share of the production which the landowner obtains. The landowner's share usually ranges between one fourth (Irbo Erash) and one-half (Ekol Erash). In the first case, the landowner leases only the land to the tenant, while in the second case the landowner, in addition, gives draught-oxen and seed. Twenty-five percent of all holdings in the Baco area are rented under Irbo Erash and 16 percent under Ekol Erash. In addition to the landowner's share tenants often have to pay a part of the

Figure 1. Agricultural Regions in Ethiopia



Source: Adapted from SRI, Ethiopian Agro-Industrial Sector Study. Report No. 13, pp. 8 and 25

Figure 2. East Wollega Province in Ethiopia

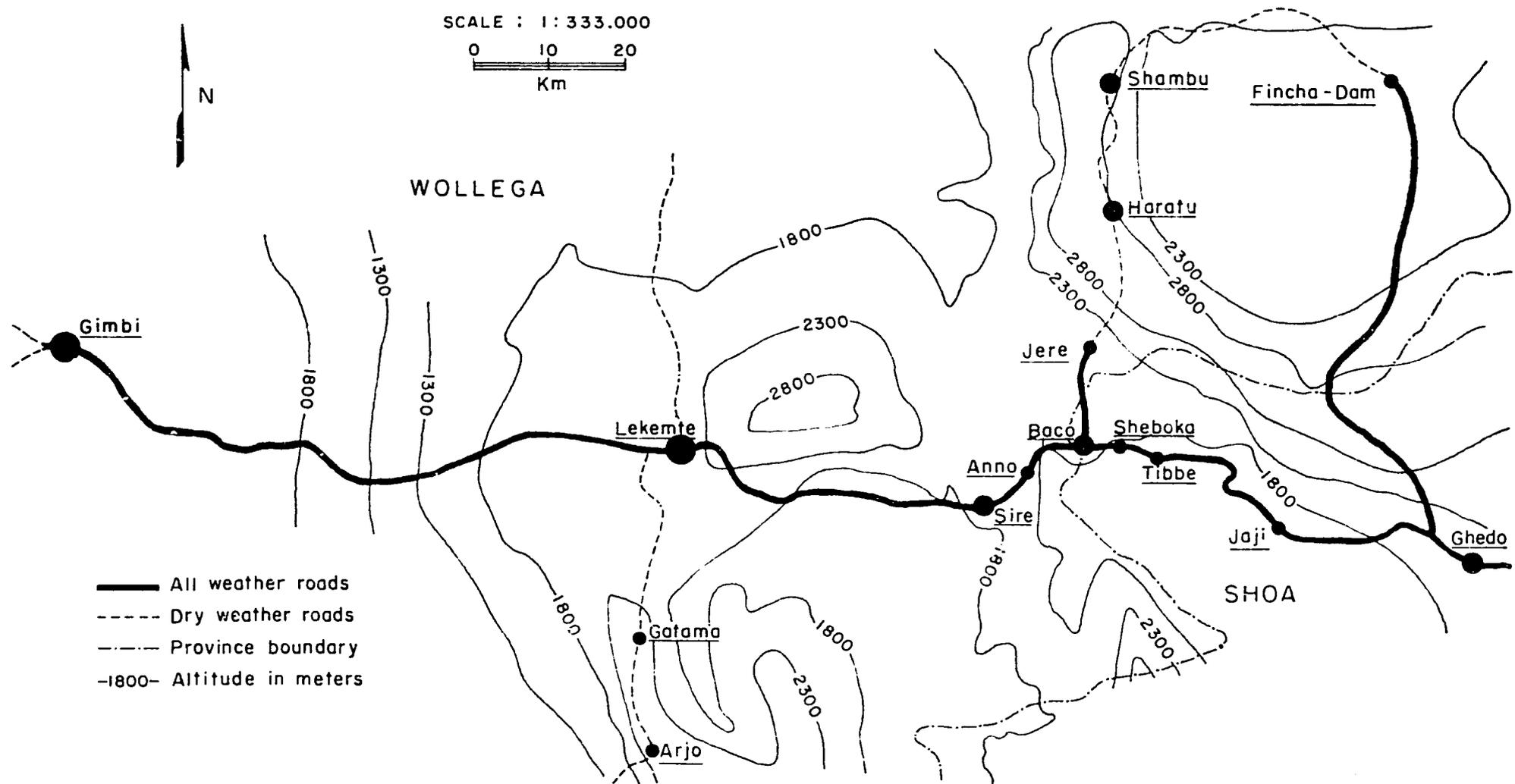


TABLE 1. LAND TENURE IN THE BACO AREA, ETHIOPIA

Subprovince (Awraja) Area	Percentage of Holdings				
	Rented		Owned	Partly Owned/ Rented	
	Share Cropping	Fixed Rent			Total
Subprovince West-Shoa (Jibat & Mecha)	n.a.	n.a.	56	32	12
Subprovince East-Wollega (Lekemte)	n.a.	n.a.	69	27	4
Baco Area	42 ¹	39 ¹	77	19	4

n. a. not available

¹Partly rented under both systems.

Sources: IEG, Central Statistical Office, Report on a Survey of Shoa Province, Addis Ababa, 1966, (7).

_____, Report on a Survey of Wollega Province, Addis Ababa, 1967, (6).

Kelber, E. and Awole Mella, Agricultural Survey of Baco Area, Ethio-German Agricultural Research Station Baco/Shoa, Ethiopia, 1970, (15).

land tax, a tithe to the church of 10 percent and other duties. Some of them also have to work a certain number of days for the landowner. Therefore, the total share for the landlord is usually higher than the system indicates.

Due to the uncertainty of the length of the tenancy contract, (the contract can be cancelled by the landowner at any time) the tenants make no investments for land improvement or for installation of irrigation systems. In reality, the contracts run for long periods and are often transferred from one generation to the next.

B. Size of Holdings

The size of cultivated land per holding in the Baco area is between 1.5-2.5 ha. There are only minor differences between owned and rented holdings, but differences are large between both types of holdings in the total farm area. The farm area of small landowners range from 14 to 20 hectares and the tenants only rent that part which they are able to cultivate. The noncultivated area of the land is grassland or open woodland.

The reason for the equality of cultivated area per holding is the limited capacity of draft power and labor force of the peasant farmers. The maximal cultivated area under the present cropping pattern and farming system is for one pair of draft oxen per 2.5 ha. (17, p. 28). Most of the farmers have none or only one pair of draft oxen.

C. Utilization of Land

14.1 percent of the total area in the western subprovince of Shoa is cultivated land. The percentage in the eastern subprovince of Wollega is only 3.2 percent. The remainder of the area is pasture or forest.

Farmers mainly cultivate cereals and the oil crop, noog (*Nigerseed-Guizotia abyssinica*) on the arable land. In both subprovinces about 80 percent of the cultivated area is planted with cereals, 30 percent of this is maize and 10 percent is sorghum. In the Baco area the cultivation of cereals is less important than in the rest of the area of the two subprovinces. Only 72 percent of the cultivated area is planted with these crops, but 39 percent of it is usually planted with maize and 30 percent with teff. Twenty percent of the arable land is planted with noog and 7 percent with red pepper (*Capsicum* sp). Pulses are cultivated on a smaller scale for home consumption.

The cultivation of the oil crop, noog, is extremely extensive. The land is only plowed, the seed is broadcasted and in due time the crop is harvested. Noog has to be totally marketed because oil presses are located only in larger towns. Due to the heavy vegetative growth, noog is able to keep down the weeds. Therefore noog is often a preceding crop for teff in order to minimize the weeding time. Teff is used for preparing the national food "Ingera," a flat cake. Red pepper is one of the main cash crops in the Baco area and a great part of the total Ethiopian production comes from here.

D. Animal Husbandry

Although Ethiopia has the highest livestock population in Africa, the livestock production is very low (17, p. 49). Of the total production in the agricultural sector of Ethiopia, \$2,141 million in 1966, only about one-fourth was animal products. (Ministry of Planning and Development, cited 29, p. 42). Due to the altitude, only cattle and poultry are important in the Baco area. The main animal husbandry regions are located in the higher elevations. As in most of Ethiopia, farmers in the Baco region have different motivations for keeping cattle, some of them objective, others subjective. The number of cattle is in many parts of Ethiopia a status symbol. Besides the size of owned land, social status is determined mainly by the number of cattle. From the farmer's viewpoint, objective reasons for cattle keeping are less important, although the whole farming system depends on draft oxen. The production of milk and butter for retail purposes is only important for a few farmers. On the other hand, beef production has no importance for most of the farmers, because cattle are only slaughtered when they are old or sold when the farmer needs a larger amount of money than normally earned. Therefore the Baco area provided the market with only a limited number of cattle. Cattle for the Baco area are delivered from higher altitudes north of Baco, and besides cattle a substantial number of sheep for consumption come from these higher regions.

In the Baco region only 70 percent of the farmers keep cattle, with 30 percent of them having more than ten cattle per holding (15, p. 24). To have one pair of draft oxen available, a farmer needs 8-9 cattle (including oxen). This high number needed for replacement of oxen is due to high calf losses, late maturity, etc. Therefore, most of the farmers have to buy oxen from the higher elevation areas because the average number of cattle per holding, of those that keep cattle, is seven heads (17, p. 49).

III. Market Structure

1. Relative Importance of Marketing in the Baco Area

Due to the farming structure and the size of holdings, it is generally assumed that the peasant agriculture in Ethiopia is producing on the subsistence level, where the farmers only have limited contact with the market. The degree of market participation was studied for typical holdings in the Baco area. The measurement taken was the share of marketed produce from the total output on the farm (in value). According to the measures used by the FAO there are three stages in the transition of subsistence to commercial farming (12).

1. Subsistence farmer (marketed share under 25 percent),
2. Transition farmers (marketed share range between 25-50 percent),
3. Market farmers (marketed share more than 50 percent).

As Table 2 shows, the total revenue of an owner-occupier with a cultivated area of two hectares is Eth. \$231 per year. Out of this amount about 50 percent is marketed. A tenant under Ekol Erash (50:50 sharing) has a total revenue before sharing of Eth. \$208 per year. Under the assumption that the landowner sells his share for leasing the land, the tenant's marketed part of the production is nearly two-thirds. The directly marketed share of the tenant is estimated to be only 15 percent. That limited part directly sold by a tenant influences his reactions to changes in market prices. The different responses to market price changes have not yet significantly influenced the farming system of a tenant, mainly because of the traditional behavior of the farmers. However, the landowner influences the kind of produce his tenants cultivate.

During the calculation of the total revenue and market participation of farmers in the Baco area, only the value of the crop production was considered. Only a few of the tenants who share the production with the landowner own animals. Their incomes are too low to permit the necessary savings needed for the purchase of animals. In most cases owner-occupiers have cattle and poultry. Under the assumption that the animal production of an owner-occupier is 25 percent, the total production is about Eth. \$308. The portion of animal products marketed is less, therefore the figures shown in Table 2 give the upper limit.

Summarizing the above, it can be stated that the high proportion of marketed production results from the existence of the all-weather road in the Baco area and therefore, in comparison to areas without road connections this region has excellent marketing conditions. Another reason depends on the cultivated crops. As shown in Table 2, the following plants are cultivated in sequence of their percentage of the total arable land: Maize, teff, noog and red pepper. Red pepper and noog are cash crops and are mainly or totally marketed.

The farmers sell only their surplus of teff. Teff can be stored without substantial losses, because the small hard grain (thousand

TABLE 2. MARKET PARTICIPATION OF PEASANT FARMERS
IN THE BACO AREA, ETHIOPIA

A. Basic data from which B. and C. are derived:

Crop	% of Total Cultivated Land	Yield in Quintal per ha.	Farmer's Price, Eth.\$/100kg.
Maize	40	10	10.00
Teff	30	5	22.00
Noog	20	4	20.00
Red Pepper	7	6	55.00
Sorghum	3	7	15.00

B. Gross Return in Eth. \$ per Holding¹

Commodity	Tenant	Owner-Occupier
Maize	72.00	80.00
Teff	59.50	66.00
Noog	29.00	32.00
Red Pepper	41.50	46.50
Sorghum	6.00	6.50 ²
Animal Products	-- ^{2,3}	-- ²
Total	208.00	231.00

C. Degree of Market Participation (Percent of Sale)

Commodity	Tenant ⁴		Owner-Occupier
	Share for Landowner	Sale	Sale
Maize	50	--	50
Teff	50	--	only surplus
Noog	50	50	100
Red Pepper	50	40	90
Sorghum	50	--	--
Total	50	15	49

¹ Cultivated area per rented holding 1.8 ha., per owned holding 2.0 ha.

² Sale of animals or animal product only when money is needed.

³ Rented holding under share cropping system with almost no livestock.

⁴ Share cropper with 50 percent of total output to landowner (Ekol Erash).

Source: Manig, W., Formen der Landwirtschaft im Baco-Gebiet, Ethio-German Agricultural Research Station Baco/Shoa, Ethiopia, 1972, (17).

corn weight is only 0.3 grams) cannot be destroyed by weevils. Besides, the yields in the Baco area, with about 5 quintals per hectare, are so low in comparison to the regions in higher altitudes, that farmers need the produced quantity for their own consumption. In recent years in the Baco area, teff is being replaced by sorghum, since a white colored sorghum variety was introduced by the Baco Research Station.

The marketing of the greater proportion of maize is surprising because maize products are the main diet in the Baco area. The reason for this is the high degree of storage loss due to weevils and rodents in addition to the necessity of payment of taxes, rents and the repayment of loans immediately after harvest (26, p. 113). According to the information obtained from many farmers in the Baco area the storage losses, especially of maize, range from 50-100 percent in a period of 3 to 5 months. Even though these figures appear to be exaggerated, investigations by the Ethio-German Agricultural Research Station, Baco, showed that storage losses reach the lower numbers cited above. Farmers often have to repurchase maize or substitutes throughout the year in small quantities at a higher price level (4, p. 60). This is economically reasonable behavior on the part of farmers because the losses can be higher than price differences weighed by quantities. Consequently the improvement of local storage facilities is one step toward a better market position for the farmers.

The farmers of the Baco area sell sorghum, other millets, beans, peas, spices, eggs, poultry and butter in small quantities in addition to maize, teff, noog and red pepper. Farmers are by no means only suppliers, they demand all of these products and imported commodities as well on the weekly open markets in each town or village.

Both wheat and barley which are cultivated mainly in the higher elevations north of Baco, are marketed in towns in the Baco area, especially in Baco itself. Larger quantities are kept in the Baco area and sold at retail on the open markets. Part of the marketed wheat and barley are sold to the consumer markets in Addis Ababa and reimported to the Wollega province and sold in Gimbi and partly in Leketse (4). In addition to the marketing channels in the Baco area, surplus products of the highlands are also transported on a newly built all-weather road between Fincha-Dam and Ghedo to Addis Ababa and Gimbi (see Figure 2). The flow of surplus commodities depends necessarily on roads which are usable throughout the year. Before the new connection between Fincha-Dam and Ghedo was built, larger quantities were shipped on a dry-weather road linking Baco with the highlands. Since the loss of this revenue, local administrators as well as wholesalers have forced the construction of a new all-weather road, the construction of which is already completed from Baco to Jere (see Figure 2).

2. Market Channels of Agricultural Commodities

An open market is held once weekly in all towns and villages in the Baco area. The market days in a certain region are distributed within a week so that retailers are able to visit a different market place each day. The farmer, or one of his household members, visits the nearest market once a week. Other market places rarely are visited

and then usually only for a special purpose. The regular visiting of markets is an important part of the social life in rural areas in Ethiopia and it is the source of news and information including the latest market prices.

Farmers sell their produce mainly at the nearest market place on open market days to a rural wholesaler or one of his assemblers. It is also possible to sell commodities directly to the consumer in the farmyard as well as on an open market or to an assembler or retailer who is located outside of town, but the quantities are limited. Cereals, noog and red pepper are sold mainly to rural wholesalers; vegetables, poultry and eggs are generally sold directly to the consumer on an open market day. All of the butter is regularly collected by assemblers, put into iron containers and sent to Addis Ababa.

The towns and villages in the Baco area are located up to 15 km. apart. The direct distance from a farmyard to the nearest market place is not more than 8-10 km. or two hours walking. The farmyards are distributed all over the area and linked only by paths to roads or to markets. The farms cannot be reached by a vehicle in most cases so that goods are carried by a farmer or his wife to market. Due to the lack of a good transportation system the farmers are forced to sell their products in the nearest market place. The farmers do not get their current price information before they reach the market, although farmers are well informed about prices in other markets. This information is distributed orally among farmers, but gives only a rough performance of past prices. As has been shown, the fluctuation of prices is very high from week to week. Past prices and their price expectations are the prime factors in the farmer's decision to sell. They must sell if they have carried their products. Only in a few special cases does the farmer have the possibility of storing his products with friends in town for later sale. Transporting the produce back to the farmyard is so difficult that it seldom happens. With few exceptions, farmers have to sell their products immediately after arrival at the market because of lack of time. The farmer or his wife arrive on a market day between 11 a.m. and 1 p.m. and have to walk back in the afternoon and therefore they are not able to deal or to sell in small quantities directly to the consumer (26, p. 128).

As will be explained later, prices do not vary between the beginning and the end of an open market day (4, p. 61), but between market places there exists, in a short-run period, large price differences (see Chapter IV). Only cultivators with larger holdings have the transportation facilities and the quantities to take advantage of these differences. Sometimes they hire pack donkeys for a rate of Eth. \$1 per day. But the large number of farmers with their small supplies do not ship their goods to the places with the higher prices, although they are often well aware of the differences.

A forward-sale of agricultural products rarely takes place in the Baco area. Such a sale usually results from receiving a loan from a trader. Usually farmers borrow money in small amounts from friends or middle size landowners. The SRI team mentioned a case of a forward-sale from the Baco area, where a farmer sold his maize in advance

(27, p. 83). According to that source, the forward-sale price of maize was Eth. \$5 per quintal. After the harvest the price rose to Eth. \$6 per 100 kg.; that is an interest rate of 20 percent in three months.

A substantial part of the farmers' marketed surplus is retailed to the rural consumer in the Baco region. The large proportion of agricultural commodities remaining in the Baco area is due to the high number of partly (like farmers) or totally market dependent people who live in the rural areas. There are no data about the market dependent population and their demand behavior available for either the whole of Ethiopia or sections of it. Some estimations, done by the Stanford Research Institute for 1966 (27, p. 25), and actualized for 1970 by the International Bank of Reconstruction and Development, give a rough performance. Out of the estimated total population of Ethiopia of about 24.7 million in 1970, 19 percent were market dependent; 4 percent living in both cities, Addis Ababa and Asmara. Five percent lived in other urban centers and the remaining 10 percent lived in rural regions. The distribution indicates large differences between regions. By taking some of the results of the Stanford Research Institute into account (27, p. 70), it is estimated for the Baco area that 70 percent of the farmers' maize supply is sold to rural wholesalers, 15 percent to retailers and 15 percent directly to consumers. The rural wholesalers sell about half of it to local retailers and half of it (or about 35 percent of the total supply) is shipped to consumer centers in Addis Ababa and Gimbi and with less frequency to Lekemte. Large quantities of wheat and barley from marketed surplus of the highlands remain in the Baco area for local consumption. Agricultural products are transported and sold in Addis Ababa or Gimbi after a certain period of storage in rural areas, dependent on price constellations and storage facilities. The cereals are sold to wholesalers in the cities or directly to a flour mill (especially wheat). The wholesalers sell the commodities to other wholesalers, to mills or to retailers (see Figure 3). Flour and also grain is sold in shops or on open markets in consumer centers. Often a smaller quantity of grain is retransported to the production area after a certain period of storage.

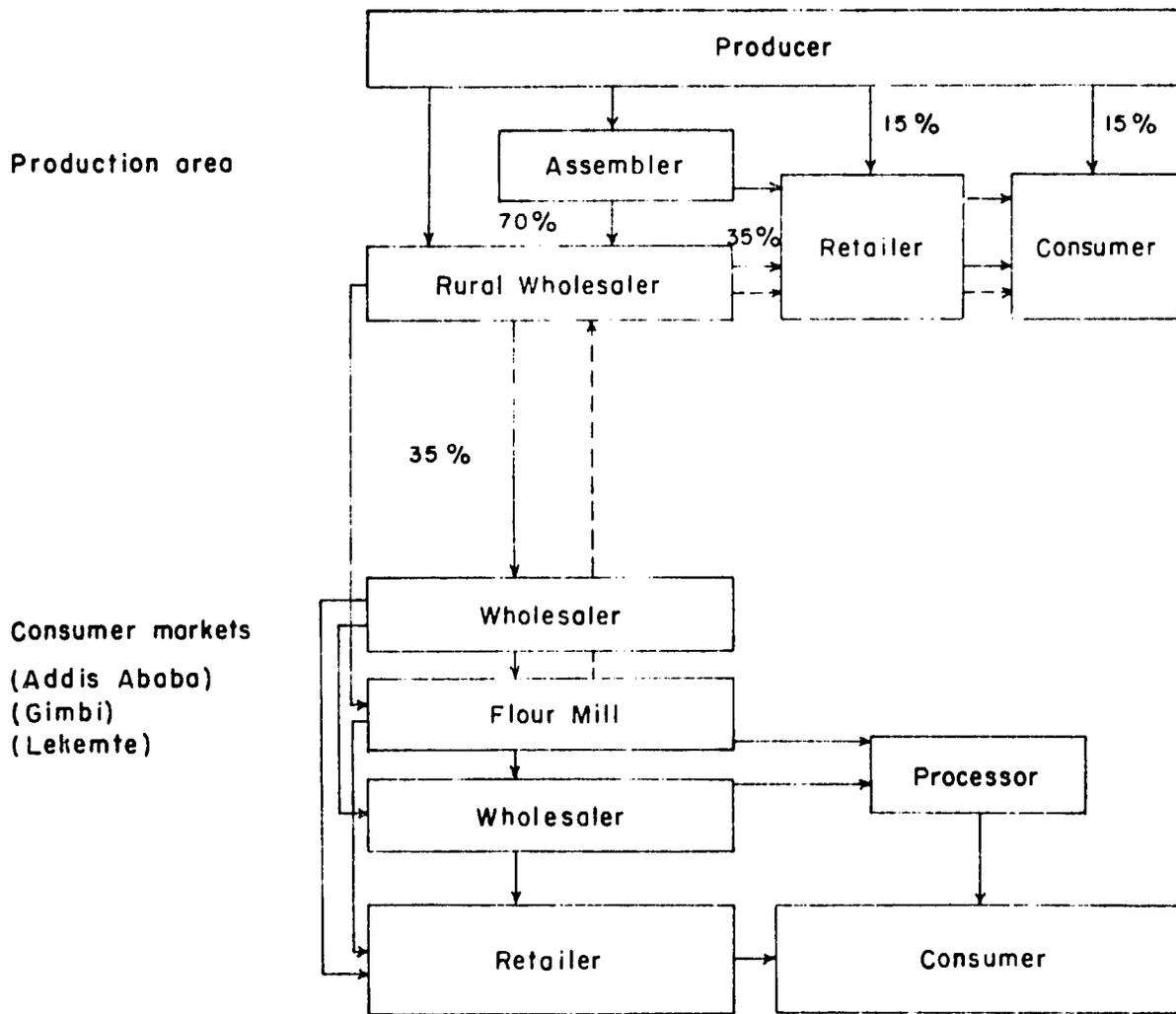
Consumers in cities as well as in rural areas grind the grains in small flour mills located throughout the Empire. These mills are usually electrically, water or diesel engine driven (27, p. 58).

