MAIZE AND BEANS MARKETING IN KENYA: THE INTERACTION AND
EFFECTIVENESS OF THE INFORMAL AND FORMAL MARKETING SYSTEMS

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Occasional Paper No. 31

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AUGUST 1979

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ABSTRACT

The study analyses the functioning of the Kenyan domestic maize
and beans marketing system with special regard to the interaction of the
formal (controlled) and informal (uncontrolled) sub-systems. It attempts
to reduce the uncertainty as to what effects relaxation of present controls
would have. The relaxation of controls has been suggested in the last
three Development Plans but no actions have yet been taken.

Initially the determinants of the marketing systems' performance --
framework for maize and beans marketing operations, structure and conduct of
the marketing systems -- are described and analysed. This is followed by
an evaluation of the performance guided by the stated objectives of the
controls: to benefit producers and consumers. To this end, more specifi-
cally, the analysis includes an evaluation of the extent to which the
marketing systems operate at lowest possible costs (achieve pricing
efficiency), prevent exploitation of farmers and consumers (achieve pricing
efficiency) and provide secure outlets for producers and sources for consumers.
Survey information of the Central Bureau of Statistics and data gathered by
a Maize and Beans Trader Survey carried out in markets of Western, Central
and Eastern Kenya with the assistance of the FAO/Kenya Government Marketing
Development Project provided the empirical base for the analysis.

In summary, the analysis suggests that the objectives of controls
are not being achieved and in fact that the present system of controls con-
tributes to marketing inefficiencies. The control legislation has created
a marketing framework which is conducive to low operational efficiency
as reflected in high marketing costs; low pricing efficiency as reflected in
poor market and seasonal integration and relatively high excess profits;
and high instability of market conditions. The analysis further indicates
that those most affected by the controls are smallholders and rural and
urban low-income consumers whereas those that benefit most are large scale
farmers. The result is a negative income distribution effect. In conclusion,
it is recommended that controls be relaxed in conjunction with other measures
to improve the situation. This would further one of the major objectives of
the present development strategy:- to alleviate rural and urban poverty.

ACKNOWLEDGEMENTS

Last but not least, I am very much indebted to Mrs. B. Wallace and Miss E. Garfield who undertook the painstaking job of editing the manuscript. Their work went far beyond normal editing duties since English is not the mother tongue of the author. I am particularly grateful to them for making the study legible and thereby increasing the convenience for the reader. I take full responsibility for any errors.

Nairobi, May 1979   G. Schmidt

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1. INTRODUCTION

1.1 Objectives of the Study

The marketing of maize in Kenya has long been a subject for study.[1] Past discussion has centered around the imperfections and inefficiencies of the system in which the Maize and Produce Board (MPB), a parastatal marketing organization, holds the **monopoly** on handling almost all **maize** beyond district requirements. Recently, maize surpluses have been an additional matter for discussion. These two issues are interrelated and each tends to aggravate the other. However, while separate measures must be undertaken to resolve each, neither can be solved in isolation.

The present study examines the effect of the maize marketing system on marketing costs, profits. producer and consumer prices and income distribution. The marketing system for beans is also analysed. The marketing problems of both crops are similar, and furthermore, maize and beans are the major staple foods of the low-income sections of the rural and urban population. In addition, the major production of both crops is by smallholders.[2]

Smallholders, who with their families account for over 70% of the total population (see Casley and Marchant 1978, p. 5), belong mainly to the low-income sections of Kenya society.[3] Most of them are affected twice vby the maize and beans marketing system, as producers and as consumers. Since these smallholders usually cannot grow or retain enough of these staples for home consumption, they rely on food purchases for a considerable part of the year.

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1. The most recent reports includes: V.A. Alvis and P.E. Temu. 1968. Marketing Selected Staple Foodstuffs in Kenya; Kenya. 1966. Maize Commission of Inquiry; Kenya. 1972. Final Report of the Working Party Studying the Maize and Produce Board; Kenya. 1973. Report of the Selected Committee on the Maize Industry; M. Hanrahan. 1974. Maize Marketing Scheme at Luanda Market; F.T. Kariungi. 1976 . **Kitui Local Maize Market**; F.K. Ireri. 1976. Kutus Maize Market; O. Hesselmark and G. Lorenzl. 1976. 'Structure and Performance of the Maize Marketing System in Kenya'; O. Hesselmark. 1977. The Marketing of Maize and Beans in Kenya; R.A. Odinga. 1977. Decision Making in Food Marketing in Kenya; G. Schmidt and E.S. Mbugua. 1976. Aspects of Marketing Effectiveness for Selected Food Crops; H.G. Gsaenger and G. Schmidt. 1977. Decontrolling the Maize Marketing System in Kenya.

2. The Kenya Integrated Rural Survey defines a smallholder as a person who operates an agricultural holding of upto 20 acres although only 25% of smallholdings exceed 5 acres (Casley and Marchant 1978, p. 8).

3. The results of the first Integrated Rural Survey (IRS-I) suggest that about 90% of smallholders have an income of less than KShs. 1500 per adult equivalent, per year; 45% have an income of less than KShs. 500 per adult equivalent, per year which is barely enough to provide adequate caloric intake; and 15% had negative cash balances. See L.D. Smith. 1978. Low Income Small-Holder Marketing and Consumption Patterns 55.

Inefficiencies in the maize and beans marketing systems doubly affect these
vulnerable smallholders, first when they sell part of their maize or beans
harvest to meet other basic needs[4] and second when they buy   either
product for their own consumption.

Clearly, the critical effect of maize and beans marketing on low-
income groups underscores the importance of thoroughly examining the operation
of the two marketing systems. The present systems are subject to relatively
strict controls[5] intended, as the respective regulations state, to protect the
interests of producers and consumers (see Kenya. 1972. The maize Marketing Act,
p. 5). In light of these underlying interests, the regulations are designed:
  (1) to guarantee a market at reasonable prices to producers in
      surplus areas,
  (2) to guarantee sufficient supplies at reasonable prices in deficit
      areas,
  (3) to guarantee fixed prices to producers and consumers,
  (4) to prevent exploitation of producers (smallholders) and consumers
  (5) to perform marketing functions at lowest possible costs.

Earlier case studies and investigations which suggested that these
objectives were not being achieved recommended relaxation of controls to allow
free movement of maize and assignment of a new role to the MPB (See note 1
above). Similar recommendations were also made in the last three Development
Plans. The 1974-78 Plan, for example, states:

> The 1970-74 Plan anticipated that major changes would be made to
> the system of maize marketing in Kenya, in particular that the
> internal maize market would be freed of all restrictions. These
> changes have not yet been made but will be introduced early in the
> new Plan period. Under the proposed marketing system maize
> millers will be free to purchase their requirements direct from
> farmers without going through the Maize and Produce Board. The
> Board will purchase any maize offered to it at a guaranteed floor
> price. It will also be responsible for maintaining the strategic
> maize reserve and for all imports and exports. (Kenya. 1977,
> Development Plan, p. 234).

The 1979-83 Plan also expresses the intention to relax internal maize movement
restrictions as a measure to improve marketing efficiency. It declares the

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4.   In 1976/77, maize and beans accounted for 28.5% of total farm sales.
Maize alone accounted for 25.6%. See Casley and Marchant 1978, p. 28.

5.   For a short period, from October 1977 to June 1978, the regulation
that all surplus maize must be sold to the MPB was relaxed because MPB storage
capacities were exhausted and it was hoped that the pressure on the MPB would
be reduced by this measure. In June 1978 the old controls were reintroduced.
See Kenya. 1972. The Maize Marketing Act, Laws of Kenya, Cap. 338, p. 5.

intention to intervene directly only where co-operatives and the private sector
cannot or do not perform essential functions and services adequately or
competitively. (Kenya. 1979. Development Plan, pp. 226/227).

Despite the officially stated intention of introducing major changes,
no definite action has been taken so far. The government's reluctance to
introduce recommended reforms perhaps reflected lack of information on the
workings of the private sector and suspicion that the private sector might be
unable to assume certain functions of the MPB or that it might exploit small-
holders and consumers.[6] To throw light on these questions this study, taking as
its frame of reference the stated reasons for the controls, focuses on the
present and potential performance of the private sector in maize and beans
marketing and attempts to quantify the effects of controls and envisaged
decontrol. Special emphasis is placed on the so-called "nformal" sub-
systems and their relation to the "formal" or controlled system. Research
in this area has not been emphasized in the past, with the result that
neither sufficient nor accurate information has been available as a basis
for recommending appropriate improvements.[7]

1. 2. Data Base

The data for this study are drawn from various surveys carried
out by the Marketing Development Project (MDP) through the Central Bureau of
Statistics (CBS). These include the Integrated Rural Surveys 1974/75 and
1976/77 (IRS-1 and IRS-2), the Market Information Survey, and the Market
Structure Survey.[8] Data from these sources supplement the author's Maize and

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6.   Private traders (middlemen) are often blamed by the people as well
as politicians of being exploitative. See, for example, the statements of the
Vice President and Minister for Finance, Mr. Mwai Kibaki, in Parliament on
October 18th, 1978, discussed in an editorial of the Standard, "Exploitation
of Small Farmers", October 23, 1978 and the letter of a farmer to the Daily Nation,
"Maize price needs control," August 11, 1978, p. 7.

7.   Thus, for the new Development Plan period "an assessment of the
institutional and legal framework required for the implementation of Government
agricultural and marketing policies" is envisaged (Kenya. 1979. Development
Plan, p. 227).

8.   Data of the surveys are published in Kenya. 1977. Integrated Rural
Survey 1974-5, Basic Report; D.J. Casley and T.J. Marchant. 1978. Smallholder
Marketing in Kenya. Price data are regularly published in the Market Information
Bulletin of the Central Bureau of Statistics. For the survey methods see the
individual publications.

Beans Trader Survey, which includes a sample of producers selling in survey markets, carried out in 1977 with the assistance of the MDP. The results of this survey may be taken as fairly representative of the total population within the sampling area.

Data for the Maize and Beans Trader Survey were collected in three maize or beans growing areas or zones. The basic sample zones, which comprise seven zones of the Integrated Rural Survey[9], may be described as follows:

(1) Western Kenya--High and medium potential agro-ecological zone (Coffee, Tea and Cotton West of Rift Valley) which comprises Nyanza and Western provinces and parts of Rift Valley Province (Kericho, Nandi);

(2) Central Kenya--High and medium potential zone East of Rift Valley which comprises mainly Central Province and part of Meru and Embu districts of Eastern province. (Machakos District was excluded because it is geographically separate from the other areas.);

(3) Eastern Kenya--Low potential zone East of Rift Valley which comprises the major parts of Eastern Province (Meru, Embu, Kitui and Machakos districts).

The first two zones are considered surplus or self-sufficient areas, while the third is a major rural deficit area for maize. All zones are smallholder areas which is particularly interesting with regard to the declared development policy of Kenya.

The results of the sampling process for these areas are shown in Table 1. For market traders and producers, a random sample was drawn of 69 markets (Map 1) evenly distributed across the zones and stratified by IRS zones

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9.   These zones are: Tea in West of Rift Valley; Coffee in West of Rift Valley; Upper Cotton in West of Rift Valley; Tea in East of Rift Valley; Coffee in East of Rift Valley (except Machakos); and Lower Cotton in East of Rift Valley. The former large farm areas were excluded. See map Al, Appendix.

and by market size (big, medium, small).[10]

Table 1:   Sample of Producers and Traders in Sample Markets by Basic Sample
           Zones[a].

Type of Trader	Western Kenya	Central Kenya	Eastern Kenya	Total
Producer	37	31	25	93
Market Maize	80	87	37	204
Trader Beans[a]	47	76	36	159
MPB agent	39	24	39	102
Lorry Trader	6	6	8	20

Note: a The sample of market traders was roughly stratified by
            size (small, big) in order to get a sufficient sample
            size for big (weekly turnover 10 bags or more).
Source: Own Compilation

10.   The sampling of markets, let alone the subsequent sampling of market
traders, was not an easy task. For this purpose all County Councils of the
respective districts (17) were visited and, as far as data were available, the
market revenue for 4 months was recorded. Later the markets were grouped into
three size categories; because sizes differed considerably between zones, each
zone was grouped separately. Where information on revenues was scanty or not
accessible within reasonable time limits, the classification of markets was made
with the assistance of the market inspector of the County Council. Markets with
no or negligible revenues (less than KShs. 100 per year) and "market centres"
without an "open market" were not included in the sampling frame. The strati-
fication of the frame developed is as follows:

Market Category	Western Kenya	Central Kenya	Eastern Kenya	Total
Large	10	6	6	22
Medium	56	25	28	109
Small	312	88	36[a]	436
Total	378	119	70	567

Note: a. In Machakos District a large number of market centres were
            listed, but no revenue was collected in these centres because
            no real "open market" on special market days was in operation.
            The total number is higher if the Coffee Zone is included.
            For Eastern Kenya, only the dry, deficit areas were sampled.

L E G E N D

TRADER SURVEY..............................	+
INFORMATION SURVEY......................	o
TRADER AND INFORMATION SURVEY......	•
INTERNATIONAL BOUNDARIES............	+ + +
PROVINCIAL BOUNDARIES.................	+ +
DISTRICT BOUNDARIES.....................	—

UGANDA
TANZANIA
SOMALIA
INDIAN OCEAN

TRANS NZOIA · UASIN GISHU · ELGEYO MARAKWET · BARINGO · LAIKIPIA · SAMBURU · ISIOLO · WAJIR · GARISSA · TANA RIVER · LAMU · KILIFI · KWALE · TAITA · KAJIADO · NAROK · NYANZA · KERICHO · NAKURU · NYANDARUA · NYERI · KIRINYAGA · EMBU · MERU · MACHAKOS · KITUI · NAIROBI · KIAMBU · MURANG'A

KAPENGURIA · KITALE · KAPKATENY · KIMILILI · TURBO · KHACHONGE · MUKHWEYA · BUNGOMA · KAPSAKWONY · KIPKARREN · ELDORET · KABARNET · SIGOWET · UGUNYA · KAPSABET · BURNT FOREST · NANDI HILLS · TIMBOROGA · SHANDA · KAKAMEGA · MUMIAS · BUSIA · BUMALA · PORT SIO · BUTERE · NDERE · BONDO · PAWAKUCHE · HOMA BAY · KENDU · TONYE · MBILI · DARAJA · KEROKA · NDOSRI · RONGO · KOMBEWA · AHERO · KIBUYE · OYUGIS · OBOCH · SONDU · KENDU · CHEPTULA · KIBIGORI · SOTIK · SEREM · LITEIN · KOIWA · KIPTERE · KIMULOT · FORT TERNAN · LONDIANI · NAKURU · OLENGURUONE · KAPSAROK · KIPKELION · NAMBA · KODERO · KAKRAO · MIGORI · KEHANCHA · NAROK · ENGARE · KAWANGWARE · WAKULIMA · RIRONI · LIMURU · GITHUNGURI · KIGUMO · KIAMBU · MACHAKOS · BURMA · NAIROBI · KANDARA · KAKUZI · THIKA · MUTHITHI · ENGINEER · GITHARENE · KABATINA · MAGUMONI · KENYANYEINI · GANNOU · ENDARASHA · KERUGOYA · RUNYENJES · EMBU · KUTUS · SAGANA · ISHIARA · CHUKA · CHOKARIGE · MWINGI · KITUI (KALUNDU) · ZOMBE · KAVISUNI · TULIA · MUI · KAMUONGO · MIGWANI · MATUU · KATAMA · YALA · MAKUTANO · TAWA · MBUMBUNI · KALAWA · KIKIMA · UPETE · MATILIKU · KASIKEU · KILALA · KAMBU · KANJAI · MIKUNDURI · MERU · (MUNDANTU) · NKUBU · MAUA · KUNATI · NANYUKI · ISIOLO · MNEMWE · TAYARI · MAJENDO · MOMBASA

Map 1.   Sample Markets for Maize and Beans Trader Survey and C.B.S. Market Information Survey, 1977 — 78.

0 20 40 60 80 100 MILES
0 40 60 120 160 KILOMETRES

Subsequently, selection of a random sample of producers and market traders
within each market was drawn. With regard to market traders, however, it
should be kept in mind that interviews with persons who may be involved in
illegal transactions are rather difficult to obtain. Therefore, at times the
copperation of respondents was considered more important than random selection.
A further constraint on the intended sample occurred in Zone 3, where throughout the
survey period maize and beans marketing was banned in the open markets of Kitui
District. The results for that zone therefore do not represent free produce
marketing conditions in Kitui.

For Maize and Produce Board agents, the objective was 100% interview
coverage in the selected markets.[11] For each zone, the target sample size was
a minimum of 30 interviews per type of trader, evenly distributed as far as
possible across the zones. An exception was the so-called "lorry trader" or
"independent produce wholesaler" who is involved largely in illegal transactions
and who plays an important role in the marketing system. Sampling for this type
of trader was not possible, but whenever there was an opportunity to meet such
traders and to gain their confidence and cooperation an interview was taken.

Interviews were carried out with standardized questionnaires (except
for lorry traders) by closely-supervised enumerators. During intensive on-the-
job training in test markets, the enumerators first tested the original question-
naires, which they afterwards helped to redesign. Interviews with lorry traders
were taken by the author hinself and the survey supervisor. In these cases,
the standardized questionnaire was taken as an interview guide. Whenever it
seemed promising certain questions were discussed extensively with the respondents.
In addition to data obtained from individual trader interviews, information on
the disposal of maize and beans was collected from each Maize and Produce Board
depot.

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11.   Originally a different approach for sampling agents had been planned.
It was the intention to use lists of agents, supplied by MPB depots operating
in the sampling areas, as a sampling frame. This plan had to be abandoned when
it was discovered that the lists obtained from the first depots visited were
incomplete or that only a very low proportion of agents listed were really active.
The majority who had licenses did not operate. Sagana depot, for example, listed
286 agents in 167 markets of Murang's Nyeri and Kirinyaga district, but only
about 25% were indicated as being active. After checking the supplies for the
previous season, it was evident that only about 10% of the listed agents had
really supplied the MPB depot regularly! Though the lists might have been more
accurate elsewhere, the Sagana example nevertheless indicated that a license
does not necessarily mean that the licence-holder acts in fact as an MPB agent.

The survey was carried out from April to October 1977. The study therefore reflects the situation before that relaxation and as it exists presently after the reintroduction of controls in June 1978.

Analysis of the survey data was carried out with the Statistical Package for the Social Sciences (SPSS).[12] It generated a weighted data file in the case of market traders and MPB agents for whom a reasonable stratified random sample was obtained; this was not the case for data on producers and lorry traders. The frequencies and parameters given in the study therefore are usually weighted figures except when statistical tests were applied. All figures, tables and charts are derived from the author's Maize and Beans Trader Survey, 1977 unless otherwise indicated.

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12.   Not all data gathered is presented in this report. File documentation with all primary data including basic statistics is available to interested researchers in the IDS Library.

2. FRAMEWORK OF MAIZE AND BEANS MARKETING

2.1 Production Patterns

It was pointed out earlier that smallholders play an important role in maize and beans production. Of an estimated total number of 1,704 million smallholders in Kenya (see Casley and Marchant 1978, p. 8), almost 90% grow maize and 70% grow beans (Kenya, 1977. Integrated Rural Survey 1974-75, p.80). On average in 1974/75, they planted 0.93 hectares of local and/or 0.67 hectares of hybrid maize and 0.75 hectares of beans. Beans are grown in a large number of varieties, the most common ones being Rose Coco, Red Haricot, Mwezi Moja and Canadian Wonder (Van Rheenen 1976, p. 6). The area devoted to maize and beans increases slightly with holding size. In the smallest size group (below 0.5 hectares) the mean area was, for example, 0.43 hectares for local maize and 0.33 hectares for beans. In the second largest size group (5.0-7.9 hectares), the mean area was 2.09 hectares for local maize. In the largest size group (8.0 hectares and above), the mean area was 1.43 hectares for beans (see Table AL, Appendix).

The estimated total smallholder production of maize for the period 1975-78 lay between 1.3 and 1.5 million metric tons (Kenya, Crop Forecast 1978, pp. 2, 5). Smallholder production accounts for more than 80% of total maize production according to figures available on large scale production (see Table A2, Appendix). This estimate, however, seems too high and does not agree with the Maize and Produce Board intake during 1975-1978. One reason for the discrepancy might be that a large number of medium scale farmers, whose contribution to total maize production is quite substantial, are covered neither by the smallholder survey nor by the large farm survey.[1] If large scale production figures are adjusted by taking into consideration the estimated consumption figures (see chapter 2.3), smallholder production seems to account for about 70% of total production.

Smallholder production of beans for the period 1975-1978 was in the range of 150,00-165,000 metric tons. This figure virtually represents total production because this crop is rarely grown on a large scale basis (Kenya Statistical Abstracts 1977, pp. 124-29).

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1.   The large farm survey sample frame of the CBS is currently under review. So far, only farms from 50 acres and above are covered. Thus, medium sized farms of 20 to 50 acres are neither covered in the small farm nor in the large farm surveys.

Cotton Zone (See Table 3). The same pattern holds for Central and Eastern provinces, where the Cotton Zone, with 19.94% of total smallholder production, was the major maize production zone, followed by the Tea Zone and Lower Cotton Zone. All zones in Central and Eastern provinces contribute about 30% of the value of total maize production. The production in the coastal zones is predictably relatively low, accounting only for about 3% of total production.

The regional distribution of beans production is seen in Table 4. It shows that, contrary to maize, beans production is mainly concentrated in Eastern and Central provinces, where about 86% of farmers (Eastern) and 98: (Central) grow beans. These two provinces account for around 70% or more of total production, depending on the harvest. Again, the major contribution within these provinces comes from the Coffee Zone which in the IRS-I sample had a share of 47.46% of the total output value for beans. After the Coffee Zone in output comes the Lower Cotton Zone with a share of almost 20%, followed

Table 4: Distribution of Smallholder Beans Production by Province 1974/75 and 1976/77.

Province	1974/75[a]		1976/77	
	'000 MT	%	'000	%
Central	38.33	26.00	63.90	37.77
Coast	0.91	0.62	–	–
Eastern	75.70	51.34	50.40	29.79
Nyanza	15.26	10.35	14.94	8.83
Rift Valley	0.74	0.50	14.94	8.83
Western	16.50	11.19	26.10	15.43
TOTAL	147.44	100.00	169.20	100.00

Note: a. Excludes pastoral and large farm area.

Source: Kenya. 1977. Integrated Rural Survey 1974/75, p. 82 and Crop Forecast 1978, p. 6.

by the Tea Zone with approximately 17%. For western Kenya too, the most
important beans production zone in agro-ecological terms is the Coffee Zone
(12.16% of output value), whereas all other zones contribute only marginally,
as is the case with the coastal zones. In terms of provinces, Western Province
is the major beans producer west of the Rift Valley.

The geographic distribution of production should be examined
together with the seasonal distribution of production which has important
implications for the operation of the marketing systems. Tables A3 and A4
(see Appendix) show that harvest times for maize and beans differ considerably
between provinces and even between adjacent zones within provinces. Both
crops are harvested throughout most of the year somewhere in the country.
Harvest times in different regions and zones therefore complement each other
to some extent so that interregional and interzonal flows of produce may
reduce the necessity of longterm storage.

Intraregional-interzonal flows seem to be as important as inter-
regional, long-distance flows. Apart from Rift Valley, all maize growing districts
have zones with a second short-rain crop enabling them to supply nearby zones
that do not have a second crop. Furthermore, the long-rain crop within one
region is usually harvested at different times in different zones, often with
a time lag of one or two months between zones.

Intraregional flows may be supplemented by interregional ones if
supply in one region is not sufficient or in regional slack seasons.[4]
Particularly important in this regard is the time lag of the Rift Valley
long-rain maize harvest and the times of beans harvest in Western and Nyanza
provinces. These harvest times lag about three to four months behind the
harvests in other parts of the country. Correspondingly, maize and beans are
harvested in Central, Eastern and Western Kenya during the Rift Valley slack
seasons.

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4.   In zones with two harvests, the short-rain production was only about
35% of the long-rain production (1976/77). See Kenya. Crop Forecast, 1975, p. 2.

2.2 Supply Patterns

The supply or sales patterns to a large extent reflect the production
system. Because of the high share of smallholder production, the marketing
system is faced with an extremely dispersed supply structure, except in some
parts of Rift Valley. The very high number of small holdings, 75% comprise less
than 2 hectares (see Casley and Marchant 1978, p. 8), together with the fact
that maize and beans are food crops grown mainly for personal subsistence,
explains that on average only about 30% of total maize production and 25% of
beans production are marketed by smallholders (see Tables 7 and 8). For maize
which is also grown on a large scale, this means that total smallholder
marketed maize production ranges between roughly 45% and 50% of the total
marketed maize production. In other words, though large scale producers con-
tribute only 25-30% of total production, their share in marketed production is
about 50-55%.

In addition, not all smallholders participate equally in the marketing
of maize. The distribution of sales of maize and beans is rather skewed, as
Table 5 reveals.

Table 5: Value of Sales of Maize and Beans by Percentage of Producers and
          Value of Sales

Value of Sales of Each Crop (KShs.)	Maize		Beans	
	% of Producers	% of Sales	% of Producers	% of Sales
Less than 20	63.1	0.3	75.2	0.3
20 - 49	9.2	1.4	7.2	2.6
50 - 99	6.0	1.9	5.2	4.2
100-499	12.4	13.7	9.1	21.6
500-999	3.4	11.4	0.9	7.2
1000-and more	5.8	71.4	2.3	64.1

	Maize	Beans
No. of Producers	1,429.1	988.9
Value of Sales (Million KShs.)	310.0	84.0

Source: L.D. Smith. 1977. The Kenya Integrated Rural-Phase 1, p. 77.

the majority of smallholders sell very little in value terms. About 71% of maize and 64% of beans marketed in 1974/75 were sold by only 5.8% (maize) and 2.3% (beans) of maize and beans producers. This, however, does not necessarily mean that these farmers all fall into the larger farm size categories. Rather, it seems to be the case that relatively high sales are made across more or less all size categories (see Table 6).

Table 6:   Percentage Distribution of Producers and Value of Sales by
           Size of Holdings 1974/75[a]

Size Group (hectares)	% of Producers			Value of Sales as % of			
	Maize		Beans	Value of Production		Total Value of Sales[b]	
	Local	Hybrid		Maize	Beans	Maize	Beans
Below 0.5	14.34	12.21	12.13	5.59	7.85	24	22
0.5 - 0.9	17.84	15.55	17.41	16.62	9.62	27	20
1.0 - 1.9	28.13	23.81	29.92	21.07	31.31	26	23
2.0 - 2.9	15.59	15.51	15.02	17.54	18.90	34	37
3.0 - 3.9	8.54	11.01	9.04	6.78	10.20	25	23
4.0 - 4.9	7.65	6.80	7.41	15.76	8.98	42	29
5.0 - 7.9	5.20	9.68	6.29	9.01	12.72	30	35
8.0 and above	2.72	5.42	2.75	8.12	0.42	39	7
TOTAL	100.00	100.00	100.00	100.00	100.00	31	26

Notes: a. Excluding pastoral and large farm areas.
         b. Rounded to the nearest whole percentage.