As previously mentioned, the consumer centers of Addis Ababa, Gimbi and to a degree, Lekemte are of the greatest importance for the production area around Baco.

Addis Ababa has a population of more than 800,000. All central governmental agencies, import and export firms and a substantial part of Ethiopian industries are located in or near the capital. Therefore Addis Ababa is the most important and largest market in Ethiopia.

Gimbi is linked by an all-weather road with Addis Ababa. All commodities from western Wollega are transported on dry-weather roads to Gimbi and from there on the all-weather road to other destinations. The broader Gimbi region is a coffee growing area and the coffee from Gimbi is exported. Also all coffee produced in western Wollega has to

Figure 3. Market Channels for Cereals in Western Ethiopia (Example Baco - Area)



Numbers give the approximate percent distribution of marketable maize in the Baco-area

be marketed in Gimbi. The farmers' activities in the Gimbi region are completely focused on coffee production. Therefore food for the urban centers and for the farmers has to be imported from other areas. According to an estimation of the Ethiopian Grain Corporation in Gimbi, about 30-40 percent of the total consumption of grains has to be imported, mostly from Addis Ababa and the Baco area. A part of the imported wheat and cereal products from Addis Ababa originates in foreign countries. The economically active town has only a permanent population of 6,500 inhabitants (5, 1969, p. 33; 8, p. 67). During the coffee harvest which occurs from December until March the population of Gimbi, as well as the rural area surrounding it, increases rapidly due to seasonal laborers (18).

The provincial capital of Wollega, Lekemte, has a population of 13,000 inhabitants (5, 1970), and all provincial governmental agencies are located there. Food is supplied mainly by farmers in the surrounding area and only partially from the Baco area.

3. Storage and Transportation

A well established system of storage and transportation facilities is necessary in order to minimize the price differences within seasons and between producer and consumer areas. As long as the storage and transportation system is not efficient, spatial and seasonal prices will differ proportionately more, given the supply and demand structure in Ethiopia.

The storage facilities for cereals, pulses and oilseeds in Ethiopia are generally inefficient in towns as well as on farms (28, p. 172). Only the Ethiopian Grain Corporation has modern silos on a large scale in cities like Addis Ababa and Gimbi. The Ethiopian Grain Corporation has a 1,000 metric tons bulk storage unit in Gimbi with 50 metric tons sack storage capacity (27, p. 95). These silos are often empty (4, p.67). Traders, both in production and consumer areas, store grain in sacks or in bulk in locally constructed houses. The grain is partially fumigated. This method of storage creates high losses because of weevils, rodents, moisture, fungi and bacteria.

Farmers store their grain in large baskets with a capacity of up to 20 quintals. These baskets are covered with a mixture of soil, teff-straw and cattle manure (chicka) and covered with a roof made of grass. Air ventilation is very good, and the high rate of loss is caused mainly by weevils and rats (see Chapter III,1). With due consideration given to the problems, the storage losses could be decreased to 3 percent per annum without the use of chemicals (14).

Due to the high storage losses and unpredictable price fluctuations, farmers and traders have to carry a high risk when they store cereals. In addition, a substantial part of the marketed grain is bought by traders with borrowed money. According to the report of the Stanford Research Institute (27, p. 79) more than one-half of the operating capital of the large traders is borrowed from banks. It was estimated that more than 25 percent of the demand for cereals and pulses in the larger consumer centers in Ethiopia is usually financed on credit. The Commercial Bank of Ethiopia (CBE) with its branches in all important

towns lends money at an interest rate of between 7.5 and 10 percent. In addition, the bank holds title to the stored goods and requires a security of about 200 percent on the credit granted. In 1971, 20.7 percent of the total credit of Eth. \$450 million was given by the Commercial Bank of Ethiopia S. C., for financing local traders (3, Special Issues, Oct./Nov. 1972, p. 45). Lack of operating capital and the necessity to obtain credit from the banking system forces the traders to energetically bargain in order to minimize the purchase prices with resulting severe price fluctuations.

If the bagged cereals were stored in the most advantageous manner in locally constructed warehouses storage costs (including losses) of Eth. \$0.44 - 0.53 per quintal per month are estimated for maize with higher costs on other grains due to their higher value. Fumigation does not increase the cost proportionately. There are only costs of Eth. \$0.40 - 0.54 per quintal per month on maize with fumigation which minimizes the risk of losses (see Table 3). The costs for bulk storage lie in the same range as sack storage, because the capital costs for buildings and the losses are higher, but sacks are not necessary.

Agricultural commodities are generally transported over long distances in Ethiopia by truck. Only imported and exported goods are shipped by rail between Addis Ababa and Djibouti or sent by air-freight. Ethiopia has an all-weather road network of about 7,000 km. (5) and an estimated dry-weather road system of the same length. The Baco area is well linked by an all-weather road with all of the important consumer centers (see Table 4) and therefore has relatively low transportation costs (Table 5).

Most trucking concerns in Ethiopia own one or two trucks. Only a few trading enterprises own a larger truck fleet. By taking into consideration the present road network and the absence of monopoly, the Ethiopian trucking system operates efficiently (see also Imperial Highway Authority, cited by 27, p. 85).

The freight costs for hauling grain between Addis Ababa and Gimbi or from towns located on the road to Gimbi ranges from Eth. \$0.06 to \$0.11 per metric ton per kilometer dependent upon absolute distance, season, destination and upon an obtained back-haul. During coffee season, from December until March, the freight tariffs are generally higher, because truck owners prefer the lucrative coffee transport. The coffee harvest falls in the dry season when many goods are hauled on dry-weather roads causing a shortage of transportation facilities and a subsequent rise in freight rates. Commodities are moved in both directions between Addis Ababa and Gimbi. Food is transported from Addis Ababa or the Baco area to Gimbi with coffee transported on the return trip. The transportation tariffs from Addis Ababa to Gimbi are lower in the coffee season than from Gimbi to Addis Ababa.

The hauling tariffs on dry-weather roads are much higher than on all-weather roads (27, p. 87).

Under competitive conditions the costs for assembling, transporting

TABLE 3. ESTIMATED STORAGE COSTS PER MONTH
AND PER QUINTAL FOR CEREAL

Items	Eth. \$/100 kg.
Capital costs and maintenance Investment - Eth. \$750 - 1.500 Capacity - 50 tons Storage period - 6 months Depreciation - 10% per annum Interest - 8% per annum Maintenance - 2% per annum	0.05 - 0.10
Sacks (Eth. \$1.50 each, used 2-3 times)	0.08 - 0.12
Fumigation	0.05 - 0.10
Investment on grain (10% per annum on grain valued at Eth. \$15.00/q.)	0.13 ¹
Wage for a guard (Eth. \$25.00/month)	0.05
Sum	<hr/> 0.36 - 0.50
Storage losses (3% per annum on Eth. \$15.00/25.00/40.00 per q.)	0.04/0.06/0.10
Storage losses (10% per annum on Eth. \$15.00/25.00/40.00 per q.)	0.13/0.21/0.33

Source: Interviews with traders.

TABLE 4. DISTANCES BETWEEN SELECTED MARKETS IN
WESTERN ETHIOPIA (in km.)

Addis Ababa	200	247	255	285	340	460
	Ghedo	47	55	85	140	260
		Sheboka	8	38	93	213
			Baco	30	85	205
				Sire	55	175
					Lekemte	120
						Gimbi

TABLE 5. TRANSPORT TARIFFS ON THE ALL-WEATHER ROAD
ADDIS ABABA - GIMBI

From	To	Eth. \$/q.	Eth. \$ per ton-km
Addis Ababa	Lekemte ¹	2.00 bis 3.00	0.06 - 0.09
	Gimbi	2.75 bis 5.00	0.06 - 0.11
Baco	Addis Ababa	2.00 bis 2.50	0.08 - 0.10
	Gimbi	1.50 bis 1.80	0.07 - 0.09

¹Tariff, given by the Imperial Highway Authority, is only Eth.
\$1.50/q. (4.5 cents per ton - km.).

Sources: IEG, Statistical Abstracts, (5).

SRI, Ethiopian Agro-Industrial Sector Study, Report No. 16,
p. 84 and p. 253, (27).

Manig, W., "Kaffeemarkt in Gimbi/Aethiopien." Ethio-German
Agricultural Research Station Baco/Shoa, Ethiopia, (Mimeo),
(18).

and storing are not higher than shown in Table 6. Spatial price differentials and seasonal price increases would remain within that range. If the assembler is trading for his own enterprise, his profit tends, under full competition, towards zero. If the assembler is an agent for a wholesaler, he will obtain a commission of Eth. \$0.20 - 0.30 per quintal.

In chapter IV, 2 and 3, regional price differences and price fluctuations over time in Ethiopia are compared with costs in order to examine the competitiveness of the grain market in the Baco area.

4. Structure of Open Markets

As was mentioned earlier, 19 percent of the total Ethiopian population was market dependent for food in 1970, but only 9.4 percent of the population lived in towns with a population of more than 2,000 inhabitants. In both provinces, Shoa and Wollega, 20.8 and 4.1 percent respectively of the total Ethiopian population lived in towns (5). Almost all of the market dependent population in urban and rural areas and also farmers purchase their food and other items predominantly in weekly open markets.

Open market days are assigned within a region over the week (see Table 7). Retailers are present on each market place. They transport their goods between markets by pack-donkey, bus or by the trader himself. The open market begins usually between 11 and 12 a.m. The peak of market business occurs between 1 and 2 p.m. At 5 p.m. the market business is finished.

Every regularly attending retailer has his place in the market. All commodities offered on an open market by a retailer are shown on burlap mats or in open sacks to interested people. Agricultural produce is traded only in volume, but gravity is also taken into consideration on the retail stage. Glasses, tins and containers made from a certain type of squash are used as measurements. In most of the markets a glass with a volume of 330 cc. (rounded) is in use although other containers with different volumes are also used. Retailers only in Gimbi measure goods in a larger enameled container. The retail sale prices are quoted either in number of containers per one Ethiopian dollar or in Ethiopian cents per container. Usually, traders are inclined to use rounded-off figures. Due to these methods of measuring, prices per 100 kg. can be changed only in larger steps, because the number of containers per one Ethiopian dollar has to be changed. Steps of price changes increase with enlarging the size of containers. For example, when the price of any commodity is set at ten containers per one dollar, change is only possible in increments of 10 percent. If container size is doubled and the price remains at the same level, or in other words, the price is set at only five containers per one dollar, price changes are made at an increment of 20 percent. This method results in keeping prices constant for as long as possible.

Other measurements are also common for products other than grain. Onions, garlic, potatoes and red peppers are traded at the retail level in small heaps for ten Ethiopian cents each. The size of the heap changes often according to the market situation.

TABLE 6. COSTS OF ASSEMBLING¹, TRANSPORTATION AND STORAGE
OF GRAINS IN ETHIOPIA

	Eth. \$/100 kg.
<hr/>	
1. Assembling, storage and selling in the Baco area	
a. Buying costs (weighing, filling sacks)	0.20
b. Handling costs in store	0.10
c. Selling costs	<u>0.20</u>
Sum a - c	0.50
d. Storage costs (losses 10 percent per annum, grain price Eth. \$15.00/q.) per month	0.49 - 0.63
<hr/>	
2. Assembling in the Baco area, storage in Addis Ababa	
a. Buying costs in Baco	0.20
b. Costs of sacks ² (value Eth. \$1.50, 30 times use for transportation)	0.05
c. Loading in Baco	0.10
d. Transport costs Baco - Addis Ababa	2.50
e. Unloading at store in Addis Ababa	0.10
f. Selling costs in Addis Ababa	<u>0.20</u>
Sum a - f	3.15
g. Storage costs (losses 3 percent per annum, grain value Eth. \$15.00/q.) per month	0.40 - 0.54
<hr/>	
3. Assembling in the Baco area, storage in Gimbi	
a,b,c,e,f like example 2	0.65
d. Transport cost Baco - Gimbi	<u>1.80</u>
Sum a - f	2.45
g. Storage costs (like example 2)	0.40 - 0.54
<hr/>	
4. Buying in Addis Ababa and transportation to Gimbi	
a. Buying costs in Addis Ababa	0.10
b,c,e,f like example 2	0.45
d. Transport costs Addis Ababa - Gimbi	<u>4.00</u>
Sum a - f	4.55
<hr/>	

¹Only direct assembling costs of rural wholesaler. Farmers bring the commodities to the store of the trader. Without cleaning costs.

²Assumed, that rural traders use their own sacks for transportation.

Source: Tables 3 and 5.

TABLE 7. WEEKLY OPEN MARKET DAYS IN THE BACO AREA

Market	Day
Jaji	Friday, (Wednesday) ¹
Tibbe	Thursday
Sheboka	Monday
Baco	Tuesday and Friday
Ano	Thursday
Sire	Saturday
Jere	Monday
Addis Ababa	Daily
Lekemte	Thursday and (daily)
Gimbi	Saturday and (daily)

¹The day indicated within brackets denotes a less important market.

The transaction takes place after a period of bargaining, during which prices can be negotiated only slightly downward by adding a fistful of grain or other produce.

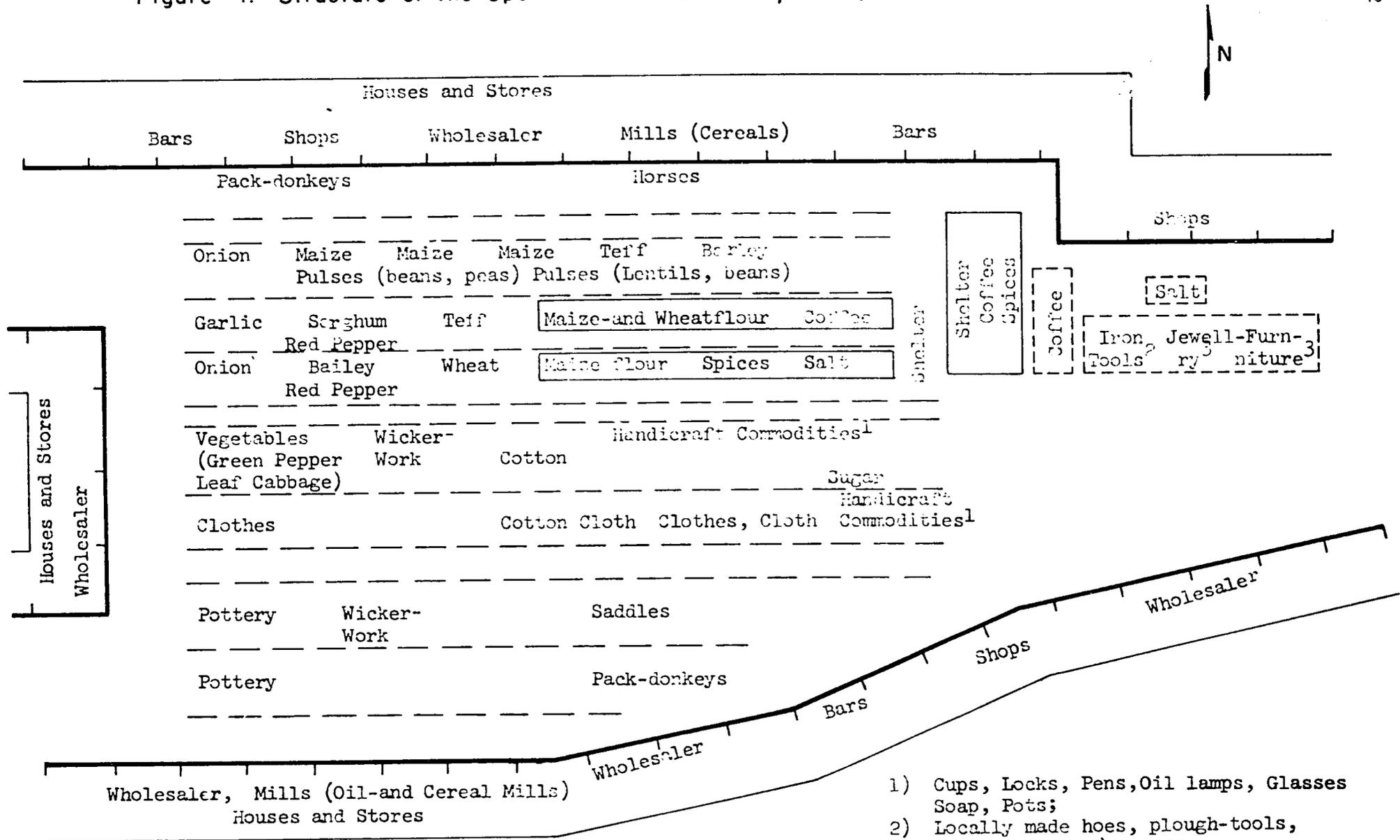
Bartering no longer exists on open markets in the Baco area as it does in some of the other regions of Ethiopia. All purchases and sales are done with the official currency, which is also the measurement of value. Besides functioning as a measure, money is also used for savings in the short term. Small amounts of money are saved until a certain target is reached. If there is no direct savings, the money is later exchanged for cattle or land. In other words, long term investments are in cattle or land, but not in currency.

As an example of the structure of an open market, the main market in the provincial capital of Wollega, Lekemte, should be examined (see Figure 4). Other markets are similar, although generally on a smaller scale.

The open market, on Thursday of every week, takes place in an area 100 m. long by about 50 m. wide. Locally constructed one or two floor houses, with a veranda, are situated around the site. These houses are built from eucalyptus sticks. The walls are covered with a mixture of soil, straw and cattle manure and the roofs are made from corrugated iron. Most of the buildings have an electrical connection. The buildings contain retail shops, bars, and oil mills and the wholesalers' stores. Most of the houses also have living areas.

The market place can be reached on three earthen roads. Also the market area itself is only earth without any cover or preparation.

Figure 4. Structure of the Open Market in Lekemte, Ethiopia



Each group of commodities has a certain selling place along the pathways. Agricultural products, like cereals and pulses, are located on the upper northern part of the area, whereas handwoven and manufactured cloth, cotton and potteryware items are sold on the lower part of the area (see Figure 4). Some highly valued agricultural commodities and other products are offered under a shelter. Open market days are held during both dry and rainy seasons. Commodities are only covered slightly while it is raining, and after the rain the market place is like a mud hole. Sanitary and disposal installations are lacking resulting in low quality hygienic conditions for food marketing.

Retailers on the weekly open markets have to pay a monthly tax to the municipality where the market is located. The payable amount depends upon the size of the occupied space and the value of the offered goods. The tax collector assigns subjective monthly payments to each trader in one of the tax brackets of Eth. \$0.20; 0.25; 0.50; 0.75; and 1.00. The number of retailers on the market can easily be ascertained based on the payment of this tax. But besides these commercial retailers, farmers or their wives also occasionally offer their products on the retail market without payment of the tax to the municipality. Some farmers sell their homemade products, such as mats, sacks, pottery and woven work, iron tools and jewelry on the open market, although comparable manufactured goods of this kind are also offered by commercial retailers.

As an example of a medium size open market, Table 8 shows the number of retailers and the monthly amount of tax at the market in Baco, where data are available. The table shows, for the period from July 1970 until April 1971, that the number of retailers on these two markets in Baco increased rapidly with the beginning of the harvest time in October. In the harvest period large quantities of agricultural products are traded on the retail level and due to the increased purchasing power of the population during this time traders offer additional consumer goods. The number of retailers between markets differs greatly but the annual fluctuation is about the same overall.

TABLE 8. NUMBER OF RETAILERS AND THEIR MUNICIPAL TAX PAYMENTS
ON THE OPEN MARKET IN BACO, JULY 1970 - APRIL 1971.

Month	No. of Retailers paying tax of Eth. \$ ¹		Total No.	Total Payment Eth. \$
	0.20 - 0.50	0.75 - 1.00		
July	42	41	83	56.25
Aug.	34	39	73	51.50
Sept.	32	42	74	52.45
Oct.	85	69	154	98.05
Nov.	89	78	167	103.45
Dec.	72	57	129	87.00
Jan.	59	68	127	86.50
Feb.	70	71	141	95.00
March	76	89	165	109.00
April	75	73	148	100.00

¹

Each retailer has to pay a monthly tax to the municipality. The amount depends on the size of the space on the market and the kind of commodity.

Source: Records of the tax collector in Baco.

IV. Prices of Agricultural Commodities in Ethiopia

1. Price Formation of Agricultural Products

Addis Ababa and Asmara require not only a substantial proportion of the marketed surplus of agricultural production in Ethiopia for their own consumption due to their large populations, but also large quantities of goods flow to these cities for redistribution to the rural areas. Therefore these markets, especially Addis Ababa, have a leading role in price formation and most of the prices in the rural areas depend partially on prices in Addis Ababa. The actual price determination in Addis Ababa depends mainly on the interaction of supply and demand due to the fully liberalized market. Prices are set by brokers, who negotiate a large part of the transactions. The world market price of cereals does not influence the national price determination; but the prices of export commodities, such as coffee, oilseeds and pulses, are greatly influenced by world market prices (27, p. 107).

The total production and therefore the supply has to be estimated by a large number of traders because no cropping and production statistics exist in Ethiopia. The sum of the subjective production estimates of the most important wholesalers, weighted solely by their market share, determines the collective price expectation and this is the crucial market force, especially during and after harvest time.

Though the Ethiopian Grain Corporation is the largest trader in cereals in Ethiopia, this semi-governmental organization has had only a 3 percent share of the marketed surplus in 1966/67 (27, p. 107). According to another source (IBRD), the Ethiopia Grain Corporation handled only 1.5 percent of the domestic market supply (excluding imports). These figures give an idea of the size and influence of a single trader on the grain market in Ethiopia.

Because of the low price elasticity of demand and supply of cereals in a short-run period and therefore a high price flexibility coefficient, the crucial impulses for price movements are closely related to the marketed supply. Due to the nonexistence of statistical data the total marketable supply is often misestimated with the resultant price fluctuations within one year and between years and these price fluctuations are even higher than the price flexibility coefficient indicates.

As pointed out earlier, prices in production areas are directly influenced by prices in Addis Ababa. The derived prices in a certain production area should be, in a competitive market, theoretically lower by the amount of shipping costs between these two places. As shipping costs rise price fluctuations in a local market may increase without initiating a flow of produce to the consumer market, with local traders accordingly becoming more influential.

Only the upper level of prices in local markets in the Baco region is set by the prices in Addis Ababa, reduced by the amount of marketing costs. Under this ceiling price, local prices differ in a broad range. The reasons are: imperfect transparency, high market risk for traders and the different market positions of merchants and farmers.

The rural wholesalers and assemblers are generally well informed of the current prices in the main markets in Ethiopia as well as on the local markets in a certain rural area as they usually exchange daily price information by telephone.

Farmers obtain their current price information at the nearest local market only after they arrive at the market, but they are well informed about past prices in markets in a certain region. They cannot profitably use their information about price differences between local markets due to the lack of transportation facilities. Better price transparency to the farmers (e.g. price information from central markets) would not change their position in view of the basic transportation problem.

As already mentioned, farmers have no choice in the selection of a specific market place but they also have no time choice for selling their produce because all taxes, rents and repayments of loans are due shortly after harvest time. In addition, the farmers need money because all necessary purchases were postponed until after harvest time. Due to the gap in time and lack of alternative sources of income (only a limited number of farmers manufacture best mats, pots or cloth) most farmers are forced to sell their produce as soon as possible. For example, the purchase of cereals by the CADU-Project in Assella is concentrated shortly after harvest time. The project bought out the total purchases; 11 percent in November and 28 percent in December, 1970; 27 percent in January, 27 percent in February, and only 7 percent in March, 1971. After March, 1971, the project was not offered grains (1).

These facts represent generally the low bargaining power and market position of the farmers. But the market risk for merchants is also high because of the lack of adequate storage facilities and especially because of the unpredictability of price movements. Therefore, traders also may sustain losses by storage. In addition from the subjective viewpoint of traders, they carry another risk because a large portion of their transactions are financed with borrowed money (Chapter III, 3).

Taking all of the foregoing into consideration, the price determination on local markets depends upon the estimation of the local supply by a few merchants. Prices in Addis Ababa are only guidelines for the ceiling price. The subjective estimation of a single trader greatly influences the price in a certain region, although there are some corrections possible due to the integration of the local markets.

2. Temporal Price Behavior

Prices of agricultural commodities in Ethiopia fluctuate greatly over time and these changes can be divided into four different components as follows: a. long-run changes (trend); b. the typical fluctuations over years (cyclical); c. fluctuations within one year (seasonal); and d. irregular changes between weekly quotations.

A. Long-run Movements

The available price series from the Baco area, Lekemte and Gimbi from May, 1970 until December, 1972 cover too short a period to analyze trend movements of agricultural commodities. By using the data from Addis Ababa for a longer period there was a typical increasing price tendency between 1957 and 1972 (Figure 5). All other price movements oscillate around the trend. The average annual increase in Addis Ababa, computed for a linear trend function for 1957 to 1972, was for maize Eth. \$0.36 per quintal; for wheat Eth. \$0.58, and for noog Eth. \$0.44 per 100 kg. According to the analysis of the Stanford Research Institute the prices increased annually on the average of Eth. \$0.51 per quintal on maize, Eth. \$0.42 on wheat, and Eth. \$1.41 per 100 kg. on teff (mixed color), calculated for the period 1957-1967 (27, p. 131).

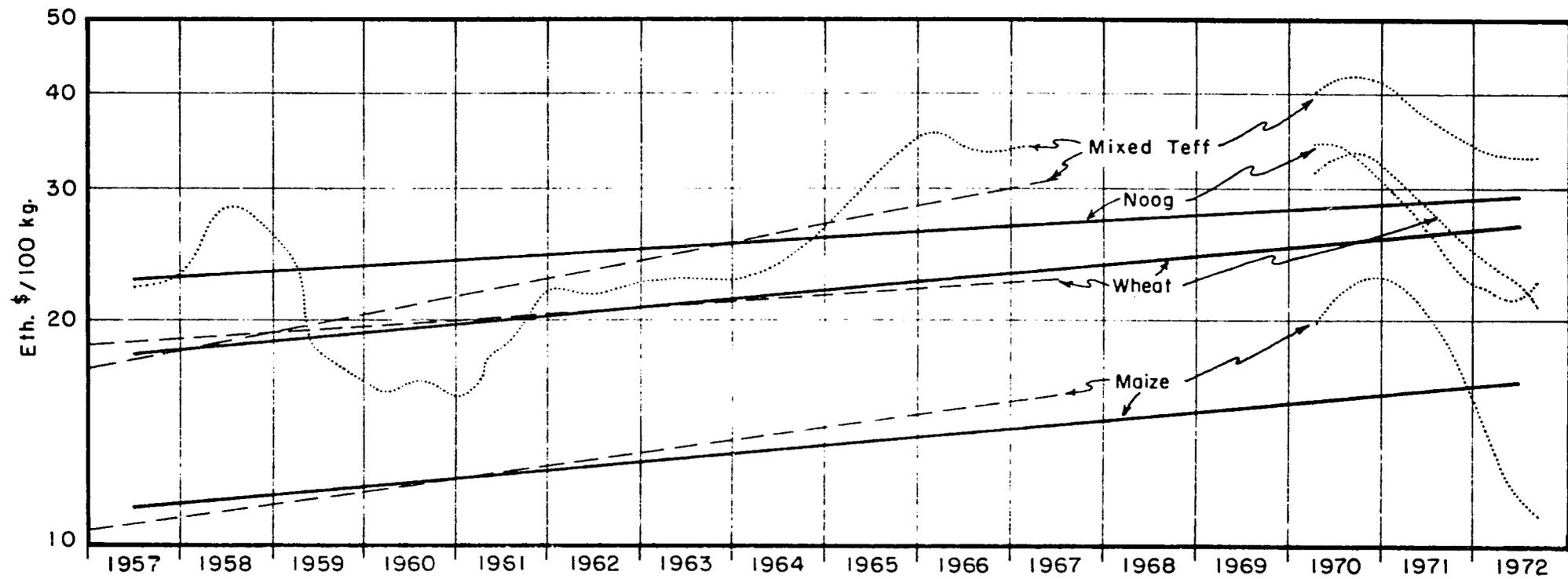
The upward trend of prices of agricultural commodities in Ethiopia is caused by substantial changes in the structure of supply and demand. The main reason for the change in demand is the growing population and the rapidly increasing market dependent population in towns as well as in rural areas. The increase in demand raises the prices of agricultural goods. These price increases respond generally to a rise in production and relieve the transition from subsistence to marketing agriculture. But this transition often causes a change in the production from food to agricultural raw materials, especially if they can be sold on the world market. Examples in Ethiopia are the production of cotton, coffee, oil crops and red pepper (for food coloring). Therefore to a certain extent, absolute food production decreases regardless of price rises and the former subsistence farmers become partly dependent on marketed food.

The dependence on imported food in Ethiopia indicates that the increases in production of food products has been less than the required amount. Therefore, development aid programs for farmers in Ethiopia (extension and credit programs) are mainly concerned with increasing the production of food. But it should be pointed out, that the present relative high price level for cereals will decline in the long-run process of development. Increasing productivity in agriculture due to technological progress (especially with use of inputs such as fertilizer, improved seed, etc.) will lead to a decline in prices, given the demand structure. But the use of these new inputs requires not only more capital and credit, the increased output has also to be marketed (see 19, p. 288). Therefore it is equally important that improvement of the marketing system be given the highest priority in order to decrease the risk of marketing, due to the uncertainty of price movements (see following chapters).

B. Cyclical Price Movements

Price fluctuations over years are mainly caused by changes in supply. Due to weather variability and its influence on yields, the supply changes over years. Also, marketing farmer's reactions cause fluctuations in the supply. For example, unfavorable weather conditions in a given year will decrease farm production causing lower marketable inventories with resultant price increases. Farmers, who market a substantial part of their production, react to these price increases by an extension of the

Figure 5. Long-run Price Movements of Maize, Wheat, Teff and Noog in Addis Ababa, 1957-1972



Linear trend — or — — —

Centered 12-month moving average

Sources: SRI, Report No. 16 and Price Datas, Collected by the CBE

cultivated area in the following year and vice versa. Annual changes in the cultivated land area are usual in Ethiopia, because most of the farmers cultivate only a part of their cultivatable land. Not only do prices of agricultural commodities cause an annual fluctuation in cultivated land, but weather conditions during the short periods of ploughing and sowing also influence the extent of the cultivated acreage. It was noted in the Baco area that farmers increase the cropping area when weather conditions are favorable during the sowing period for a certain crop, but when heavy rains start early in the rainy season, a part of their land cannot be cultivated.

These annual reactions to price fluctuations, modified crucially by weather conditions during ploughing and sowing time and also during the whole vegetation period, cause typical three to four year price cycles in Ethiopia (27, p. 130).

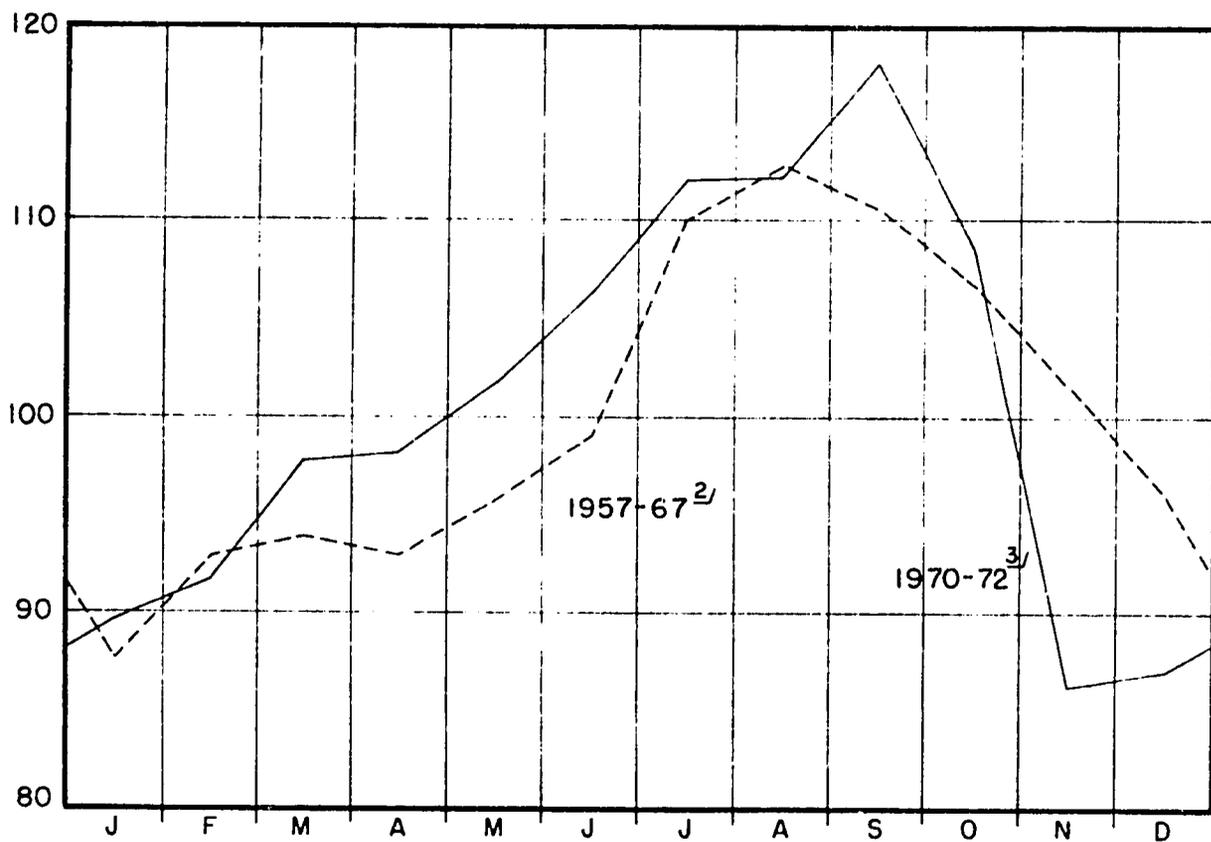
The short time range of available data for the Baco area deny definitive answers to the existence of cyclical price movements but, as shown in Table 5, information on typical cycles in Addis Ababa was available. Teff (mixed color), for example, brought high prices in 1958, 1961-62, 1965-66 and 1970.

C. Seasonal Price Movements

The most obvious price movements for agricultural commodities in Ethiopia appear within a one year span. Shortly after harvest time, from October until December, the lowest prices exist and before a new harvest, the highest prices are usually obtained. As shown in Figure 6, the seasonal price indices on maize around the centered 12 month moving average for two different long-run periods, reached the peak in August and September. The shortage of available price series for the Baco area do not allow the computation of seasonal indices by elimination of cyclical movements. A comparison of price series for different agricultural products between markets in the Baco area show a similar seasonal pattern in some years as above (compare Figure 6 with 7 to 13), but with typical distinctions in peaks and frequencies. The fluctuation of prices in the production area is much higher than in Addis Ababa. Due to the high fixed costs of moving commodities, which are a stabilized factor, prices in consumer centers tend to have smaller fluctuations. Besides this, the competition of different production areas with slightly different seasons stabilizes the changes of prices in Addis Ababa. On the other hand, additional supplies tend to increase price fluctuations in a more or less closed production area but the upward movements are limited due to the attitude of traders, who are oriented to prices paid in Addis Ababa.

In Gimbi, because of the greater dependence on transported food supplies, prices are somewhat higher than in Addis Ababa. According to information obtained from the Ethiopian Grain Corporation, Gimbi branch, most of the food is hauled in January and February to Gimbi and stored for later consumption. Because of the coffee transportation to Addis Ababa in that time, transport tariffs are lower for backhauls. The seasonal price fluctuations for cereals such as maize, wheat and barley, for which Gimbi is import dependent, is lower than in Addis Ababa, due

Figure 6. Seasonal Price Indices^{1/} for Maize in Addis Ababa (1957-67 and 1970-72)



^{1/}Computed as the relationship between the average of the actual prices of each month to the average of the centered 12-month moving average for each month

^{2/}Source: SRI, Report No. 16. ^{3/}Computed from data collected by the CBE

to the stabilizing factor of transportation costs. But the main factor, which prevents extremes in price fluctuation is the high purchasing power during the coffee season, October to February, in Gimbi, the period when prices would normally fall. Due to the glut of teff in the Gimbi area prices react in the same way as for other products in the Baco area.

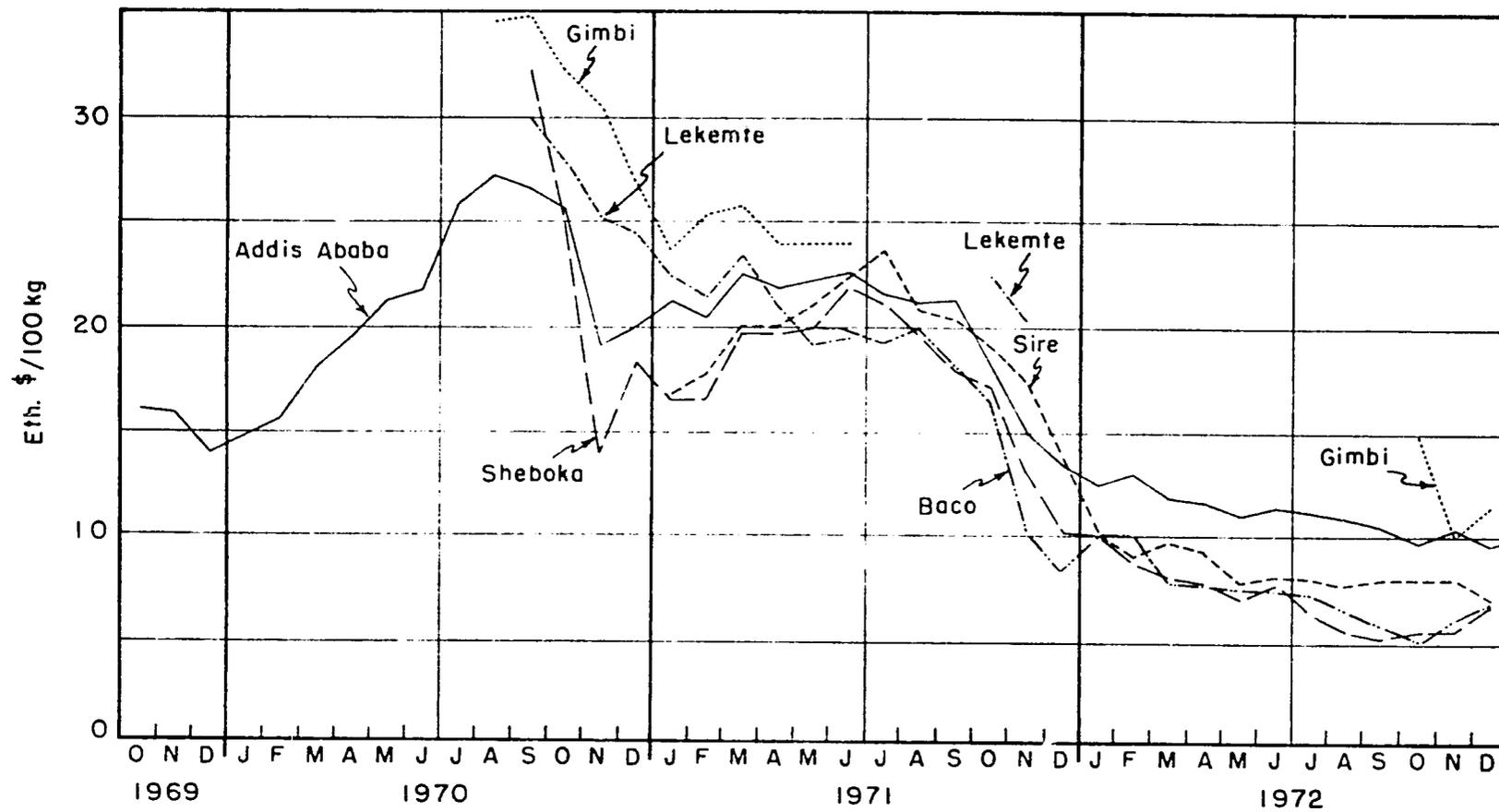
The influence of cyclical components on the seasonal fluctuation of prices is so high that often seasonal shifts will not occur or prices will move in a different direction (see Figure 7). The superimposing of differently caused price movements bring a high risk factor into the storage of cereals, because price movements cannot be predicted with confidence (see Chapter IV, 2e). The varying production over time, and over the total country as well as for a certain area, produces that superimposing. Although the crop yield causes objective price movements, the collective yield estimation of merchants and the reaction of wrong estimates are responsible for the actual price behavior. As long as the collective estimation comes true, price movements are normal. In the cause of wrong estimates, price movements are abnormal in the long run.

The price behavior of maize from 1969 to 1972 is an example of an abnormal price movement: The price of maize was Eth. \$7.00 per quintal in Baco and Eth. \$13.00 to 15.00 per 100 kg. in Addis Ababa in December 1969. The local traders overestimated the crop yield in the Baco area and therefore they had no intention of paying a higher price. To a lesser extent, the supply was also overestimated country-wide, causing a low price level in Addis Ababa. The price differences between Baco and Addis Ababa produced a flow of maize to Addis Ababa. But in January/February traders became aware of their overestimation of the maize yield and wholesale prices increased from that time until August/September 1970. The quotation for maize in the Baco area rose to Eth. \$30 per quintal, in Addis Ababa the highest prices were Eth. \$27 per quintal. The price differences caused a back flow to the Baco area. The prices fell with the beginning of harvest time to Eth. \$15 - 17 per 100 kg. in Baco and to Eth. \$19 per quintal in Addis Ababa, both quotations are from October/November 1970. Thus, the seasonal price increase in 1971 was much lower than the year before, because the price adjustment during harvest time, November/December 1970, was too high and did not correspond with the high yield. After harvest time in October/November 1971 maize prices fell but throughout 1972 they were kept down and fell more. In 1972 there was no seasonal price increase (see Figure 7).