Source: Derived from Kenya, Integrated Rural Survey 1974/75 and
          unpublished IRS-1 data.

Smallholder maize producers with more than 5 hectares (8% of local maize and 15% of hybrid maize producers) account for only roughly 17% of total sales, whereas maize farmers with less than 3 hectares (75.9% of local and about 67% of hybrid maize growers) have a share of nearly 61% of total maize sales. The same pattern holds true for beans farmers. Those with more than 5 hectares (9.04% of total beans producers) account for about 13% of total sales, whereas those with holdings below 3 hectares (around 75%) account for about 68% of the total sales value. Thus, the distribution of maize and beans sales by size of holdings is not as skewed as one might expect when looking at Table 5.

Similarly, the number of sales transactions by quantity sold in one transaction
is more equally distributed. More than 50% of maize and 60% of beans sales, by
number of transactions, are in amounts of 30 kilograms (maize) or 40 kilograms
(beans) or less (see Casley and Marchant. 1978, pp. 52, 54).

Table 7: Percentage Distribution of Market Supply (Quantity) of Maize and
          Beans by Province 1974/75[a]

| | Maize | | Beans | |
Province	% of Pro- duction	% Total Marketed Output	% of Pro- duction	% of Tatal Marketed Output
Central	20.45	9.18	15.57	14.61
Coast	1.35	0.08	2.33	0.05
Eastern	22.20	7.55	26.87	49.87
Nyanza	41.93	52.61[b]	60.86	22.78
Rift Valley	34.80	13.10[b]	20.08	0.37
Western	32.44	17.47	30.51	12.33
TOTAL	30.98	100.00	25.69	100.00

Notes: a. Excluding pastoral and farm areas.

        b. Taking the national production figures of 1976 to 1978 into account,
            Rift Valley would be in much the same position as Nyanza in 1974/75,
            and vice versa. In 1977/78, smallholders in Rift Valley marketed
            about 38% of the total production and contributed 63.6% to total
            national marketed production. Nyanza, faced with a bad harvest, sold
            only 18.6% of the production, which accounted for only 9.7% of the
            total marketed production. See Kenya. Crop Forecast 1978, pp. 2-3.

Source: Derived from Kenya. Integrated Rural Survey 1974/75, pp. 80, 82.

        Table 7 and 8 show the regional pattern of smallholder maize and
beans supply in 1974/75. In that year, smallholders in Nyanza, Rift Valley and
Western provinces marketed on average a higher proportion of their maize
production relative to smallholders in other provinces. Thus, because these
provinces accounted for the highest national contributions, the supply patterns
became even more pronounced than the regional production pattern. The 1976-78
figures, which include the former scheduled areas in Rift Valley, show that this
tendency continued to hold true for maize. The difference, however, is that in
the later years Rift Valley overtook Nyanza as the dominant smallholder maize
supplier. In 1977/78 smallholders in Rift Valley Province sold the highest
proportion, 38%, of total production; because of relatively high production
figures, these sales accounted for 63.6% of total marketed smallholder production

(see footnote b, Table 7). If in addition, the large farm supplies are taken into consideration, Rift Valley Province, particularly the western parts (High Altitude Grassland Zone), definitely becomes the major surplus area. It is followed by the Coffee Zones of Nyanza, Western, Central and Eastern provinces (see Table 8).

Table 8:   Percentage Distribution of Market Supply of Maize and Beans by Major Agro-Ecological Zones 1974/75[a]

		Maize		Beans	
Zone		% of Value of Pro-duction	% of Total Value of Marketed Output	% of Value of Pro-duction	% of Total Value of Marketed Output
West	Tea	22.82	9.45	25.00	0.59
of	Coffee	44.10	61.56	46.98	22.24
Rift	Upper Cotton	24.62	8.26	27.27	1.78
East	Tea	11.63	2.16	5.01	3.33
of	Coffee	22.67	14.51	16.68	30.80
Rift	Lower Cotton	28.57	3.93	52.91	41.14
Coastal Zones		1.27	0.13	3.03	0.12
TOTAL		31.14	100.00	25.67	100.00

Note: a. Excluding pastoral and large farm areas.

Source: Derived from L.D. Smith. 1977. The Kenya Integrated Rural Survey, Tables 6 and 7.

The outstanding position of Rift Valley in maize supply seems to be so pronounced that not even adverse weather conditions in that province would change the basic regional supply pattern. Of course, the effect on the level of national supply might be crucial in such a case, were it not balanced out by favourable production conditions in other areas. This was the case in 1974/75 when a good harvest in Nyanza balanced out bad harvests in the Rift Valley. This example also indicates that the marketing system must be very flexible to cope with changes in regional supply patterns; one cannot just concentrate on the marketing system in one major supply area.

The marketing system for beans is also faced with changing regional supplies (see production figures in Table 4). Compared to maize, there seems to be a difference in that the areas and zones with the highest production sell a lower proportion of it than areas with lower production. In 1974/75, for example, Nyanza accounted for only 10.35% of national production but marketed more than 60% of it. In contrast, Eastern Province, the major producer with a share in total production of 51.35%, sold only 26.87%. For beans, then, the regional supply pattern is less pronounced than the production pattern.

In particular in Western Kenya, the Coffee Zones of Nyanza and Western provinces (see Table 8) become more important in terms of supply (22.24%) than in terms of production (12.16%). Farmers there sold about 47% of their production. The major differences between production and supply patterns, however, can be observed in the Coffee and Lower Cotton zones East of Rift. Compare smallholders in the Coffee Zone, who as the major producers (47.5% of total production) sold only about 17%, with smallholders in the Lower Cotton Zone, who sold roughly 53% of their production to account for only 20% of the national total. In 1974/75 therefore, the Lower Cotton Zone East of Rift became the major supply area for beans, followed by the Coffee zones East and West of Rift. The high marketed proportions in the Lower Cotton Zone East of Rift and the Coffee Zone West of Rift suggest that a considerable number of farmers in those areas grow beans as a cash crop.

The seasonal pattern of supply follows the pattern of harvest times shown in Table A3 and A4 in the Appendix. Variations between years may be considerable depending on the timing of the rains. For maize, the sales usually peak after a time lag of one to three months from harvest. The major supplies of maize therefore appear from January through March in Rift Valley and Western provinces, September through December in Eastern Province, and from October through December in Central, Nyanza and Western provinces (see Casley and Marchant 1978, pp. 36, 39, and Hesselmark and Lorenzl 1976, p. 163). April through June are slack months for all provinces. The peaks for beans sales are usually earlier by approximately one to two months.[5]

Major determinants of the seasonal and regional supply patterns are the diversified production conditions in Kenya. It will be seen later that these are to a great extent responsible for the complex structure of the

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5.   Often beans are interplanted with maize and need only three months to mature.

marketing systems. As mentioned earlier, another important factor is the high proportion of smallholder **production which** leads to an extremely dispersed supply structure. This dispersed structure is moreover rather unstable because the subsistence demand for food, especially maize and beans, has a tendency to intensify the effects of weather conditions on harvests. Bad harvests, for example, often result in an absolute as well as a relative decline in marketed output because subsistence requirements must first be satisfied. Supply in these cases is a residual of demand.

2.3 Demand Patterns

Maize and beans are the major staple food crops particularly for the low-income sections of the population. Their importance naturally varies from region to region.[6] Maize is usually consumed as maize meal (flour) and whole maize, green or dry.[7] Only a very low proportion is consumed in the form of breakfast cereal and corn oil or is processed to starch. Maize is also used as animal feed, though so far on a very low scale.[8]

Table 9: Estimated Rural and Urban Demand for Maize and Beans 1975

| | Maize Flour | | Beans[a] | |
	Total '000 MT	Per Capita Kg/year	Total '000 MT	Per Capita Kg/year
Rural[b]	1,465.63[c]	122.79	134.38	11.26
Urban	147.35	90.18	17.12	10.48
TOTAL	1,612.98	118.86	151.50	11.16

Notes: a. Based on home produced consumption only.

   b. Under the assumption that 80% of "Other Cereal Flour" purchased was maize flour.

   c. Under the assumption that all home produced maize grain is consumed as maize flour.

Source: Derived from M.M. Shah **and** H. Frohberg. 1979. Tables 17-23.

6.   See Tables A5 and A6 (Appendix) and Shah and Frohberg. 1979, Tables 17, 25 and 31-36. In urban areas, beans are less important than in the rural areas.

7.   Unfortunately, up to **the** present no breakdown of figures is available to specify the consumption of green maize, milled maize (posho and sifted), or other forms in common use.

8.   One of the major reasons is the relatively high price despite the subsidy.

Beans are usually consumed in various cooked forms without prior processing.[9]
Because of their high protein content, they are particularly important
nutritionally.

Since the majority of Kenyans live and work in rural areas,[10] the
demand there far exceeds the urban demand. Rural Kenyans account for
approximately 90% of the total demand for maize and beans (see Table 9);
this figure includes subsistence demand. However, even in terms of market
demand rural areas dominate. An interesting fact which emerged from the
IRS-1 data is that food retained from production for subsistence needs accounts
for only 50% of total food consumption (see Table A5), Appendix). As far as
maize is concerned, on average approximately 35-40% of total consumption seems
to have been based on purchases. In other words, only around 60-65% of
consumption was covered by retained production, which corresponds to about 56%
of production.[11] The high retention of beans production (77.2%) indicates that
the percentage of purchased beans must be lower than that of maize, probably
around 15-20%.[12] The figures suggest that on average smallholders seem to sell
maize and beans despite the fact that the remaining amounts are insufficient
to meet their own requirements and that they must buy back considerable quantities
of those crops later.

This pattern is particularly true for the poorer smallholders.
They buy back a greater proportion than the higher-income groups (See Table
A5, Appendix). Assuming the above percentages, altogether the rural market
demand for maize or maize flour[13] accounts for about 80% of total demand.

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9.   Only the variety Mexican 142 is grown exclusively for processing.
Other varieties are processed only if there is surplus.

10.   The estimated rural population accounted for 87.9% of total popu-
lation in 1975. Shah 1978, Tables An 1 and An 2.

11.   Derived from Table A6 (Appendix) and from Shah and Frohberg 1979,
Table A17. Table A17 contains the category "Other Cereal Flour" which was
derived from IRS data where cereal purchases were not differentiated. In their
calculation of per capita consumption of maize or maize flour, they assumed
that 80% of other cereal was maize.

12.   Derived from Table A6 (Appendix) under the assumption that beans
account for less than 10% of purchases.

13.   Separate figures for demand of maize and maize flour were not
available.

Table 10. Distribution of Rural Demand for Maize and Beans by Province 1975[a]

Province	Total Demand			
	Maize Flour		Beans	
	'000 MT	%	'000 MT	%
Central	233.77	15.95	35.91	26.72
Coast	85.89	5.86	1.18	0.88
Eastern	265.28	18.10	75.66	56.30
Nyanza	318.92	21.76	8.92	6.64
Rift Valley	374.76	25.57	2.16	1.61
Western	187.01	12.76	10.55	7.85
TOTAL	1,465.63	100.00	134.38	100.00

Note : a. Under same assumptions as Table 9.

Source: Derived from Shah and Frohberg 1979, Tables 17-23, 33.

This is approximately 3.5 times the demand in urban areas (see Table 9). For
beans, the rural market demand ranges between 55% and 60% of total demand.
These percentages demonstrate that the rural marketing **sub-systems for maize**
and beans are important not only as outlets but also as sources.

Comparing Table 10 with Table 2, it can be seen that the regional
distribution of rural demand follows the distribution of production, except
for maize in Eastern **Province**. The major producers (Rift Valley for maize
and Eastern for beans) are also the major consumers. Furthermore, the tables
show that rural areas in all provinces, except Eastern and Coast provinces,
could meet their maize requirements through smallholder production unless af-
fected by bad harvests. Typically there has even been a small surplus, the
highest being in Rift Valley. In beans, all areas except the Coast Province
seem to be self-sufficient, although Eastern Province may fall short during a
low harvest as happened in 1976/77. With regard to Eastern Province, it should
be kept in mind that consumption figures are based on the favourable 1974/75
results. Assuming that consumption patterns vary with harvest results, per
capita consumption may have been lower in 1976/77. The same condition applies
to maize consumption in Nyanza during 1976/77.

Consumption patterns are likely to vary not only with harvest results
but also with time. Consumption can be assumed to follow seasonal production
and supply patterns but supporting figures are not yet available.[14] These
figures would indicate the seasonal periods of surplus and deficit for each
region and show the pattern of potential marketing flows over time and space.
In this regard, the overall figures per province and year are of limited use.

2.4 Marketing Infrastructure

The term marketing infrastructure is used in this study to refer
to that part of the national infrastructure which determines and facilitates
marketing operations. Especially important are the spatial organization of
settlements, the transportation and communication networks, and access to
financial institutions.

As mentioned earlier, the degree of urbanization in Kenya is still
relatively low. Only about 12% of the population lives in urban centres, the
major ones being Nairobi, Mombasa, Kisumu and Nakuru. The rural settlement
structure is largely dispersed with smallholders usually living on their farm.
Rural market or trading centres provide the necessary central services which
naturally increase with the size of the centre. Although there are no
statistics on population by size of rural centres, the sample frame (see
section 1.2) suggests that about 80% of these market centres are relatively
small. Bigger market centres, including townships such as Nyeri, Karatina,
Embu, Meru, Kisii, Kisumu and others, are greatly overrepresented among CBS
sample markets. Nevertheless, a majority of these sample markets (52%) had no
more than 20 shops.[15] The relatively small size of rural centres corresponds
to the findings of the 1969 Census that over 70% of the existing localities,
(sublocations which often have more than one market centre) had a population of
less than 5000 (Kenya. Statistical Abstract 1977 p. 15). The high market
density, however, means that smallholders usually have fairly easy access to
the basic marketing infrastructure, that is, markets[16] and transport facilities
such as bus and _matatu_, which are used to transport small quanties of commodities
(see Table 11).

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14.   The new IRS data are supposed to include the seasonal consumption,
demand and supply patterns.

15.   Casley and Marchant 1978, Table 5.2. The table refers to satellite
communities of shops in or around the markets because major townships are
included. For the smaller market centres, however, these shops are usually
the only ones.

16.   It is not clear whether the figures refer to real so-called barter
markets or only to market centres, which do not necessarily coincide. As
mentioned earlier, there are numerous small market centres with shops but with-
out barter markets.

Table 11: Access of Smallholder Households to Marketing Infrastructure by
           Percentage of Households

| Province | Market Centre | | Bus Route | | Matatu Route | |
	Below 2 Miles	Above 4 miles	Below 2 miles	Above 4 miles	Below 2 miles	Above 4 miles
Central	41.71	19.62	64.95	14.08	73.88	10.67
Coast	22.38	56.29	68.12	9.23	66.57	15.06
Eastern	25.23	43.76	34.98	44.61	64.92	12.00
Nyanza	46.34	9.63	70.93	10.16	78.93	6.06
Rift Valley[a]	34.90	25.53	26.75	49.92	46.50	27.19
Western	38.36	24.35	53.86	11.08	67.02	10.51
TOTAL	37.09	25.66	55.30	23.08	69.88	12.15

Note: a. Excludes pastoral and large farm areas.

Source: Kenya. Integrated Rural Survey 1974/75, p. 40.

        In the densely populated areas of Central, Nyanza and Western provinces,
40% or more of smallholders find market centres within 2 miles and 75-90% find
centres within 4 miles. Bus and matatu routes are even closer to the holdings
since they can be found at the nearest possible road. Areas with lower
population density, such as Eastern and Coast provinces, generally have less
favourable access to the basic marketing infrastructure.

        Most roads that link small markets with each other and with bigger
rural and urban centres are not tarmacked.[17] During the rainy seasons, they
are often virtually impassable. This fact has important implications for the
interregional exchange of commodities in rural, particularly remote, areas.
The major market centres usually are connected by tarmac roads.[18]

        In addition to road transport, the railway is very important, parti-
cularly for transport of larger quantities over longer distances. Historically,
the rail network has had a major impact on the spatial structure of public
procurement centres and storage facilities. Most of them are located along
the main lines from Western Kenya and Nanyuki via Nairobi to Mombasa and they
largely serve the former scheduled large farm areas.

17.   Only about 10% of all roads including international and national
bank roads were tarmacked by 1977. See Kenya. Statistical Abstracts 1977,
p. 211.

Like the transportation infrastructure, access to communication and banking facilities is not very conducive to marketing in rural areas. With the exception of the larger urban market centres, communication largely depends on personal contacts. Newspapers are not widely distributed in rural areas although this fact is partly due to the high rate of illiteracy. More revealing is the fact that radios are not yet common in rural smallholder households. The average ratio of radios per household is 0.23 (see Kenya Integrated Rural Survey 1974-75, p. 41).

Telephones do exist in a number of the larger market centres. Among the CBS sample markets, 62% had a telephone within the trading centre in which the market was located (Casley and Marchant 1978, par. 5. 18). But telephones are not necessarily available to the public and connections are often difficult. In general, however, the potential exists for secondary and terminal markets to be linked by telephone. Access to banking facilities seems likely to remain limited for some time. In 58% of the CBS market centres, for example, banks were located more than 10 km away (Casley and Marchant 1978, par. 5. 18). This is not unexpected in view of the settlement structure described above.

2.5   Marketing Regulations and Controls

As pointed out early in this discussion, maize marketing, and to a lesser degree beans marketing, are subject to regulations and controls executed primarily by the Maize and Produce Board (MPB). The MPB was established in 1966[19] under the enabling powers of the Agricultural Produce Marketing Act.[20] The Act, which dates to 1936, specifies the constitution, powers and regulations of Marketing Boards; delineates the powers of the Minister of Agriculture to fix maximum, minimum or specific producer prices for regulated produce; and contains the Agricultural Produce Marketing (Maize and Produce Board) Order which led to the establishment of the MPB.

The regulations, their execution and the degree of control over maize

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18.   Among the CBS sample markets, small and big, about 43% had tarmac connections.

19.   The MPB was preceded by the Maize Control and Maize Marketing Board. For a brief history of maize marketing legislation, see Hesselmark 1977, pp. 1-4.

20.   Kenya. The Agricultural Produce Marketing Act. Laws of Kenya, Cap. 320. The objectives stated are "to control and regulate the marketing of agricultural produce, to enable Marketing Boards to be established for marketing such produce and to provide for the powers and functions of such Boards, and for matters connected therewith and incidental thereto".

marketing are laid down more specifically in the Maize Marketing Act.[21] Their general provisions apply also to beans and other scheduled produce. The basic regulations are summarized below (see Kenya. Maize Marketing Act, p. 5). The primary functions of the MPB, as stated in the Maize Marketing Act, can be described as follows:

1. to regurate, control and improve the supply, distribution and all other maize marketing activities including storage;

2. to carry out all operations including import and export in order, so far as possible, to fulfil the requirements both of consumers and producers in Kenya;

3. to advise the Minister of Agriculture on production, import and export of maize.

In order to carry out its functions the MPB is empowered to appoint agents to act on its behalf within certain limits. Among other conditions, the Board controls the definition of the area in which the agent is allowed to operate.[22] With the consent of the Board, agents may appoint subagents.

Section 15 of the Act grants the MPB a monopsony and monopoly position for all maize above subsistence requirements as well as beans and other produce. Subsection 1, subject to the exemptions of subsection 5 dealing with subsistence consumption, states as follows:

All maize grown in Kenya shall, subject to the provisions of this Act, be purchased by and sold to the Board, and shall, without pre-judice to the Board's liability for the price payable in accordance with section 18 of this Act, vest in the Board as soon as it has been harvested:

Provided that the Board's liability for such price shall be conditional upon the delivery of the maize in accordance with subsection (2) of this section, and upon its acceptance by the Board.

The MPB is empowered to specify the terms of delivery. The maize must be delivered in a "fit state". The risk up to the time of delivery lies with the producer unless the Board, with the concurrence of the Minister of Agriculture, specifies a date after which the Board accepts liability for the crop and compensates the owner for any loss or deterioration where the delay in delivery is due primarily to the action or non-action of the Board (see subsection 4). Although the MPB

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21.   The Act is described as "an Act of Parliament to make provisions for regulating the collection, purchase, storage, marketing, distribution and supply of maize and maize products and to provide for the registration of certain maize millers, to establish a Maize Marketing Board and prescribe its functions, powers and duties, and for matters incidental to and connected with the foregoing". Kenya. The Maize Marketing Act, p. 4.

22.   See The Maize Marketing Regulations, Form A, Certificate of Appointment of Agent for Purposes other than the handling of Maize and Maize Products for Export. Kenya. Maize Marketing Act, p. 32.

"may specify", it is not obliged to do so, and the author is aware of no such case in the recent past. The practice seems to be that producers are obliged to sell or deliver maize (and other produce) in a fit state as soon as possible after harvest, but are not compensated if the MPB fails or is not able to absorb all surpluses. The same condition applies to most MPB agents: they must deliver all maize and produce as soon as possible.

To ensure the MPB's monopoly position over all movements of surplus maize, controls are imposed by subsidiary legislation under section 24, the Maize Marketing (Movement of Maize and Maize Products) Order (see Kenya. _Maize Marketing Act_, p. 28). According to this Order, all movements of maize, with some exceptions, require a movement permit valid for only 24 hours which must be obtained from the MPB or another authorized person. Movements at night are generally prohibited. Exempted from these regulations are: the movement of maize or maize products within the boundaries of the farm, the movement of not more than 2 bags (180 kg) accompanied by the owner, and the movement of not more than 10 bags within the boundaries of a district accompanied by the owner and intended for consumption by the owner or his family. With regard to district boundaries, the Board may declare that two or more contiguous districts shall be treated as one (Kenya. _Maize Marketing Act_, pp. 27-28). If contiguous districts are not declared as one and a farmer wants to take 3 bags to the market or to an agent located in the adjacent district, he first must obtain a permit, often from a place farther than the market he wants to reach. The same movement regulations apply to beans. The above regulations, prescribed under terms of the Agricultural Produce Marketing Act, are the major rules governing domestic marketing of maize grain. The Act also provides for import and export of maize and maize products, the registration and duties of mills, the operation of the Maize and Produce Board and penalties for violation of the Act.

The Price Control Act should be mentioned within the context of marketing regulations and controls (Kenya. Price Control Act). The Agricultural Produce Marketing Act and the Maize Marketing Act regulate the fixing of producer prices by the Minister of Agriculture. This applies to both maize and beans. In addition, the Price Controller, housed in the Ministry of Finance, fixes the MPB depot, wholesale and retail prices for maize and maize flour. (So far beans have not been price controlled by this office). Consequently, except in the informal subsystem, prices for maize are fixed at all levels of the marketing system. The District Commissioner as Deputy Price Controller has the power to adjust prices if local conditions require it. He apparently even has the power to ban all maize and other marketing activities in markets within his district as occurred in Kitui. Further controls are thereby added to those imposed by the marketing control legislation.

3. STRUCTURE OF THE MAIZE AND BEANS MARKETING SYSTEMS

3.1. Marketing Functionaries

The Maize and Produce Board (MPB) is the dominant marketing institution in the maize and beans marketing systems. The following main functionaries also can be distinguished: market traders, produce stores or MPB agents and produce independent wholesalers (lorry traders) and processing enterprises. Of lesser importance are cooperatives, only some of which are involved, often to a very limited extent, in maize and/or beans marketing. The same is true for general wholesalers and retail shops which as far as maize is concerned are more involved in the distribution of maize flour (see Spliet. 1978).

Market traders are members of the so-called informal marketing sub-system. They usually operate on a local level in the open-air markets where transactions are exempt from any direct controls. Table 12, which summarizes the basic characteristics of the major marketing functionaries, shows that the majority of market traders for maize and beans are women between 30 and 50 years old. Their standard of formal education is usually very low. More than 50% of maize traders and more than 60% of beans traders never attended school, though a few of them (10.3% and 3.4% respectively) reached Form II or higher. Before they engaged in trade, most of them had been with the family, either unemployed or farming. Fewer than 10% (maize) or 5% (beans) had been previously employed, and fewer than 1% had been in any other trade or business. On average they had 6 to 7 years experience in maize and beans trade. The median value, however, was 3.1 years (maize) and 2.8 years (beans) showing that fluctuation within the trader population must be relatively high.

Market traders usually work alone and concentrate on maize and/or beans trade. Especially in Western Kenya,[2] many maize traders (45.3%) dealt solely in maize. By contrast, the number of beans traders handling beans only was relatively small (12.6%). The majority of beans traders (71.4%) also handled maize; 16.8% handled millet and/or sorghum;[3] 19.3% dealt in other produce such as cow peas, green grams and groundnuts; and 11.6% handled other crops or food items, such as potatoes, other vegetables and fish. Only 39.1% of maize traders, mainly those in Central Kenya,[4] also traded in beans. Millet and/or sorghum were handled by about 19% of maize traders, other produce by only 8%, other crops or food items by 11.3%, and non-food items (such as hides and skins) by only 0.1%.

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1. For the marketing of maize and beans by cooperatives in Kenya, see in particular J. de Graaff. 1978.
2. In Western Kenya 72.5% of all maize traders handled only maize. They accounted for 76.3% of all "pure" maize traders.
3. In Western Kenya the member of beans traders who handled millet and/or sorghum rose to 5.9%.
4. Central Kenya accounted for 57.8% of maize traders who handled both crops.

Table 12. Basic Characteristics of Major Marketing Functionaries

		Market Trader		Produce Store (MPB Agent)	Produce Whole-saler[b] (Lorry Trader)
		Maize	Beans		
Sex (%)	Male	29.2	12.4	78.1	65.0
	Female	70.8	87.6	21.9	35.0
Age (%)	Below 30	37.2	13.3	8.4	10.0
	30 to 50	54.8	73.8	71.6	85.0
	Above 50	8.0	12.9	20.0	5.0
Education (%)	Illiterate[a]	52.9	61.7	29.5	15.8
	Standard 4 - 8	36.7	34.8	61.1	68.4
	Form 2 and above	10.3	3.4	8.3	15.8
	Other	0.1	0.1	1.2	-
Prior Activities (%)	School	16.5	4.5	6.5	5.6
	Unemployed/Family	34.3	35.5	28.5	11.1
	Farming	38.2	54.8	48.7	33.4
	Employed	9.8	4.0	11.0	33.3
	Self employ (excl. trade)	0.3	0.5	-	-
	Trade/Business	0.9	0.7	5.4	16.7
Seasonality of activity	% not active all time	49.2	34.1	9.4	20.0
	Mean period inact. (weeks)	10.0	15.3	27.8	19.8
Experience (no. of years)	Mean	6.5	6.5	8.4	9.5
	Std. dev.	7.4	7.9	10.6	7.6
Partnership		1.8	1.4	22.0	40.0
Product mix % of traders with	Maize/Beans only	45.3	12.6	21.4	10.0
	Maize and Beans	39.1	71.4	56.5	90.0
	Sorghum/Millet	18.9	16.8	13.8	25.0
	Other Produce	8.0	19.3	8.4	35.0
	Other Food	11.3	11.6	44.3[c]	40.0[c]
	Non-Food Items	0.1	-	6.5	15.0
Income from Maize and Beans as % of total trade income		86.0	77.2	67.9	68.9
Mobility	% Resident trader (not moving)	35.4	34.3	N.A.	N.A.
	Itinerant trade within 50 km radius % of traders	50.8	55.8	N.A.	N.A.
	Mean radius	24.8	21.8	N.A.	N.A.
Mobility	Itinerant trader above 50 km radius % of traders	13.8	9.9	N.A.	N.A.
	Mean radius	77.9	154.8	N.A.	N.A.
Mean working capital (KShs.)		759	1,042	7,620	48,988
Mean Turnover per year (bags)	Maize	350[d]	414[d]	3,020[d]	27,994[d]
	Beans	332	280	753	9,920
% of Traders with other sources of income	Farm	69.3	70.2	58.2	35.0
	Non-farm	3.2	9.3	23.8	25.0
	Total	70.2	70.9	18.6	58.8
Trading income as of total income (mean)[e]		50.0	45.0	55.5	56.9

Notes: a Without formal education.   b Unweighted.
        c Including processed food.   d Only traders handling beans/maize.
        e For traders with other sources of income.