As a comparison between Figures 7 to 11 demonstrates, the price movement of other cereals was similar to maize due to the possible substitutions. The range of price movements were somewhat higher on other crops like wheat (Figure 8), white teff (Figure 9) and sorghum (Figure 11).

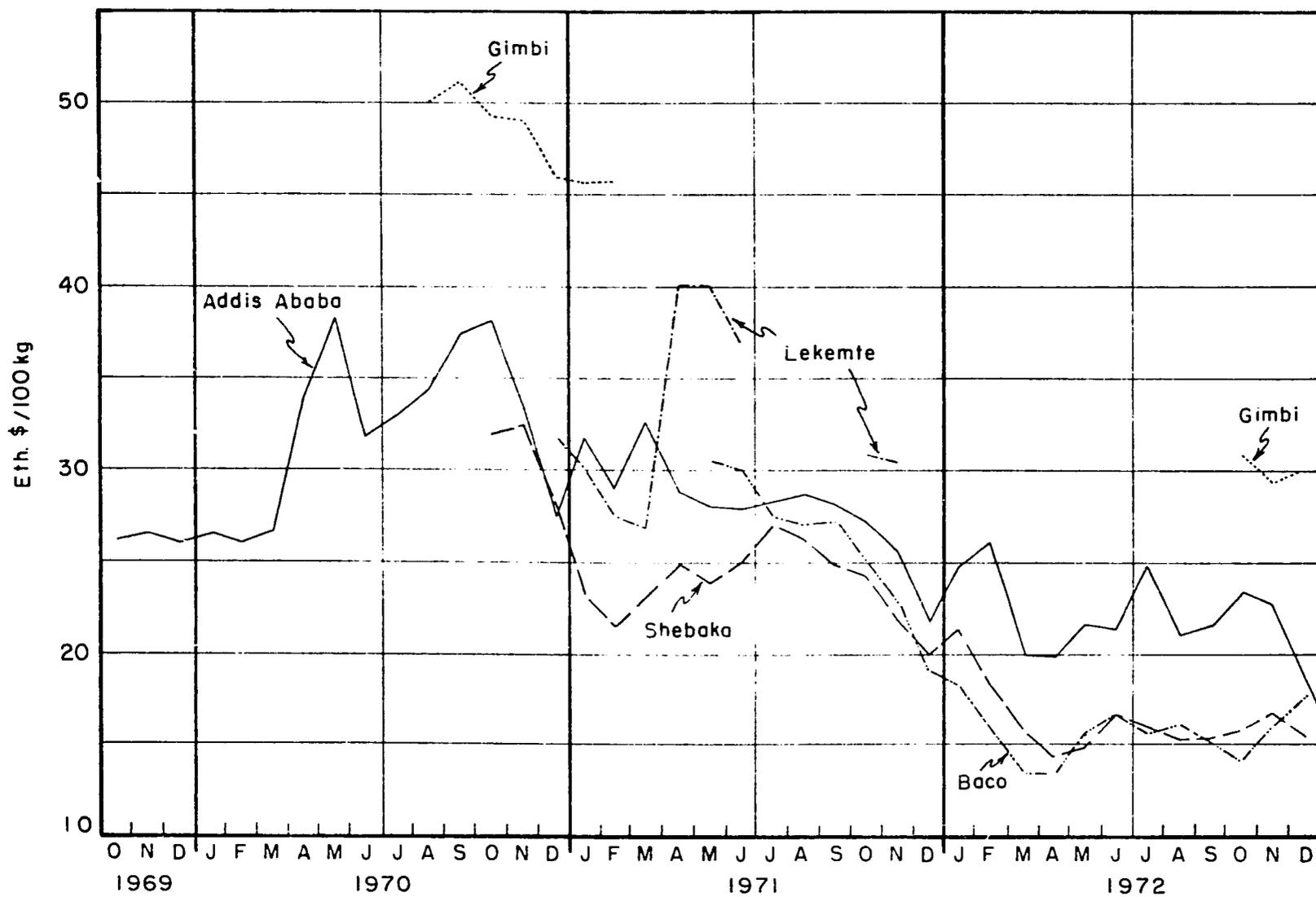
The price behavior of noog (Figure 12) showed a decrease from 1970 until April/May 1972 and an increase in the second part of 1972. The monthly fluctuation was relatively low. Of greater importance for the marketing of noog within the Baco area is the market in Sire. Most of the production from the southern lower areas is marketed through channels in Sire. Little noog is traded in the Baco market and therefore price quotations are not always available, while a wholesale market for noog does not exist in Gimbi.

Figure 7. Monthly Wholesale Prices of White Maize in Selected Ethiopian Markets, 1969-1972
 (in Ethiopian Dollar per 100 kg)



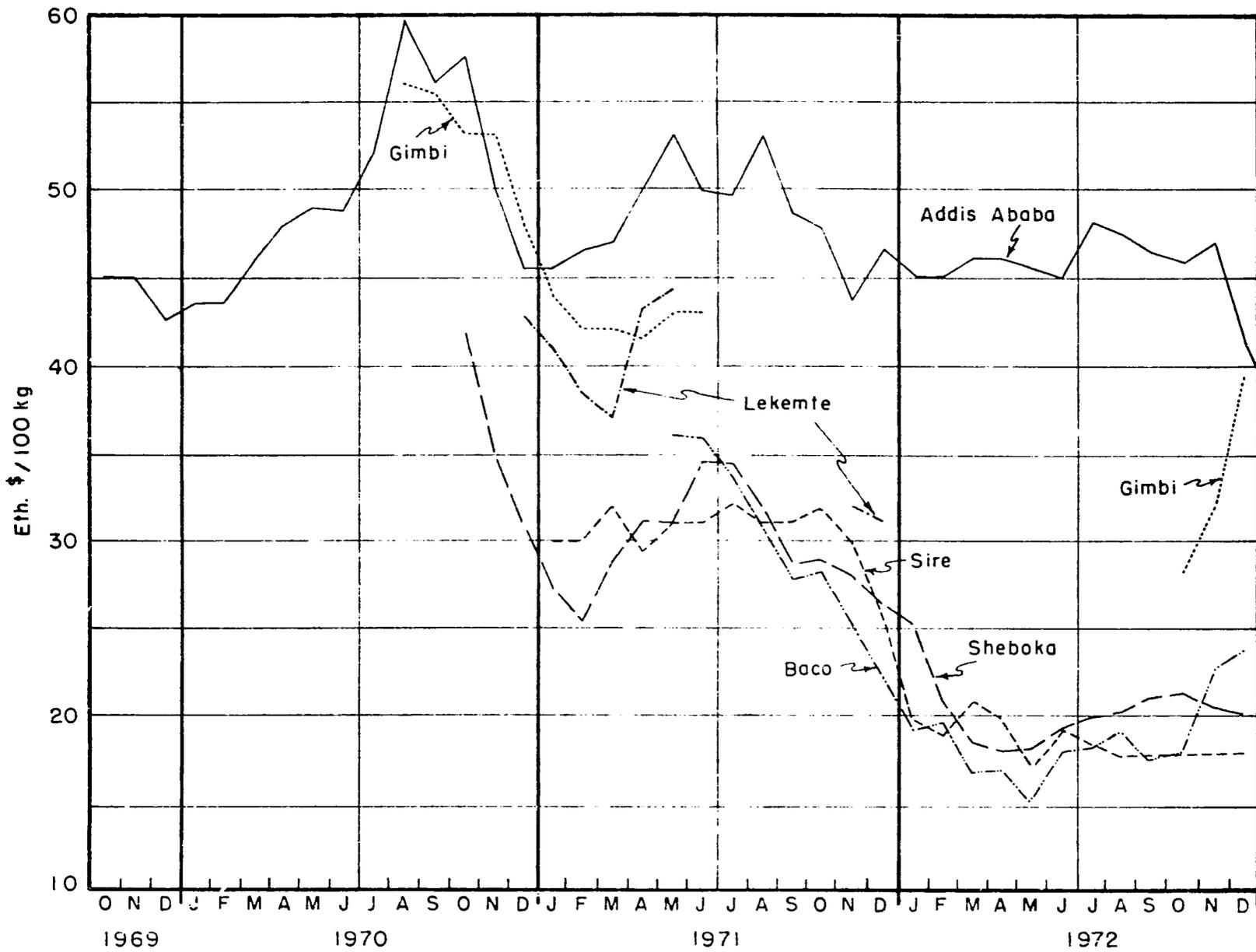
Source: App. A

Figure 8. Monthly Wholesale Prices of Wheat in Selected Ethiopian Markets, 1969-1972
(in Ethiopian Dollar per 100 kg)



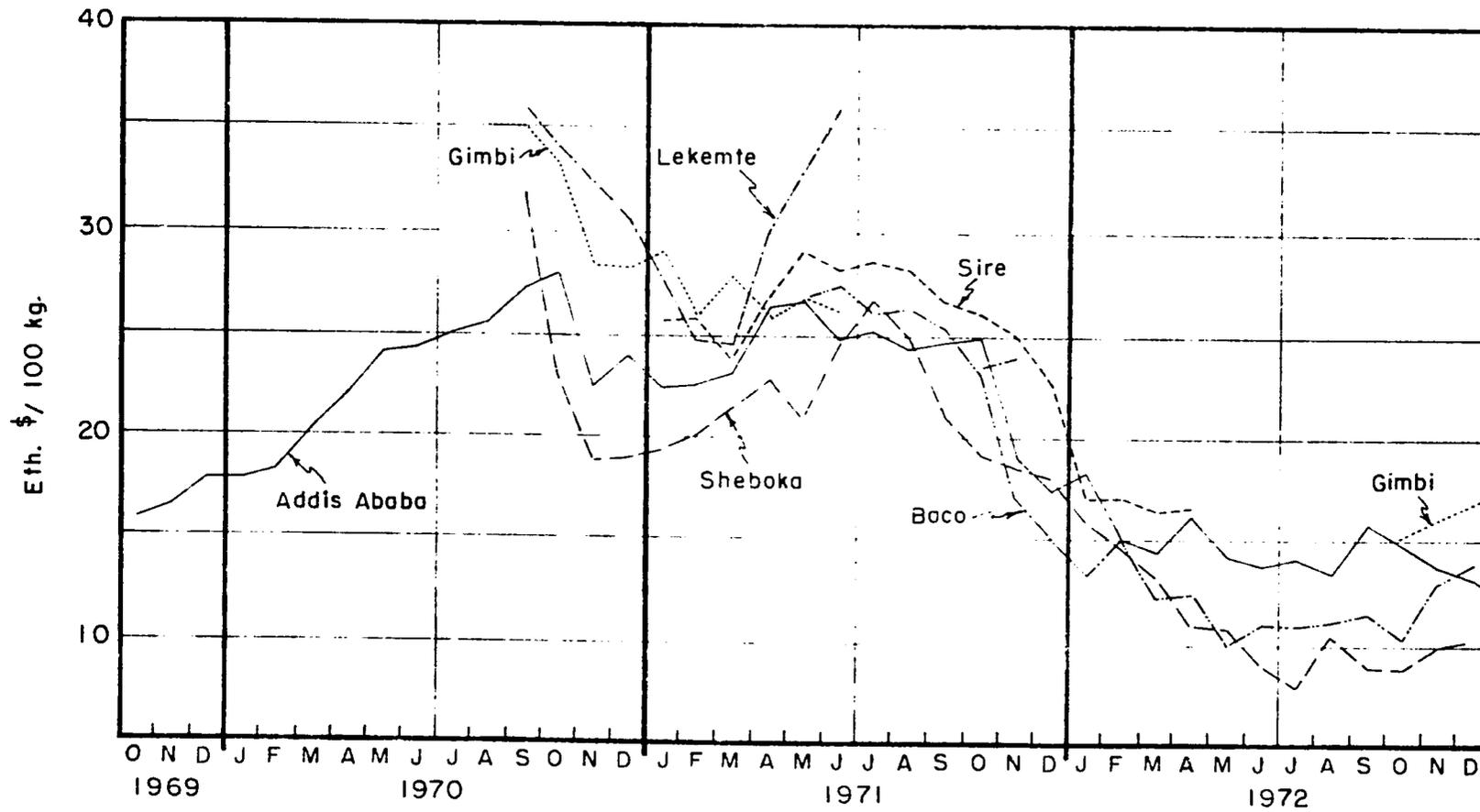
Source : App. A

Figure 9. Monthly Wholesale Prices of White Teff in Selected Ethiopian Markets, 1969-1972
(in Ethiopian Dollar per 100 kg)



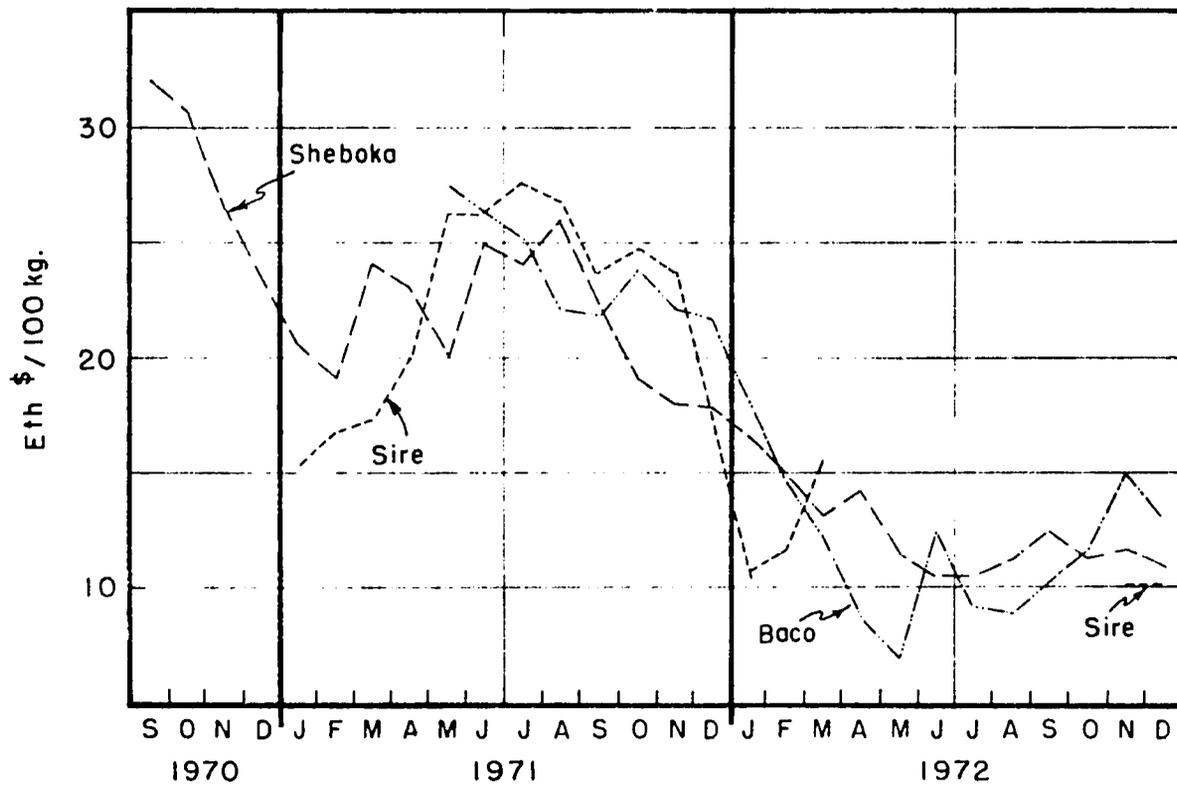
Source: App. A

Figure 10. Monthly Wholesale Prices of Barley in Selected Ethiopian Markets, 1969-1972
 (in Ethiopian Dollar per 100 kg)



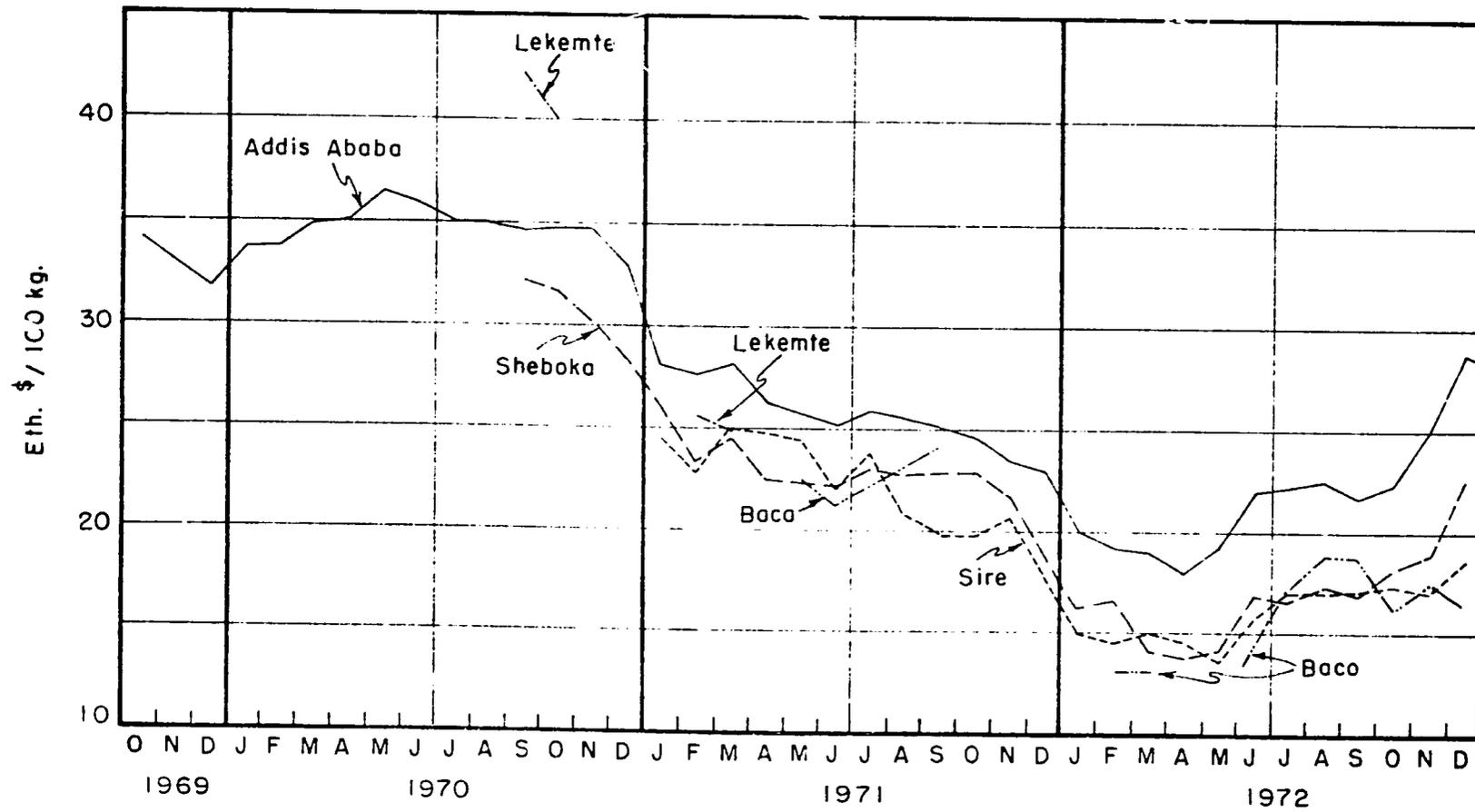
Source : App. A

Figure II. Monthly Wholesale Prices of Sorghum in Selected Ethiopian Markets, 1970-72 (in Ethiopian Dollar per 100 kg)



Source : App. A

Figure 12. Monthly Wholesale Prices of Noog in Selected Ethiopian Markets, 1969 - 1972
 (in Ethiopian Dollar per 100 kg)



Source: App. A

The prices of red pepper (Figure 13) fluctuate in Addis Ababa and in the Baco area with high absolute rates but due to the high value per unit the relative changes are similar to other agricultural commodities. Red pepper is usually marketed in the local measurement "fasula". One unit is officially 17 kg., but it ranges between 15 and 20 kg. In this survey, 17 kg. per unit was used. Price quotations on wholesale levels were not done in Gimbi and Lekemte. On these markets, red pepper was marketed in smaller quantities only on the retail sale level.

D. Short-run Irregular Price Movements

Wholesale prices in production areas often perform high short-run fluctuations between several weeks. For white maize, these movements are shown in Figure 14 for Baco. Price changes are explainable by the attitude of traders on a market. Between the two to three leading traders on a market collusion seemed to exist with respect to the setting of prices and all other less important traders followed their advice. The daily prices are constant from the beginning until the end of marketing with no consideration given to actual supplies or other monetary influences. The reaction to the supply occurs on the next day, usually over a weekly period. Farmers' responses to prices are also a week behind and only retailers are able to respond immediately to price stimulation. They therefore stabilize the price fluctuations. As the following scheme shows, a four week cycle exists. The fifth week is similar to the first.