Source: Own compilation.

Overall, the degree of specialization in the informal maize and beans trade is relatively high, both crops contributing 86% (for maize traders) and 77.2 for (beans traders) of the total trading income. Trade in other products is usually a sideline of the main business, probably to bridge slack seasons. Many traders stop trading for a period of the year. Among maize traders, 49.2% average 10 weeks without trading, while 34.1% of beans traders halt for an average 15 weeks. However, this does not mean that they are idle during these periods. Around 70% of the market traders have other sources of income, usually a small farm which may require their labour 69.3% of maize traders and 70.2% of beans traders derived an income from farming; 3.2% and 9.3% respectively had income from non-farm sources. In terms of income generation, trading and nontrading activities seem to be equally important for those maize traders, each contributes 50% total income. For beans traders with other sources of income trading activities seem to be somewhat less important, accounting for 45% of total income generated.

The trading income depends largely on the scale of operation. Because of the working capital at hand, the scale is generally quite low. Maize traders operating with an average working capital of about KShs. 760 had an annual turnover of 350 bags of maize. For beans traders, with a working capital of KShs 1,042, the annual turnover was 280 bags. Traders handling both maize and beans had a relatively higher turnover in both crops (414 bags of maize and 332 bags of beans).

For the majority of traders, however, the scale of operation is much lower than the average figures indicate. The distribution of both variables, working capital and turnover, is heavily skewed. Most traders (75%) operated with a working capital of less than KShs 500 in maize and less than KShs 600 in beans trade. The median values were KShs 402 (maize) and KShs 302 (beans). Figures on turnover show that 75% of maize traders handled fewer than 340 bags and 50% handled fewer than 240 bags of maize annually. The corresponding figures for beans traders show that 75% handled fewer than 280 bags and 50% handled fewer than 100 bags of beans annually.

There are considerable regional variations, however, as Table 13 reveals. Traders in maize and/or beans in Eastern Kenya, the major rural deficit area, on average seem to have significantly higher working capital and turnover than traders in other parts of the country. The figures should be regarded with caution, however, since the sample was affected by the banning of maize and beans trade in markets of Kitui District. In Western Kenya, the level of working capital and turnover are particularly low for beans.

Table 13. Average Working Capital and Turnover of Maize and Beans
for Market Traders by Basic Sample Zones, 1977.

ZONE	Turnover (bags)		Working Capital (KShs.)	
	Maize	Beans	Maize Trader	Beans Trader
Western	312	113	338	269
Central	34	316	975	1,184
Eastern[a]	1,012	658	4,457	3,225
TOTAL	350	280	759	1,042

Note. [a]Sample not representative because maize and beans marketing were
banned in Kitui District.

Source: Own compilation.

The majority of market traders are mobile and move between two or
more markets, usually taking advantage of price differences for arbitrage
activities.[5] Only about one third of maize and beans traders do not move and
therefore could be termed resident traders. The rest are itinerant traders
who can be further differentiated with regard to either their catchment area
or the distances they bridge. Though the differentiation is somewhat arbitrary[6]
market traders who bridge no more than 50 km between markets can be viewed as
intraregional traders; those who travel more than 50 km to the next selling or
buying market tend to link different regions and therefore can be called inter-
regional traders. The latter, who largely belong to the group of bigger
traders, account for approximately 14% of maize traders and 10% of beans
traders; they travel an average distance of around 78 km (maize) or 155 km
(beans) respectively. Apparently, interregional beans traders travel longer
distances which most likely reflects the production situation.

The largest category is that of intraregional traders who account
for 50.8% of maize traders and 55.8% of beans traders. They travel to the
next market which is an average distance of about 25 km (maize) or 22 km
(beans). Distances recorded for Eastern Kenya are comparatively higher for
intraregional as well as interregional traders.[7] This is largely explained
by the effects of relatively low population density on market centre density
(see sample frame, chapter 1.2).

5.   Around 20% of maize and beans traders had more than two buying and/
or selling markets. When moving, they often cross district boundaries.

6.   The travel distance is in part of a function of population density.

7.   The mean travel distances (km) of traders for the basic sample zones
were as follows:

	Western	Central	Eastern
Maize traders	32	33	189
Beans traders	35	21	190

In view of the regional and seasonal patterns of supply and demand
which necessitate constant intraregional and interregional trade flows to
link surplus and deficit areas, itinerant market traders who perform this
function play an important role within the marketing system for maize and
beans. Their position is especially vital since other private marketing
functionaries are generally not permitted to participate in these marketing
flows except through the MPB. Without controls, MPB agents would increasingly
involve themselves in these marketing transactions.

MPB agents refers in this study to private individuals appointed by
and acting as agents of the MPB. Not covered by the survey are certain other
institutions which may act as MPB agents: cooperatives and, in Rift Valley,
the Kenya Farmers Association (KFA) with its many stores throughout the province
In typical smallholder areas, however, the individual MPB agent is the predominant
feature. He is a trader, sometimes with partners (22%), who operates one or
more (22.7%) licensed permanent stores in market, trading or other centres.
The MPB agent's business is frequently registered even as a 'produce store';
even without the legal MPB monopoly the owner would probably continue to
perform the same functions which he does as an agent but he would not sell
exclusively to the MPB. In practice, certain agents violate the Maize Marketing
Act by selling to other outlets. 'Produce store' is therefore a more neutral
term for these marketing functionaries and allows for the fact that whether
or not they are official MPB agents, they may or may not sell to the MPB.

Produce storeholders (MPB agents) are characterized in Table 12.
Unlike the market traders who are usually women between 30 and 50 years old
with little formal education, most (about 72%) of the produce storeholders
are men between 30 and 50 years old with comparatively high education. Only
29.5% had no formal education; 61.1% had reached Standard 4-8; 8.3% attended
school to Form II or above; and 1.2% had additional training of some sort. At
the time of the interviews, the average number of years in business was 8.4[8]
Before starting the produce store business, 11% had been employed and 5.4% had
been engaged in other trading or business activities. Most of them, however,
had been farming (48.7%), had stayed with their families or had been unemployed
(28.5%), and only a few had started in business right after school (6.5%). In
addition to trading, 81.6% of produce storeholders derived an income from other
sources: 58.2% from agriculture and 23.8% from non-agricultural sources. Trade
however, was still the major source of income, contributing an average of 55.5%
of total income.

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8.   The median value is 3.9 years.

Most produce storeholders were active throughout the year. Only
9.4% closed down, usually during the off-season, for an average period of
about 7 months. The major share of their trading income (67.9%) was derived
from maize and beans sales). Only 21.4% of the agents dealt in maize only,
56.5% handled both crops, 13.8% dealt in millet and/or sorghum and 8.4% in
other produce. Besides being active in maize, beans and other produce trade,
a relatively high number of produce storeholders (44.3%) ran a retail shop
that sold other food and non-food (6.5%) products.[9] Thus, the product mix of
their business was diversified. Their average working capital for maize and
beans was KShs 7,620. However, 50% worked with less than KShs 5,000 (though
none had below KShs 400 of working capital).[10]

The average amount of maize and beans handled per year was 3,020
bags (maize) and 753 bags (beans).[11] As usual, the size distribution is
rather skewed. 75% of the agents (produce stores) annually handled fewer
than 2,760 bags and 50% handled fewer than 1,440 bags of maize. The respective
figures for beans are 320 bags (75%) and 81 bags (50%). The highest average
annual turnover for maize and beans was recorded for Central Kenya with 4,417
bags of maize and 1,294 bags of beans. Western Kenya followed with 2,993 bags
of maize and 795 bags of beans. In Eastern Kenya, agents averaged 2,603 bags
of maize and 487 bags of beans. The regional distribution of working capital
does not follow exactly the same pattern. Although it was highest in Central
Kenya at KShs 14,794, agents in Eastern Kenya came next with KShs 11,231;
agents in Western Kenya, with only KShs 6,113, came last. One reason for
discrepancies might be higher prices in Eastern Kenya.

Whereas market traders are members of the informal marketing sub-
system, MPB agents belong to the formal marketing sub-system. The third major
type of marketing functionary operates more or less illegally in or between
both sub-systems. This is the independent produce wholesaler or lorry trader.
Officially, this type of trading does not exist since it is illegal. Similar
to the interregional market traders, though usually bridging more distant
regions,[12] independent produce wholesalers move directly between surplus areas
and/or within deficit areas and take advantage of existing high price differen-
tials between areas to earn a profit. Beyond the control of the MPB, they
operate on a much larger scale than MPB agents. They use their own or hired
lorries and operate from one or more stores. For the purposes of this study,

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9.   In some cases they were even linked to a wholesale business.

10.   The median value was KShs 4,971.

11.   Refers only to agents who handled beans.

12.   On average lorry traders travelled more than 200 km for buying and/or
selling.

wholesalers who had a weekly turnover of more than 50 bags of maize and beans, who channeled 25% or more of this turnover by evading the MPB, and who provided their own transport were defined as "independent produce wholesaler" or "lorry trader".

The majority of lorry traders interviewed were men (65%) but the proportion of women among them (35%) can be considered relatively high.[13] Most (85%) were between 30 and 50 years old and their level of education on average was the highest for all functionaries: 15.8% had attended school to Form II or above and 68.4% attended to Standard 4-8. Compared to higher figures for the other groups, only 15.8% lacked formal education; even these, however, were definitely not illiterate. Before joining maize and beans trading, only 11.1% had been unemployed or with their family. All others were either farming (33.3%), engaged in other trade or business activities (16.7%), or were still attending school (5.6%).

On average, independent produce wholesalers had almost 10 years of business experience in maize and beans marketing. Most operated throughout the year, although some (20%) stopped transactions for a period of about 20 weeks. Most of them (90%) handled both maize and beans; 25% also traded in sorghum and/or millet; 35% in other produce; and only 10% handled maize only. Furthermore, 40% sold other food products, including processed food, and 15% even sold non-food products at the retail wholesale level. For some of them (16.7%), maize and beans trade was only a sideline business, though on average it accounted for 68.9% of total trading income. Additional sources of income were mentioned by 58.8% of lorry traders. 35% had a farm and 25% had non-farm income. These sources contributed an average 43% of total income.

The large scale operations of lorry traders result in much higher working capital and turnover. The working capital used for maize and beans marketing transactions exceeded KShs 20,000 in 50% of the cases and KShs 40,000 in 25%. The maximum figure was above KShs 300,000, leading to an average of almost KShs 50,000. Disregarding that extreme value, however, the average working capital was about KShs 27,000. The average annual turnover, reflecting the amount of working capital, was about 30,000 bags of maize and 10,000 bags of beans, including extreme values.[14] Without the extreme values, lorry traders on average handled 16,836 bags of maize and 3,790 bags of beans. Although the

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13.   Since proper sampling methods could not be applied, figures are not representative (see section 1.2).

14.   The maximum given was 240,000 bags for maize and 108,000 for beans.

majority handled less, 50% still had a turnover of more than 10,000 bags of maize and 2,350 bags of beans and 25% handled more than 15,000 bags of maize and 4,000 bags of beans. Clearly, the scale of operation is usually far greater than that of other individual marketing functionaries and even of cooperatives,[15] which handled an average of 2004 bags of maize and 252 bags of beans (see de Graaff 1978. Table 10, p.14). The highest turnovers were recorded for Central and Eastern Kenya, whereas those for Western Kenya were considerably lower.[16] This finding corresponds to the regional distribution of turnover for the other marketing functionaries.

The most important functionaries of the maize and beans marketing system, market traders, produce stores or MPB agents and lorry traders have now been described. The following section shows how they interact with each other and with other marketing functionaries.

3.2 Marketing Channel Structures

The structures of the maize and beans marketing systems are complex and difficult to identify. Furthermore, they vary with changing market conditions. The proportion of produce handled by each marketing channel as presented in Figure 1 and 2 is based on respondents' estimates as to their sources of supply and their outlets during different seasons. They provide a rough, though not a bad, approximation of the relative importance of individual marketing channels at the time of and prior to the survey.

3.2.1 Marketing Channels for Maize: Outlets are different for smallholders, on the one hand, and for large-scale and medium-scale producers, on the other. Whereas the marketed volumes of the larger producers enable them to sell to MPB depots, smallholders are dependent on MPB agents, cooperatives or traders whom they meet in the markets or who come to their holdings. One can speak therefore of a dualistic maize marketing structure for small-scale and large-scale farmers.

According to the IRS 1976/77 data, the major outlets for smallholders are traders of the informal sectors who account for about 60% of maize sales (Casley and Marchant 1978, p.42). These include "other local traders" who were not further specified, but some of them must be lorry traders who buy at the holding. The lorry trader share was estimated to be on the order of 3%.[17]

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15. Handling maize and/or beans.

16. Because the sample of lorry traders was small and not necessarily representative - most important lorry traders were met in Central and Eastern provinces - no regional distribution is given.

17. This does not include purchases from medium-scale farmers.

Only 20% of smallholder sales go to MPB agents and 8% to cooperatives; 12% is sold directly to consumers.

Figure 1 shows that market traders resell a major share of their maize to other market traders before it reaches the consumer. By so doing, they perform wholesale functions. This practice is particularly common during the peak season when there is a limited retail market because most rural customers consume their own maize. Then, the maize is sold to inter-regional and intraregional traders who take it to a market where a less favourable supply situation prevails. In this way, maize often passes through three or more marketing channel stages, especially when "primary buyers" buy at the farm gate or roadsid and sell in the market.[18] Other important outlets for market traders during the main supply season are lorry traders and to a lesser extent MPB depots.[19] Minor shares go to posho mills or brewers.

During the off-season the picture changes. The same traders who previously acted as wholesalers now act as retailers. Maize bought from farmers is for the most part sold directly to consumers. The farmers' supply at this time, however, is usually not sufficient to meet the market demand. Therefore, traders rely heavily on supplies from other distant markets with sufficient supplies and thus lower prices. Only a minor supply role is played by shops and by lorry traders, who could bring in supplies from major surplus areas. Moreover, the MPB plays almost no part in supplying maize to rural markets. Its role increases only if shops and produce stores are included as competitive sources for consumers and this condition occurs more in urban centres than in rural areas.

MPB maize sales to wholesalers, retailers and other traders accounted for only about 18% of their total sales. This figure includes agents who like market traders act as retailers during the off-season. The major proportion of MPB sales goes to big commercial mills (66%) and other processor such as stock-feed and starch manufacturers (6%); 4% was exported and 6% was used for the famine relief programme.

The Board gets its maize supplies primarily from the large farm sector. Less than 25% originates from smallholders, if production estimates

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18.   About 16% of maize bought from farmers by market traders in the survey area was bought at the farm gate (15.5%) and roadside (1%), mainly by smaller traders. In Central Kenya a considerably higher percentage (about 31%) was bought at the farm gate.

19.   Those market traders overlap with storeholders.

Figure 1: Marketing Channels for Smallholder Marketed Maize 1976/77
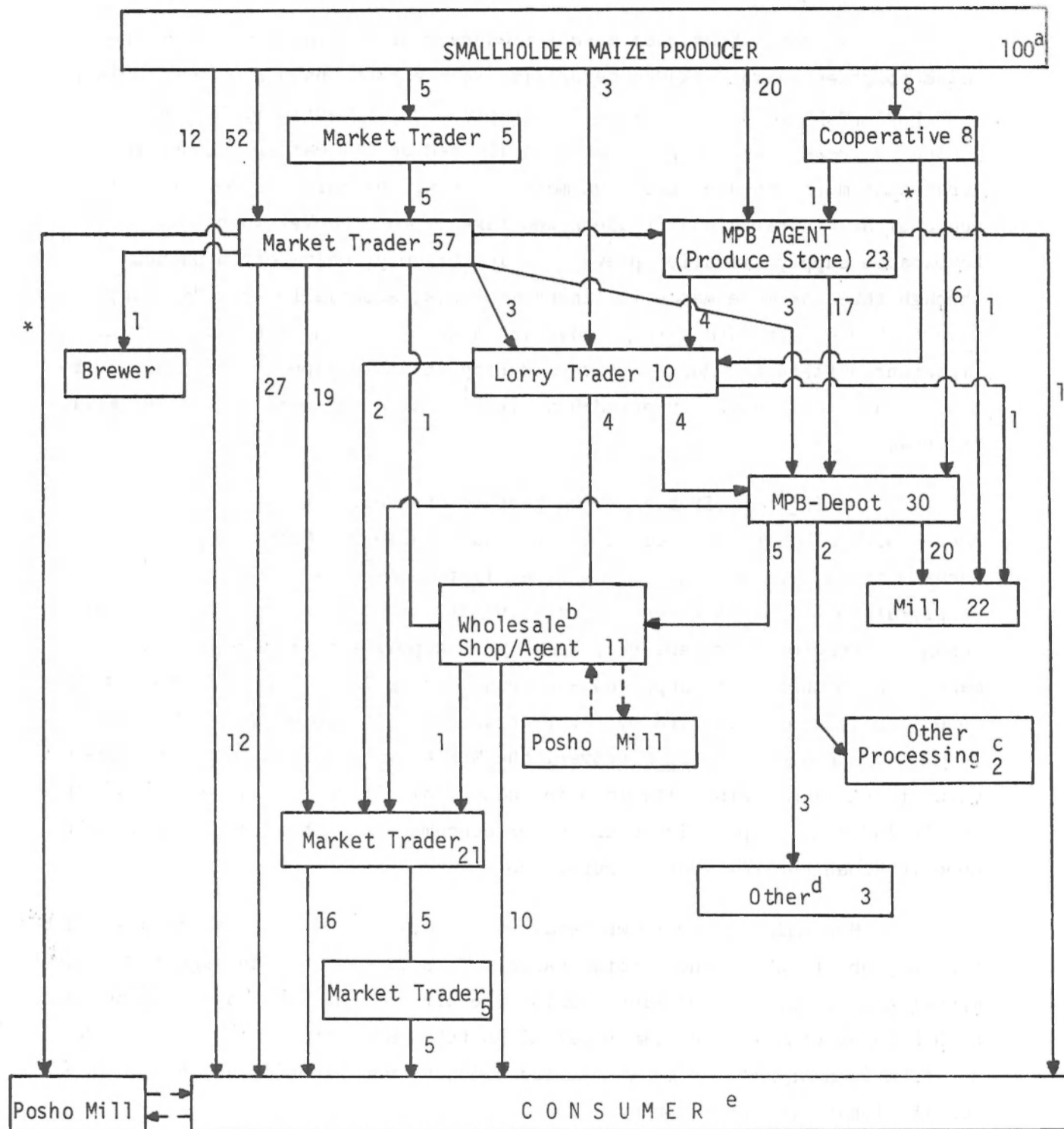
* Marginal participation (below 1%)

a Smallholder marketed maize output accounted for about 30% of total smallholder out-
   put and roughly 45-50% of total marketed production including large scale marketed
   production.

b During off-season agents sold about 6% of their turnover to other retail shops,
   lorry trader with general wholesale business sold more than 75% to retail shops.

c Stockfeed, starch etc.

d Exports, Famine Relief, Cooperatives, Institutions (schools, hospitals, prisons etc.)

e Including Institutions, which accounted for about 1-2 per cent.

are correct.[20] This gives the MPB a market share of 30% in the smallholder
maize market. Apart from agents and cooperatives, who respectively accounted
for 57% and 20% of this share, the MPB was supplied by lorry traders (13%)
and by market traders (10%). The smallholder market share of the MPB would
be higher if, as the regulations stipulate, all maize beyond local requirements
was supplied to the depots. But agents and cooperatives admitted selling about
25% to other outlets, partly because of the inefficiency of the MPB. For lorry
traders this proportion was (per definition) much higher: those interviewed
sold an average of 60% to non-MPB outlets, mostly to shops (40%), with minor
amounts to market traders (10%) and to mills (10%).

Mills got an estimated 2% of smallholder-marketed maize from
channels bypassing the MPB, which accounted for almost 10% of their intake
from smallholder sources. However, because the MPB, with more than 75% of
their supply from large and medium-scale farmers, is the main supplier of the
mills, it is difficult to use survey data to estimate the overall magnitude
of illicit supplies to the milling sector.[21] Altogether, flour mills and
other processors received about 24% of maize marketed by smallholders which
means that, neglecting exports, roughly 75% reaches the consumer or distribu-
tors without prior processing. Part of the maize purchased from the MPB by
wholesalers and other traders is converted for a fee into posho by small
posho mills before it is sold to consumers, but usually consumers buy the maize
and go themselves to a posho mill if they want it to be ground. This is parti-
cularly true for maize bought from market traders.[22]

So far, national averages have been given for channel proportions.
There are, of course, regional differences stemming from production conditions,
market structures and infrastructure. In some areas, for example, especially
within the Coffee Zones, seasonal supply patterns are not as pronounced as in
other areas. Therefore, market traders and storeholders in these areas are
able to get supplies from farmers throughout the year, making them less
dependent on sources such as the MPB and lorry traders during the off-season.

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20.   The relative importance of wholesale and retail shops indicated in
Figure 1 therefore increases if the supplies of medium- and large-scale farmers
are considered. However, it should be kept in mind that after 1976/77 a con-
siderable portion of the MPB supply could not be sold and had to be stored.

21.   This depends largely on how much maize from large- and medium-scale
farmers reaches mills without being channelled through the MPB. That this
happens was confirmed by lorry trader respondents.

22.   Due to various constraints, posho mills could not be included in the
survey. Consequently, no exact channel figures can be given with regard to
maize milled by posho mills.

On the other hand, deficit areas like Kitui which were affected by drought
for several years were almost exclusively dependent on the MPB or on more
competitive supplies by lorry traders. After the ex-depot price at Kitui
was raised from KShs 84.70 to KShs 116.80 in March 1977, sales of the MPB
in that area dried up almost completely. From that time onwards, the whole
district was supplied by lorry traders.

The importance of various types of outlets for farmers is highly
dependent on the conditions in local markets and on the marketing infrastruc-
ture. In Western Province, for example Bungoma District, many market and
trading centres were observed where either no markets operated or maize and
beans were not handled in these markets; this left produce stores as the
only legal outlets for smallholders and, together with retail shops, the
only shopping facility for maize and beans consumers (see chapter 3.3). The
situation was similar in Kitui and parts of Machakos District because of the
banning of all maize transactions in the markets.

The pattern also differs in the former large farm areas of Rift
Valley Province, that is Trans Nzoia, Uasin Gishu, and Nyahururu. There,
smallholder marketing infrastructure is often very poor. Only a few markets
exist, mostly on major trunk roads, and the network of feeder roads is poorly
developed. In these areas, market traders play a less important role than in
the traditional smallholder regions; the major outlets are storeholders and
lorry traders.[23]

These areas are particularly attractive to lorry traders and it is
not surprising that a number of such traders mentioned them as among their
major supply areas in Rift Valley Province.[24] Meru, Embu and Kirinyaga
were other supply areas mentioned, mainly by the lorry traders serving Kitui
and Machakos. Those areas have been neglected by the MPB marketing infra-
structure, which is limited in capacity and oriented towards the railway
line from Nanyuki via Nyeri to Nairobi.[25] There are no direct links between
the above mentioned areas and adjacent deficit areas.

Supply and sales areas reported by lorry traders are major surplus
and deficit areas respectively. They thus give some indication of the illicit
interregional channel pattern. Major flows originate in the production areas
of Rift Valley Province and move towards the deficit areas in the northern

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23.   Despite the fact that lorry traders do not act as MPB agents according
to the legislation, they often sell a major portion of their maize to the MPB.

24.   One lorry trader in Western Kenya mentioned that they deliberately went
to places with bad infrastructure.

25.   Thus, in 1976/77 for instance, MPB agents (produce storeholders) in Meru
sold about 70% of their sales to lorry traders; only about 30% was delivered to the
depot.

and eastern parts of the country. Flows to the southwest (Western and Nyanza provinces) also take place but seem to be of minor importance. Other major flows can be observed between the Coffee Zones East of Rift, particularly Meru and Embu, and areas of Kitui, Machakos and adjacent districts. For the latter areas, Meru, Embu and similar areas of Central Province[26] were said to rank second to supply areas of western Rift Valley districts and Nyahururu.[27] Some supplies came from the Machakos and Oloitokitok area. Districts of Central Province also received supplies from surplus areas in Meru and Embu; these were supplemented by other flows, particularly from Nyahururu. Altogether, these interregional flow patterns indicate that, despite the controls, private illicit channels have been developed which for certain regions play an important role and sometimes outrank the MPB role in terms of volumes shipped.

3.2.2. <u>Marketing Channels for Beans</u>. The basic channel structure for marketing of beans, shown in Figure 2, is quite similar to that for smallholder-marketed maize. The most important channels are those of the informal sub-system in local markets, followed by MPB channels, lorry traders and cooperatives. There are, however, differences with regard to the relative importance of individual channels. The most striking difference is that a considerably higher proportion of marketed beans was either retailed by market traders immediately after being bought from farmers (approximately 30%) or was sold directly by farmers to consumers (28%).[28] Since in addition MPB agents sold to consumers about 18% of beans obtained from farmers, around 60% of the beans were marketed directly or passed through only one intermediate channel step.

A further major difference observed at the initial stages of the marketing system is that cooperatives seem to be only marginally involved.[29] Furthermore, MPB agents got only 16% and MPB depots received only 14% of the marketed beans. Thus, the formal sub-system in general seems to be even less important than in the case of maize. This was true despite the comparatively favourable prices offered by the MPB at the beginning of and prior to this survey. Earlier and again later the MPB offered lower prices and as a result were virtually out of the market, except for one variety, Mexican 142, which

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26.   These areas were referred to as "Kikuyuni" by several respondents but could not be specified further. Sometimes it was not quite clear whether it was the traders who came from there or the maize, which of course could have been bought elsewhere, or both.

27.   One big distributor in Kitui estimated that supplies from Rift Valley accounted for approximately 50%, Meru and Embu 40% and other areas 10% of total supply. Another respondent even claimed that supplies from Western Kenya, including Kisii, were channelled via Nyahururu into Central and Eastern provinces.

28.   One reason for this might be that beans are not as widely grown as maize and therefore have a better market locally.

29.   A special survey on cooperatives showed that especially in Western and Eastern provinces some cooperatives handle beans, though according to IRS data no beans were sold to them. See de Graaff 1978, p.14 and Casley and Marchant 1978, p.42.

Figure 2: Marketing Channels for Smallholder Marketed Beans 1976/77
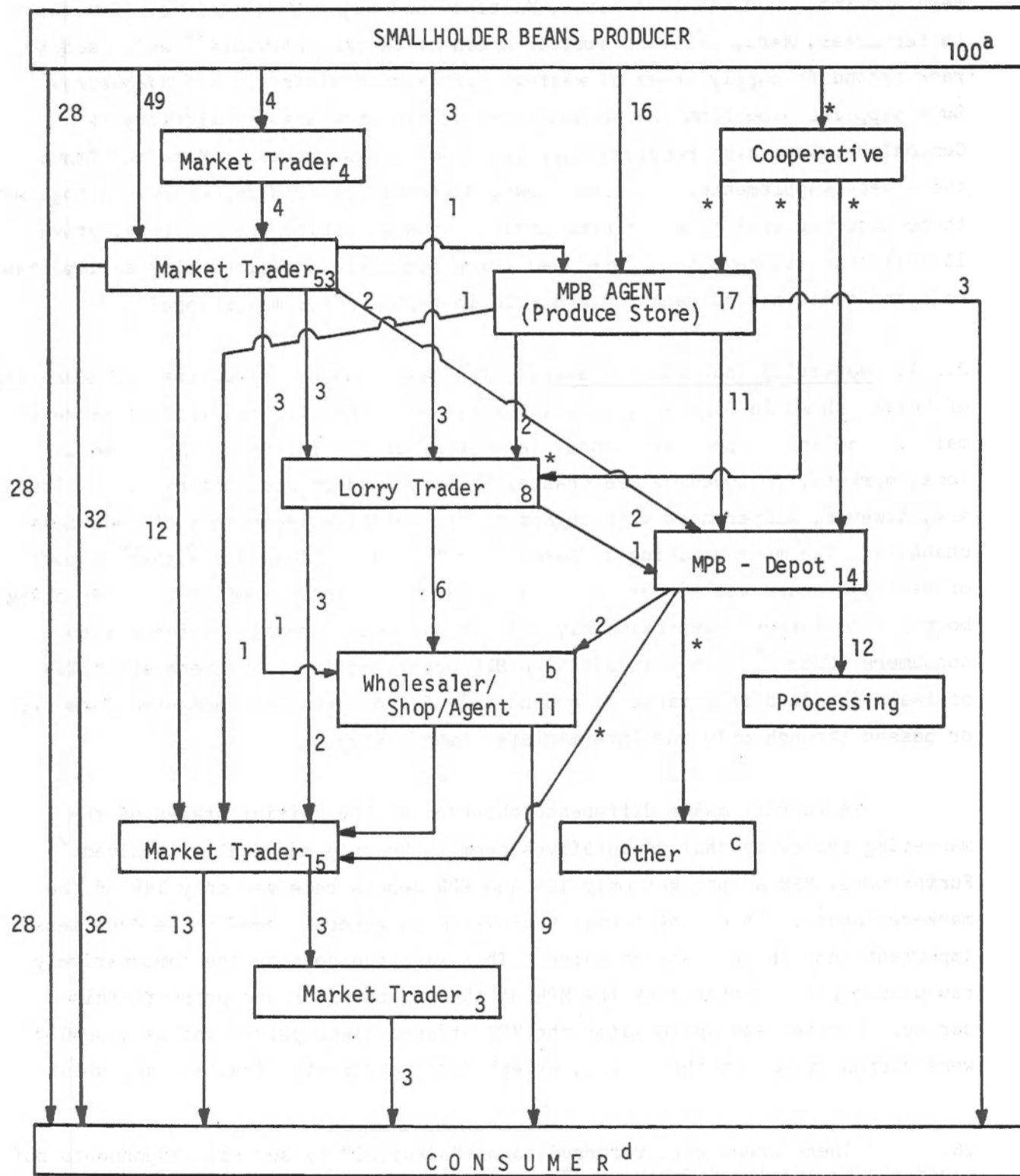
* Marginal participation (below 1%)

a Smallholder marketed beans production accounted for about 25% of total small-
   holder beans output which is almost 100% of national beans production.

b During off-season agents sold 6% of their beans turnover and lorry traders
   with general wholesale business almost 90% to retail shops.

c Institutions, Cooperatives

d Including institutions accounting for about 1 - 2 per cent.

is used for canning.[30]

Most beans (86%) received by the MPB are sold to processors (canners)
on tender basis at Nairobi. Minor amounts are sold to wholesalers and shops
(14%), market traders, institutions or are used for famine relief and similar
programmes. The MPB's market share in the distribution of unprocessed beans
therefore is rather low even when it is supplied with beans. Consequently,
it accounted for only 20% of beans purchases made by wholesalers and shops, most
of which operate in urban areas, particularly Nairobi. In rural areas the
contribution of the MPB is even less. Furthermore, since only negligible
amounts of beans channelled through the MPB reach rural markets, beans consumers
in these areas are almost exclusively dependent on supplies from non-MPB
sources. Beans obtained from shops were mostly supplied by market traders or
lorry traders who accounted for 30% and 50% of supplies respectively.

Lorry traders got most of their supplies from producers (37.5%),
market traders (37.5%) and agents (25%). They then sold mainly to whole-
salers and shops. They also supplied market traders, but even during the
off-season market traders bought mostly from farmers and other market traders.
In Central and Eastern Kenya lorry traders, shops and stores were of some
relevance to market traders, though their contribution in volume terms was
relatively unimportant. In markets, direct marketing by farmers and
retailing by traders prevail. On average, only about 18.5% of beans handled
in the informal, local marketing sub-system reached a second or third stage
within the market trader channel, whereas for maize the proportion was about
32%. About 76% of beans purchased by rural consumers in markets did not go
through any wholesale stage.

Regional differences correspond to findings on maize. In areas
like Bungoma and Kitui, where neither beans nor maize was handled in markets,
the importance of stores and lorry traders as outlets and sources increases.
Western Kenya and Rift Valley Province, however, are not major production
or demand areas, and lorry traders were generally of little significance
there. Beans sold to stores usually were delivered to the MPB. In Eastern
Kenya, a major production and supply area for beans, stores, shops and lorry
traders were important outlets, at least for market traders, in places where
beans were handled in markets. During the season, about 35% of their sales
were to such outlets and 28% went to MPB depots[31] which indicates major

30.   In Eastern and Central provinces for example, where beans production
is most important, only 843 bags (other than Mexican 142) were delivered to
the Board in 1973/74. See Maize and Produce Board, Eighth Annual Report, 1973/
1974.

31.   Because of the nature of the sample, this figure might not be rep-
resentative (see chapter 1.2).

surpluses. During the off-season the stores, shops and lorry traders were significant in supplementing supplies from farmers. This pattern was even more pronounced in Central Kenya, where during the off-season these sources accounted for about 38% of supplies to market traders, that is, 75% of supplies from non-farm sources.

Although lorry traders were of little significance for Western Kenya, the opposite was true for Central and Eastern Kenya. Depending on the season, these areas supplied each other with beans.[32] The respective flows were mainly facilitated by lorry traders. For stores (agents) in Central Kenya, lorry traders were the major outlet during the season and the major source during the off-season accounting for more than 50% of both sales and purchases. In Eastern Kenya, most surpluses were said to be supplied to the MPB but, as in the case of maize, checks on records of depots showed that this was not always correct. The same was true with regard to supplies during the off-season. Interviews with lorry traders showed that at last in Kitui, they supplied those areas where stores claimed to buy from the MPB.[33] Overstatement of sales to and supplies from the MPB was a general problem with interviews of agents or produce stores; if they admitted using different channels they were admitting violations of the marketing legislation. Thus, it is possible that the MPB role as a marketing channel is even less than indicated by the proportions given in the flow charts.

3.3 Market Structure

The market structure in terms of market concentration (number and size of market participants), market transparency (information) and market entry is a major determinant of the performance of marketing systems. According to the concept of competition, performance is expected to be satisfactory under the following conditions:

> (1) if a sufficient number of buyers and/or sellers exist to provide alternative outlets and/or sources without one of them having the market power to dominate the others;
>
> (2) if market transparency with regard to product quality, varieties, grades and prices is given; and
>
> (3) if no serious barriers to market entry exist.

The following sections will examine these conditions for different channel levels of the maize and beans marketing system.

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32. Sales of beans usually precede those of maize which, in 1976/77 they were at peak during July - September in Eastern Province and during October-- December in Central Province. Sales in Central Province remained significant from January-March, but this was not the case in Eastern Province (Casley and Marchant 1978, p.36).

33. Lorry traders reported that 65% of their supplies to Kitui came from Meru and Embu and 35% came from Machakos.

3.3.1. <u>Degree of Market Concentration</u>: Market concentration varies
considerably with the points of sales or purchases, markets, regions and
time. According to IRS data for 1976/77, about one third of maize and
beans was sold at the holding or roadside not at a market or trading
centre.[34] This agrees with the results of the Maize and Beans Trader
Survey which showed that a number of market traders, produce stores and
especially lorry traders buy at the holding or roadside (see Table 14).
For market traders, this is particularly true in Central and Western
Kenya with regard to maize, and in Central and Eastern Kenya with regard
to beans. As far as stores are concerned, purchases at the holding or
roadside are relatively more important in Western and Eastern Kenya.[35]

Table 14: Point of Purchase for Major Marketing Functionaries During
the Supply Season (%)

Point of Purchase	Market Trader		MPB Agent	Produce Store	Lorry Trader	
	Maize	Beans	Maize	Beans	Maize	Beans
Holding	17.2	18.0	20.3	16.3	40.0	36.8
Roadside	1.9	4.6	0.1	0.3	15.0	15.8
Market	86.0	81.7	26.4	35.4	30.0	26.3
Shop	N.A.	N.A.	100.0[a]	100.0[b]	26.3	36.8

Notes: a   Not applicable.
        b   52.2% of storeholders claimed that they bought maize <u>only</u> at the
            shop. The respective figure was 50.1% for beans.
Source: Own compilation.

Farmers selling at the holding or roadside are usually faced with
a buyer holding a monopsony or quasi monopsony position at the time of trans-
action, although over a period of time, the number of buyers may be numerous.

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34.   See Casley and Marchant 1978, p. 30. The proportion includes sales
to consumers.

35.   See Table A7, Appendix. The percentage of maize and beans bought
by market traders at the holding and roadside is as follows:

	Western	Central	Eastern	Total
Maize	11.4	24.8	8.5	16.4
Beans	1.4	30.0	39.1	21.1

Unless the farmer has a good knowledge of market conditions and possible outlets in a nearby market or trading centre, his/her alternatives are limited or non existent, which reduces his/her bargaining position considerably. This is the case especially during the peak supply season where rural markets or assembling centres also face a buyers' market, though the number of outlets, traders and stores is usually high.

In general, large and small markets handling maize and beans in surplus areas have an atomistic structure during the peak season. In other words, they provide sufficient numbers of outlets for sellers, that is, farmers and market traders. In most markets visited where maize and beans transactions took place, more than 10 traders were operating at a time (see Table 15). At major markets during peak months, usually more than 30 maize traders and sometimes as many as 100 or more are present.[36] The respective number for beans traders is generally lower but more than 20 traders and even as many as 50 is not rare.[37]

During these peak periods, one finds primarily wholesale transactions. Later, when local supplies from farmers go down, markets turn mainly into retail and sellers' markets with a considerably lower number of retailing and supplying traders. At Luanda and Limuru markets, for example, the large number of peak-season traders fell to only 19 and 13 maize traders and 12 and 16 beans traders respectively at a later time of the season.[38] Thus, in many of the smaller markets, oligopolistic or even monopolistic market structures can emerge, particularly for beans marketing (see Table 15).[39] However, in the majority of markets where maize and beans trading continues throughout the year, one can expect 5 or more traders (at least for maize). In CBS sample markets handling maize and/or beans, only 13.5% had fewer than 5 maize traders and 31.1% fewer than 5 beans traders.[40] Moreover, market traders at the retail level during the off-season had to reckon with shop and storeholders as competitors.

From the above it can be concluded that markets handling maize and/or beans tend to provide competitive structures in terms of the number of traders, though this is true to a lesser degree during the slack season. As Table 15 reveals, however, markets do not provide laternative outlets

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36.   The highest number of maize traders (341) was counted at Luanda Market, Kakamega District; the second highest (210) at Limuru.
37.   The highest number of beans traders were counted at Luanda (50) and at Limuru (67).
38.   Unpublished data of CBS Market Structure Survey.
39.   Reliable figures cannot be cited because market structures could not be monitored throughout the survey period.
40.   Unpublished data of CBS sample markets.

Table 15: Number of Market Traders In Sample Markets At Day of
Visit by Basic Sample Zone (%)

Crop	Zone	0	1 - 5	6 - 10	11 - 20	21 - 30	Above 30
Maize	Western	45.2	–	6.5	19.4	6.5	22.6
	Central	11.1	5.6	11.1	5.6	22.2	44.4
	Eastern	63.2	5.3	5.3	5.3	10.5	10.5
	Total	41.2	2.9	7.4	13.2	11.8	25.0
Beans	Western	45.2	16.1	12.9	6.5	16.1	3.2
	Central	11.1	16.7	5.6	11.1	22.2	33.3
	Eastern	57.9	5.3	10.5	5.3	10.5	10.5
	Total	39.7	13.2	10.3	7.4	16.2	13.2

Source: Own compilation.

for farmers or sources for consumers as often as is commonly thought.
Numerous markets did not trade in maize and/or beans.[41] Thus, in about
40% of sample markets, particularly in Western and Eastern Kenya, no maize
or beans traders were found. The percentage might be slightly lower if
only the peak seasons were taken into account, because not all markets
could be visited at that time. But the difference should be only slight,
since according to the time schedule for the survey, maize and beans
transactions were to be expected in these markets, especially those in
Western Kenya.[42] Furthermore, for most of the markets it was ascetained
that the situation was no different at other times of the year.

In places where no maize and beans markets operate, farmers and
consumers rely mainly on MPB agents, individual storeholders or shops.
This condition applied to 64.3% of the sample markets.[43] In 14.3% of them,
a cooperative performed the functions of an agent, but elsewhere neither
market traders, individual storeholders, nor a cooperative could be identified.
Reasons for their absence might include the presence of these outlets in
nearby larger centres or, as in the case of Kericho Market, KFA stores which
were supposed to deliver the necessary services.[44]

41. In addition, it should be kept in mind that in quite a number of
market or trading centres no regularly operating markets exist (see section 2.4).
42. During the slack season in Western and Central Kenya, interviews
were carried out in Kitui where marketing of maize and beans was banned through-
out. Even later on, despite a relatively good harvest, the ban on marketing
in Kitui continued.
43. This situation is likely to occur also in the former large farm areas
which were not covered by the Maize and Beans Trader Survey.
44. At least in Sotik, such outlets did not exist. Members of the dairy
and pyrethrum cooperative reported that they had to sell to lorry traders.

In the majority of centres where produce stores or MPB agents were found, two or more stores provided alternatives within this group of marketing functionaries (see Table 16). Only in 16.7% of these centres was only one active agent identified. Even in these centres, if intertype competition exists, that is, if market traders or cooperatives are alternative marketing channels, the negative impact of only one active agent was mitigated. In all the sample centres, this was found to be the case. Furthermore, it should be kept in mind that except for Eastern Kenya the market centre density was relatively high. Storeholders in adjacent centres therefore might be regarded as competitors.

Table 16: Percentage of Sample Markets with MPB Agents (Produce Stores) by Number of Stores and Basic Sample Zones

Number of Stores	Western Kenya	Central Kenya	Eastern Kenya	Total
0	44.8	50	10.5	36.4
1	6.9	11.1	15.8	10.6
2-3	34.5	16.7	42.1	31.8
4-5	6.9	11.1	21.1	12.1
5 and above	6.9	11.1	10.5	9.1

Source: Own compilation.

Agents, however, should not be viewed as ordinary competitors. They are meant to perform a special role within the marketing system: to guarantee a minimum price fixed by the Government in contrast to open market prices which fluctuate according to supply and demand. Taking this special role into consideration, the picture is less favourable than it appears initially. In 30.4% of the sample markets — in Western Kenya 44.8% and in Central Kenya 50% — no active MPB agent or produce storeholder could be identified. Consequently, in quite a number of market centres, no alternative existed to the informal open market system, or to lorry traders.[45] This conclusion holds true even if one considers that in a few cases (6.7%) cooperatives assumed the role of an agent. Moreover, it is supported by the fact that 52.8% of producers interviewed in the sample markets did not know any MPB agent in the vicinity of the market.

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45. This statement does not consider that market prices might be permanently above the MPB prices so that no agent could compete.

The situation turns out to be critical, especially at the assembly
stages of the marketing channel, if there is no outlet other than lorry traders,
even though there might be competition among lorry traders. No reliable
information exists regarding how often this condition occurs. However, though
sample markets with no operating maize or beans market and no storeholders or
agents were not major surplus areas, the survey shows that in one case farmers
had no choice but to sell to lorry traders. The respondent in this case did
not know how many lorry traders were competing with each other.

With regard to the competitive situation of lorry traders, the only
information available is that given by the lorry traders themselves. Their
responses indicate that in 75% of the places where they bought maize or beans
they competed with two or more lorry traders, and in 47% of the places with four
or more.[46] But it should be kept in mind that at a given time they might
enjoy a quasi-monopolistic situation, particularly in areas with bad infra-
structure.

On the distribution side, the situation is usually less problematic,
since lorry traders at least come into competition with the MPB. Disregarding
the MPB, they usually competed with more than one distributor. In Kitui, one
of the major distribution areas for lorry traders, during peak periods maize
was distributed by 50 to 100 lorries usually belonging to different traders.[47]
Thus, the structure in terms of number of lorry traders can be termed atomistic.

Even with respect to lorry traders, in most cases alternatives seem
to be available to buyers and sellers at the distribution and assembly stages,
regardless of whether or not other types of marketing functionaries compete
with them. Often they do. Thus, at all channel levels a sufficient number
of market participants usually can be assumed, though intertype competition,
especially from MPB agents, cannot be guaranteed in all rural centres. More-
over, usually no one competitor is big enough to control the actions of the
others. This holds true even if the skewed size distribution described earlier
is taken into consideration. Though the overall distribution is rather skewed,
it does not necessarily apply to the same extent for specific centres or markets.
Larger differences in the size of operation were more evident between different
places and regions than within one centre or market. Furthermore, if the
number of traders in markets decreased and the market turned into a retail
and sellers market, all remaining retail traders were generally small. Usually
no operation was big enough to dominate the market.

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46.   As Table 14 shows those competitors might even be MPB agents who buy
at the holding roadside.

47.   This figure corresponds to the weekly requirements of the Kitui popu-
lation. At that time, the MPB was selling virtually nothing. It provided maize
only under the famine relief programme.

There are, however, exceptions to the rule which are difficult to
quantify. Some market traders, for example, complained that during the off-
season, supplies of maize and beans dry up and become very erratic.[48] Under
such conditions a major supplier is likely to enjoy a monopolistic situation
on specific market days. Lorry traders might enjoy similar monopoly powers
when supplying storeholders. Apart from this, certain lorry traders operate
on such a scale that they are probably in a position to control the market
in their area of operation. Such control, however, seems to occur mainly in
supply areas; in major sales areas they have to compete with many other
traders, as the example of Kitui shows. In these cases, the degree of market
concentration is rather low despite the fact that some traders operate on a
considerably higher scale than others.

3.3.2 Market Transparency. Market transparency affects the intensity of
competition. If buyers or sellers do not have proper knowledge about market
conditions, the intensity of competition is low despite a sufficient number
of market participants to ensure competition. In open markets, the pre-
conditions for a high degree of market transparency are rather poor. There
are no uniform measurements or weights or standard grades. Market traders
use a multitude of different tins, kalabashes, cups, debes, baskets and bags
so that direct price comparisons are very difficult. Although the price
within the market usually tends to be uniform, the amount sold for that price
differ greatly: price variations are replaced by quantity variations. Test
weighing revealed that at the retail level, weights varied from 20% to more
than 100% at a given price.[49] Similar weight variations of around 20% can be
assumed at the market wholesale level especially considering the number of
debes (4 gallon tins) whose sides are deliberately pounded in or out to affect
volume. In addition, bags used were not uniform.

Lack of standardized grades adds to the possibly deliberate confusion
over containers used for measuring. Because of the numerous varieties handled,
the problem is more severe in the case of beans. The MPB distinguishes 15
different varieties, but a survey by Van Rheenen found 78 different types of
food beans differentiated by colour, size and shape (Van Rheenen 1976, pp. 5.6).
Among them he identified 10 types common to almost all beans growing areas, of
which 6 belonged to the Rose Coco group. Despite this reduction a smaller
number of common types, the heterogeneity among the beans is so great that

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48.   16.1% of all maize traders and 19.1% of all beans traders complained
of lack of or irregular supplies during the off season. In addition to this,
11.3% and 7.7% of maize and beans traders respectively complained of general
lack of supplies.

49.   These samples cannot claim to be representative.

market transparency is definitely diminished.

Transparency is reduced still further by such factors as impurities infestations, treatment with insecticides, and so forth, that increase the differentiation of the commodity handled. Such conditions affecting product quality also obscure market transparency for maize, though the issue of variety is less important. The major distinction in terms of consumer preference is that between white and yellow maize. Because yellow maize is viewed as inferior, it is not found very often in markets; where it occurs it is usually mixed with white maize. Another major factor of differentiation, particularly for maize, is moisture content. It varies considerably and, with the other differentiating factors, aggravates price comparisons for all market participants.

The effects of poor market transparency are not limited to the markets but also have implications for the interaction between the informal and formal sub-system. Because standardized weights and measures used in the formal sub-system are different from those in the informal system, comparisons between the two system. Grades are rather broadly defined. The MPB accepts a "fair average quality" (FAQ) and rejects any supply below that standard but pays no premium for higher quality. Furthermore, grading of maize and beans by agents or storeholders is subjective and therefore may allow them to influence market conditions in their favour. Such problems also exist at depots, where managers may try to take advantage of their power to determine whether maize or beans can be classified as FAQ or not. This practice was emphasized by 50.2% of all MPB agents interviewed. Moreover, the MPB depot managers often sell without repeating the grading or weighing process which is necessary because of infestation, shrinkage, and so forth. Thus, even within the formal MPB channels market transparency is limited because grades and weights often are not reliable.

Insufficient market transparency is a more serious problem for farmers and consumers who buy in the market. Consumers who buy from formal sources such as shops do not face big problems with regard to market trans-parency unless they want to compare conditions with those in markets. Those buying in the market, however, usually have less knowledge about market conditions than do traders. The same distinction applies to farmers as opposed to traders. Unlike farmers and consumers, traders have their own measurements, tins, kalabashes, etc. and know exactly how much each contains

when it is filled.[50] For every transaction, therefore, they only use their
measure which they easily relate to other standard measurements.

Farmers and consumers, faced with a multitude of measurements,
clearly suffer under the imperfections described. When buying from farmers,
for example, traders (including lorry traders and storeholders who buy at the
farm or roadside) often use debes whose sides have been pounded out. When
selling, they exchange them for debes whose sides are beaten. Another
example was given by a woman trader who used a small kalabash in order to
impress farmers by the large number of measuring transactions. As she
explained, farmers thought she paid much more for a given amount than the
MPB agent, who poured all the maize at once into one container and thus had
only one measuring transaction. In fact she paid less. In this case farmers
were misled psychologically. The same deceptions happen with consumers.

Traders, too, are affected by the lack of standardization if they
do not visit other markets to exchange market information. They can be
particularly hampered in assessing quality standards, which under the present
marketing systems requires personal inspection. As far as standard measure-
ments are concerned, those mentioned above, can and do serve as common
denominators for traders.

Apart from the degree of standardization or differentiation, market
transparency depends on the extent to which market participants are informed
about prevailing market conditions. Farmers and traders were therefore asked
about their knowledge of market prices. The majority of producers selling
in markets showed that they were aware of the importance of this question.
Most of them (65.6%) claimed that they knew prices in advance before going
to the market to sell. Information was obtained by prior visits or from
others who returned from the market.[51] However, only 13.7% of them were also
informed about prices in adjacent markets, and only 45.6% knew about prices
paid by the MPB agents in the vicinity of the market.[52] Because their infor-
mation generally was confined to the conditions of one place, their bargaining

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50.   In one market a woman trader was observed trying to find a new small
kalabash exactly the same size as her old one which was broken. As she explained,
she knew how many of her kalabashes filled both a Kimbo tin and one standard debe.
She wanted the same size in order not to change her basis of calculation.

51.   In Western Kenya, however, farmers were significantly less informed than
in the other zones. Only 41.7% had prior knowledge about market prices compared
to 87.1% in Central and 73.9% in Eastern Kenya.

52.   In Western Kenya only 39.1% and in Central Kenya 30.7% were informed about
MPB prices, whereas for Eastern Kenya the figure was 61.9%. These percentages, how-
ever, should be regarded with caution because the relevant question was originally
designed to find out whether farmers knew the official MPB prices. Farmers often
referred instead to the actual prices paid by agents. Since in this way it was
possible to detect that certain agents bought far below the official prices, the
question was not changed-taking into account that there would be no consistency
with regard to the price mentioned.

position was comparatively weak. It was weakened further if they were not aware of selling prices of other farmers at the time of sale. Only 41.6% claimed to have this information which was mostly obtained by observation (64.9%).

As expected, the degree of information among market traders was higher. Excluding a minority of about 10%, all maize and beans traders obtained more than just one price information before buying; over 75% also had such information before selling. For agents, the question was relevant only if they bought from sources other than farmers or the MPB. Where this occurred, most of them (72%) had received prior price information from other than the actual supplier. The same pattern applied to lorry traders.

Even more important than knowledge of prices at the point of purchase or sale is information about conditions in other places. In general, such information is very limited. Table 17 suggests that almost no intermarket or interregional exchange of information takes place except that based on personal contacts and observation. In the case of farmers, knowledge of market conditions is confined to the specific market or area of operation.

Table 17. Knowledge of Marketing Functionaries About Market Prices (%)

Criterion of Degree of Price Information		Market Trader Maize	Beans	Produce Stores (MPB Agent)	Lorry Trader
Knowledge about prices in other markets[a]		55.6	45.8	47.5	57.9
Radius of Price Information	Adjacent markets	59.6	81.2	80.9	45.5
	Not adjacent, othe districts	39.9	17.8	18.8	27.3
	Not adjacent, other provinces	0.5	1.1	0.3	27.3
Method of Obtaining Price Information	Observation	71.4	74.9	56.0	72.7
	Personal Communication	28.4	24.7	23.7	9.1
	Both	0.2	0.4	20.3	9.1
	Other Method	–	–	–	9.1

Note: [a] Market traders were asked whether they knew prices in markets other than the one at which they were interviewed.

Source: Own compilation.