Reaction of supply and demand on prices in local markets

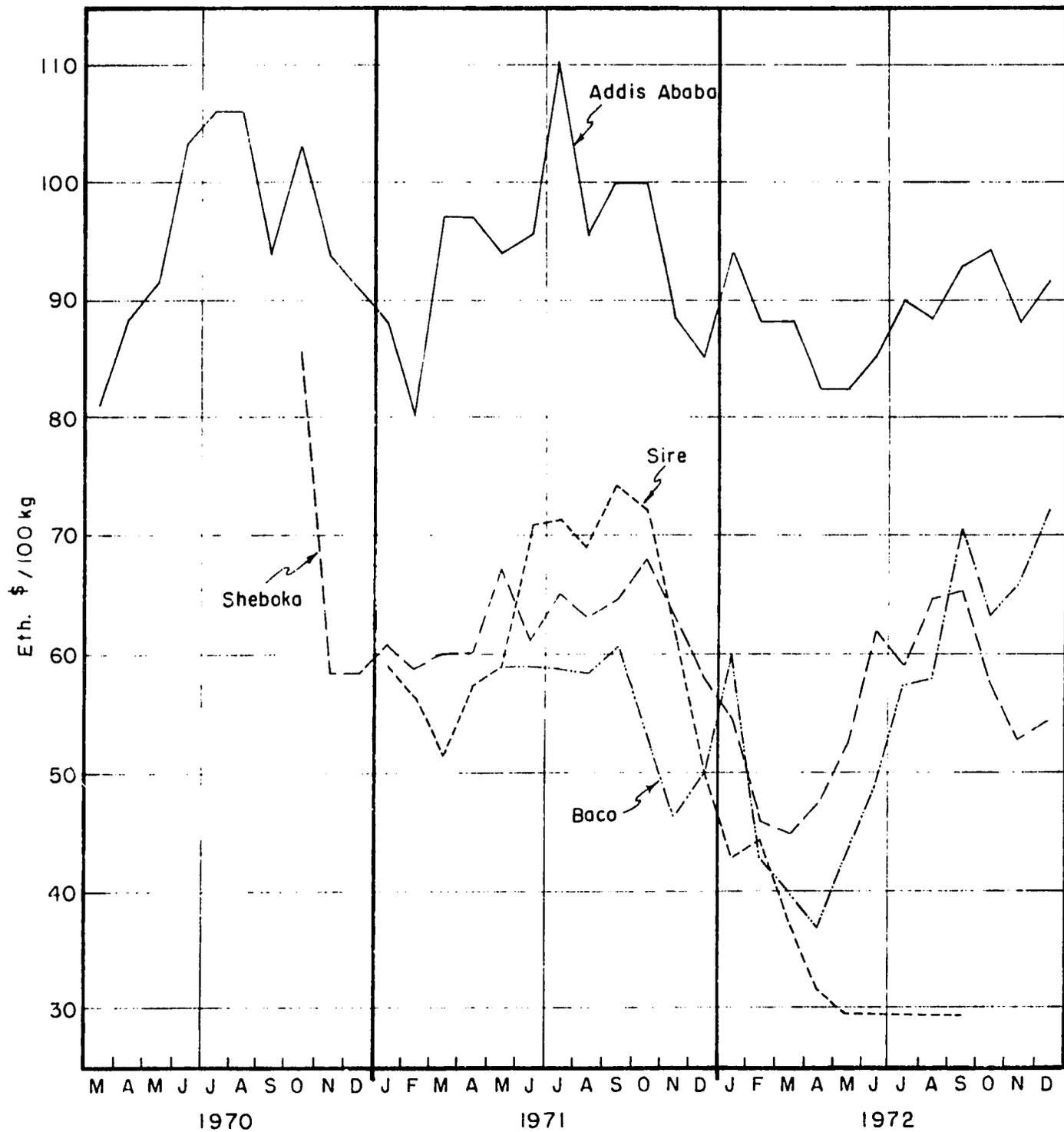
Market-day (weekly open market)	Wholesaler	Farmer	Retailer
1.	high prices	↘	large supply ← small demand
2.	low prices	↙	large supply ← large demand
3.	low prices	↘	small supply ← large demand
4.	high prices	↙	small supply ← small demand
5.	high prices	↘	large supply ← small demand

The retail prices in the local markets depend to a high degree on wholesale prices. But short run movements are not always synchronous. (Figure 14 and Chapter IV, 5).

E. Seasonality of Prices and Storage Costs

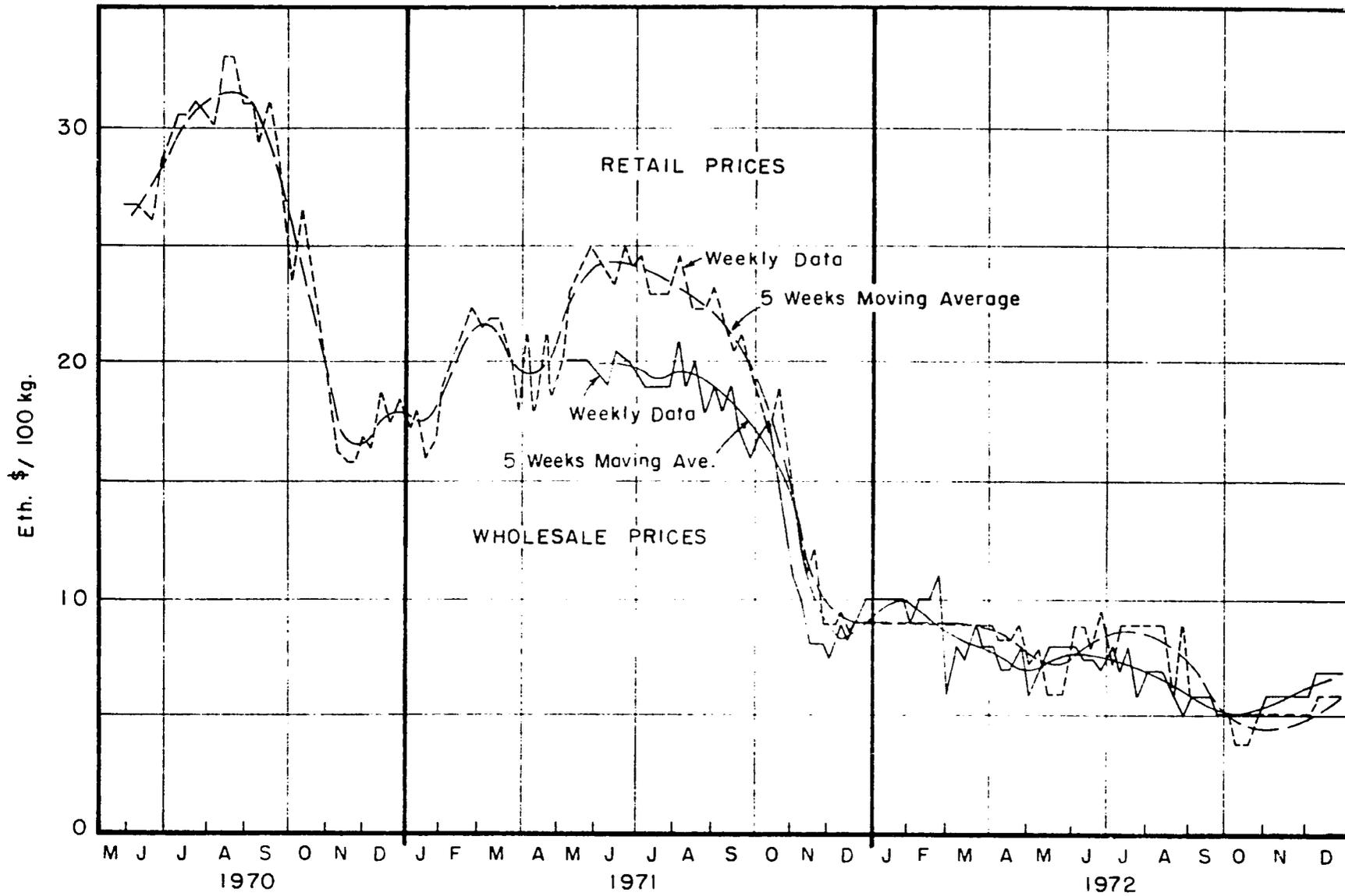
In a perfect market seasonal price increases reflect the storage costs. The profit of the traders is positive, but would tend to zero.

Figure 13. Monthly Wholesale Prices of Red Pepper in Selected Ethiopian Markets, 1970-72 (in Ethiopian Dollar per kg)



Source : App. A

Figure 14. Weekly Wholesale and Retail Prices of White Maize in Baco, 1970 - 1972
 (in Ethiopian Dollar per 100 kg)



Source : App. A

In Figures 15 and 16, the seasonal price movement is compared with storage costs for maize, wheat and white teff in Addis Ababa and is representative for the Baco region in Sheboka. The harvest for maize and wheat occurs normally in November/December. Prices are lowest in this period. The harvest time for teff also starts in November, but extends over a longer period with additional time for the grain to ripen afterwards. Therefore the time of the highest supply and the lowest prices is usually in January/February. For the following calculations, the monthly average prices in November/December on maize and wheat and the January/February price of teff were used. Based on these averages the computed storage costs (see Chapter III) are added for each month under the assumption that the storage period ends in October or December of the following year (10 months). By taking a variation of pure storage costs and losses of a 3 to 10 percent range on maize and wheat and of only 3 percent on teff into account, Figures 15 and 16 show the monthly increases.

The storage of maize was profitable in Addis Ababa in 1969/70. Under the assumption that maize was bought at an average November-December 1969 price and sold in August 1970, a gross margin of Eth. \$7.35 - 9.80 per quintal could be obtained. In 1970/71 the gross margin was positive at Eth. \$0.95 - 1.55 per 100 kg. maize, when it was bought at an average November-December 1970 price and sold at the highest prices in March 1971. A longer storage period decreased the margin. Storage of maize in Addis Ababa and Sheboka was not profitable in 1971/72 because wholesale prices fell steadily after harvest time 1971. Using the assumption of a storage period from November-December 1970 the calculated negative gross margin was Eth. \$8.20 - 10.60 per quintal in Addis Ababa and Eth. \$10.10 - 12.40 per kg. in Sheboka (see Figures 15 and 16). When maize was bought at the absolute lowest price and sold after a certain storage period, the losses were smaller than the above figures.

Wheat storage was profitable in 1969/70, but not in the two following years. By assuming that wheat was stored at average prices paid in November - December 1970 and sold after ten months, a negative gross margin of Eth. \$7.75 - 10.65 per quintal was calculated for the market in Addis Ababa, traders in Sheboka lost Eth. \$10.20 - 13.10 per quintal. The losses for a ten month storage period from November - December 1971 until October 1972 were Eth. \$3.50 - 7.40 per 100 kg. for Addis Ababa and Eth. \$9.05 - 11.95 per 100 kg. for Sheboka. Even by buying at the lowest prices and selling wheat at supposedly the most advantageous time, storage was not profitable for traders (Figures 15 and 16).

Storage of white teff was similar to maize and wheat, highly profitable in 1970 in Addis Ababa but in 1971 it was only profitable in Addis Ababa and Sheboka when the timing of buying and selling was right. In 1972 the storage of teff in Addis Ababa was not profitable, in Sheboka with good timing it was only slightly profitable. A comparison between prices on teff in Addis Ababa and the Baco area clearly shows the higher price level in Addis Ababa with a smaller price decrease in 1971/72.

Under the assumption of average storage costs and storage periods

Figure 15. Seasonal Price Movement and Storage Costs of Maize, Wheat and White Teff in Addis Ababa, 1970 - 72

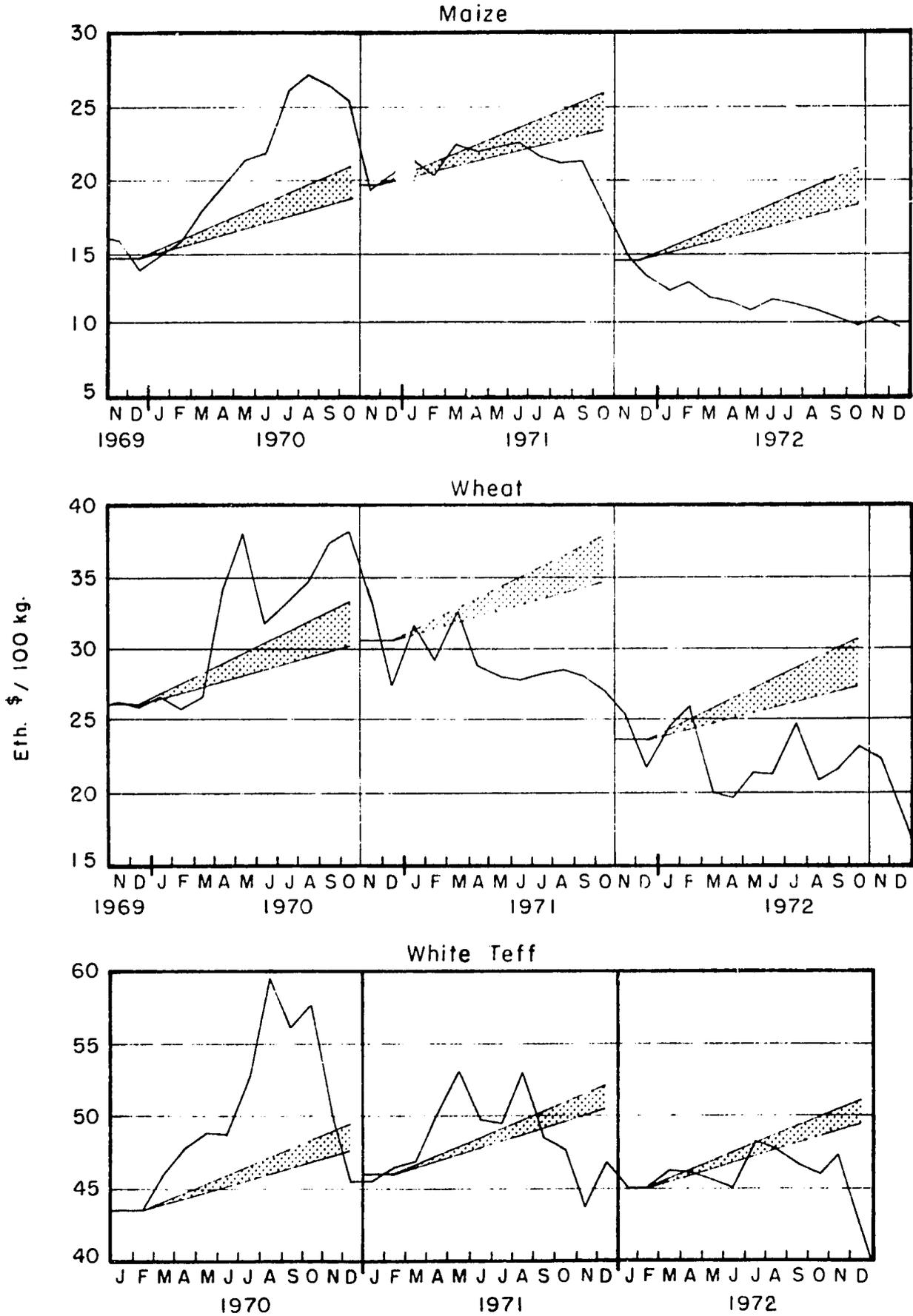
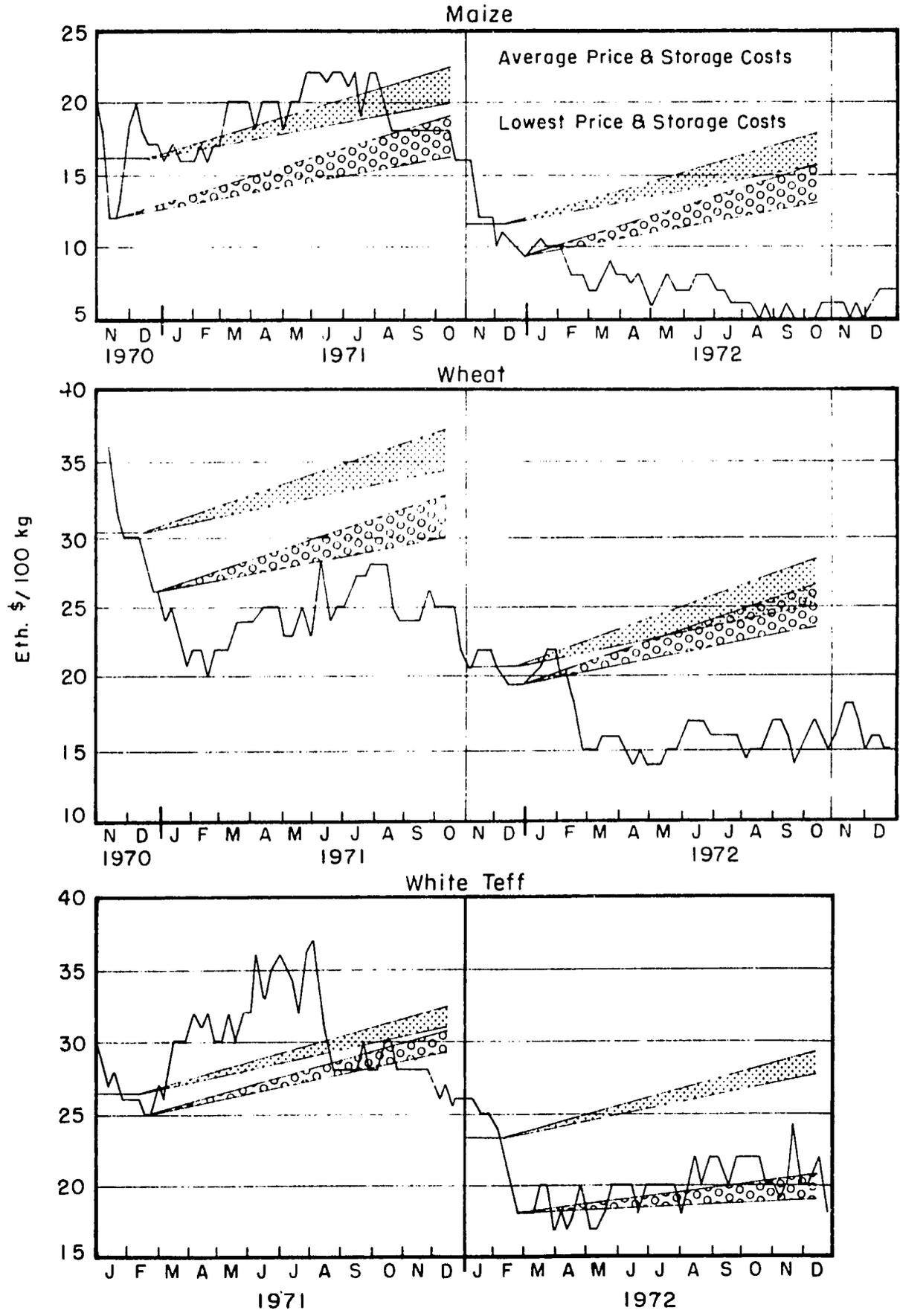


Figure 16. Seasonal Price Movement and Storage Costs of Maize, Wheat and White Teff in Sheboka, 1971- 72



of 6 and 10 months respectively, the following gross margins and gross rates of margin were calculated (see Table 9). As the table shows, the gross rate of margin was generally positive in 1969/70, partly in 1970/71, with a profit loss in 1971/72.

In summary, the storage of grains involves a high risk in Ethiopia, because of the uncertainty of price movements. In some years, exorbitant profits are possible, but in other years losses can also be very high. When a single trader successfully times purchases and sales, profits are higher than stated above, but the merchant system as a whole has to absorb the losses. It should be mentioned that wholesale prices on a local market do not represent buying prices of traders. The farmer's price can be up to 10 percent lower and therefore the profit of merchants higher (see Appendix A).

3. Regional Price Behavior

In the following chapters, prices of agricultural commodities will be compared between markets in the production area around Baco and in the consumer market in order to obtain spatial differences as well as the degree of dependence between markets.

A. Market Integration

To obtain performance of the mutual dependence of markets, the degree of the synchronous price movements between these markets can be calculated. A sufficient measure is the correlation coefficient "r". This measurement gives the degree of price dependence between two markets. On a high degree of integration between markets, the coefficients tend to 1. Because of transport costs between two markets, prices in one market may vary around these costs without having a shipment between them. The higher the shipping costs the higher the independent price movements can be and therefore the lower the correlation coefficient. A small correlation coefficient indicates a low market integration (G, p. 22).

Tables 10 to 13 show the correlation coefficients on maize, wheat, white teff and red pepper for synchronous price data between different markets.

The degree of market integration between markets on maize in the Baco area is unexpectedly high and ranges between $r = 0.93$ to $r = 0.97$ (Table 10). A high degree of integration also exists between markets in the Baco area and Addis Ababa and Gimbi. Between Baco/Addis Ababa and Baco/Gimbi a correlation coefficient $r = 0.99$ was obtained. These degrees are remarkable. The integration of the market in Lekemte to the system is relatively low. For the calculation weekly wholesale prices were taken. Monthly average prices were used only for Addis Ababa.

The market integration on wheat is significantly lower than on maize (see Table 11). Only the dependence of price movements between Addis Ababa and Gimbi and between Lekemte and Baco exceeds the $r = 0.90$ level. The coefficients between Lekemte and the other markets are generally higher on wheat than on maize (compare Tables 10 and 11).

TABLE 9. ESTIMATED GROSS MARGINS FROM STORAGE OF MAIZE,
WHEAT AND TEFF IN ADDIS ABABA AND SHEBOKA,
1969/70 - 1971/72

Commo- dity	Year	Storage Period (months)	Addis Ababa ¹		Sheboka ²	
			Gross Margin ³ Eth. \$ per 100kg	Gross rate ⁴ of Margin ⁴ (%)	Gross ³ Margin ³ Eth. \$ per 100kg	Gross Rate of Margin ⁴ (%)
Maize	1969/70	6	+4.18	+23.79	n.a.	n.a.
		10	+6.15	+23.79	n.a.	n.a.
	1970/71	6	+0.17	+ 0.76	+2.54	+13.12
		10	-6.04	-24.36	-3.60	-16.67
	1971/72	6	-5.65	-33.20	-7.21	-48.20
		10	-9.03	-47.78	-11.70	-68.02
Wheat	1969/70	6	+2.56	+ 8.77	n.a.	n.a.
		10	+7.10	+22.79	n.a.	n.a.
	1970/71	6	-5.66	-16.90	-9.09	-26.66
		10	-8.45	-23.84	-12.40	-33.83
	1971/72	6	-5.24	-19.78	- 8.14	-32.97
		10	-5.20	-18.28	-11.25	-41.28
White Teff	1970	6	+2.27	+ 4.88	n.a.	n.a.
		10	+8.70	+17.83	n.a.	n.a.
	1971	6	+0.57	+ 1.16	+2.42	+8.18
		10	-3.55	- 6.92	-5.50	-17.35
	1972	6	-3.18	- 6.60	-5.98	-22.67
		10	-4.30	- 8.55	-8.25	-28.95

n.a. not available

¹Average storage costs of Eth. \$0.43 per quintal and month and 3 percent losses per annum.