For all marketing functionaries, observation and personal
communication are virtually the only sources of information, the former
being more important than the latter. Moreover, only slightly more than
50% of maize traders and even fewer beans traders are informed about prices in
other markets, mainly prices in adjacent markets. Maize traders, particularly
in Western Kenya (Table A8, Appendix), are relatively better informed, but
most of their price information is for markets in other districts in which
they themselves operate. Information on prices in markets of other provinces
is generally lacking. Only in Eastern Kenya were traders found who had
knowledge of prices in other provinces (see Table A8, Appendix).[53]

For MPB agents and to a certain extent for lorry traders the
situation is similar. Market prices are known by only about 50% of agents
and 60% of lorry traders. Furthermore, the knowledge of agents is also
mostly confined to home or adjacent markets. This is more or less the case
in all zones.[54] Only among lorry traders is the knowledge about prices in
markets of other districts and provinces significantly higher. The figure
in Table 17 actually underestimate their degree of market information
because they refer only to prices in open markets. Lorry traders who buy at
the farm, roadside or store are certainly aware of prices in those places
if not in markets.

It is clear that, except for lorry traders, the knowledge of
marketing functionaries about prices and market conditions beyond their home
or adjacent areas is not very great. Hence, as far as market information is
concerned, the network of markets constituting the informal system is not
well integrated. Furthermore, the whole informal network is poorly integrated
into the formal system since the MPB has no functioning market intelligence
service for its operations.[55] Thus, it can be concluded that on a national
level market transparency within the maize and beans marketing system is rather
limited and therefore not conducive to high marketing efficiency.

3.3.3. Market Entry. Barriers to market entry reduce the threat of potential
competition and therefore impede marketing efficiency. Barriers can result
from limited know-how, capital requirements, institutional restrictions and
non competitive reactions of established traders. Generally, market entry is

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53.   See footnote 38, in which the mean travel distance of market traders
by zones was given. Traders from Eastern Kenya travelled much farther than
those of Central and Western Kenya.

54.   When comparing Eastern, Central and Western Kenya, the relative sizes
of provinces and districts should be taken into account.

55.   So far only a crop forecast system has been introduced.

not a major problem within the maize and beans marketing system-though if asked, traders often complain of capital, experience and knowledge.[56] But these factors do not really prevent traders from entering the market, as can be seen both from the high number of marketing functionaries at all channel levels and from the relatively high fluctuation of the trader population, except for lorry traders (see Section 3.1.).

Furthermore, throughout the country and across all types of marketing functionaries the reaction to "aggressive" newcomers conforms to the concept of competition. On average only a minority of less than 1% of market traders and 5% of storeholders (agents) were determined to use non competitive means to prevent a potential competitor from market entry. Most of those storeholders (5%) said they would defend the market area allocated them by the MPB by reporting a threat to the authorities.

As far as know-how for maize and beans trade is concerned, no special training is required. The business is learned by doing. Only with increased scale of operation and diversification of the product line is knowledge of basic accounting and other skills of advantage. Courses offered by Trade Officers of the Ministry of Commerce and Industry were attended by 40.6% of storeholders (agents) and 38.8% of lorry traders.

The major impediments to market entry are usually the capital requirements. But even these barriers to maize and beans marketing are relatively low, irrespective of the zone (see Table 18). The highest average starting capital was recorded, of course, for storeholders and lorry traders, but 50% of them started with even less than the average KShs. 2200 (storeholders) and KShs. 4000 (lorry traders). Generally the initial capital requirements are so low that sources beyond personal or family savings are unnecessary. This was the case for 95% or more of market traders and storeholders. Only lorry traders (11.8%) used credit facilities such as banks. Those who did were general wholesalers who used their general overdraft to enter maize and beans trade.

Institutional restrictions to market entry are relevant for MPB agents (storeholders) and lorry traders. The former are appointed by the MPB under the terms of the Maize Marketing Act which stipulates that agents

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56.   These questions are therefore not very helpful and were only asked of market traders. They gave the expected answers as follows (percentage for maize and beans traders respectively): lack of capital (76.4; 86.8); lack of experience (49.9; 47.1); unknown (28.7; 20.0), established traders (10.7; 6.4); other (1.9; 6.5); and starting difficulties (0.6; 0.4). There were no major regional differences in answers.

be assigned a specific area in which to operate. The number of agents
appointed for an area is at the discretion of the MPB. However, as
mentioned earlier, a considerably higher number of storeholders hold
licences than actually operate, so that from a competitive point of view
licencesing practices are not an impediment to market entry. Only if an
agent wants to be licensed for more than one area might difficulties arise.[57]

Table 18: Mean Starting Capital of Marketing Functionaries by Sample Zone
           (KShs.)

| Sample Zones | Market Trader | | Produce Store | Lorry |
	Maize	Beans	(Agents)	Trader
Western Kenya	87	52	3,488	N.A.
Central Kenya	337	418	2,959	N.A.
Eastern Kenya	266	213	3,858	N.A.
TOTAL	166	237	3,517	9,805

Source: Own compilation.

        In practice, then, market barriers are only a serious problem for
lorry traders. The Maize Marketing Act absolutely prohibits lorry trader
operations. Those who take the risk to operate are relatively few compared
to the potential number who could function under a decontrolled maize and
beans marketing system. In such a situation, lorry traders predicted a
tremendous increase in competitors. As a group, they could then compete
with the MPB which holds the legal monopoly for interregional exchange in
which lorry traders currently are involved illegally.

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57.   One respondent registered for additional shops with the help of
dummies ("partners").

4. MARKET CONDUCT OF MAJOR MARKETING FUNCTIONARIES

Market conduct is second to market structure as a major determinant of the performance of a marketing system. Analysis of market conduct entails an examination of the: buying and selling behaviour of various marketing functionaries; forms which competition amongst them takes (e.g. pricing, terms of payment, credit and the like); level of activity; and actions to avoid competition by, for example, collusion.

4.1 Market Traders

A survey of market trader perceptions of supplier and buyer motivations was undertaken in order to ascertain their market conduct. The results summarised in Table 19 show that the basic pattern for maize and beans traders is similar. Both consider cash payment the major factor which attracts suppliers; this holds true for all zones (see Table A9, Appendix).[1] More than 90% of maize and beans traders claimed that they always pay cash. It therefore seems to be an important factor of differentiation among market traders competing for supplies. This most likely reflects the importance suppliers and traders place on it as well as the limited working capital situation of market traders. The absorptive capacity of an individual trader is small; once she has spent her available cash, she can no longer compete with those who are still able to pay on the spot.

The supplier's priority for immediate cash payment reduces the necessity for intensive price competition. In fact, for beans traders, particularly in Western and Eastern Kenya, personal relations seem to play a more important role than price competition. However, for maize traders price competition ranked second to cash payment. If one in addition considers that a number of traders were supplied because of prior arrangements (about 9%) or credit extended (between 5 and 9%), then one can safely conclude that pricing in buying competition (i.e. competition for supplies) is not a major factor of market conduct. This generalization holds at least under the conditions of a buyer's market after harvest; later on during the season, prices paid and charged do have some impact on the supply decision of farmers. Some traders (4-6%) indicated that farmers may anticipate buying maize or beans back from the market later in the season and therefore take the potential buy-back price into consideration when making their selling decision.

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1. Most answers referred to farmers and market traders as the major suppliers.

Table 19: Perception of Market Traders about the Motivation of Suppliers and Buyers (%)

| Motivations | Maize Trader | | Beans Trader | |
	Suppliers	Buyers	Suppliers	Buyers
Price	30.3	23.7	19.1	16.3
Cash Payment	69.2	N.A.[a]	68.3	N.A.
Credit	5.1	13.7	9.1	17.3
Quality of Produce	N.A.	21.6	N.A.	27.6
Fairness[b]	4.3	-	5.9	-
Socially with Buyers	N.A.	67.5	N.A.	75.4
Personal Relations	17.1	2.8	27.8	5.5
Arrangements	8.8	8.6	9.7	5.2
Lack of Supply	N.A.	3.0	N.A.	8.9
Other	0.4	0.3	0.7	0.5

Notes: a. Not applicable.

b. Trader is charging reasonable price if supplier is customer during off-season.

Source: Own Complation.

In regard to competition for buyers, being "friendly" or having social ties with buyers (mainly consumers) was by far the most important factor mentioned by both maize and beans traders (see Table 19). Prices ranked second for maize traders and third for beans traders. Prices and quality of produce are interrelated. Quality of produce was mentioned as often as price as a determinant of buyers' preference by maize traders and considerably more often than price by beans traders. However, if one looks at the combined percentage for price and quality, it still remains second to social relations with buyers.

The selling price as action parameter seems to loose importance as one goes from west to east. Whereas in Western Kenya prices rank second to "social behaviour", in Eastern Kenya they come last (see Table A9, Appendix). In fact, in Eastern Kenya price was not even mentioned once by either maize or beans traders as a decisive factor in attracting buyers. On the other hand, "lack of supply" increases in importance as a motive for buying from specific traders as one moves from west to east. This suggests that the supply situation relative to demand in Central and Eastern Kenya is such that no price reductions are necessary to sell trader stocks. Conversely

due to a tight supply situation, buyers may have to offer higher prices
to ensure being supplied. This situation reflects the conditions typical of
a sellers' market which prevails during off-seasons.

In general, it can be concluded from this examination of market
trader behaviour towards suppliers and buyers that they respond to market
conditions. These conditions, however, are in their favour vis à vis suppliers
(farmers) during the season and vis à vis buyers (consumers) during the
off-season. This partly explains why price is often not an action parameter.
The rest of the explanation rests with market structure conditions: when
traders are numerous and run relatively small operations, they act as price-
takers, e.g. no one trader has the power to influence the market price. In
the face of passive pricing attitudes, other preference constituting factors
such as personal relations, behaviour in conformity with social norms, and
economic factors such as produce quality and scarce capital resources gain
importance. These might give the individual trader some limited freedom to
differentiate prices in her favour. This is particularly so if credit is
extended. Yet credit extension generally plays a minor role, slightly larger
for consumers than farmers. Furthermore, according to traders, it was for
the most part extended free of charge. Only 24.2% of maize traders and 13.7%
of beans traders extending credit to consumers claimed that they charged either
a higher price or interest.[2]

Although Tables 19 and A9 (Appendix) suggest that pricing plays only a
slight role in competition, they do not suggest that traders are reluctant to
adjust prices to market conditions. Actually, Tables 20 and 21 support the
opposite view. Market traders aim for a target margin which they add to the
buying or subtract from the envisaged selling price (see Table 20).[3] (This will
be referred to as the costplus method.) Target prices arrived at in this way
are subject to adjustments according to the market situation. This, however,
is more true on the selling side since the price calculation is based on the
expected selling price. Traders have no certainty about the actual selling
price when buying which reduces their readiness to pay higher than expected
prices to suppliers. Only in the case of better produce quality, which has some
importance for selling competition (see Table 18), were the majority of traders
willing to pay higher prices to suppliers.[4] A minority of traders also mentioned

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2.   These figures may be understated.

3.   The margin is usually calculated in absolute terms.

4.   This was not the case for Eastern Kenya (see Table A9, Appendix).

Table 20:   Market Traders' Method of Price Calculation by Sample Zone (%)

	Maize Traders				Beans Traders			
	Western	Central	Eastern	Total	Western	Central	Eastern	Total
Cost Plus[a]	75.3	92.4	76.1	81.7	71.0	91.0	94.2	85.0
Market	24.7	10.8	23.9	20.0	30.6	14.2	5.8	18.6
Other	-	0.5	—	0.2	-	0.5	-	0.3

Note: a. Adding or deducting target margin.

Source: Own Compilation

the market supply situation and longstanding business relations as reasons for purchasing at higher prices. Other motives such as increase of sales, credit, and market transparency of suppliers (farmers) were even less important or only important in certain regions.[5]

Table 21:   Percentage of Market Traders Using Price as Action Parameter in Buying and Selling, by Different Motives

Motives for Pricing Actions	Maize Traders		Beans Traders	
	Buying[a]	Selling[b]	Buying[a]	Selling[b]
Market Situation	28.7	56.c	26.9	55.7
Large Transactions	N.A.	26.2	N.A.	19.8
Increase of Sales	0.2	42.3	1.3	44.3
Longstanding Business Relations	12.2	27.9	6.0	22.9
Quality of Produce	57.8	3.8	61.5	12.6
Credit	5.9	N.A.	0.8	N.A.
Other	0.9	-	4.8	-
% of traders using pricing actions	66.3	89.4	62.0	78.3

Notes: a. Higher buying prices.
        b. Lower selling prices.
        c. Not applicable.

Source: Own Compilation.

5.   Credit extension played a role in Western Kenya only, whereas market transparency of farmers (e.g. knowledge of prices) was mentioned more frequently by beans traders in Eastern Kenya than any other motive. Increase of sales was mentioned in Western and Central Kenya (See Table A10).

...

As stated earlier, once supplies have been purchased, the selling price is calculated on the basis of the actual purchase price. Under these conditions of greater certainty about costs, a relatively higher number of maize (89% versus 66%) and beans (78% versus 62%) traders were willing to reduce selling rather than raise buying prices in order to maintain or increase their turnover. A majority cited the market situation as the motive; a smaller percentage indicated increase of sales and large transactions (see Table 21). Longstanding business relations and low quality were of minor importance.

Regionally, the percentage of traders ready to reduce selling price decreases from west to east (see Table A10, Appendix). This shows the same regional trend observed for general attitudes towards selling price. The trend is attributable to regional differences in the market supply situation. Maize traders in Eastern Kenya (deficit-area) showed the least inclination to reduce selling prices and when they did change prices were less motivated by the market situation or related motives such as increase of sales and large transactions than beans traders or maize traders of other zones.

Lack of motivation to change prices was not unique to maize traders in Eastern Kenya, it was found to varying degrees in all the sample zones. This raises the question of whether collusive behaviour instead of or in addition to response to the market supply and demand situation was a major contributing factor. This question is not easy to answer since traders usually are not willing to disclose such practices to outsiders. Nevertheless, those who stated that they did not raise buying or reduce selling prices were "innocently" asked whether they had arrangements with other traders. Surprisingly, quite a number did not hesitate to admit such arrangements.

Table 22: Percentage of Market Traders with Price Arrangements in Buying and Selling by Sample Zones

Zone	Maize Traders		Beans Traders	
	Buying	Selling	Buying	Selling
Western	12.4	1.0	7.4	2.7
Central	8.9	16.0	8.0	14.7
Eastern	14.7	6.1	18.8	9.7
TOTAL	11.4	6.5	9.5	10.3

Source: Own Compilation.

As Table 22 reveals, the largest percentage (16% for maize, 14.7% for beans) of traders involved in selling price arrangements were detected in Central Kenya, followed by Eastern Kenya (6.1% maize, 9.7% beans) and to a very limited extent Western Kenya (1% maize, 2.7% beans). Arrangements with regard to buying prices were most prevalent in Eastern Kenya whereas in Central and Western they were markedly lower except for maize. In general, however, as already suggested by the data presented above, price arrangements or collusive behaviour are not a predominant feature in maize and beans markets irrespective of location. Furthermore, such collusive arrangements are usually successful for short periods only in small markets where small scale resident market traders dominate and competition from outsiders and other types of traders is weak and depends on the seasonally determined supply and demand pattern. In most cases, under a favourable supply situation, collusion does not even work in such markets.

On the basis of the available data, it can be concluded that although market traders for maize and beans have a relatively passive attitude towards pricing competition, they do adjust to changing market conditions. They are oriented towards ensuring a target margin (in absolute terms) and thus should pass on price changes to the preceding or subsequent marketing channel level (see section 5.2.1).

.2 MPB Agents (Produce Stores)

MPB agents, wholesalers and retail shops are in a totally different situation with regard to competitive actions than market traders. Theoretically, price is not an action parameter since, except for beans at the wholesale selling and retail level, buying and selling prices are fixed by the government. In practice, however, prices paid to farmers and other suppliers are often below the official prices (see chapter 5.3) so that prices may indeed play a competitive role among agents.

Some indication for this lack of adherence to fixed prices can be derived from Table 23 which indicates which methods agents used for determining buying prices. Only 43.2% of the agents stated that they had no choice but to follow instructions of the MPB. Except for Eastern Kenya,[6] the majority of agents were applying the same methods as market traders: deducting a target

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6.   The author observed that those agents who claimed that they had no choice but to buy at the MPB price, a majority in Eastern Kenya, were also those who seemed to be more mistrustful during the interview.

As stated earlier, once supplies have been purchased, the selling
price is calculated on the basis of the actual purchase price. Under these
conditions of greater certainty about costs, a relatively higher number of
maize (89% versus 66%) and beans (78% versus 62%) traders were willing to reduce
selling rather than raise buying prices in order to maintain or increase
their turnover. A majority cited the market situation as the motive; a
smaller percentage indicated increase of sales and large transactions (see
Table 21). Longstanding business relations and low quality were of minor
importance.

Regionally, the percentage of traders ready to reduce selling price
decreases from west to east (see Table A10, Appendix). This shows the same
regional trend observed for general attitudes towards selling price. The
trend is attributable to regional differences in the market supply situation.
Maize traders in Eastern Kenya (deficit area) showed the least inclination
to reduce selling prices and when they did change prices were less motivated
by the market situation or related motives such as increase of sales and large
transactions than beans traders or maize traders of other zones.

Lack of motivation to change prices was not unique to maize traders
in Eastern Kenya, it was found to varying degrees in all the sample zones.
This raises the question of whether collusive behaviour instead of or in
addition to response to the market supply and demand situation was a major
contributing factor. This question is not easy to answer since traders usually
are not willing to disclose such practices to outsiders. Nevertheless, those
who stated that they did not raise buying or reduce selling prices were
"innocently" asked whether they had arrangements with other traders. Surpri-
singly, quite a number did not hesitate to admit such arrangements.

Table 22: Percentage of Market Traders with Price Arrangements in Buying and
           Selling by Sample Zones

Zone	Maize Buying	Traders Selling	Beans Buying	Traders Selling
Western	12.4	1.0	7.4	2.7
Central	8.9	16.0	8.0	14.7
Eastern	14.7	6.1	18.8	9.7
TOTAL	11.4	6.5	9.5	10.3

Source: Own compilation.

As Table 22 reveals, the largest percentage (16% for maize, 14.7% for beans) of traders involved in selling price arrangements were detected in Central Kenya, followed by Eastern Kenya (6.1% maize, 9.7% beans) and to a very limited extent Western Kenya (1% maize, 2.7% beans). Arrangements with regard to buying prices were most prevalent in Eastern Kenya whereas in Central and Western they were markedly lower except for maize. In general, however, as already suggested by the data presented above, price arrangements or collusive behaviour are not a predominant feature in maize and beans markets irrespective of location. Furthermore, such collusive arrangements are usually successful for short periods only in small markets where small scale resident market traders dominate and competition from outsiders and other types of traders is weak and depends on the seasonally determined supply and demand pattern. In most cases, under a favourable supply situation, collusion does not even work in such markets.

On the basis of the available data, it can be concluded that although market traders for maize and beans have a relatively passive attitude towards pricing competition, they do adjust to changing market conditions. They are oriented towards ensuring a target margin (in absolute terms) and thus should pass on price changes to the preceding or subsequent marketing channel level (see section 5.2.1).

4.2 MPR Agents (Produce stores)

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Some indication for this lack of adherence to fixed prices can be derived from Table 23 which indicates which methods agents used for determining buying prices. Only 43.2% of the agents stated that they had no choice but to follow instructions of the MPB. Except for Eastern Kenya,[6] the majority of agents were applying the same methods as market traders: deducting a target

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6.   The author observed that those agents who claimed that they had no choice but to buy at the MPB price, a majority in Eastern Kenya, were also those who seemed to be more mistrustful during the interview.

margin from the expected selling price[7] and/or following market prices.

Table 23:   MPB Agents' (Produce Stores) Method of Buying Price Calculation
by Sample Zones (%)

Method	Western	Central	Eastern	Total
Deducting Margin	59.0	37.8	34.2	53.1
Market Comparison	3.2	14.0	1.7	3.7
Use MPB Prices	37.8	48.2	64.2	43.2

Moreover, target margins of MPB agents were similar to those of market traders.
Given this background, competitive pricing actions-- offering better prices than
others buyers-- are likely unless collusive arrangements or unconducive market
conditions arise. Evidence of collusive arrangements was found in only one market.
On average almost 50% of the agents did not know whether competing agents were
paying more or less than they were, whereas 10.4% claimed others were paying less
and 6.4% claimed that others were paying more. So, according to the data, collusion
does not seem to be common among agents. An active pricing policy would require
knowledge of competitors' prices, but this is not the case. Hence, agents adopt
a more passive stand.

This is also suggested by Table 24 on agent perceptions of why suppliers
sell to them. As in the case of market traders, cash payment ranked far above
price as a perceived motive for suppliers sales. Throughout the survey area,
the majority of agents (88.3%) paid cash and only in Western did the percentage
fall below 90.[8] Apparently, agents to respond to the demands of suppliers in
this area. Prices are second to cash payment as a source of preference for one
agent over another; if personal relations and social behaviour are seen together

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7.   Despite the fixed price, there was not necessarily certainty about
the selling price since it was not known whether the MPB was able to absorb all
supplies or whether bribes would be necessary.

8.   This may be explained by the fact that working capital of agents in
Western Kenya is less than that in other zones.

as non-economic supply motives, however, the importance of prices decreases.
Furthermore, the price importance is less if one takes into account quality of
produce. The MPB price makes no distinction for "fair average" and better quali-
ties; the choice, although illegal, facing the agent was whether or not to adjust
prices downward for lower quality produce. 45% of the agents admitted doing
this. However, the majority of agents in Western Kenya (78.8%) and a significant

Table 24:   Perception of MPB Agents (Produce Stores) about Motivations
                   of Suppliers Selling to Them (%)

	Western Kenya	Central Kenya	Eastern Kenya	Total
Price	18.5	29.1	22.7	19.1
Cash Payment	56.4	70.2	68.0	58.7
Credit	9.5	–	17.0	9.6
"Fairness"	17.9	10.1	7.5	16.2
Socially with Suppliers	8.0	–	–	7.3
Personal Relations	18.3	17.1	20.8	18.5
Arrangements	3.2	–	2.0	2.9
Other	–	2.6	11.3	1.4

Source: Own Compilation.

number in Central (39.3%) and Eastern Kenya (30.6%) claimed they rejected
lower quality supplies. On the other hand, fairness with regard to off-season
prices was mentioned by quite a number of agents and must be included under
price considerations. Yet this does not affect the general picture derived from
the data: agents cannot be assumed to pursue an active pricing policy. However,
it must be emphasized that this stems from the framework within which they operate
rather than their unwillingness to be price responsive. In addition, it must
be kept in mind that although they may not face price competition among themselves
they do face it with other traders.

A similar situation applies to distribution and retail activities
which may be a part of an MPB agents activities as well. At these levels, as
mentioned above, prices and margins for maize are fixed as well. Selling below
the controlled price is either not possible because of the low margin or else
not necessary since the price is justified by the control. Provision of
credit may reduce the readiness and necessity for competitive pricing actions
at the assembly stage and increase the possibility of exploitation. This is

an often criticized practice in Asia. However, only 12.2% of MPB agents had extended credit to farmers[9] and only 9.5% in Western Kenya and 17% in Eastern Kenya saw this as a motive for supplier farmers to sell to them. The amount provided on credit was usually quite small and the number of cases so few that credit extension can not be viewed as an area which affects pricing behaviour towards suppliers. If credit is granted it is usually viewed in connection with retail activities as an additional means of increasing the number of customers and sales, not as a means of tying farmers to exploitative prices.

4.3 Independent Produce Wholesaler (Lorry Trader)

The most competitive marketing functionaries were found among the independent wholesalers or lorry traders even though they usually operated in an environment unconducive to open competition. This statement is based not only on data from standardized interviews, but also on impressions that the author obtained during personally-conducted interviews.[10]

Like market traders and storeholders, lorry traders usually follow the cost-plus approach to determine target selling or buying prices; if the market situation permits, these target prices are then subject to bargaining. This is more often the case at the distribution that the assembly levels particularly when, lorry traders buy from smallholders. When buying, lorry traders usually encounter a buyers' market in which they compete with other types of assemblers. Quite a lot have prior arrangements with farmers, storeholders or market traders. However, this does not mean that the question of price is unimportant. Only a quarter (23.1%) of the lorry traders agreed that sometimes they paid less than other buyers, whereas nearly one half (46.7%) claimed to pay more. Furthermore, the majority of market traders (81% of maize traders and 86.9% of beans traders) particularly in Central and Eastern Kenya confirmed that

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9.   The amount granted in credit did not exceed KShs.1000 or KShs.50 per farmer in 50% of the cases and it was usually used for consumption purposes In only three cases did the total amount exceed KShs. 10,000 which was used for non-consumption purposes. These three agents claimed to have extended a total of KShs. 15,000 (KShs. 100 per farmer), KShs. 20,000 (KShs. 200 per farmer) and KShs. 100,000 (Kshs. 400 per farmer) respectively. They were all agents from Machakos District. The agent extending KShs. 100,000 credit had a bank loan and was engaged in various other businesses. It was not clear whether he belonged to the category of lorry trader or that of MPB agent.

10.   Because of the limited time lorry traders had for interviews, the standardized questionnaire often was followed for the most important data and questions on market conduct were skipped. This is why the following discussion contains few figures. If time was left after completing the questionnaire, the interview was continued. This often created a very relaxed atmosphere which made it possible to get a much deeper insight into the whole business than can be obtained by a formalized set of questions.

there was scope for bargaining when selling to lorry traders.[11] The lorry
traders are usually ready to pay relatively favourable prices in order to get
sufficient supplies to fill their lorries without wasting too much time.

Lorry traders sometimes arrange for market traders to perform the
initial assembly functions for them; they are paid in cash or sometimes receive
a cash advance. Storeholders are also used in this way. Farmers are sometimes
provided with production credit, but, like advances to primary assemblers,
this is not a common practice. The highest recorded amount extended was KShs.
25,000, or KShs. 2,500 per farmer.

Apart from cash payment, pricing is the major field of action for lorry
traders. As expected, indications of collusive behaviour were not found since
the buying and selling situation cannot be controlled by competitors. The compe-
titive attitude of lorry traders towards pricing is even more pronounced in selling
than in buying. This conclusion is borne out by selling prices in Kitui during
the survey period. As buyers confirmed, prices for maize went down as far as
KShs. 75 per bag compared to the official MPB ex-depot price of KShs.115.50
Our information supports the impression that lorry traders were fully aware of
the relation between the size of the margin and the rate of turnover as deter-
minants of total profit to be earned. In a competitive environment, they were
more oriented towards a high rate of turnover than towards a high margin. This
finding is supported by the fact that 75% of those operating in markets claimed
that they did not always sell for cash. This was confirmed by market traders.
When their financial capacity to buy was exhausted and only a couple of bags were
left for distribution, lorry traders would often give market traders the bags
without cash payment rather than try to sell them in another place. The pay-
ment was then collected on the next trip. In summary, lorry traders showed much
more dynamic marketing behaviour than market traders or storeholders.

4.4 Maize and Produce Board.

The Maize and Produce Board is supposed to operate in a manner which
brings market stability and security for the benefit of producers and consumers
The conduct of the Board is almost the opposite of lorry traders in that it is
the most passive marketing functionary within the whole maize and beans marketing
system. Based on its legal monpoly position, it announces procurement times

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11.   The Lowest percentage (59.4%) was found for maize traders in Western
Kenya whereas in all other areas and for beans traders it was above 80%.

(periods for accepting deliveries), buying conditions and the fixed prices established by government. These are essentially the only actions of the Board apart from the physical handling of the produce. It more or less waits for suppliers and customers. It is little concerned with whether its announcements reach all addressees or whether the marketing conditions set reflect actual conditions. Buying prices are usually fixed for long periods in advance without considering regional and seasonal differences. Therefore they often are poorly adjusted to the market. This is true also to a certain extent for selling prices. Only for beans were buying prices changed more frequently; in the recent past, however, price levels discouraged supplies to the Board.[12]

The conditions set by the MPB result in various shortcomings. For example, during peak seasons maize suppliers must line up for days and nights to deliver one lorry load. In deficit areas like Kitui, the MPB may sell only negligible amounts (see section 3.2.1). Beans supplied to the Board are usually shipped to Nairobi and auctioned to the highest bidder. Customers in rural areas may be left without supplies though beans prices there may be much higher than those realised at auction (see Hesselmark 1977, p. 6). Payment terms are usually cash, but there have been occasions when the Board ran out of money leaving the suppliers no alternative but to wait weeks or months until the financial problems were rectified.[13]

In summary, the market conduct of the MPB is exactly what one expects from a monopolist. To a certain extent, the organization alone cannot be blamed for its inactivity; it is not autonomous in its actions, especially with regard to pricing, financing, export, and so forth. The MPB operates within the framework set by government legislation and is subject to decisions taken by various government ministries. Thus it executes rather than sets policy. No matter who ultimately is responsible for the market behaviour of the MPB, the fact remains that the MPB's passivity has severe implications for the performance of the whole marketing system. This performance will be examined in the following chapters.

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12.   This was and still is because of the current maize surplus.

13.   On March 26th, 1977, the Daily Nation (p.3) reported complaints of Uasin Gishu farmers that the Board had not paid them since January and therefore owned them a total of KShs. 20 million.

5. PERFORMANCE OF THE MAIZE AND BEANS MARKETING SYSTEMS

In the short run, performance is determined by market structure
and conduct, whereas in the long run performance interacts with and influences
these marketing conditions. Performance will be evaluated according to the
stated objectives of the controls. The analysis will include evaluation of
operational efficiency, pricing or allocative efficiency, and security of outlets
and sources as it relates to price stability, income and distributional effects.

5.1 Operational Efficiency

Operational efficiency concerns the costs involved in marketing.
If a marketing system performs its functions at higher costs than necessary, there
is scope for increasing operational efficiency. As will be shown in the following
discussion, this is the current situation within the controlled maize and
beans marketing systems. The possibilities for improving operational efficiency
will be analysed separately for each of the main marketing functions although
it is recognised that these functions are interrelated and often must be per-
formed together.

5.1.1 Assembly and Distribution. The rural marketing system faces an extremely
dispersed supply and demand situation. The result is a relatively expensive
system based on numerous marketing functionaries who assemble and distribute
produce on a small scale. This differs for large farm areas with a high con-
centration of production where producers can directly supply depots or mills
without any marketing intermediaries. Likewise, for urban areas with a larger
concentration of consumers, distribution is handled on a larger scale. Since,
however, the dispersed pattern prevails in Kenya, the system of many market
traders and agents (produce stores) is well suited to the marketing conditions.
However, the question remains as to whether there is scope for reducing
marketing costs within this system.

The main assembly and distribution coast facing market traders and
producers, apart from transporation costs which will be discussed later, is
market fees. These fees are imposed and collected by the County Council and
are beyond the control of producers and traders. As Table 25 shows, they vary
considerably between markets and districts, ranging from KShs. 1 to KShs. 5
or more per bag. The fee within a market may be even higher if one takes into
account that headloads are charged half of the fee for one bag. Three headloads,
the equivalent of one bag, would therefore be charged more than a full bag. The
fees, therefore, seem to discriminate against those with small amounts for sale
and those dependent on headload transport. In summary, these market fees are
purely a tax on marketed output by County Councils which bears no relation to

actual marketing services provided. The justification for such taxes which part-
icularly affect the lowest income groups and raise marketing costs needs to be
reviewed.

Table 25: Frequency Distribution of Market Fees for Maize and Beans

KShs./bag	Maize	Beans
1 - 2	27	22
3 - 4	26	17
5 and more	9	22
Total No. of Markets	62	61

Source: Casley and Marchant; 1978 p.

In addition to market fees, a number of market traders pay fees for
specific marketing services. Some markets provide stalls for traders where
they can keep a limited amount of carryover stock from one market day to the
next. 15% of maize and beans traders rented stalls for between KShs. 12 and
KShs. 75 per month, the average being KShs. 20 per month. Another 5% of market
traders used to keep, if necessary, carryover stocks in the open market or in
shops around the market for which they paid between KShs. 1 and KShs. 5
weekly to a watchman or shopkeeper. However, some shopkeepers did not charge
for this service. About 3.4% of the traders, who used to leave untensils and
produce regularly in the market, paid an average of KShs. 5 per month for a
watchman hired jointly with several other traders.

Such assembly and distribution costs were incurred by only a
minority of market traders and even then not necessarily on a regular basis.
These costs rarely amounted to more than KShs. 0.50 per bag and the expense
is usually justified since it reduces the risk of losses especially as the scale
of operation increases. Losses in the market were generally low, about 5% on
average, since most traders dispose of their stocks very quickly. However,
losses can increase considerably under adverse weather conditions due to lack
of shelter in open markets. Average losses under such circumstances were
about 15%.

Bribing must also be taken into account as a potential distribution cost. Interregional traders operating on a larger scale face the risk of being caught in police road checks. This usually results in payment of a bribe to police officers of between KShs. 5 and KShs. 10 per bag. Lorry traders face similar situations. They pay between KShs. 500 and KShs. 1000 per lorry which means about KShs. 1 and KShs. 2 per bag; they were caught in about 20-25 percent of their transactions. Seven lorry traders reported bribing costs per year ranging from KShs. 10,000 to more than KShs. 250,000. The total amount for all seven was more than KShs. 350,000.[2] These costs would difinitely fall off under a free marketing system.

Bribing costs were not simply a problem with regard to illegal movements of maize and beans. More than 90% of the MPB agents mentioned this or corresponding reasons for it in regard to deliveries to MPB depots. In fact, in some areas the problem was so severe that bribes were the major cost item for agents. Bribing is sometimes necessary for virtually all steps to get maize into the depots: obtaining movement permits, passing the gate, passing the moisture test, getting the lorry off-loaded and so forth. For some depots in Western Kenya, bribes were reported to range between KShs. 300 and KShs. 350 per lorry of KShs. 3 and KShs. 3.50 per bag.[3] For other depots in Western and Central Kenya, bribes at peak times ran as high as KShs. 500 per lorry.[4]

These are the rates prevailing at peak delivery periods and therefore do not apply to all supplies. Bribes at other times ranged around KShs. 1 per bag. Problems for agents increase as soon as it becomes evident that a depot's storage capacity is insufficient for all offered supplies. Traders and agents must then compete for the limited storage space. Either they bribe their way into the depot or they will be forced to keep their stocks since no other legal outlet for them exists. The only other alternatives are to sell at much lower prices to lorry traders or to get involved in illegal movements which is not a viable alternative for most agents. The size of bribes in these cases

2.   The highest figure given was KShs. 40,000 per month.

3.   The breakdown given was as follows (KShs.   ): permit 100, gate 50, moisture test 100, off-loading 60, and clerk 40.

4.   This figure was mentioned several times. Even after the temporary relaxation was announced, a lorry trader claimed that he had to pay KShs. 300 for a permit valid for several days. Under the controls, permits were usually valid for 24 hours only.

can be viewed as the market price for the remaining storage capacity of the depot or, in other cases, for the time saved. These bribery costs are economically justified if compared with opportunity costs to suppliers.

General assembly costs for agents and lorry traders are quite moderate compared to bribes. The major items are: rent for the store, licence fees and, in some cases, salary for a watchman. Average assembly costs per bag for MPB[b] agents were estimated by allocating general assembly costs and miscellaneous overhead costs such as water, electricity, stationary and the like according to the importance of maize and beans in total business revenues[5] and then to the proportion of maize and beans in total turnover.[6] The average assembly costs for agents ranges between KShs. 0.63 and KShs. 0.82 per bag of maize depending on the zone (see Table 26).[7] Among the most efficient agents (the top 25%), costs were considerably lower, on average KShs. 0.27 per bag. Lorry traders proved more efficient perhaps due to economies of scale. They had overhead costs of KShs. 0.20 per bag which includes assembly for those not buying from primary assemblers and distribution for those not delivering to the MPB.

Table 26: Major Assembly Costs (KShs.) per Bag of Maize for MPB Agents by Sample Zones

Variable Costs	Western Kenya	Central Kenya	Eastern Kenya	Total Kenya
Store Rent	.33	.53	.31	.35
Licence	.15	.12	.08	.13
Watchman	.20	.08	.15	.19
Miscellaneous[b]	.09	.09	.09	.09
TOTAL	.77	.82	.63	.76

Notes: a. Allocation of overheads according to share of maize and beans in business revenues and the proportion of maize and beans in total turnover.

b. Cases were too few for a regional breakdown.

Source: Own Compilation.

5.   The average share was 75%.

6.   The average proportion for beans was 17%.

7.   The calculations were done on a monthly basis; it was assumed that during the slack seasons stores would or could be used for different purposes. Thus, even if the store remained unused (which was not asked in the interviews) costs were not allocated to maize and beans assembly or distribution.

Due to lower turnover, costs per bag of beans were less than KShs. 0.25.
Average costs for agents amounted to KShs. 0.23 per bag following similar
regional variations as maize, whereas lorry traders' average costs were
only KShs. 0.09 per bag. If one takes the value of each crop as a basis for
allocating overhead, costs for maize would come down and costs for beans would
go up.

Since all methods overhead allocation are somewhat arbitrary and maize
is really the outstanding product line, we will accept the above figures as a
basis for examining the cost of possible alternative marketing arrangements.
One possible alternative to the MPB agent scheme is for the MPB to hire employees
to perform the assembly functions. Each would be responsible for several major
market centres and for maintaining small storage facilities in each. How
would the costs compare with the agent system? In the past, the MPB assumed a
gross margin for agents of KShs. 2.50 per bag of maize. Deducting average
costs of Kshs. 0.75 per bag for operating costs of small scale storage
facilities and allowing for other costs on the order of KShs. 0.50 per bag
the MPB would be left with about KShs. 1.25 per bag to pay the employee.

If one assumes that product inspector level employees would carryout
these functions at a salary of KShs. 1,500 per month,[8] the MPB would bre even
if each Product Inspector managed a turnover of 1,200 bags of maize per month
or 300 bags per week. For beans, for which a gross margin of KShs. 6 per bag was
paid in the past, the volume would range around 70 bags per week. The break-
even point would be even lower (about 200 bags of maize per week) if Product
Inspectors could achieve the efficiency of lorry traders which is however not
very likely. In any case, the above break-even volumes appear feasible for
major production areas although certainly not for all zones. Furthermore,
the above calculation assumes overhead for the active assembly periods only;
this implies that stores were either rented temporarily or utilized for other
purposes during other times of the year. The above alternative needs to be
tested in the field including evaluation of its effect on bribes and final
prices paid to farmers (see section 5.3).

More important from the cost point of view than introduc g a new
assembly system for the MPB in smallholder areas is the possibility of relaxing
controls. The controls and the resulting monopoly position of the MPB un-
necessarily increase the length of the marketing chain. Mills and wholesalers

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8.   This salary corresponds to a Grade 2 MPB Product Inspector including a
house allowance of KShs 400 per month.

could for the most part be directly supplied as occurred during the temporary relaxation of controls. Mills are located in the vicinity of MPB depots, their major suppliers. Supplying the neighbouring depot and them shipping from there to the mill adds an additional, economically questionable marketing channel.[9] Wholesalers face a similar situation.

Marketing costs therefore could be reduced significantly if direct sales to mills or distributors were permitted. Per unit costs for the MPB might increase, but this is not necessarilly so. Growing output requires the expansion of current capacity, but with direct sales existing capacity would probably be sifficient. Furthermore, the MPB could extend activities for other produce neglected in the past because of maize.

It is difficult to estimate total savings from a direct sales policy, because there is no information on the proportion and structure of fixed and variable costs within the MPB margin. Currently, the MPB works with costs of about KShs. 12 per bag of maize excluding railage (Unpublished circular, Maize and Produce Board 1979). Overhead on administration, storage and operation is calculated at KShs. 6 per bag and finance costs at another KShs. 6 per bag including the cost of holding the national reserve.[10]

In the absence of a detailed study of the operation and cost structure of the MPB, which would be very useful, one can reasonably estimate that direct sales would result in a net saving of KShs. 2 per bag of maize and beans.[11] This figure might be higher if it is taken into account that certain overhead costs are fixed for specific periods of operation. However, assuming a net saving of KShs. 2 per bag and that 25% of current MPB sales bypassed if it were sold directly to mills and wholesalers, the potential reduction in total marketing costs on the basis of 1976/77 figures should be on the order of KShs. 3 million for maize and KShs. 600,000 for beans. The actual figure might be well above that level. Reduction of private costs could be even higher than this estimate because buyers of maize would save approximately KShs. 12 (overhead cost of MPB) for each bag purchased from other sources.

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9.   At Sagana, for example, the new mill is just opposite the depot. Maize supplied to the depot gets shipped across the road. However, the entire MPB margin including all overhead costs is charged.

10.   The national reserve serves the interests of the whole public and therefore the entire nation not just maize producers and consumers should bear its cost.

11.   The working party studying the MPB (1969) calculated that fixed overheads are roughly 50% of total overhead. Kenya, Final Report 1969, p. 34.

In summary, improvement of operational efficiency in assembly and distribution depends largely on relaxation of controls on maize and beans marketing. If controls are relaxed, marketing costs can be substantially reduced. If not, the scope for improving operational efficiency is limited since present assembly and distribution structures seem to be quite well adjusted to the existing framework. The operational efficiency of the MPB employee alternative assembly system for smallholder areas needs to be tested. At the present time, however, lorry traders and agents operating on a similar scale are the most efficient assemblers in terms of overhead cost per bag.

Lorry traders often perform the distribution function as well; usually this does not involve additional overhead costs except when selling to the MPB. Lorry traders seem to be the most efficient marketing channel for both functions. This holds true even if they concentrate on distribution buying from primary assemblers. For some, maize and beans marketing is part of a general wholesale business and therefore reflects the overall efficiency of wholesale operations. The same applies to general retail shops. The analysis of overall efficiency of those wholesale and retail operations is beyond the scope of this study (see Spliet 1978). However, wholesale and retail margins for maize are controlled and seem to leave no room for reducing distribution costs (Hesselmark and Lorenzol 1976, p. 176).

5.1.2. Transport. Another crucial area with regard to the operational efficiency of the maize and beans marketing systems is the performance of the transport function, in particular within the informal sub-systems. Legislation restricts the informal sub-systems to the district level. Shipments of more than 10 bags of maize and beans within a district and more than 2 bags across district boundaries are prohibited unless delivered to the nearest MPB depot under a movement permit.

The movement control regulations have severe implications for the mode of transport at the disposal of market traders and consequently for transport costs. Due to the restrictions, market traders and farmers shipping amounts beyond human carrying capacity (by head) are forced to break down their shipments into small lots and therefore are usually left with no alternative but to use buses and matatus or for short distances pack animals. Lorries and pickups which could be used jointly by several traders are out of question since under the controls their loading capacity cannot be utilized. Furthermore, it is virtually impossible to prove to police making road checks that the des-

tination of the vehicle is within the district particularly since major markets
are often located at or near district boundaries. These factors limit the ship-
ment volume to a maximum of 2 bags. As can be seen from Table 27, lorries and
pick-ups, in fact, play almost no role within the informal system. Apart from
the headload which is the transport mode of most small resident traders who
do not move between markets, matatus, buses, and pack-animals (in Western Kenya)
are the most common modes of transport.

Table 27. Means of Small Scale Transport by Sample Zones (%)

Means of Transport	Western	Central	Eastern	Total
Head	28.6	24.0	50.9	28.2
Hand Cart	3.3	5.6	3.2	4.1
Animal Drawn Cart	-	6.5	-	2.3
Pack Animal (Donkey)	30.6	-	-	18.1
Bus	12.1	7.5	11.8	10.5
Matatu	30.8	53.5	37.6	39.2
Pick-up	0.1	8.8	5.6	3.5

Source: Own Compilation.

Transporting small volumes by bus and matatu means paying a personal fare
and an extra fare for the produce which for one bag sometimes, especially in
Western Kenya, exceeds the personal fare. Consequently, the transport costs
are extremely high. This is worsened by the fact that traders tend to reduce the
transported volumes to below one bag because they are not well informed about the
regulations and more importantly, because the limited transport capacity of matatu
and buses makes it more difficult to get a ride with a larger load. Also, the
fare for the produce is often less expensive for a bag which is only partially
filled.

All these factors contributed to the fact that itinerant maize and beans
traders (before the increase of petrol prices in 1978) paid an average of
KShs. 6.46 per ton/km (see table 28) for transport compared to Kshs. 2.95 per
ton/km which MPB agents and produce storeholders using lorries and pick-ups
paid. It is striking that small scale transport costs tend to increase as one
moves from west to east whereas large scale transport costs follow the opposite
trend. However, the range of variation (standard deviations) should also be
noted.

Table 28. Transport Costs by Scale and Sample Zones (KShs. per ton/km)

Zones	Small Scale (Market Trader)		Large Scale (Produce Stores)	
	Mean	Std Dev	Mean	Std Dev
Western Kenya	6.26	3.09	3.20	2.26
Central Kenya	6.68	4.55	2.04	0.61
Eatern Kenya	7.23	4.99	1.66	0.92
TOTAL	6.46	3.85	2.95	2.16

Source: Own Compilation.

        Irrespective of regional variations, the differences in transport
costs between large and small scale traders is striking. Overall transport
costs could be considerably reduced if more economic modes of transport were
not discouraged by the present controls. A shift from bus and matatu to
pick-ups (see Table 29) would cut transport costs on average by one half.
A shift to lorries would bring costs down to almost one third the current level
although this would only be possible for a portion of the volumes handled
by the informal sub system. Nevertheless, under a marketing system free of
movement restrictions even a shift to lorries can be foreseen within a
reasonable time.

Table 29: Transport Costs by Mode of Transport (KShs. per ton/km)

Mode of Transport	Mean	Std Dev.
Donkey[a]	3.33	N.A.
Bus	6.79	2.71
Matatu	6.78	3.99
Pick-up[b]	3.48	0.82
Lorry	2.60	1.92

Notes: a. Traders interviewed had their own donkeys. Price
            was inquired from other respondents.

        b. Not representative because of small number of cases.

Source: Own Compilation.

Pick-ups and lorries are not only superior on medium and long hauls but even on short hauls. This can be derived from the double-log transport cost functions for small scale transport (bus/matatu) by market traders and large scale transport by storeholders (agents) and lorry traders which are shown in Figure 5. The original values for both functions are plotted in Figures 3 and 4. The functions computed are as follows: [12]

$$(1) \quad \text{Log}(\text{TRC}_{ssc}) = 1.32 - 0.44 \log (\text{TRD})$$

$$\text{with } r = -0.70 \text{ and } r^2 = 0.48$$

$$(2) \quad \text{Log} (\text{TRC}_{isc}) = 1.5 - 0.72 \log (\text{TRD})$$

$$\text{with } r = -0.78 \text{ and } r^2 = 0.60$$

Where

TRC_{ssc} = small scale transport (bus/matatu) by market traders per ton/kilometer

TRC_{isc} = large scale transport by storeholders (agents) and lorry traders per ton/ kilometer.

TRD = distance in kilometers.

Substituting function (2) into (1) leads to a critical distance of $D = 4.4$ kilometers. Thus, only for distances below 4.4 kilometers are usually covered with headloads by foot does small scale transport by bus or matatu seem to be more economical.

For both functions, per unit transport costs are highly negatively correlated with the transport distance (small scale, -0.7 and large scale, $r = -0.78$) showing that per unit costs decrease with increasing distances (see Figure 3 and 4). Under the present situation, small distances are bridged and as a consequence more distant areas often are linked in multiple steps. If, therefore, more distant regions could be connected directly, which is to be expected with free movement, transport costs would come down. Long distance haul lorries, for which per unit costs decrease at a relatively faster rate as distance increases than for other modes, would probably become the major means of transport.

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12.   The correlation of both functions is significant at the .001% level.
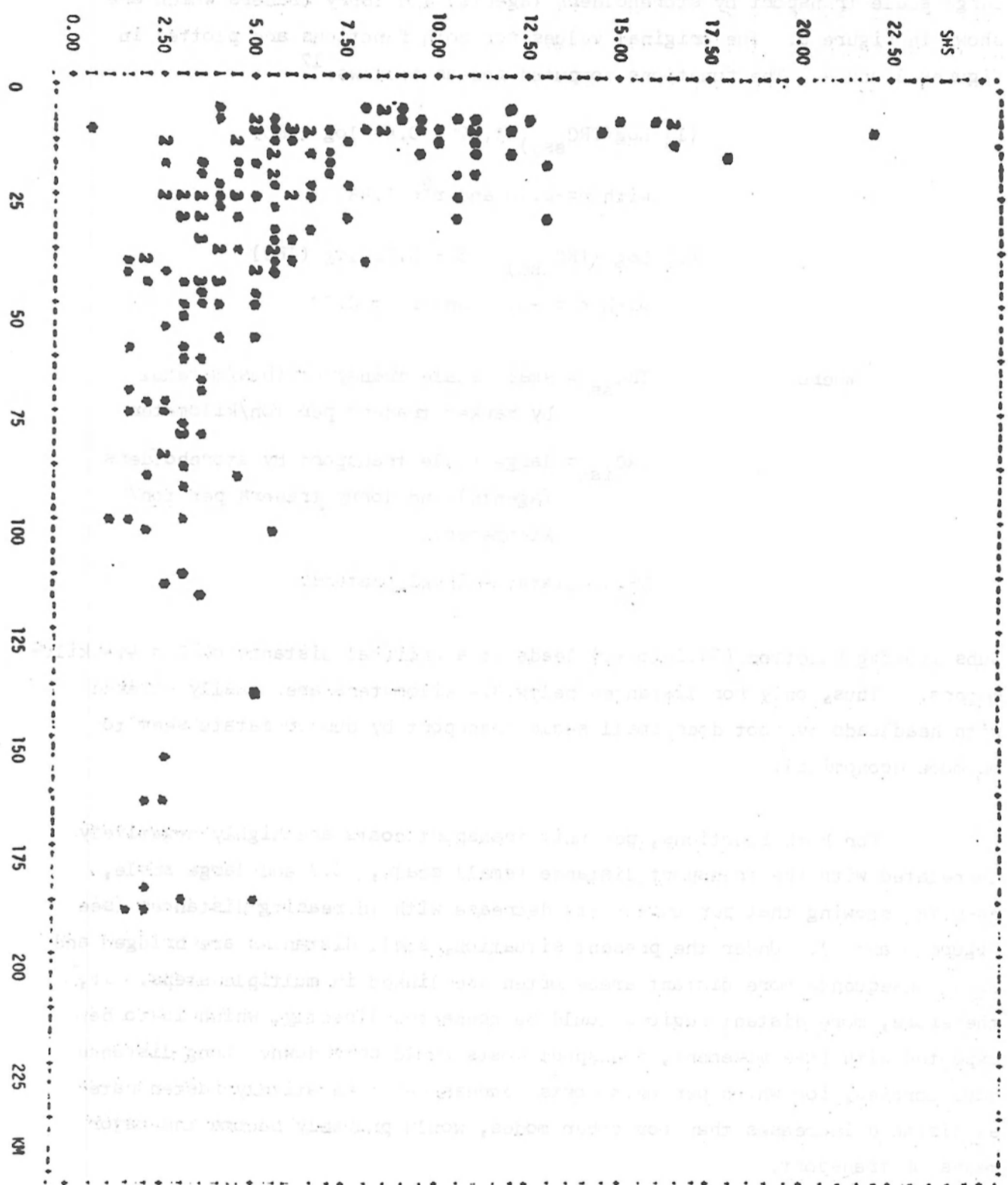
Figure 3 : TRANSPORT COSTS IN SHS/TON/KM FOR SMALL SCALE TRANSPORT (BUS, MATATU) BY TRANSPORT DISTANCE (KM)