²Average storage costs of Eth. \$0.43 per quintal and month and 10 percent losses per annum.

³Purchasing in November/December on maize and wheat; in January/February on teff. Selling 6 and 10 months later. Prices are based on two months or monthly average prices. Gross margin = Selling price in off season minus (Average purchasing price during harvest time + storage costs and Losses).

⁴Gross margin as percentage on investment (purchasing price plus storage costs and losses).

Sources: Chapter III and Appendix A.

TABLE 10. CORRELATION COEFFICIENTS "r" FOR SYNCHRONOUS WEEKLY WHOLESALE PRICES OF WHITE MAIZE IN SELECTED MARKETS IN ETHIOPIA, 1970-1972¹

Market	Addis Ababa	Sheboka	Baco	Sire	Lekemte	Gimbi
Addis Ababa ²	1.00	0.94	0.99	0.95	0.55*	0.84
Sheboka		1.00	0.97	0.96	0.38	0.72
Baco			1.00	0.93	0.21*	0.99
Sire				1.00	0.07*	0.90
Lekemte					1.00	0.82
Gimbi						1.00

¹Different periods of time.

²Monthly average prices.

* No significance. All other data significant at 1 percent level.

TABLE 11. CORRELATION COEFFICIENTS FOR SYNCHRONOUS WEEKLY WHOLESALE PRICES OF WHEAT BETWEEN SELECTED ETHIOPIAN MARKETS, 1970-1972¹

Market	Addis Ababa	Sheboka	Baco	Lekemte	Gimbi
Addis Ababa ²	1.00	0.88	0.83	0.66 ³	0.92
Sheboka		1.00	0.84	0.76	0.89
Baco			1.00	0.94	0.35
Lekemte				1.00	0.75
Gimbi					1.00

¹Different periods of time.

²Monthly average prices

³Significant at 5% level. All other data significant at 1% level.

The degree of dependence of price movements on white teff is similar to wheat. The correlation coefficient of $r = 0.94$ between Baco and Leketē is by far the highest (see Table 12).

The low degree of synchronous price movements on wheat and white teff is partly explainable because of either the nonexistence or rough grading of these products. Some differences are recognized in the markets, but they differ between localities. Variations in grades exist related to color, estimated impurities and specific gravity, but the graduation is rather subjective. Therefore, the lack of standards for grading these cereals may explain part of the price differentials.

Due to the short run fluctuation of prices on red pepper with a high deflection, the synchronous price movements between markets occur generally on a low degree of dependence (see Table 13).

To summarize, the degree of market integration explained in the correlation coefficient of synchronous price data either between markets within the Baco area or to Addis Ababa, Leketē and Simi, is very low, except on maize. Due to the lack of competition between traders on local markets, prices vary somewhat on each market but the ceiling price level is limited by prices paid in Addis Ababa with unlimited variations downward. Therefore, actual prices in local markets are far below the equilibrium price obtainable with competitive conditions.

B. Regional Price Differences and Shipping Costs

The source of price data, their weaknesses and confidence are discussed in detail in Appendix A. Therefore, only brief mention will be made in this section.

The so-called wholesale prices are obtained by merchants selling their products to other large traders, retailers and in a few cases, to the consumer. According to the information from wholesalers and farmers, farmers obtain the same price for their sold commodities. There is no trade margin for merchants. For produce like wheat, barley and some teff, channeled through markets in the Baco area to consumer centers, these statements might be true. Only by accounting spatial and temporary price differences can a profit be obtained.

For agricultural commodities sold by farmers to wholesalers, the farmer's price at the market is up to 10 percent lower than the wholesale price. Farmers normally use a broad variety of measurements, generally in volumes. Traders have balances or only dummy balances and therefore it is easy to manipulate the weight with a resultant up to 10 percent underweight, according to a survey.

As mentioned earlier, there does not exist a competitive bidding system among wholesalers between markets in the Baco region. To get a performance of the magnitude of price differences between markets in the Baco region, parity prices between Baco and Sheboka, were computed. By a fictitious shipping from one market to another, shipping costs were assumed to be in the range of Eth. \$0.50 per 100 kg. If higher price differentials were to exist between two markets, then a flow of goods

TABLE 12. CORRELATION COEFFICIENTS FOR SYNCHRONOUS WEEKLY WHOLESALE PRICES OF WHITE TEFF BETWEEN SELECTED ETHIOPIAN MARKETS, 1970-1972¹

Market	Addis Ababa	Sheboka	Baco	Sire	Lekemte	Gimbi
Addis Ababa ²	1.00	0.73	0.68	0.54	0.71 ³	0.69
Sheboka		1.00	0.89	0.87	0.68	0.84
Baco			1.00	0.85	0.94	0.75
Sire				1.00	0.64	0.77
Lekemte					1.00	0.49
Gimbi						1.00

¹Different lengths of periods.

²Monthly average prices.

³Significant at 5 percent level. All other data significant at percent level.

TABLE 13. CORRELATION COEFFICIENTS FOR SYNCHRONOUS WEEKLY WHOLESALE PRICES OF RED PEPPER BETWEEN SELECTED MARKETS IN ETHIOPIA, 1970-1972¹

Market	Addis Ababa	Sheboka	Baco	Sire
Addis Ababa ²	1.00	0.62	0.61	0.68
Sheboka		1.00	0.38	0.48
Baco			1.00	0.30
Sire				1.00

¹Different lengths of periods.

²Monthly average prices.

All data significant at 1 percent level.

would be possible. Forty-one percent (35 cases) of the weekly price quotations on maize in Baco and Sheboka are within a range of positive/negative Eth. \$0.50 per quintal. In 27 percent of the quotations, the price in Sheboka is more than Eth. \$0.50 per quintal lower (negative) and in 32 percent of the cases the price is higher (positive) than in Baco. The percentage distribution of higher price differences than Eth. \$0.50 per quintal among other markets and on other agricultural commodities tends to be much higher than on maize. On white teff for example, only 12 percent of the differences on price quotations are between Baco and Sheboka within a range of Eth. \$± 0.50 per 100 kg., which are lower than shipping costs between these markets (see Table 14). The frequency distribution on Table 14 correlates heavily with the degree of market integration in Tables 10 to 13, which means that a high correlation coefficient corresponds with a high centralization of the frequency distribution and vice versa.

Taking shipping costs between markets in the Baco area, Addis Ababa and Gimbi under consideration, parity prices on terminal markets were computed in order to obtain information about profitability of shipments.

The following equation was developed for computing the difference between the actual and parity prices in a terminal market, explained as a percentage deviation of the price of the assembling market:

$$(I) \quad PP_{ij} = \frac{P_j - (P_i + T_{ij})}{P_i} \cdot 100,$$

where

PP_{ij} = Deviation of the actual price in market j to the parity price in market j (price in market i plus shipping costs from market i to market j), explained as percent of the price of market i .

P_i = Wholesale price in market i (Assembler market) for 100 kg.

P_j = Wholesale price in market j (Terminal market) for 100 kg.

T_{ij} = Shipping costs for moving 100 kg. commodity from market i to market j .

A positive deviation means that by dispatching goods from market i to j profit in percentages of the wholesale price of the assembler market can be obtained. A negative deviation shows that the price differences between two markets does not cover the shipping costs. Figure 17 and Table 15 show the result for selected commodities between different market points.

The wholesale prices on maize in Addis Ababa in November 1970 and in January and February 1971 were higher than the parity price of a dispatch from Sheboka (Figure 17 and Table 15). A shipment from Sheboka as the representative market of the Baco area to Addis Ababa was profitable in these months. During the rest of 1971 the parity prices were higher than the actual wholesale price in Addis Ababa. Beginning in

TABLE 14. DISTRIBUTION OF PRICE DIFFERENCES ON MAIZE, WHEAT, AND WHITE TEFF BETWEEN MARKETS IN THE BACO AREA, ETHIOPIA, 1970-1972

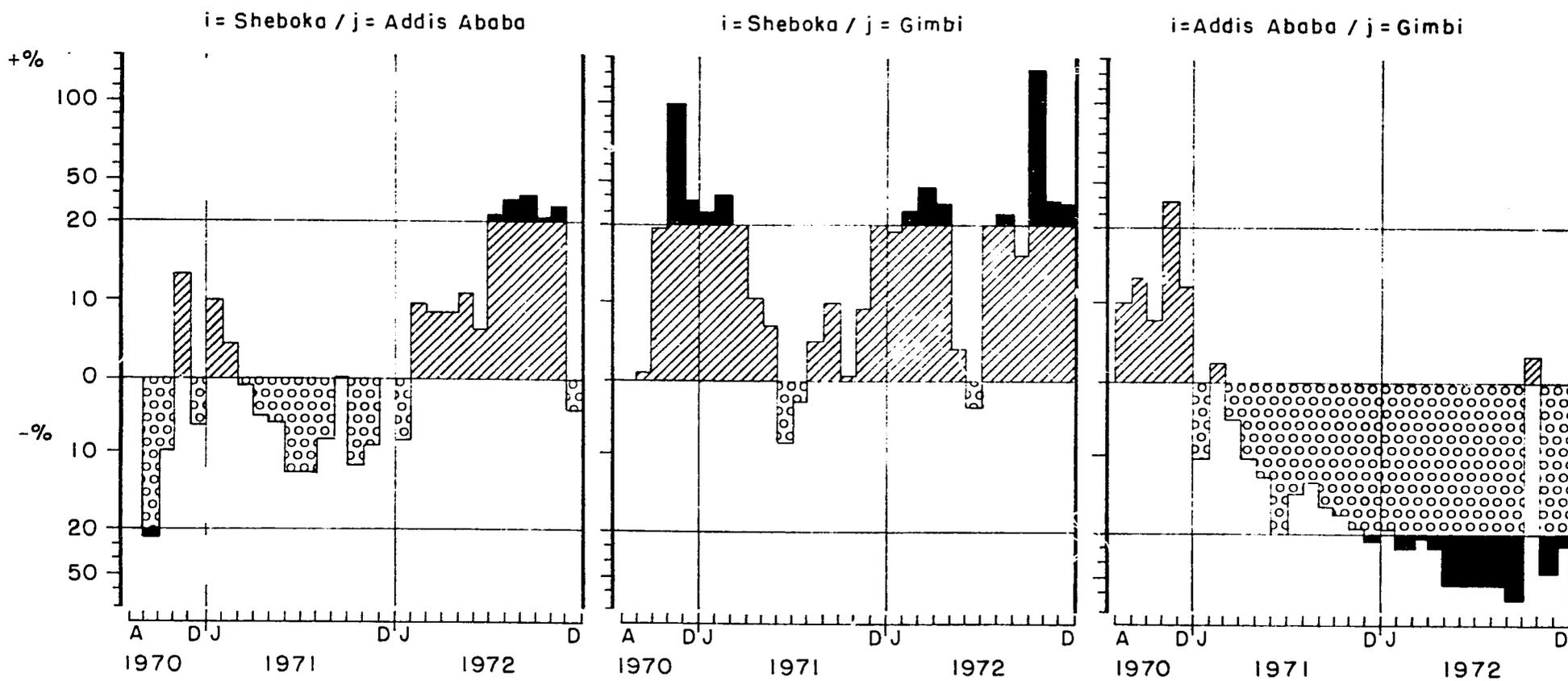
		No. of Weeks with Price Differences of											Total No. Of Weeks	
		Negative ¹					Positive ²							
		> 3	2-3	1-2	0.5-	0.1	0.1-	0.5-	1-2	2-3	> 3			Eth. \$ per 100kg between Two Markets
					1.0	0.5	No	0.5	1.0					
Maize	Baco/ Sheboka	0	1	5	17	0	29	6	11	9	6	2	86	
	Baco/ Sire	0	0	2	4	1	12	7	9	21	13	17	86	
	Sheboka/ Sire	1	0	1	8	4	12	1	18	29	18	12	104	
Wheat	Baco/ Sheboka	10	7	8	14	1	11	1	10	11	9	4	86	
White Teff	Baco/ Sheboka	6	4	4	10	2	7	1	11	10	16	15	86	
	Baco/ Sire	16	6	3	7	2	11	1	6	8	7	19	86	
	Sheboka/ Sire	18	5	20	6	0	17	2	1	16	5	14	104	

¹Negative price differences: the price in the second mentioned market is lower than in the first market.

²Positive price differences: the price in the second mentioned market is higher than in the first market.

Source: Appendix A.

Figure 17. Percent Deviations* from the Parity Price on White Maize between three Markets in Ethiopia, 1970 - 1972



* For explanation see text

TABLE 15.

PER CENT DEVIATIONS FROM THE PARITY PRICE¹ ON WHITE MAIZE AND WHEAT
BETWEEN DIFFERENT MARKETS² IN ETHIOPIA, 1970-1972

Year/ Month	White Maize						Wheat				
	i = Sheboka		i = Baco		i = Addis	i = Sheboka		i = Baco		i = Addis	
	j = Addis Ababa	j = Gimbi	j = Addis Ababa	j = Gimbi	Ababa j = Gimbi	j = Addis Ababa	j = Gimbi	j = Addis Ababa	j = Gimbi	Ababa j = Gimbi	
<u>1970</u>	Aug.	n.a.	n.a.	-16.1	+12.0	+10.3	-13.5	n.a.	-21.1	+19.7	+60.7
	Sept.	-26.9	+ 0.8	-11.3	+22.3	+13.6	+35.0	+104.8	-14.2	+21.7	+24.4
	Oct.	- 9.7	+19.6	+ 5.7	+40.0	+ 7.9	+ 9.7	+ 47.0	+ 6.5	+42.7	+17.5
	Nov.	+13.2	+100.4	+ 6.4	+88.3	+36.6	- 5.9	+ 43.2	- 2.5	+48.3	+32.0
	Dec.	- 6.4	+36.4	+ 7.0	+55.9	+12.3	+13.5	+ 55.5	-15.4	+55.7	+51.4
<u>1971</u>	Jan.	+ 9.7	+28.5	+24.4	+45.7	-10.3	+23.0	+ 85.7	+10.0	+66.1	+29.4
	Feb.	+ 4.4	+39.0	-19.2	+19.2	+ 2.3	+20.2	+101.4	- 6.6	+56.5	+42.1
	March	- 0.9	+20.4	+ 3.2	+25.3	- 5.0	+26.5	+ 40.3	+ 6.6	+18.2	- 6.3
	April	- 5.0	+10.5	+ 4.8	+22.0	-10.2	+ 2.9	+ 20.9	-18.5	- 4.2	- 2.7
	May	- 5.3	+ 7.2	- 5.3	+22.2	-12.5	+ 4.6	+ 57.4	-18.5	+22.5	+26.0
	June	-12.1	- 8.0	- 2.6	+ 1.5	-19.8	- 1.3	+ 57.0	-17.7	+30.8	+33.5
	July	-12.2	- 2.4	- 4.3	+ 6.5	-14.7	- 7.0	+ 48.9	- 8.7	+46.1	+34.8
	Aug.	- 7.6	+ 5.1	- 3.8	+ 3.8	-13.0	- 2.8	+ 63.8	- 5.1	+60.0	+42.7
	Sept.	+ 0.6	+10.1	- 6.0	+ 8.9	-16.6	+ 1.7	+ 65.7	- 8.0	+57.7	+37.6
	Oct.	-11.7	+ 0.7	- 8.4	+ 4.5	-17.3	- 1.6	+ 17.0	- 3.6	+14.6	- 2.7
	Nov.	- 8.9	+ 9.2	+12.8	+35.2	-19.3	+ 2.0	+ 46.0	- 2.0	+40.3	+17.1
	Dec.	+ 0.2	+19.8	+23.1	+47.2	-24.3	- 6.5	+ 59.5	- 2.6	+66.2	+36.3
<u>1972</u>	Jan.	- 8.0	+19.2	- 7.5	+20.7	-19.4	+ 1.0	+ 35.1	+18.4	+58.3	+ 8.2
	Feb.	+ 9.7	+28.8	- 4.0	+12.7	-23.1	+25.2	+ 11.1	+42.8	+26.7	-30.1
	March	+ 8.7	+45.6	+10.1	+47.5	-20.4	+ 8.0	+ 29.9	+25.7	+51.3	- 9.2
	April	+ 8.7	+33.0	+10.5	+35.3	-29.6	+14.5	+ 47.9	+23.0	+58.9	- 2.0
	May	+11.0	+ 3.9	+ 5.0	- 1.8	-52.7	- 2.8	+ 23.2	+15.6	+54.6	- 1.7
	June	+ 6.1	- 3.2	+ 8.3	0.0	-52.5	+ 8.1	+ 79.5	+ 8.1	+79.5	+31.6
	July	+24.2	+22.3	+ 8.6	+ 2.5	-51.9	+35.0	+ 98.4	+39.4	+104.8	+19.8
	Aug.	+35.7	+28.2	+18.8	+12.2	-52.7	+13.6	+104.8	+ 8.6	+96.0	+42.9
	Sept.	+38.5	+16.2	+26.8	+ 6.1	-61.7	+18.4	+ 67.9	+20.3	+70.1	+11.3
	Oct.	+22.2	+123.6	+34.4	+146.0	+ 3.3	+25.6	+ 76.9	+43.6	+102.1	+12.7
	Nov.	+29.1	+36.6	+20.5	+29.2	-46.5	+15.2	+ 59.2	+13.3	+65.1	+ 9.6
	Dec.	- 4.2	+34.1	- 4.2	+34.1	-27.8	- 2.6	+ 77.7	-13.7	+60.3	+39.5

¹For explanation, see text.

²Wholesale prices in Gimbi and Baco partly derived from retail sale prices.

February 1972, wholesale prices in Addis Ababa have risen relatively higher than in Sheboka, with profits resulting from shipment of maize.

Shipping maize from other markets in the Baco area to Addis Ababa during that time has been almost equally profitable, with some exceptions. For example, the actual price in Addis Ababa was 39 percent higher than the parity price based on Sheboka prices in September 1972, while in October 1972 the deviation in the terminal market was 34 percent based on Baco prices. Computation of parity prices were based only on monthly averages. Due to the high fluctuations of weekly wholesale prices in assembler markets, astute traders could capitalize on their knowledge to make higher profits.

A comparison of data in Figures 15, 16 and 17 shows clearly that in years when storage of maize was profitable, spatial price differences were too low to cover transportation costs (1971). In 1972 storage of maize was not profitable but shipment from the Baco area to Addis Ababa was highly profitable. Especially in surplus years, prices decline to a greater extent in the production area than in the consumer markets, due to the stabilization effect of shipping costs to the terminal markets and the attitude of the merchants in the local markets.

Higher quantities of maize were sent to Gimbi from the Baco area although the quantity itself is unknown. This was a profitable venture during most of 1970 to 1972, often with exorbitant profits. For example, traders could earn more than 100 percent over local prices by dispatching maize from Sheboka to Gimbi in November 1970 and October 1972; almost 150 percent profit could be made in October 1972 (see Figure 17 and Table 15). Due to the different price movements in Addis Ababa and Gimbi, shipment from Addis Ababa did not cover costs, except in 1970. The increase in production of maize in the Baco region made it possible to provide Gimbi from this area.

The dispatch of wheat through channels in the Baco area to Addis Ababa and Gimbi was profitable in either direction when based on local prices during most of 1970 to 1972. Because most of the supply in Gimbi is channeled through Addis Ababa, dispatches from the nearer Baco area were made with excessive profits (Figure 17 and Table 15).

Summarizing spatial price differences and shipping costs; prices in assembler markets were usually low enabling traders to often obtain a high profit due to the lack of competition. Traders are able to press prices down because short run supply on the farmer's level is inelastic after harvest time.

4. Intra and Inter Commodity Price Differentials

The demand for different varieties of commodities can be partly or totally substituted for each other. Therefore, there exists a certain degree of relationship between prices of food products.

Intra-Commodity Price Differentials

A direct price dependence exists between different varieties of one

commodity because they are often completely substitutable. Consumers often prefer a variety, distinguished by color or another characteristic, which will bring a higher price in comparison to the other varieties. The gradation of agricultural commodities in Ethiopia is rather crude, color being the most common distinction. The available price series only distinguishes different maize and teff although other cereals, such as wheat, barley and sorghum are graded by color.

Teff

Differentiation is commonly made between white, mixed (sergenia), brown and red teff. One or two colors dominate in each region. The consumer preferences and the highest prices correspond to the above order. White teff gives a light "injera" and is always the most expensive. As is shown in Figure 18, the price relationship between colored and white teff differs between markets. The ratio depends upon the purchasing power of the consumer, degree of urbanization, yearly and seasonal supply, and in the short run is highly influenced by the existence of holidays.

Although only the prices of brown teff were available in Addis Ababa (brown teff has a higher price than red teff) it can clearly be seen in Figure 18 that the price relationship in the capital is wider than in the rural areas around Baco. The main reason for this phenomena is the higher purchasing power in Addis Ababa. Therefore demand for the higher priced white teff is relatively higher than in the rural areas throughout the year. The price of white teff is so high that only a certain group are able to buy it regardless of the price. Poorer people purchase white teff only on holidays and for ceremonies, like weddings.

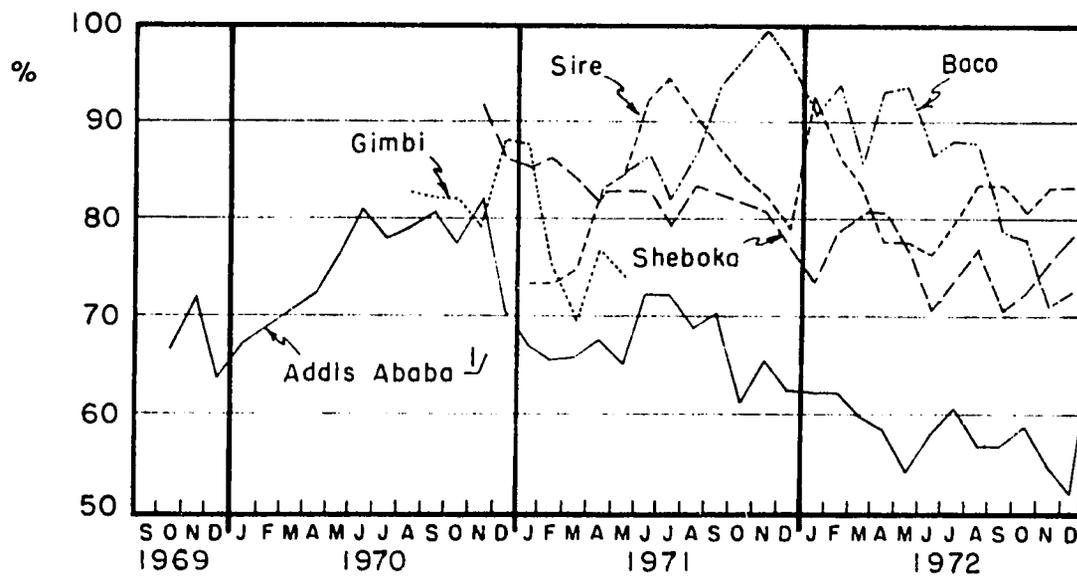
In the Baco area the prices of the different varieties are more closely related. But the influence of the yield and therefore supply within the area, and seasonal differences in supply and demand on the price relationship is higher than in Addis Ababa, with colored teff affected more than white teff. An average, following yearly price relationship in 1970 to 1972, was calculated:

Year	Addis Ababa (brown teff = 100)	Prices of White Teff		Sire
		Sheboka	Baco (red teff = 100)	
1970	75.7	----	----	----
1971	67.2	82.4	90.5*	82.7
1972	57.8	75.7	84.9	82.4

* 8 months

Price differences between white and brown teff in Addis Ababa have spread in years of relatively high supply, like 1971 and 1972 in comparison to 1970. That means by increasing supply, white teff prices did

Figure 18. Monthly Wholesale Price Relationship between Red and White Teff in Ethiopia, 1969-1972 (White Teff = 100)



— Brown teff

Source: App. A

not decrease as much as prices of brown teff. With gradual differences, prices in the Baco area behaved the same way but the decrease occurred in smaller steps. The price differences between these different varieties decreased as a new harvest approached and increased after harvest time in Addis Ababa as well as in the Baco region. In periods of increasing scarcity and therefore high price levels (depending also on annual and seasonal supply) price differences decrease and vice versa (for other years see 27, p. 120). This attitude could be seen on all markets, although the changes did not occur simultaneously (Figure 18).

The retail prices of white and red teff have a closer relationship than the wholesale prices. The annual and seasonal changes in the relationship are also perceptible, but the fluctuation of the ratio appears lower.

Maize

The maize cultivated by peasant farmers is a mixture coming from different provenances. In a particular ecological region, one or a few local varieties are now grown. These local varieties can be distinguished in most cases by minor differences, the most common being the color or the prevailing color because most of the varieties are a mixture of different colors. In the Baco area the dominant color is yellow.

The white colored maize is usually a hybrid maize, bred in the highlands of Kenya. The peasant farmers in the Baco area are familiar with the hybrid maize which is distributed through the Baco Research Station.

The consumer in the rural areas around Baco prefers yellow to white maize. Because local varieties have smaller grains and a higher volume weight than hybrid maize, the yellow maize has ostensibly a higher price because maize is marketed at the retail level only by volume. But when measured in weight, prices of yellow (mixed) and white maize are very similar with some exceptions. Price quotations in Addis Ababa do not distinguish between yellow and white maize.

As the following figures show, the wholesale and retail prices of yellow maize in Baco and Sheboka were quoted only slightly lower than those of white maize in an average twenty to twenty-seven month period. But in Gimbi the price of yellow maize was more than 3 percent higher on the wholesale stage and about 11 percent on the retail level than the price of white maize. In Lekemte only minor differences could be observed.

Price of Yellow Maize (White Maize = 100)

Market	Period	Wholesale Prices		Retail Prices	
		Average	Range	Average	Range
Baco	5/71 - 12/72	99.98	96.2-105.2	98.0	93.5-102.1
Sheboka	10/70 - 12/72	99.4	93.3-103.6	96.6	89.1-101.8
Gimbi	8/70 - 12/72 ¹	103.1	97.5-116.1	111.1	94.5-169.5
Lekemte	10/70 - 12/72 ¹	100.2	99.6-100.8	98.3	94.4-100.7

¹Different length of periods for wholesale and retail prices.

As can be clearly seen from the above, the differences and the range are larger at the retail level.

The price of white maize decreases more than yellow maize in Gimbi during and after harvest time in November/December of each year. Toward harvest time when scarcities exist and prices are high, differences in price tend to decrease, but price differences between varieties of maize can be partly accidental because of short-run high fluctuations.

Inter-Commodity Place Relationship

To what degree several crops can substitute for each other in a given society depends on their relative prices and consumer tastes and preferences.

In the Baco area, like many other regions in Ethiopia, teff, maize and sorghum can be used for preparing a flatcake. These cereals may be used solely or mixed in different proportions, but of course each of the various mixtures influence the taste. The most preferred flatcake is made from teff. Wheat, on the other hand, is used for baking bread. Bread is increasing most rapidly in urban areas. Barley, mainly, but other grains too, is used for preparing a kind of beer, "talla".

As Table 16 shows for Baco, synchronous weekly wholesale prices of white maize/barley and wheat/barley had a high ($r \geq 0.95$) degree of parallel fluctuation and of white maize/wheat, white teff/wheat and white teff/barley a moderate ($r = 0.90 - 0.95$) degree of parallel fluctuations. Similar analyses on different markets in Ethiopia, done by the Stanford Research Institute (27, p. 116), resulted in a lower degree of price inter-relationship between comparable commodities. The highest correlation with $r = 0.85$ was obtained by relating prices of teff and barley in Dese in 1957-1967 (monthly data).

Inter-commodity price relations can be also expressed by relating relative prices, e.g., prices of calories, as is shown in Table 17 for Baco and Addis Ababa. The cheapest calories can be obtained by buying maize, the most expensive with white teff. These relative differences clearly indicate consumer preferences between commodities and demand regions.

Due to the extremely high price of white teff in Addis Ababa, differences were greater there than in Baco. Generally, the price of white teff increased in the last few years more than the price of other cereals (27, p. 117), but with a relatively higher rise in the consumer center of Addis Ababa than in the production area around Baco.

5. Retail Prices of Agricultural Products

As was mentioned earlier, a large portion of the marketed surplus remains in the production area and is used for providing its market dependent population as well as farmers with food. The retailers sell these commodities to the consumer on open markets (see Chapter III). Although retailers are able to react immediately to price changes, optimal response is often restricted by their lack of capital. On the other

TABLE 16. CORRELATION COEFFICIENTS FOR SYNCHRONOUS WEEKLY WHOLESALE
PRICES OF CEREALS IN BACO, 1971-1972

Commodity	White Teff	Wheat	Barley	Sorghum
White Maize	0.88	0.94	0.96	0.81
White Teff	1.00	0.93	0.92	0.87
Wheat		1.00	0.95	0.69
Barley			1.00	0.86
Sorghum				1.00

All correlation coefficients are significant at 1 percent level.

TABLE 17. RELATIVE WHOLESALE PRICES OF CEREALS IN BACO AND ADDIS ABABA,
1971-1972

	Ethiopian Cents per 1.000 Calories ¹				
	White Teff	White Maize	Wheat	Barley	Sorghum
Baco 1971 (8 months)	8.51	4.64	7.80	7.05	6.34
1972	5.35	2.04	4.70	3.65	3.54
Addis Ababa 1971	13.71	5.63	8.40	7.07	.
1972	12.96	3.11	6.59	4.46	.
	Relative Prices (White Teff = 100)				
Baco 1971 (8 months)	100	55	92	83	82
1972	100	38	88	68	66
Addis Ababa 1971	100	41	61	52	.
1972	100	24	51	34	.

¹It is assumed that teff contains 3530 calories per 1 kg.; maize contains 3560; sorghum contains 3430; wheat contains 3340; and barley contains 3320 calories per 1 kg.

Source: Appendix A and data, collected by the CBE.

hand, retailers are able to take advantage of price differences between markets in the Baco area because they change market places every day. Due to the high number of retailers at a market, each trader can sell only limited quantities which automatically limits profits.

To obtain the degree of synchronous movements of wholesalers and retail prices, correlation coefficients on pairs of weekly prices in Baco were calculated. Series of retail and wholesale prices on white maize in Baco correlate to a high degree (correlation coefficient $r = 0.98$) (Table 18). Taking a five-week moving average price series rather than actual price series, which eliminates short run irregular price fluctuations, a correlation coefficient of $r = 0.99$ (significant at 1 percent level) was computed. The correlation coefficients of synchronous price movements on other crops in Baco are lower than on maize (Table 18).

Also retail prices between markets within the Baco area are moderately related. For example, retail prices for white maize in Baco and Sheboka correlated with a coefficient of $r = 0.90$ (significant at 1 percent level), but wholesale prices between the two markets for white maize were related with a higher correlation coefficient of $r = 0.97$ (Table 10).

But the more important question in the relationship of retail and wholesale prices in a market is the absolute and relative difference between both series, which gives the market margin for retailers. Definitive conclusions about the earnings of retailers cannot be obtained, because no figures of marketed quantities and costs are available. But absolute and relative differences between retail and wholesale prices give at least an idea about the effectiveness of the market system. The following pairs of retail and wholesale prices are related in order to obtain the gross margin and the gross rate of margin on the retail stage. The figures probably give only the lower level of gross margins because it can be assumed that larger quantities were bought at low prices than would have been the case in times of high prices.

The figures in Table 19 give a performance of the average gross margins of retailers for various products in Baco in two periods. The gross rate of margin ranges between -2.9 percent for white teff in the period of May to October 1971 and +49.1 percent for sorghum in the period of November 1971 to October 1972. Regardless of these high trade margins it should be pointed out again, that due to the high number of retailers, each of them earns a rather limited amount of money by trading. Omitting the advantages of employment to large numbers of traders even at the subsistence level, there are doubts that the entire retail system works effectively. That question cannot be answered with the available set of data.

TABLE 18. CORRELATION COEFFICIENTS "r" FOR SYNCHRONOUS
WEEKLY WHOLESALE AND RETAIL PRICES
OF CEREALS IN BACO, MAY 1971-Dec. 1972

	" r " ¹
White maize	0.98
White teff	0.91
Wheat	0.89
Barley	0.92
Sorghum	0.80

¹Significant at 1 percent level

TABLE 19.

GROSS RATE OF MARGIN
FROM RETAIL SALE OF CEREALS
IN BACO, 1971-1972

	<u>Period from May-Oct. 1971</u>		<u>Period from Nov. 1971-Oct. 1972</u>	
	Gross Margin ¹ Eth. \$/Quintal	Gross Rate of Margin ¹ %	Gross Margin ¹ Eth. \$/Quintal	Gross Rate of Margin ² %
White Maize	3.23	17.1	0.46	5.9
White Teff	-0.94	-2.9	0.43	2.3
Wheat	2.83	10.2	3.03	18.6
Barley	1.98	7.7	4.31	34.4
Sorghum	4.71	19.4	6.39	49.1

¹Average difference between wholesale and retail prices per quintal in the period.

²Percentage of gross margin on wholesale price.

V. Summary and Conclusions

The marketing policy for agricultural commodities has a key role in the transition from subsistence to market farming. Because cereals make up the bulk of the Ethiopian diet and production of the needed quantities lags with concomitant imports, the development policy of the government towards the agricultural sector is directed towards increasing production and gaining the participation of the subsistence farmers in the marketing process. Present prices for cereals are high and far above world market prices and increases in indigenous production have to be accompanied by decreasing prices over the long-run, a goal attainable through technological change in agriculture.

This study attempts to analyze the present marketing situation of agricultural commodities in the Baco area of Ethiopia and to search for the reasons for the existing market imperfections. The following conclusions for improving the marketing system evolve from this evaluation.

1. The Present Marketing System

In comparison to other regions, farmers in the Baco area have reached an unexpectedly high degree of market participation due to the relatively good road linkages between this area and the consumer markets in Addis Ababa towards the east and Gimbi in western Ethiopia. But great differences exist between owner-operators and tenants. An owner-operator, with an average holding size of two hectares of cultivated land, was able to market about half of his total output. A share cropper, who pays 50 percent of his output for rent to the landowner, could market directly only 15 percent of his output. It can be assumed that the landowner markets, in most cases, the total share received from the tenant, and the tenant's marketable surplus thus reaches almost two-thirds of his output. Most of the farmers in the Baco area are tenants (77 percent out of the total number) and 42 percent of the farmers have rented their land under one of the different share cropping systems.

Analysis of the marketing system in the Baco area was based only on the most important crops, cereals, red pepper (*Capsicum* sp.) and the oil crop Nigerseed (noog - *Guizotia abyssinica*) because 72 percent of the cultivated land is normally used in the production of cereals (maize occupies only 39 percent of the land), with 20 percent used for noog and 7 percent for red pepper. The last two are the main cash crops and both are mostly or totally marketed.

These products are marketed mainly on the weekly open market days and sold to a rural wholesaler or to agents of wholesalers. The rural wholesaler sells the commodities after a certain storage time, depending on price constellations, to a wholesaler in one of the consumer markets, Addis Ababa or Gimbi, or to a local retailer. The local retailer sells the produce immediately in small quantities to the consumer on open market days. These products are demanded by the directly market dependent population as well as by farmers. It was estimated for maize that farmers sell about 30 percent of marketable quantities directly to consumers and retailers and 70 percent to a rural wholesaler. Half of the latter flows to a terminal market and half remains in the rural area for local consumption with the shares fluctuating annually.

Most of the farmers sell maize in excess of their marketable surplus after harvest time because of a lack of adequate storage facilities and excessive storage losses. Later in the season, farmers repurchase maize for consumption or exchange for other grains for a high price on open markets. That farmers behave in this manner makes economic sense under present conditions because storage losses can be higher than price differences. In addition to lack of storage, some farmers are forced to sell their produce immediately after harvest, even at low prices, because all taxes, rents and repayment of borrowed money comes due at this time and necessary purchases of consumer goods have been postponed until this time because of lack of money.

Prices of cereals on the main market in Ethiopia, which is Addis Ababa, are set by brokers by taking supply and demand into consideration. Due to the competitive conditions in the capital, prices reflect market conditions with one essential restriction. In Ethiopia there is no crop estimate. Merchants have to estimate the expected supply before a new harvest occurs and that estimation determines their collective price expectation. Wrong estimates of supply are common.

Countrywide annual changes in supply due to weather conditions result in proportionately higher price fluctuations, because elasticities of supply and demand are low in short-run periods. This tendency of high price flexibility increases with the usual wrong estimation of the supply and the ensuing reaction of traders. When prices are falling traders expect further decreases and do not purchase and this fact imposes sharper price declines due to the collective behavior of traders and their expectations. These price movements, due to wrong estimation of the supply, superimpose all other fluctuations. Seasonal price movements are sometimes negative and the price movements cannot be predicted, which adds a high risk factor on storage of cereals at all marketing stages.

All prices in rural areas depend to a certain degree on prices in Addis Ababa. But prices in Addis Ababa, reduced by shipping costs from the production area to the capital give only the upper limit of local prices. Although price fluctuations in rural areas are caused by the same reasons as the countrywide fluctuations, the magnitude of change is somewhat higher due to the market position and bargaining power of rural wholesalers for a particular region and the lack of competition between traders. One surmises that rural wholesalers on a certain market are in collusion with respect to prices or they follow the leading merchant's recommendations. Prices are set on open market days at the beginning of the market period without knowledge of the supply and remain stable regardless of other influences. The market integration as a degree of competitiveness between markets in the Baco area and to consumer markets is, except on maize, generally low. Price changes respond in only a few cases to a dispatch of goods between markets. Although transport rates in Ethiopia are relatively low, price differences between markets do not reflect these conditions in all cases. A noncompetitive situation exists at the local market level with no outside ameliorative influences. Large wholesalers in consumer markets are not much interested in interfering in local markets, because traded quantities from these markets are rather small for them.

Only a few transactions take place at the wholesale level between rural markets, although price differences would allow profitable shipments. But transactions would decrease price differences to shipping costs. It can be assumed that the planned response to price differences between rural markets in a certain region would already decrease these differences.

In addition to the necessity of selling immediately after harvest time, farmers are forced to sell their produce on one of the nearest markets because they have to personally carry the goods to market. This fact enables merchants in villages in the Baco area to press prices down, especially after harvest time.

Although the prices of cereals tended upwards in the last two decades in Ethiopia, fluctuations between years and within a year were often so high and unpredictable that storage was burdened with an extremely high risk factor, and in addition, a large proportion of the transactions were financed on a credit basis.

In 1971/72 traders sustained a profit loss of 48 percent of their investment (buying price and storage costs) in Addis Ababa and of 68 percent in Sheboka, after having stored maize for ten months. A shorter period decreased losses without reaching the break-even point. Storage of other cereals was carried out with similar results. In 1969/70 storage of cereals was highly profitable during the entire period; but in 1970/71 storage was profitable only when the timings of purchases and sales were right. Losses could be decreased or profits increased in the above mentioned years when short run price movements were turned to account or there was a high turnover of merchandise.

There is a high degree of competitiveness in the Ethiopian trucking system. Most of the truck operators and some traders own one or two trucks but only a few large enterprises with diversified activities have a truck fleet. Freight tariffs represent the competitive conditions and are low under the present road conditions and costs. There is often a shortage of hauling capacity and freight rates rise in the dry season. The analyses of the spatial price differences while taking shipping costs into account shows that in years when storage of grains was not profitable, traders could obtain a high gross margin by shipping cereals from the production area around Baco to consumer centers and vice versa. For example, in 1971/72 with high storage losses in the Baco area and Addis Ababa, a dispatch from Baco to Addis Ababa and to Gimbi was highly profitable. In 1970 and 1971 shipment was profitable in only a few cases.

The Gimbi region must import food from other areas with most products channeled through Addis Ababa. Hence, price constellations have to allow for these shipments. Production of coffee for export in the Gimbi region creates high purchasing power which raises prices. Since the Baco area is well located with respect to Gimbi, shipment of grains (except teff) was in some cases possible with earnings of excessive gross profits.

2. Conclusions and Implications to Marketing Policy

The study indicated clearly that the present marketing system for

agricultural commodities works effectively, except on the village level market, when the general economic conditions in Ethiopia are taken into consideration. The replacement of the existing system by other trading systems is therefore not justified. All development programs, which improve the farmers' condition as well as their market position and bargaining power leading to greater competition on the village market will improve the entire marketing system. Under present economic conditions, improvements of the existing marketing system will have the great advantage of getting faster results, being less expensive, and easier to manage than a replacement.

From the results of this study, directions for improving the marketing of agricultural commodities can be suggested. As it was pointed out, the uncertainty of price movements and the lack of competition on the village level markets are the main weaknesses of the marketing system for agricultural products in the Baco area and generally in Ethiopia. All participants in the marketing of agricultural commodities in Ethiopia are faced with the problem of unpredictable price movements over time. In addition to this, farmers are in a weaker position due to the noncompetitive village markets. This study has clearly shown this to be true of the Baco area even though it is linked with all-weather roads to the terminal markets. It may be hypothesized that the competition on village markets which have access to the entire market system by only dry-weather roads is much lower than on markets in the Baco area due to the magnitude of transportation costs. Although access to the existing road system by construction of feeder roads is a prerequisite for all development activities, increased market competition and more income to farmers from decreased shipping costs cannot be anticipated to any great extent. As the Baco area shows, linkages of village markets to terminal markets do not necessarily lead to highly competitive village markets.

Even after consideration is given to all these factors and to the constraints of limited capital and scarce qualified administrative personnel, it can be stated that a Marketing Project, which gives farmers an alternative to selling their surplus produce and leads to an increase in competition on village level markets, has unequivocal priority. Following in the rank of necessity and feasibility are a nationwide Crop Estimation Service and a Price Stabilization Program. These single or joined programs should be supported by several other projects to obtain optimal results.

A. Major Marketing Programs

a. Marketing Project

In order to increase the competitiveness of local markets and to pay farmers the equilibrium price for their produce a Marketing Project besides, or better within, the existing extension service (Minimum Package Program) should be temporarily established. The creation of such a project should accompany the existing extension service in a given area and should continue to parallel a new Minimum Package Program, as they are set up in new districts. The establishment of the Marketing Project in areas of the extension service has the advantage that this

project can be based, at least in the beginning, on the administrative structure of the extension service. This project has in regions with extension services a higher degree of priority than in other areas because increases in marketable surplus, caused by development activities, depress local prices due to the market imperfections. The Marketing Project should be maintained at least until local markets perform in a competitive manner or until cooperatives are able to replace this project in several regions.

The amount of capital and trained personnel available for the proposed project sets the extent of its activities. An effective working project needs especially well trained personnel at all levels. The Marketing Project competes for limited capital and administrative talent with other development activities in the agricultural sector, especially with the extension service. The success of the extension service in Ethiopia depends to a degree upon the effective marketing of surplus production. In areas with extension services, the farmers' earnings -- after repayment of credit for fertilizer and improved seeds -- were sometimes lower after participation in extension activities than before. This will obviously adversely influence farmers' participation in the extension programs. It thus seems to be absolutely necessary that extension activities in Ethiopia be accompanied by marketing projects.