Figure 4 : TRANSPORT COSTS IN SHS/TON/KM FOR LARGE SCALE TRANSPORT (PICK-UP, LORRY) BY TRANSPORT DISTANCE (IM) KM
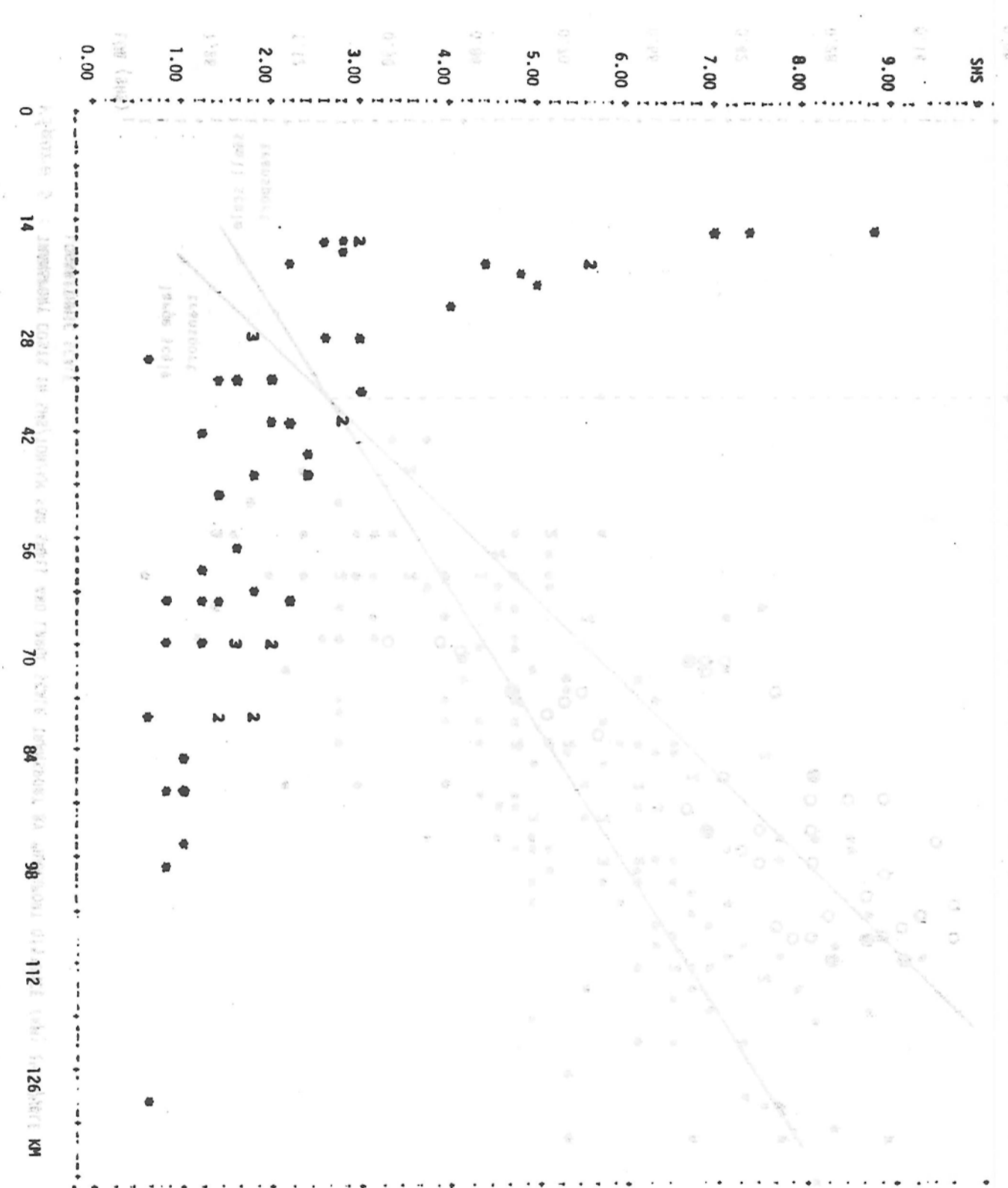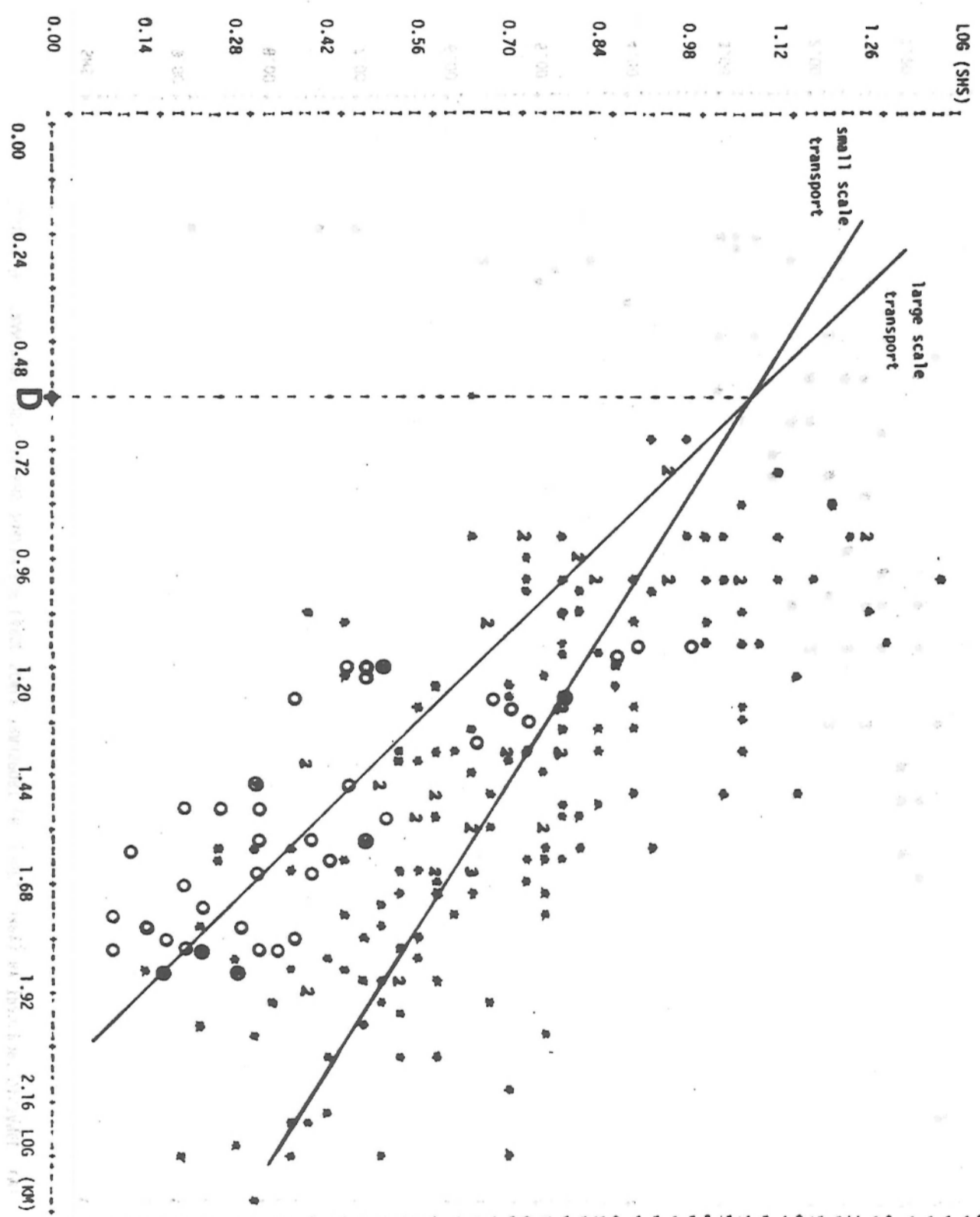
Figure 5 : TRANSPORT COSTS IN SHS/TON/KM FOR SMALL AND LARGE SCALE TRANSPORT BY TRANSPORT DISTANCE (KM) IN DOUBLE LOGARITHMIC SCALE

On long hauls, distances of 150 kilometers or more, per unit transport costs would come down to KShs. 0.86 per ton/km (KShs. 0.08 per bag/km) and even further.[13] The cheapest mode of transport for long hauls, however, would still be the railways, used by the MPB, provided that the railway distance did not considerably exceed road distance. The average per unit railway transport costs calculated for the MPB was KShs. 0.20 per ton/km on average for 1976/77. Lorry traders in Eastern Kenya indicated that if allowed they would use the railway for their shipments.

According to the data, movement restrictions are a major impediment to reducing transport and consequently marketing costs. Overall about 85% of maize and 80% of beans handled by market traders is shipped at least one trip averaging a distance of 28.7 (maize) or 33.8 (beans) kilometers. Thus, for recent years, total transport costs per annum within the informal system are estimated on the order of KShs. 70.9 million for maize and KShs. 7.7 million for beans, if not more given the probability of multiple transport steps.[14] If one assumes that initially under a decontrolled marketing system, 10% of the volume of transported produce shift to less expensive modes of transport such as pick-ups, total transport costs for maize and beans ceteris paribus would be reduced by more than KShs. 4.3 million or 5 to 6%. Taking into account that in the long run this percentage would increase, lorries would increasingly be used, and that the elasticity of the transport cost function at the current transport distances is high, the potential savings within the informal system far exceed the estimate of KShs. 4.3 million.

Savings within the formal system are also envisioned although on a smaller scale. The potential for savings will reflect the relative efficiency or inefficiency of the MPB's handling of interregional flows, shipments between depots and areas, of maize and beans. In some areas, for example, like Meru and Kitui Depot there are no direct transport links. These matters and their effect on total transport cost needs further study.[15]

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13. For a distance of 250 kilometers, per unit costs are KShs. 0.59 per ton/km or KShs. 0.05 per bag/km. These figures were derived from the cost function (2) Figure 4 and are supported by information given by lorry owners during informal interviews.

14. This is based on the assumption that: smallholder production =1.5 million metric tons (MT), marketed output= 30%; beans production=169,000 MT, marketed output=26%.

15. H.K. Maritim is currently working on an interregional model of the Kenya maize market for his Ph.D. thesis. See H.K. Maritim 1978.

Another factor to be examined is whether or not transport costs for large scale hauls are higher then necessary because of monopolistic structures in the transport market, lack of transport facilities (vehicles) in relation to demand or other distortions. MPB agents, who for the most part depend on other transporters, were asked about this.[16] Only about 20% of them hired from only one transporter and only 23.2% of these (less than 5% of the sample) did so because no other convenient alternative existed. For Western Kenya, however, particularly in some parts of Kisii and South Nyanza Districts, severe market distortions were detected. Although in theory transport alternatives existed, in practice there was no alternative but to use one specific transporter who had collusive arrangements with the depot managers. Whenever an agent tried to arrange transport independently, he was forced to wait outside the depot indefinitely until he gave up and went away. This certainly did not contribute to low marketing costs and might be one of the reasons why average large scale transport costs in Western Kenya were higher than in other parts of the country.

Another reason might be the general supply and demand situation which was mentioned as a transport problem more frequently in Western than in Central and in Eastern Kenya, although even there the market situation was the main problem mentioned (See Table 30).

Table 30. Transport Problems for MPB Agents (Produce Stores) by Sample Zone

	Western	Central	Eastern	Total
No problem	21.6	26.0	43.2	25.2
Demand/Supply for Transport	58.7	34.7	40.8	53.9
Remote Location	13.6	13.1	8.0	12.6
Transport Costs	-	10.8	2.0	1.3
Road Infrastructure	-	-	8.0	1.5
Delays at Depot	6.3	13.1	-	5.7
Police Checks	-	-	6.0	1.1
Other	-	2.3	-	0.2

Source: Own Compilation.

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16.   On average, less than 10% had their own means of transport. In Eastern Kenya, the percentage was 22.7%, in Central it was only 6.2% and in Western it was 8%. 52.7% of the lorry traders had their own vehicles.

If agents are located in remote areas, which was the second most frequently
mentioned problem, they are at a disadvantage since transporters to such locations
have difficulties getting a load both ways which would reduce costs considerably.
Other factors mentioned which contribute to higher transport costs are bad road
infrastructure and delays at the depot. Surprisingly, road infrastructure was
mentioned only for Eastern Kenya whereas delays at the depot was mentioned by
agents in Western and Central Kenya and not Eastern. However, delays at the
depot due to congestion during the peak season are a general feature and
therefore may not have been seen by agents as a transport problem. Yet, many
were forced to wait several days at the depot incurring high opportunity costs.
To avoid these costs, bribery is common. Regardless of who pays for bribes and
lost time, agents or transporter, it adds to transport costs.

In summary, in addition to movement restrictions, there are various
other factors contributing to relatively high transport costs. These factors,
however, as is the case with movement controls, are part of the framework under
which marketing functionaries are working and therefore beyond their control.
The situation is to a certain extent similar with regard to storage which will
be analysed next.

5.1.3 Storage. Under the present regulations and structures, storage is
mainly a function of the formal sub-system and within it that of the MPB.
Market traders usually do not have the facilities and working capital for storage.
As described above, they only keep, if necessary, unsold stocks from one
market day to another; this is considered as part of their assembly and dis-
tribution functions so related costs are ascribed there.

MPB agents are not officially supposed to perform the storage
function unless the Board cannot accept additional supplies -- not uncommon
in the recent past. The regulations state that all produce subject to the
provisions of the Maize Marketing Act shall vest in the Board as soon as it has
been harvested. In accordance with this directive, no storage premiums are
paid to farmers or MPB agents and no credit facilities exist to provide supple-
mentary working capital for storage. Therefore, it is not surprising that quite
a number of agents (19.5%) claimed they were not storing any maize and beans,
mainly because of capital constraints (14.3%) and the regulations (7.1%). More-
over, 33% of those who stored, but primarily those in Western Kenya (38%), did
so for a limited period only because depots had stopped accepting maize and
beans due to lack of storage capacity.

Storage of maize and beans by private individuals is thus officially discouraged. This is reflected in the capacity utilization of existing storage facilities. Table 31 shows that on average only 32.6% for maize and 5.6% for beans of available storage space was utilized and merely for an average period of 8 weeks for maize and 13 weeks for beans. The figures for Central Kenya are highest with 47.1% (maize) and 17.9% (beans) of space utilized and storage periods of 12 weeks (maize) and 15 weeks (beans). Overall, the degree of capacity utilization is low particularly in view of the strain the MPB has experienced with regard to its own facilities.

The storage capacity of MPB agents and other marketing functionaries such as lorry traders is considerable. The total number of licensed agents reported lies between 1,800 and 2,600 (Anderson and Pfost 1978; Kenya 1979)[17] which means that with a mean working capacity of 404 bags per agent (Table 31)[18] the total available storage capacity of individual produce stores ranges between 65,000 and 100,000 tons. Compared to the MPB capacity in 1977 of 544,500 tons (Manarelli, 1978, p. 77), this is quite substantial. If private storage capacity had been used to a fuller extent, some of the storage problems of the MPB would have been alleviated.

Table 31: Storage Capacity and Degree of Utilization of Produce Stores by Sample Zone

Sample Zone	Mean "Working" Capacity of Stores (bags)	Mean Percentage of Storage Space Utilized		Approximate Mean Storage Period in Weeks	
		Maize	Beans	Maize	Beans
Western	288	32.4	2.8	8	15
Central	458	47.1	17.9	12	15
Eastern	646	28.2	7.3	3	6
TOTAL	404	32.6	5.6	8	13

Source: Own Compilation.

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17.   Other even speak of 5000 agents (Weekly Review, February 23rd 1979, p. 33). As indicated earlier, in Muranga, Nyeri and Kirinyaga districts alone 286 agents were registered. But most of them were not active. Thus, the total number is most likely nearer to 2600 than to 1800 or 5000.

18.   Lorry traders' mean storage capacity was 1,378 bags. This is not included in the above calculation.

A justified reason for discouraging private storage on a relatively
small scale would exist if storage costs were higher than those of the larger
scale Board. These storage costs, however, are not easy to calculate, parti-
cularly for multi-purpose stores such as the general produce stores of agents
and depots. Nevertheless, an attempt to estimate approximate storage costs for
produce stores was carried out on the basis of the survey data. These are
shown in Table 32 to 35.

In order to have a reasonable basis for comparison with the MPB figures,
the new 1979 basic MPB buying prices for maize and beans, (KShs. 65 maize and
KShs. 190 beans) minus an average gross margin for MPB agents was used for
calculating interest on working capital.[19] Rent for hiring a store was taken
as the main overhead cost since most agents did not own stores. For those who
did, expected rent was taken as an opportunity cost and used for calculation.
Figures on losses must be accepted with caution because they are based on re-
spondents' estimates and not on storage trials. However, they ranged from on
average 2% for 2 months to 15% for 12 months. Compared to the figure of 2%
to 3% given by the MPB for normal years, although no period of time is specified
(see Weekly Review, Feb. 23, 1979, p. 34),[20] the estimate show that with good
storage management, ceteris paribus, storage costs could be even lower.

With regard to storage management, traders seemed to have taken
necessary measures according to expenditure levels for such items as insecticide.[21]
The author observed in a number of cases that fumigation was necessary. However,
most agents suffering storage losses had applied insecticides and on average
had spent KShs. 2.06 per bag. This figure compares relatively well with KShs.
2 per bag calculated by the storage engineer of the Ministry of Agriculture
(Hunt 1978).

19.   MPB prices of beans vary by variety. For convenience the prices
of most common varieties in the major production areas, i.e. Rose Coco,
Canadian Wonder, and Mwezimoja were taken. Since 1977, the prices for Rose Coco
were higher for central and Eastern provinces than for other areas.

20.   For years with particularly high losses the MPB reckons on 7% to
10% loss.

21.   All but one who complained about losses had taken preventive measures.

Tables 32 and 34 present estimates of storage costs based on the
assumptions that the stores were used to about 75% of capacity for maize and
beans and the degree of capacity utilization for the two crops was in a
proportion 2 : 1 (maize:beans). These assumptions are quite realistic.
However, it was further assumed that the so determined 'working capacities'
were used to 100% which does not reflect the actual situation. Yet in order
to compare the relative advantages or disadvantages of private storage and
MPB storage under changed regulations, this seems justified. In addition the
behaviour of storage costs under lower degrees and different kinds of capacity
utilization were analysed and are shown in Tables 33 and 35.

Storage costs for maize and beans estimated in Tables 32 and 34
have to be compared with the MPB overhead and total margin per bag. According
to the regulations, the MPB alone is responsible for performing the storage
function. Agents (produce storeholders) face a situation in which they have
to deliver all supplies from farmers to the depot and later during the off-
season buy back supplies from the depot to sell to consumers. The spread between
the MPB buying and selling price is therefore in effect the price the agent
pays the MPB for performing the storage function. (The MPB margin however,
includes other costs besides storage.) To this price, transport cost to and
from the MPB depot must be added. Therefore, to evaluate the efficiency of
the MPB agent performing the storage function, one must calculate the price
spread between the MPB ex-depot price plus transport allowance[22] and the agents
'into store' price (including new gunny bag) and compare it to the estimated
storage costs of MPB agents. On the basis of the new proposed MPB buying and
selling prices for maize the margins (price spreads) range between roughly KShs.
24 and KShs. 36 per bag depending on the zone.[23] The lower figures apply to
Central and Western provinces, the higher ones to Eastern and Coast provinces.[24]

The margins are still based on subsidized MPB selling prices.
If the MPB sold at prices covering all overhead costs[25] the margins above

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22.   The MPB used to pay transport allowances to agents which differed
with the density of the depot network in one region. With a higher density
(e.g. Western Province) transport costs were lower. They discontinued this in
1976. However, in the above calculation these must be taken into account.

23.   The prices were derived from a circular of the MPB after the Cabinet
decisions of 15 February 1979. The buying price for all zones is uniform,
whereas the selling price varies with railage costs throughout the year.

24.   The price spread for Coast Province is highest because of railage costs.

25.   The MPB had a lower and a higher option for overheads. Here, the
lower one was assumed.

Table 32: Approximate Storage Cost of Produce Stores (MPB agents) Per Bag
           of Maize (KShs.)

	Storage Period (Months)			
Cost Variable	2	4	6	12
Store rent[a]	0.85	1.71	2.55	5.10
Treatment	2.00	2.00	2.00	3.00
Interest[b] on Working Capital[c]	1.08	2.17	3.28	6.83
Losses	1.10	2.75	5.50	8.25
Total Costs	5.03	8.63	13.33	23.18

Notes: a. Multi-purpose store, used to 75% for maize and beans,
           2/3 for maize and 1/3 for beans.

        b. 10% per annum or 0.8% per month (compound interest). The MPB
           works with only 7.5% per annum.

        c Includes approximate 1979 buying price KShs. 57.50 per bag,
           new gunny bag KShs. 7.20, expenditure on treatment and monthly
           store rent per bag.

Source: Own Compilation.

would come up to KShs. 26 and KShs. 44.05 per bag. If these figures are
now compared with the storage cost data in Table 32 and 33, one can safely
conclude that for medium term storage of 6 months or less it is more efficient
to allow and to encourage MPB agents or private produce stores to store
rather than to deliver all stocks to the depots even if they have low rates
of capacity utilization. Private storage of maize for a period of 6 months
would save between KShs. 5 and KShs. 12.50 per bag, if all MPB costs were
included. Moreover, if one assumes conditions given for the first 5 alternatives
in Table 33, which represent the most likely situations, private small scale
storage could even compete with the MPB for long term storage except in those
areas with a high density of depots (Western and Central provinces). Therefore,
from the cost point of view, even private long term storage should not
generally be discouraged. However, it is unlikely that agents will undertake
it since their main reason for storage is seasonal price differentials which
entials medium term storage only.

        With regard to beans storage, the situation is not quite as clear.
Since the MPB has no fixed selling prices, it is difficult to compare the al-
ternatives. Taking into account that allocated overhead for beans is much

lower than for maize[26] and that storage periods are usually short, one can
assume that the MPB works with a smaller margin for beans than for maize
although the working capital required for one bag of beans is more than
double the amount for maize. Nevertheless, the margin which the MPB requires
for beans should be at least KShs. 10 per bag[27], which leads to a spread
between 'into store' price of agents and MPB selling price plus transport
allowance of between KShs. 20 and KShs. 25 per bag. These lower price spreads
have to be compared with higher storage costs for beans. Storage of beans

Table 33. Sensitivity of Storage Costs Per Bag of Maize to Kind and Degree
of Capacity Utilization (KShs.)

Percentage of Overhead Allocation[a]	Degree of Capacity Utilization	Storage Period (Months)			
		2	4	6	12
50	100	5.03	8.63	13.33	23.18
	75	5.31	9.20	14.18	25.88
	50	5.88	10.33	15.88	28.28
	100	5.46	9.47	14.61	27.76
75	75	5.89	10.32	15.88	28.30
	50	6.74	12.02	18.43	33.44
	100	5.89	10.32	15.88	28.30
100	75	6.45	11.45	17.58	31.68
	50	7.58	13.72	20.98	38.48

Note: a Dependent on kind of capacity utilization. Store exclusively used
for maize storage corresponds to 100% overhead allocation.

Source: Own Compilation.

by agents or storeholders instead of the MPB seems to be relatively less
favourable than for maize. However, medium term storage by agents seems to be
advantageous if one considers that for the MPB only short term storage with
negligible storage losses was assumed. Therefore, the data do not support
the view that storage of beans should be left primarily to the MPB.

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26.   The MPB in 1976/77 purchased 548,306 tons of maize and allocated
about KShs. 6 of general overhead per bag. During the same period, it purchased
11,123 tons of beans which had an overhead allocation of only KShs. 1.30 per
bag.

27.   The MPB was not in a position to give the actual margins. But according
to the scanty information on selling prices, the MPB price spreads for Rose
Coco or Canadian Wonder in 1976-78 ranged between KShs. 6 and KShs. 29.50 per
bag. The simple average amounted to KShs. 18.14 per bag.

Table 34: Approximate Storage Costs of Produce Stores (MPB agents) per Bag of Beans by Storage Period (KShs.)

	Storage Period			
	2	4	6	12
Cost Variable	0.43	0.85	1.28	2.55
Store Rent[a]	2.00	2.00	2.00	3.00
Treatment[b] on Working Capital[c]	3.04	6.13	9.27	19.10
Losses	3.50	8.75	13.13	26.26
Total Costs	9.07	17.73	25.68	50.90

Notes: a. Multi-purpose store, used to 75% for maize and beans, 2/3 for maize and 1/3 for beans.

b. 10% per annum or 0.8% per month (compound interest). The MPB works with only 7.5% per annum.

c. Includes approximate 1979 buying price KShs. 180 per bag (Rose Coco), new gunny bag KShs. 7.20, expenditure on treatment and monthly store rent per bag.

Source: Own Compilation.

So far, the relative advantage of small scale storage by private storeholders over the alternative of MPB storage has been analysized. It has been shown that, particularly with regard to maize storage, efficiency would be increased if storeholders were permited and encouraged to take over the short and medium term storage function. Efficiency would be even higher if lorry traders were included as an MPB alternative since their overhead per bag is much lower than the average produce store.[28] Also, storage efficiency could be increased if storage management and facilities were improved. Without the storage monopoly of the MPB, storage efficiency could be increased even further because some of the present storage and treatment costs would fall off under free marketing conditions. As mentioned above, a number of MPB agents kept stocks simply because the MPB stopped buying due to insufficient storage capacity. If allowed, they could directly dispose of these stocks in deficit areas. For beans, the situation was even more critical than for maize since maize was considered higher priority by the MPB and therefore first to be accepted. In regard to maize, one must also consider that the MPB tries to get rid of old stocks first. In other words, it has a policy of 'first in, last out'. With

28.   The store rent per bag storage capacity for lorry traders was KShs. 45 per month of half that of agents.

Table 35: Sensitivity of Storage Costs Per Bag of Beans to Kind and Degree of
Capacity Utilization (KShs.)

Percentage of Overhead Allocation[a]	Degree of Capacity Utilization	Storage Period (Months)			
		2	4	6	12
	100	9.07	17.73	25.68	50.90
0.25	75	9.10	18.01	26.10	51.75
	50	9.39	18.58	26.95	53.45
	100	9.39	18.58	26.95	53.45
0.50	75	9.67	19.15	27.80	55.15
	50	10.24	20.28	29.50	58.55

Note: a Dependent on kind of capacity utilization. Store exclusively
used for beans storage corresponds to 100% overhead allocation.

Source: Own Compilation.

such a policy, the MPB has to take a very serious stand on moisture content,
because it must assume that the maize may be stored for a long time. High
moisture content will lead to higher storage losses or if the maize is artificially
dried (driers are available in two depots) to additional drying costs. For
drying the MPB currently charges KShs. 5 to KShs. 6 per bag. In sum, savings
could be considerable if direct disposal to mills or other areas was possible.
Apart from this, the MPB could reject consignments where no drying facilities
exist without the currently experienced negative consequences of additional costs
to the supplier.

In summary, potential savings on storage costs could be substantial
if marketing regulations allowed private initiative. However, estimates of
total savings are rather difficult because total storage costs also depend
on the efficiency of interregional exchange-- an important consideration given
production patterns in Kenya. Estimates of total storage and transport costs,
therefore, would have to be determined simultaneously under varying assumptions.
This is beyond the scope of this study.[29] If one, to get some impression,
assumes that MPB agents would be allowed and financially supported to utilize
their storage facilities to a greater extent than in the past, this could mean
that with the total storage capacity available and under the above stated

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29.   For this type of calculation refer to the study of H.K. Maritim 1978.

assumptions,[30] agents could retain an additional 20,000 to 25,000 tons in the stores instead of delivering it to the MPB. This is about 20% to 25% of their seasonal turnover and corresponds to the amount they used to buy from the MPB during the off-season. This policy would reduce marketing costs on the order of KShs. 2 to KShs. 3 million per year. If in addition increasing storage efficiency is considered, the potential savings are even greater.

5.1.4 Other Marketing Functions. In conjunction with assembly, distribution, transport and storage there are other marketing functions to be performed which might result in additional costs for marketing functionaries. Marketing transactions have to be financed and produce has to be weighed, measured, packed, graded and handled.

Financing costs depend on the value of the produce handled and the rate of capital turnover. In this regard, private marketing functionaries are quite efficient. A high rate of capital turnover enables them to work with relatively small amounts of working capital which results in low financing costs (see section 3.1). Maize and beans traders realized an average monthly capital turnover ratio of 8.3;[31] the highest ratio was in Eastern Kenya (11.9) followed by Western Kenya (8.5) and Central Kenya (7.4). Assuming an opportunity cost of 10% interest on working capital,[32] financing costs for market traders are usually not more than KShs. 0.10 per bag of maize and KShs. 0.30 per bag of beans. The average monthly capital turnover ratio was 4.2 for agents and 6.8 for lorry traders which results in average capital costs per bag of maize of less than KShs. 0.20 for agents and KShs. 0.10 for lorry traders. Per bag of beans these costs are KShs. 0.30 for agents and KShs. 0.60 for lorry traders.

Comparisons with MPB financing costs is difficult since the Board is the main holder of stocks including the national reserve of 2 million bags of maize. However, the Board is hardly in the position to achieve similar high ratios of capital turnover and low capital cost. It gave its average capital costs per bag of maize as KShs. 6. Given this high cost, increasing the volume of produce flowing through private channels would contribute to higher operational efficiency in the marketing system.

30.   Storage capacity 65,000 tons, extra 40% capacity utilization, which means storage costs of about KShs. 13 to KShs. 16 for 6 months compared to a minimum price spread of KShs. 24 per bag.

31.   The medium value was 6.0.

32.   The market traders were operating with their own working capital.

A major cost item with regard to packing, weighing and handling is the depreciation on bags and other containers used. Maize and beans are handled in bags in both the formal and informal subsystems. Usually depreciation of 100% of the value of a new gunny bag, currently costing KShs. 7.20, is assumed since the bag is sold with the produce. This may hold for the individual marketing functionary buying the bag, but it does not apply to the marketing system as a whole.