The main outline of structure of a Marketing Project in the Baco area could be as follows: The nucleus of the project should be located in Baco, which is also the administrative center of the Baco region Minimum Package Program. Besides administrative facilities the project needs some middle size warehouses for storing a portion of the purchased grains. Another portion should be directly sold after harvest time to terminal markets. With Baco designated the hub, outpost should be established in surrounding villages. The number to be established would be dependent upon the capital and administrative resources acquired for this purpose. Three to four outposts for the Baco area would be the minimum number required and they should be set up in the most distant markets in close proximity to the producing farms because of the farmers' lack of transportation. Baco, in addition to being responsible for its adjoining areas, would be the main market for the entire region. The Baco area now lacks a middle sized market between the terminal and village markets and with the creation of a Marketing Project Baco could fulfill this function for the area. These new adjustments in the marketing process could increase competition because marketed quantities would become large enough to attract merchants from other areas and terminal markets. The prices paid by the Marketing Project to farmers should be derived from actual prices in Addis Ababa, so that all nationwide changes in supply and demand would influence prices. Marketing Project would give farmers an alternative in selling their surplus, thus increasing local market competition. As long as local traders pay a higher price than would be offered by the project it would have no reason to intervene. All nationwide price fluctuations due to changes in supply and especially in wrong estimations would still exist after establishment of a Marketing Project, but the magnitude of changes on local markets would decline. There is a moderate risk factor associated with the creation of such a project because of the uncertainty of nationwide cyclical and seasonal price movements. In order to decrease unpredictability of prices, more knowledge is required with respect to supply, which leads to the next proposed project, a nationwide Crop Estimation Service.

b. Crop Estimation Service

As previously mentioned, unpredictable price movements are mainly due to annual changes in supply, which is often over or underestimated. These wrong estimates create proportionately higher price fluctuations. Therefore, better knowledge about annual supply is required, which makes the establishment of a Crop Estimation Service necessary. Due to the large regional differences in climate and production of main crops it will be difficult to obtain actual and reliable data. To ensure success such a project would also need highly qualified personnel. After taking these constraints under consideration, it is not possible to justify this service as a separate entity but it should be established within the existing extension service. The personnel of the Minimum Package Program must be trained in methods of yield estimation. This lack of knowledge on the part of the extension agents is partly compensated for by their intimate knowledge of their extension area. With improvement of qualifications and experience, the reliability of data will improve. The obtained data should be made accessible to interested merchants so that they are able to base their price performance on these data. The creation of this project within the existing extension service has the advantage of requiring only a small amount of additional capital and few highly qualified scientists, but significant results cannot immediately be expected.

c. Price Stabilization Program

To obtain immediate results and also due to the fact that price uncertainty is universal in Ethiopia, a nationwide Price Stabilization Program including a buffer stock could reduce price instability to a defined price movement over time and space. The objective is to reduce only price fluctuation due to uncertainty and its proportionately higher reaction, but not the fluctuation due to changes in demand and supply over time. That means that the price support level has to be set annually near the equilibrium price. For operation of the existing market system, the support level should be set under the estimated balance price and announced immediately before a new harvest time. The equilibrium price has to be calculated for the main Ethiopian markets, Addis Ababa and Asmara, taking demand and estimated yields and therefore supply under consideration. The support price should be regionally and seasonally adjusted, taking real shipping and storage costs into account. Such a price stabilization scheme is recommended only for a few main cereals such as wheat, teff, maize and sorghum. The Ethiopian Grain Board and/or the Ethiopia Grain Corporation could handle the proposed program, including the imports of cereals. These organizations would be obligated to purchase grain at the support price level and to sell it again, if prices reach an upper limit. The grains for the buffer stock operation can be stored, at least partially, in the existing modern storage facilities of the Ethiopia Grain Corporation. This price support policy has in the long run some further advantages: First, it is flexible for technological changes in the development process and secondly, this policy can be used for reallocation of resources within agriculture and among sectors and regions (for more details for such a price support policy, see 20, 21, 22).

Major impediments exist before a Price Stabilization Program could be established due to limited governmental capital and administrative resources, because this program requires substantial financing and highly qualified administrators and scientists. Under present conditions of uncertainty the support price may be set far below the equilibrium price reducing the risk but also the efficacy of the project. Another alternative is the improvement of knowledge about supply, which requires the creation of a highly qualified Crop Estimation Service with well trained personnel. These constraints upon capital and personnel limit the feasibility of the Price Stabilization Program. In addition, as would be the case universally, it is highly probable that such a program could be abused for political purposes and pressures of different interest groups could effect support prices.

B. Accompanying and Supporting Projects

Besides the proposed major marketing programs there can be additional directions drawn from this study which should support these programs. All of these directions are by no means of less importance. The implementation of each improves, with a different degree, the marketing system. According to the approach, these directions can be categorized into three groups:

a. Improving the Bargaining Power and Market Position of Farmers

All programs which increase farmers' incomes, including land reform and changes of the present tenant-landlord relationship, potentially improve the farmers' market position. However, under existing conditions increases in physical output do not necessarily raise revenues. Due to uncertainty and the market position of traders in production areas, increases in supply often results in sharply decreasing prices. Therefore, to improve the actual market position of farmers, extension programs with the main objectives of increasing output have to be definitively joined by a marketing program, such as the one proposed.

Improving farmers' grain storage facilities is another important suggested program. Decline in storage losses at the farm level would have a twofold effect: First, farmers would not be forced to sell their produce immediately after harvest time at a low price. Second, due to the decline in losses of stored produce for home consumption, supplies increase proportionately with resultant increases available for consumption. The results of experiments of the Baco Agricultural Research Station concerned with local storage clearly showed that farmers' present storage facilities could be easily improved by the farmers themselves without capital investment, thus reducing losses to a normal rate (14).

As a long-run program, establishment of cooperatives in addition to the existing marketing channels could increase the competition on local markets. Without the creation of the proposed marketing programs, cooperatives will be faced with the same problems of price uncertainty and risk which the private traders face at present. Although cooperatives might play an important role in the development process, experiences in other countries indicate that the indiscriminate establishment of cooperatives can misallocate scarce capital resources and limited administrative personnel. Therefore, cooperatives should be promoted only in the most favored areas as a long-run program.

One of the forces compelling farmers to sell their produce immediately after harvest time at low prices is the payment of taxes, rents, etc. A time extension for the payment of taxes would give immense support to the marketing policy of the Ethiopian Government.

b. Traders

Although entry to markets for new entrepreneurs is legal and free, restrictions exist especially on village markets in the form of discrimination and generally in the form of lack of capital resources. The existing participants are faced with a scarcity of capital, too. Therefore an improvement in credit facilities for traders would increase market competitiveness.

An effort should also be made to improve merchants' storage facilities by providing more knowledge and capital.

c. Improvement of Market Information

The creation of a price reporting and information service for major agricultural commodities would lead to a better market transparency. Prices and transactions on important Ethiopian markets should be broadcast daily. At the village market level all price quotations in the region should be announced by the Minimum Package Program or by municipalities. This price information service requires the introduction of a grading and a uniform measurement and weight system for the entire Empire.

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APPENDIX A

Sources of Price Series

The price series used in this study were obtained mainly from two sources:

a. Prices in Addis Ababa

The Commercial Bank of Ethiopia S. C. collects and publishes average monthly wholesale prices of selected commodities from Addis Ababa (CBE, Market Report). These price series, supplemented by data collected by the Department of Economic Research of the National Bank of Ethiopia, were used for the calculations. This agency collects data from traders and branches of the Ethiopia Grain Corporation in all major towns in Ethiopia. Those data are published annually in the Ethiopia Statistical Abstracts. But the data are by no means complete.

b. Prices on Markets in the Baco area, Lekemte and Gimbi

The Economic Research and Extension Section of the Ethio-German Agricultural Research Station Baco established price collectors on the main markets in the Baco area, Lekemte and Gimbi in 1970. These collectors ascertain retail prices on open markets weekly and watch transactions to assure reliable data. Wholesale prices were collected from several traders. Only in Baco were the prices collected twice a week.

Wholesale Prices:

Information about wholesale prices was obtained from traders without difficulty. Prices of several of the merchants coincided completely or almost so at a certain time. These prices were merchant's wholesale prices, or in other words, the prices in Eth. \$ per 100 kg. produce, which retailers had to pay when purchasing commodities. Farmers also officially received the same price from wholesalers by selling produce to them. This information was obtained from both merchants and farmers. Wholesalers said that they do not make any profit by trading on this level, but investigations showed that traders obtained a profit by the manipulation of the weight when goods were purchased from farmers. Traders use balances or similar instruments so it is easy for them to underestimate the real weight and some traders estimate the weight only. Farmers usually have no means of checking the trader's decisions. The underestimated weight ranges, due to the great experience of the merchants, between 5 and 10 percent of the real weight. Similar figures resulted from surveys of the CADU Project and Debre Zeit. Farmer's prices were in reality 5 to 20 percent lower than assigned prices for grains in the CADU Project area (2). Only a rough estimation can be made of the prices farmers actually receive under present conditions.

Retail Prices:

At the retail level produce is sold not only by volume but also by taking estimated specific gravity into consideration. For the collection of retail prices the most common volume measurement was taken and

recurrently balanced in order to obtain the current volume weight. Collectors gathered several observations from each commodity on the open market day. Besides this, they watched transactions in order to examine the trader's assignments. Every one or two months data were also collected by an unknown person in addition to the normal collection in order to check all data. Because retail prices differ slightly between retailers, the arithmetic average was calculated for this study.

TABLE A1. MONTHLY WHOLESALE PRICES OF SEVERAL COMMODITIES IN
MARKETS OF THE BACO AREA, 1970 - 1972

- Ethiopian Dollar per 100 kg ⁻¹

Month	White Maize	White Teff	Wheat	Barley	Sorghum	Noog	Red Pepper
1	2	3	4	5	6	7	8
1. Baco							
1971							
May	20.0	36.0	30.5	26.8	27.3	22.3	58.8
June	19.9	35.8	30.0	27.4	26.3	21.0	58.9
July	19.3	33.8	27.5	26.0	25.3	22.0	58.8
Aug.	19.8	31.1	26.9	26.4	22.1	23.0	58.4
Sept.	18.2	27.9	27.1	25.4	21.7	24.0	60.3
Oct.	16.4	28.3	24.8	22.8	23.8	----	53.0
Nov.	10.5	25.0	22.6	17.3	22.3	----	46.3
Dec.	8.3	22.5	19.1	15.2	21.6	18.0	49.4
1972							
Jan.	10.0	19.3	18.3	13.5	18.5	----	60.3
Feb.	10.0	19.8	16.0	15.0	15.0	13.0	42.7
March	7.7	16.8	13.4	12.2	12.3	13.0	39.8
April	7.5	17.0	13.5	12.5	8.8	----	36.8
May	7.4	15.4	15.8	10.1	6.8	----	42.1
June	7.5	18.3	16.8	11.0	12.5	14.3	48.5
July	7.3	18.5	15.5	11.0	9.3	17.3	57.7
Aug.	6.4	19.4	16.2	11.2	8.8	18.6	58.0
Sept.	5.8	17.8	15.3	11.5	10.3	18.5	70.6
Oct.	5.0	18.3	14.0	10.5	11.8	16.0	63.2
Nov.	6.0	22.6	16.2	13.0	15.2	17.4	65.9
Dec.	6.8	23.8	17.5	14.0	13.3	16.3	72.0
2. Sheboka							
1970							
Oct.	24.8	42.0	32.0	23.0	30.5	31.5	85.9
Nov.	14.0	35.3	32.5	19.0	26.5	30.0	58.8
Dec.	18.0	38.8	28.0	19.2	23.8	28.4	58.8
1971							
Jan.	16.4	27.3	23.3	19.5	20.5	26.0	60.3
Feb.	16.5	25.5	21.5	20.3	19.0	23.3	58.8
March	19.4	28.6	23.2	21.6	23.8	24.4	60.0
April	19.5	31.3	24.9	22.8	23.0	22.5	60.3
May	20.0	31.0	23.8	21.0	20.0	22.3	67.6
June	21.9	34.4	25.0	24.4	25.0	22.0	61.2
July	21.0	34.3	27.0	26.8	24.3	22.8	65.4
Aug.	19.5	32.0	26.3	24.8	25.8	22.5	63.3
Sept.	18.0	28.6	24.6	21.0	22.0	22.6	64.8
Oct.	17.0	29.0	24.3	19.5	19.0	22.8	67.6
Nov.	13.0	28.0	21.8	18.5	18.0	21.8	63.2
Dec.	10.2	26.2	19.9	18.0	17.8	19.2	58.3

TABLE A1. cont.

Month	White Maize	White Teff	Wheat	Barley	Sorghum	Noog	Red Pepper
1	2	3	4	5	6	7	8
1972							
Jan.	10.1	25.4	21.4	15.8	16.5	16.3	54.4
Feb.	8.8	21.0	18.3	14.8	15.0	16.5	45.6
March.	7.8	18.6	15.6	13.4	13.2	14.2	44.7
April	7.6	18.3	14.5	11.0	14.3	13.8	47.0
May	7.0	18.4	14.8	10.8	11.4	14.2	51.8
June	7.8	19.5	16.8	9.3	10.5	16.8	61.8
July	6.5	20.0	16.0	8.0	10.5	16.5	58.8
Aug.	5.6	20.4	15.5	10.4	11.2	17.2	64.7
Sept.	5.3	21.3	15.5	9.3	12.5	16.8	65.3
Oct.	5.5	21.5	16.0	9.0	11.3	18.0	57.3
Nov.	5.6	20.6	16.8	10.0	11.6	18.8	52.9
Dec.	6.8	20.3	15.5	10.3	11.0	22.5	54.4
3. Sire							
1971							
Jan.	16.8	30.0	----	25.7	15.3	24.5	59.1
Feb.	17.8	30.0	----	25.8	16.8	22.3	56.6
March	20.1	31.9	----	23.8	17.3	25.0	51.5
April	20.0	29.5	----	26.6	19.8	24.6	57.3
May	21.0	31.0	----	29.3	26.3	24.3	58.8
June	24.0	31.1	----	28.0	26.3	21.8	70.9
July	23.8	32.1	----	28.5	27.5	23.5	71.3
Aug.	20.8	31.0	----	28.1	26.8	20.8	69.1
Sept.	20.4	31.2	----	26.5	23.6	19.8	74.1
Oct.	19.0	32.0	----	26.3	24.8	19.8	72.4
Nov.	17.5	30.0	----	25.3	23.8	20.5	61.1
Dec.	13.4	25.8	----	22.6	17.7	17.4	50.0
1972							
Jan.	10.3	19.6	----	17.3	10.8	15.0	42.6
Feb.	9.0	19.3	----	17.3	11.6	14.5	44.1
March	9.6	21.1	----	16.4	15.7	15.0	36.5
April	9.3	19.6	----	16.5	----	14.5	31.6
May	7.6	17.2	----	14.0	----	13.6	29.5
June	8.0	19.5	----	----	----	15.5	29.5
July	8.0	18.5	----	----	----	17.0	29.5
Aug.	7.6	18.0	----	----	----	17.0	29.5
Sept.	8.0	18.0	----	----	----	17.0	29.5
Oct.	8.0	18.0	----	----	----	17.3	----
Nov.	8.0	18.0	----	----	10.0	17.0	----
Dec.	7.0	18.0	----	----	10.0	18.5	----

¹Arithmetic average of weekly price quotations.

TABLE A2. MONTHLY RETAIL PRICES OF SEVERAL COMMODITIES IN
MARKETS OF THE BACO AREA, ETHIOPIA, 1970 - 1972
- Ethiopian Dollar per 100 kg. - ¹

Month	White Maize	White Teff	Wheat	Barley	Sorghum	Noog
1	2	3	4	5	6	7
1. Baco						
1970						
June	26.8	38.1	40.5	37.6	33.1	----
July	30.3	41.0	41.1	38.4	33.1	----
Aug.	31.8	44.1	44.3	44.5	37.5	----
Sept.	29.3	43.2	44.5	43.5	38.1	----
Oct.	23.5	37.3	36.6	35.1	32.0	----
Nov.	16.6	31.4	34.9	24.8	24.3	----
Dec.	17.5	30.4	31.8	23.0	19.6	36.0
1971						
Jan.	16.1	28.0	28.9	21.6	18.0	34.1
Feb.	21.4	30.4	30.8	26.7	21.4	34.5
March	20.7	30.3	30.6	26.0	21.3	29.3
April	19.6	30.0	34.9	27.5	23.8	40.6
May	22.9	31.6	34.9	30.0	29.3	39.2
June	24.2	33.6	33.4	29.1	30.9	36.8
July	23.4	34.3	31.1	27.8	32.2	37.0
Aug.	23.0	30.5	30.2	29.0	28.1	----
Sept.	21.1	28.2	28.7	26.4	26.3	----
Oct.	17.5	27.3	26.0	24.5	25.8	----
Nov.	11.3	25.0	22.0	21.1	25.9	----
Dec.	9.0	24.5	19.7	20.1	28.1	22.0
1972						
Jan.	9.0	25.5	23.8	20.1	22.9	22.0
Feb.	9.0	19.7	20.8	19.4	18.5	21.0
March	8.9	18.2	18.3	20.5	17.0	21.2
April	8.6	17.4	18.4	18.7	11.6	22.0
May	6.7	16.5	17.2	13.3	10.3	22.0
June	8.9	17.8	18.0	14.4	16.1	19.7
July	8.6	18.1	21.1	15.5	21.2	22.0
Aug.	8.4	17.0	18.0	14.1	24.4	22.0
Sept.	5.8	17.0	18.8	12.9	17.8	22.0
Oct.	4.5	17.0	17.1	12.0	19.0	22.0
Nov.	5.0	18.2	20.3	13.4	19.0	22.5
Dec.	5.8	20.8	23.4	14.6	20.6	22.0
2. Sheboka						
1970						
Oct.	24.6	40.6	36.5	24.7	36.4	44.3
Nov.	13.6	31.5	36.5	18.1	30.4	44.3
Dec.	18.0	33.1	31.5	22.3	30.2	39.9

TABLE A2. cont.

Month	White Maize	White Teff	Wheat	Barley	Sorghum	Noog
1	2	3	4	5	6	7
2. Sheboka						
1971						
Jan.	17.8	29.4	25.8	21.8	22.4	26.3
Feb.	18.0	26.5	25.7	22.3	20.0	23.3
March	19.4	31.3	26.0	22.3	23.6	33.3
April	19.1	31.4	26.0	22.3	21.8	27.5
May	20.5	34.3	29.9	22.9	20.0	26.4
June	22.3	34.3	34.3	26.7	29.2	43.4
July	22.0	33.0	32.9	28.3	33.8	42.2
Aug.	20.8	30.8	28.6	25.5	33.6	44.3
Sept.	20.9	27.2	28.0	23.8	30.2	40.3
Oct.	16.9	27.9	27.0	21.8	27.8	27.6
Nov.	19.5	26.8	27.8	21.8	26.1	22.0
Dec.	14.5	26.3	24.8	21.1	26.4	22.0
1972						
Jan.	9.3	26.1	24.5	21.5	19.9	21.3
Feb.	8.8	20.9	20.2	19.4	17.6	21.5
March	8.8	17.6	17.5	18.6	18.3	21.6
April	8.9	17.1	16.3	12.6	16.6	20.8
May	8.9	17.0	16.1	11.7	12.5	19.9
June	9.0	18.0	18.0	14.8	12.5	22.0
July	9.0	17.5	18.0	14.8	12.5	22.0
Aug.	9.0	16.9	16.5	11.6	12.5	22.0
Sept.	7.3	21.1	16.7	12.6	12.0	22.0
Oct.	7.8	17.0	17.4	11.0	13.1	22.0
Nov.	7.1	18.6	17.7	11.0	12.5	22.0
Dec.	8.5	19.0	18.0	11.9	12.5	22.0
3. Sire						
1971						
Jan.	16.9	30.6	----	28.6	17.1	22.5
Feb.	18.5	31.2	----	28.6	22.3	24.0
March	20.3	30.8	----	28.0	23.8	33.1
April	19.0	29.9	----	29.2	20.6	23.3
May	21.1	29.9	----	29.5	23.6	25.1
June	22.8	28.0	----	35.9	25.4	23.8
July	23.4	28.3	----	34.6	26.8	24.0
Aug.	20.8	28.5	----	33.1	24.4	22.0
Sept.	20.0	26.8	----	27.1	22.8	22.2
Oct.	21.4	25.8	----	29.8	24.9	23.3
Nov.	18.6	27.9	----	30.8	24.3	25.3
Dec.	13.5	21.9	----	22.4	17.7	21.0

TABLE A2. cont.

Month	White Maize	White Teff	Wheat	Barley	Sorghum	Noog
1	2	3	4	5	6	7
3. Sire						
1972						
Jan.	13.5	18.8	-----	17.1	15.4	19.4
Feb.	10.8	18.3	-----	16.7	12.3	20.3
March	9.5	16.4	-----	15.7	15.0	19.8
April	8.6	16.6	-----	15.8	17.4	20.8
May	8.4	16.7	-----	16.3	19.0	22.0
June	8.3	16.6	-----	16.3	19.0	22.0
July	8.5	16.3	-----	16.3	19.0	22.0
Aug.	8.0	16.7	-----	16.3	19.0	22.0
Sept.	8.0	15.9	-----	16.3	19.0	22.0
Oct.	8.0	15.5	-----	13.8	18.3	22.0
Nov.	8.0	15.5	-----	12.8	10.2	22.0
Dec.	7.3	15.5	-----	11.0	9.5	22.0

¹Arithmetic average of weekly price quotations.