Bags are often used several times and then sold as secondhand. This is done by private traders as well as the MPB. Actual costs are therefore lower than the 100% depreciation assumes. This is particularly true for storeholders, lorry traders and market traders who buy secondhand gunny bags and use them more than once since long term storage is not a concern. Storeholders and lorry traders may be more demanding about the state of a gunny bag which should be reflected in their depreciation allowance. Generally, however, costs for depreciation on bags are not more than KShs. 2.50, if the bag is not sold along with the maize or beans. In the latter case, the full value must be depreciated. The depreciation for the MPB or traders who sell the empty bag after using it once is probably higher than KShs. 2.50 but should not exceed half the price of the new bag, i.e. KShs. 3.60. Among market traders, bags are used by most itinerant traders. Depreciation on a new bag costing KShs. 7.20 ranges from KShs. 0.50 to KShs. 1. However, often good secondhand bags costing between KShs. 3 and KShs. 3.50 are used. With only a slightly lower lifespan, depreciation on these bags is between KShs. 0.30 and KShs. 0.60 per bag.

Costs associated with other containers used are more or less negligible. Depreciation on all items used for weighing and packing like debes, tins, kalabashes and baskets adds up to only KShs. 0.01 per bag.[33] Depreciation on stand scales used by 59.8% of MPB agents and also lorry traders was not more than KShs. 0.05 per bag due to long life expectancy.

Grading results in certain costs in the form of foreign matter and bad grains or beans removed from the stock which diminish its volume. It was difficult to obtain more detailed information about these costs through

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33.   In a small supplementary survey, prices for scales, sieves and other utensils were asked. According to the information, the average value of scales amounted to KShs. 1830 which has to be seen against a life expectancy of far above 20 years. The latest value was given as KShs. 3025. A set of new volume measures with the same life expectancy was valued at KShs. 600 if bought in 1978 and sieves with a lifespan between 5 and 10 years at around KShs. 150. The average values were KShs. 333 and KShs. 105 respectively.

interviews. It was possible to obtain estimates of grading losses
for MPB agents only. According to MPB agents, who use sieves for grading,
these losses ranged between .5 and 1 kilogram per 90 kilogram bag of maize
and between 1 and 2 kilograms per 90 kilogram bag of beans. Under the new
MPB prices, this corresponds to approximately KShs. 0.30 and KShs. 0.60 per
bag of maize and between KShs. 2 and KShs. 4 per bag of beans. For market
traders, these losses are probably less both in quantity and value terms.

Market traders do most of the handling work themselves so they do
not incur labor costs. Handling costs for storeholders and lorry traders,
on the other hand, are a major cost item. This takes the form of wages
paid to casual labour for loading and unloading the produce. For the survey
period, these were given as KShs. 0.30 per bag. Lorry traders or big storeholders
who employed permanent labour had slightly lower (KShs. 0.25 per bag) handling
costs. All other miscellaneous handling costs (depreciation of equipment
including bags and wages have been accounted for) should not exceed KShs. 0.10
per bag.

All handling, packing, weighing, and grading costs are more or less
determined exogeneously for the marketing functionaries and therefore are
not subject to major reduction. Reduction of these costs would only be
possible if a change in the handling method, such as shifting from bag to
bulk is not practical under the present market framework.

5.2 Pricing Efficiency

The assessment of pricing efficiency, often referred to as allocative
efficiency, is concerned with the pricing aspects of the marketing process.
On the basis of theoretical considerations, prices are expected to be
interrelated through space, time and form to costs. Profits earned in
excess of opportunity costs of management and capital inputs are viewed
as 'excess profits' which raise prices artificially (USDA/USAID, p. 47).
They are exploitative in nature and distort the allocation of scarce resources.

The analysis of pricing efficiency will begin with an examination
of efficiency at channel interfaces; in other words, to what extent do
marketing functionaries pass on price changes to subsequent or preceding
marketing channel levels. Second, the degree of interregional efficiency
will be looked at in order to see whether geographically separated markets
are sufficiently interlinked by arbitrage activities. Third, intertemporal
efficiency will be assessed; to what extent prices are related to storage costs?
Finally, an attempt will be made to roughly estimate the magnitude of excess

profits by contrasting the income of interviewed marketing functionaries against
different assumptions about opportunity costs.

5.2.1 Pricing Efficiency at Channel Interfaces . It is a widespread belief
that market traders are exploitative. In this section, the hypothesis is tested by
examining interface pricing efficiency; in other words, whether or not price
changes are passed on to other marketing levels. The degree of interface
pricing efficiency is usually assessed using regression and correlation analysis
to test to what extent profit margins of private marketing functionaries are
statistically dependent on buying and/or selling prices (see Ruttan 1968 and
Schubert 1973). If margins are independent of prices and thus constant in
absolute terms, price changes are being passed on to the next market channel
level.[34] Such a situation is consistent with the competitive market model
(Ruttan 1968, p. 85) and does not prevail under exploitative pricing conditions.
Independent margins are statistically indicated by a low correlation between
the margins and prices and a slope coefficient of the linear regression equation
which is not significantly different or is very close to zero. This corresponds
to a situation in which selling and buying prices are highly correlated and the
regression coefficient is not significantly different from or is very close to 1.

A test of the relationship between margins and buying prices was
carried out for maize traders (some of whom sell beans) on the basis of 909
observations of maize net buying (excluding procurement costs) and selling prices
for 1977 provided by the CBS through its Market Information Survey. The results,
significant at the 0.1% level, are shown in Figure 6. As can be seen, selling
and buying prices are highly correlated with each other; 70% of the variation
in selling prices is explained by buying prices ($r^2=0.6961$). The corresponding
correlation coefficient between the profit margin and buying price is - 0.137
indicating that in fact profit margins are largely independent of prices. This
is also reflected in the slope coefficient for the regression equation in Figure
6. Although the coefficient is significantly different from 1, the difference
in view of the market structures described in section 3 is relatively small.[35]

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34.   If only gross margins are available, it is assumed that marketing costs
under a situation of limited scale economies are independent of price. Thus,
the supply function of marketing services is assumed to be highly elastic (Ruttan
1968, p. 84).

35.   In view of the high number of observations (909), a high significance
level was to be expected even in the case of minor differences from 1.

Figure 8 : RELATIONSHIP BETWEEN MARKET TRADER'S SELLING AND NET BUYING PRICE FOR MAIZE 1977 (KSHS/KG)

$$y = 0.23 + 0.9161 x$$

$$r = 0.8343$$

$$r^2 = 0.6961$$
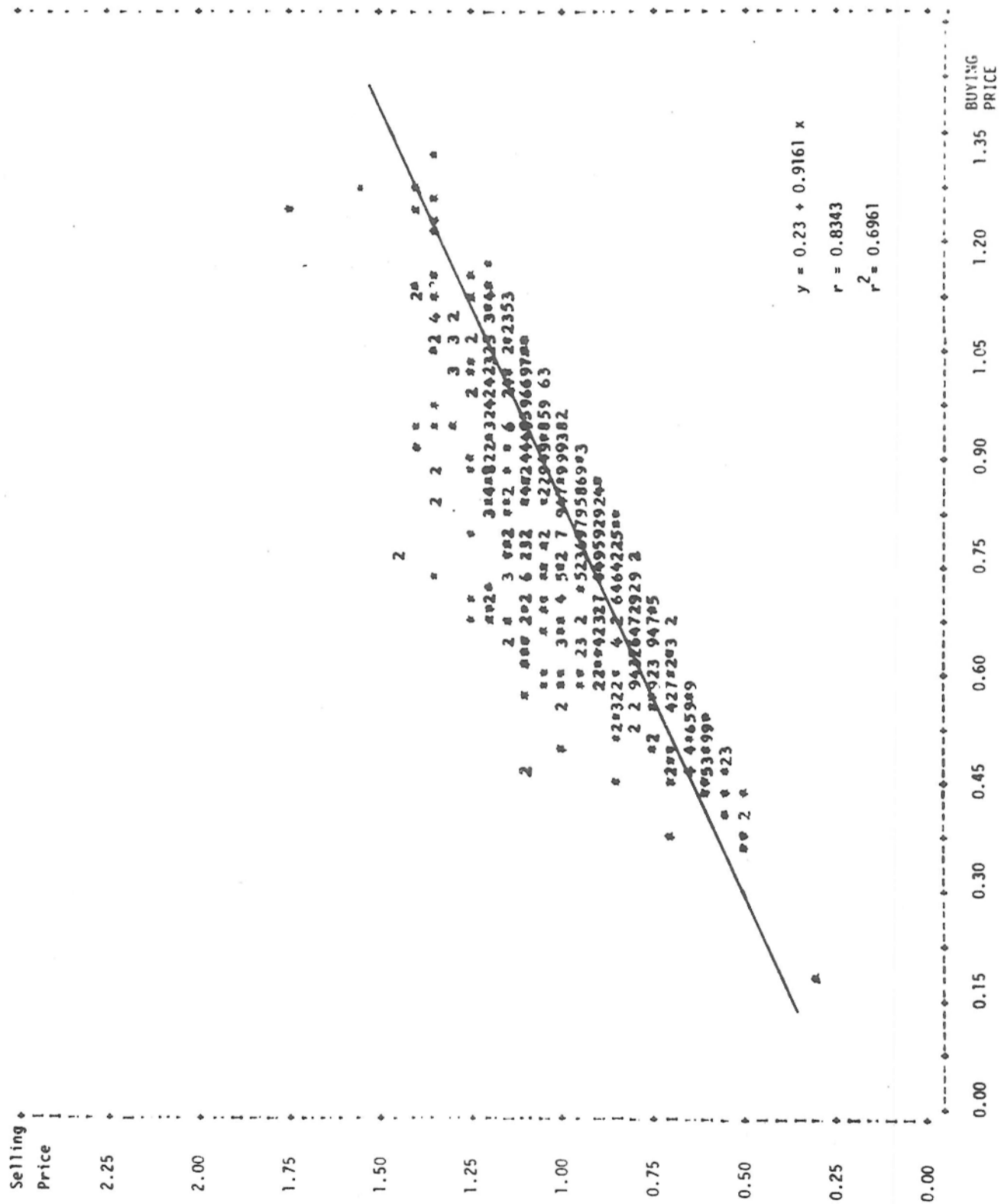
The hypothesis of exploitative market traders of maize (and beans) can be rejected on the basis of this evidence.

For other marketing functionaries, such as produce storeholders and lorry traders, price series for regression analyses were not available. Yet even for lorry traders, though to be the worst exploiters, the hypothesis does not hold. For example, at a time when the MPB was selling maize at Kitui for KShs. 116.80 per bag ex-depot, lorry traders sold it for as low as KShs. 75 per bag at the shop. This information was provided by distributors who bought from lorry traders and is therefore reliable.

Rejection of the hypothesis of exploitative traders does not mean that high excess profits cannot or are not being earned. The data suggests that if excess profits are realized, it is primarily due to the non competitive framework of the marketing system which is unconducive to high pricing efficiency and not to the unscrupulous nature of traders. This explains the variation of margins shown in Figure 6 and the deviation from 1 of the slope coefficient. In view of the conditions found with regard to market structures, pricing efficiency at channel interfaces must be assumed to be fairly high. Traders, for the most part, work with constant profit margins and pass on price changes to other channel levels unless the competitive framework allows a different behaviour.

5.2.2. Interregional Pricing Efficiency. Interregional pricing efficiency concerns the extent to which price differences between interrelated areas or markets correspond with transfer costs and therefore are correlated with each other. Under conditions of perfect competition, correlation of price movements for a given commodity in any two markets will be perfect, i.e. 1.00 (Lele 1968, p. 11). However, since conditions in the real world are not perfect, there are many reasons why correlations may be below 1.0. Among these are imperfect pricing efficiency at channel interfaces, imperfect mobility, imperfect market transparency and imperfect homogeneity of product. In the previous section (see section 5.2.1.), it was shown that although pricing efficiency at channel interfaces is fairly high, it is not perfect. Mobility is a key factor in interregional pricing efficiency. Imperfect mobility is primarily due to transfer costs.[36] Prices in one market may fluctuate without without resulting in any

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36.   It also stems from time requirements for shipments which lead to time lags.

arbitrage activity, unless the price difference between markets exceeds the
transfer costs. The higher the transfer costs, the larger the range within
which prices can vary in relation to prices in the other market and hence
the lower the correlations will be (lele 1968, pp.11, 12). Nevertheless,
with effective market integration (i.e. interregional pricing efficiency),
correlation coefficients of above 0.9 are achieved (see Lele 1969, pp. 64,
114, 165-167; Jones 1972, p.141). Generally, interregional pricing efficiency
is assumed to be satisfactory if the coefficient is 0.70 or more (Gsaenger
1975, pp. 212).

Interregional pricing efficiency in the Kenyan maize and bean
marketing systems, as reflected by correlation coefficients between price
movements in CBS sample markets (see Map 1), can be derived from Table 36,
37 and A11 to A14 (Appendix). Interpretation of the tables should be
cautious since price movements for all 65 markets were correlated with each
other, regardless of actual arbitrage activities.[37] Also, production and
demand patterns in Kenya are so heterogeneous (see sections 2.1 to 2.3)
that negative correlations are possible for areas separated by high transfer
costs. On the other hand, negative correlations between more or less
adjacent markets indicate that reasons other than transfer costs such as
movement restrictions are responsible for the lack of market integration.
Finally, market prices are not necessarily wholesale prices for which
correlations tend to be higher. They represent wholesale prices for the
most part only for surplus periods and larger secondary markets (see
section 3.3.1). However, despite these factors likely to reduce the degree
of correlation between markets, the tables do highlight the general performance
of the maize and beans marketing system particularly if one looks at Central
and Western Kenya separately with regard to interregional efficiency.

As hypothesized in view of the marketing framework for maize and
beans trade, market integration and thus interregional pricing efficiency
seem to be rather low. In Central Kenya (Central and Eastern Province) only
0.5% and in Western Kenya (including Rift Valley) only about 6%[38] of corre-
lations between movements of maize prices are significantly[39] greater or
equal to 0.7; 21.7% (Central Kenya and about 30% (Western Kenya) of the
correlation coefficients ranged between 0.3 and 0.69 indicating a medium

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37. Prices however can be correlated with each other, if markets are
related with each other through a third market. Thus, direct arbitrage is
not necessary for a high degree of correlation.

38. Many of those are based on a small number of observations (below
20). See Schmidt, Zettelmeyer, Casley and Marchant 1979.

39. Significant at 10% or higher.

Table 36: Percentage Distribution of Correlation Coefficients of Weekly Maize Prices in CBS Sample Markets[a]

Correlations Between Markets In

Coefficients		Western Kenya[b] Significance level (%)				Central Kenya[b] Significance level[c] (%)				Western and Central Kenya[b] Significance level (%)				Total Kenya Sign. level (%)[c]			
		Better than 5	5-10	Not Sig.	Total	Better than 5	5-10	Not Sig.	Total	Better than 5	5-10	Not Sig.	Total	Better than 5	5-10	Not Sig.	Total
Positive	0-0.29	0.5	10.1	23.9	34.5	0.9	19.1	21.9	41.9	0.2	8.2	24.7	33.0	0.4	11.0	23.9	35.3
	0.3-0.69	19.3	10.8	1.2	31.3	19.6	2.1	-	21.6	5.1	4.0	0.4	9.5	12.1	5.5	0.5	18.1
	0.7-1.0	5.8	-	0.4	6.2	0.5	-	-	0.5	0.5	-	0.1	0.6	2.1	-	0.1	2.1
Negative	0-0.29	0.2	4.8	16.8	21.7	0.2	6.9	21.6	28.8	0.2	11.6	29.8	41.6	0.2	8.7	24.4	33.4
	0.3-0.69	2.5	2.8	0.8	6.2	4.6	2.1	0.5	7.1	6.7	6.1	1.0	13.7	5.1	4.3	0.8	10.2
	0.7-1.0	0.2	-	-	0.2	-	-	-	-	1.5	-	-	1.5	0.8	-	-	0.8
Total		28.5	28.5	43.1	100.0	25.8	30.2	44.0	100.0	14.2	29.9	56.0	100	20.7	29.5	49.7	100
Number of Market Pairs		161	161	244	566	112	131	191	434	148	311	582	1041	421	603	1017	2041

a Total number of markets was 65 including markets with incomplete time series.

b. The zone of Western Kenya includes Rift Valley markets and Central Kenya includes those of Eastern Province.

c Significance levels assume randomness though price series are autocorrelated. They therefore have to be taken as approximations.

Source: Derived from Schmidt, Zettelmeyer, Casley and Marchant 1979.

degree of correlation. A very high percentage about 70% (Central Kenya)
and 64% (Western Kenya) show a weak negative or an insignificant relationship.
The relationship between markets in Central and Western Kenya, separated by
high transfer costs, follows the same basic pattern.

The results for beans are slightly better in Central Kenya, the
main production and consumption area, than those for maize. 3.1% of the
coefficients are greater than or equal to 0.7 and 32.3% are between 0.3 and
0.69. For the relationship between markets in Central Kenya and Western
Kenya, they are also slightly better: 0.6% are greater than or equal to 0.7
and 16.9% are between 0.3 and 0.69 compared to 0.5% and 9.1% respectively
for maize. In Western Kenya, the figures for beans are worse than those for
maize: 0.7% greater than or equal to 0.7 and 15.1% between 0.3 and 0.69.

In time series analyses, if time lags are taken into account the
correlations may improve. However, for the weekly maize and beans prices
in CBS sample markets, time lags consistent throughout the year were rarely
observed.[40] Time lags only occurred for a few markets and for limited
periods (Casley and Marchant 1978, par. 5.65). These could not be taken
into account in the computer analysis although they might have improved
the results slightly. Overall the general impression of low market integration
given by Tables 36 and 37 would not have changed. Even correlations based
on seasonal values (13 weeks moving average) show poor interregional pricing.
In the case of maize, only 13.6% of the correlations for Central Kenya and
16.6% for Western Kenya were significantly greater than or equal to 0.7; in
the case of beans, these figures were 16.4% (Central Kenya) and 9.5% (Western
Kenya) (see Tables A11 and A13, Appendix).

Despite the apparent low market integration, arbitrage transactions
do take place as shown in the Trader Survey. The affect market prices though
very erratically as reflected in the correlations of residual values (see
Tables A12 and A14, Appendix).[41] However, as the results of the original and
seasonal series suggest, arbitrage transactions are insufficient to effectively
link markets. The actual extent to which they affect interregional pricing
efficiency can be seen by examining specific cases in which a high positive
correlation between markets was expected.

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40.   See Footnote 2
41.   In total more than 20% of maize and beans price residuals were signi-
ficantly correlated either positively or negatively, with each other.

Table 37: Percentage Distribution of Correlation Coefficients of Weekly Beans Prices in CBS Sample Markets[a]

Correlation Between Markets In

Coefficients		Western Kenya[b] Significance level[c] (%)				Central Kenya[b] Significance level[c] (%)				Western and Central Kenya[b] Significance level[c] (%)				Total Kenya[b] Significance level[c] (%)			
		Better than 5	5-10	Not Sig.	Total	Better than 5	5-10	Not Sig.	Total	Better than 5	5-10	Not Sig.	Total	Better than 5	5-10	Not Sig.	Total
Positive	0-0.29	-	8.5	31.3	39.7	0.8	13.3	24.7	38.9	-	10.2	30.5	40.7	0.2	10.4	29.4	40.0
	0.3-0.69	9.3	5.8	1.3	16.4	27.8	4.5	0.6	32.9	11.5	5.4	1.3	18.3	14.5	5.3	1.1	21.0
	0.7-1.0	0.7	-	0.8	1.5	3.1	-	0.4	3.5	0.6	-	0.2	0.8	1.2	-	0.4	1.5
Negative	0.0-29	0.1	5.5	25.9	31.6	-	4.5	16.6	21.0	0.1	6.7	22.5	29.3	0.1	5.9	22.1	28.1
	0.3-0.69	4.1	5.0	1.5	10.6	2.0	0.6	0.8	3.5	5.1	4.3	0.8	10.2	4.2	3.7	0.9	9.0
	0.7-1.0	0.1	-	-	0.1	0.2	-	-	0.2	0.4	-	0.3	0.6	0.3	-	0.3	0.4
Total		14.3	24.8	60.8	100	33.9	22.9	43.1	100	17.7	26.6	55.6	100	20.5	25.3	54.2	100
Number of Market Pairs		88	153	373	614	166		211	489	200	300	627	1127	454	565	1211	2230

a Total number of markets was 65 including markets with incomplete time series.

b The zone of Western Kenya includes Rift Valley markets, and Central Kenya includes those of Eastern Province.

c Significance levels assume randomness though price series are autocorrelated. They therefore have to be taken as approximations.

Source: Schmidt, Zettelmeyer, Casley and Marchant 1979.

Karatina and Kutus markets in Central Kenya and Luanda and Oyugis
markets in Western Kenya, for example, are known as important markets which
should show a high degree of market integration with adjacent or linked
markets. The results of the correlation analysis discussed below therefore can
only be explained by severe distortions in interregional maize and beans trade.
Karatina shows a negative correlation of maize prices with Kerugoya (-.31),
Gakindu (-.14) and Sagana (-0.03), all adjacent markets (see Map 1), and shows
a positive correlation of only 0.39 with Nyeri, an urban terminal market.
A similar pattern emerges for Kutus market which is negatively correlated
with Nyeri (-0.08) and has only a very weak positive relationship to Karatina
(0.01), Sagana (0.02), Kerugoya (0.13) and Ishiara (0.30). No market in
Central Kenya shows a correlation higher than 0.4. Due to the banning of
maize transactions, the number of correlations between Kutus and Kitui markets
is limited to Mwingi (48 price pairs) and Migwani (59 price pairs) for which
some price information was available. Using 1975 price information for 17
weeks, Kariungi found a correlation between the wholesale maize prices of
Kutus and Kalundu (Kitui) markets of 0.8 (Kariungi 1976, p.60). However,
correlations with two other major markets, Mwingi and Migwani, were found
in this study to be negative (-0.13).

The picture for Western Kenya is not much better. Although Luanda
and Oyugis were not negatively correlated with nearby markets, the degree
of positive correlation was low. The correlations for Luanda with Kibuye
(Kisumu), Kibosua, Bondo, and Mumias, for example, were below 0.2 and with
Ndere and Cheptual were only 0.36. Oyugis maize prices showed only an
insignificant correlation with those of Sondu (0.07) and Daraja Mbili (0.15)[42]
and a low though significant one with those of Kebirigo (0.38) an adjacent
primary market.

The results for beans, for which movement controls are less strict,
are better than maize for Central Kenya. Karatina as well as Kutus markets
have no negative correlations with adjacent markets and, moreover, correlations
are relatively high. Karatina shows significant correlations of above 0.5
with Nyeri (0.54), Kerugoya (0.55) and Sagana (0.70); only Gakindu is below
that level (0.41). Kutus has correlations above 0.5 with Karatina (0.53)
and Ishiara (0.56) whereas those with Kerugoya and Sagana are again compara-
tively low, 0.25 and 0.10 (not significant) respectively. The correlations
of beans prices in Western Kenya more or less resembles those for maize prices.

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42.   The time series for Nyanza markets unfortunately is incomplete so
that the number of pairs is often less than those for the other provinces.
This has to be taken into account when interpreting the correlations.

Interregional pricing efficiency in maize and beans marketing is obviously severely lacking. The degree of inefficiency is so high that it cannot be explained by common market imperfections. Movement controls which impede arbitrage activities are largely responsible for the situation. This is suggested by the above results as well as by the fact that the same kind of analysis for white and red potatoes, important staple food crops which are not subject to any kind of marketing controls, leads to much better results (Zettelmeyer 1979). More than 20% of the correlations for white potatoes and more than 30% for red potatoes are greater than or equal to 0.7. Central Province markets correlated with all other CBS sample markets results in 39.2% greater than or equal to a correlation of 0.7. A substantial number of coefficients are even above 0.9 which is not the case even once for maize and beans price correlations for the original series.[43]

Low market integration is likely to result in high excess profits. This can be ascertained by looking at existing regional price differences which should more or less correspond to transfer costs if excess profits are not being made. An examination of the maize and beans price data for CBS markets reveals that these price differences are considerably greater than transfer costs and therefore that excess profits are being enjoyed. Prices for maize in Meru District (Maua Kianjai, Ishiara) from March to May 1977, for example, fell as low as KShs. 27 to KShs. 45 and stayed at KShs. 45 to KShs. 55 during September/October, whereas at the same time maize at Machakos and Kitui markets (Mwingi, Migwani, Tala, Tawa) and also in Central Province (Sagana, Karatina, Kutus, Nyeri) was sold retail at KShs. 90 to more than KShs. 100 per bag; the price spreads were KShs. 45 to more than KShs. 60 per bag.[44] Such price differentials existed even between markets within adjacent districts, such as Maua and Mundantu (Meru Town); and Muthithi, Githumu, Kandara and Sagana, Karatina, Nyeri. Between the low price markets and Kawangware (Nairobi), price differences amounted to more than KShs. 90 per bag. In Western Kenya the situation is similar. At the same time that market prices for maize in Kisii fell to KShs. 30 to KShs. 50 per bag, market retail prices in Kakamega, Siaya and Busia District markets (Luanda, Bondo, Sio Port, Bumala) ranged between KShs. 90 and KShs. 150 per bag. These prices spreads must be compared with transport costs of KShs. 10 to KShs. 20 per bag on long hauls with lorries and KShs. 15 to KShs. 30 for short and medium hauls up to 150 km by matatu and bus.

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43.   There is one exception. A significant perfect correlation (1.0) was computed for beans in 2 Mombasa markets (Majengo and Mwembe Tayari). It is likely, however, that this was a result of collusion or the enumerator.

44.   Kariungi (1976, p. 61) in 1975 found a similar situation with regard to transfers between Kutus and Kitui town (Kalundu market).

The potential for excess profits in beans marketing is also
tremendous. In Central and Eastern Provinces, prices in Meru markets
(Maua, Kianjai, Mundantu) from February through   May ranged between
KShs. 110 and KShs. 180 per bag at the same time that beans at Machakos,
Nyeri and Kiambu district markets (Tawa, Kikima, Tala, Nyeri and Kiambu)
were sold retail at about KShs. 270 to KShs. 450 (Tawa, Tala).[45]   In
Western Kenya, when prices were low in Kisii (Daraja Mbili) and South
Nyanza (Migori), between KShs. 135 and KShs. 165 per bag, beans sold at
KShs. 280 to KShs. 450 in Kisumu, Siaya and Bungoma district markets (Ahero,
Bondo, Bumala, Mumias, Kimilili). Thus price spreads of KShs. 90 to more
than KShs. 300 existed and transport costs for beans are generally similar
to those for maize.

Interregional price differences exceed private transfer costs
within both the informal and the formal subsystems. This mainly applies to
maize since beans distribution and retail prices are not controlled. The
structure of controlled maize prices reflects the transfer costs of the
MPB which with regard to the spatial pattern is biased towards the railway
infrastructure and assumes that all surplus maize throughout the year is
coming from Western Kenya. This neglects the fact that, for example, rural
deficit areas in Eastern Kenya are able to get major supplies from adjacent
areas in Central Province and from their own surplus zones of Meru and Embu.
During the survey period, the official price spread between the farmers'
price in Meru at MPB agents stores (about KShs. 70 per bag) and the Kitui
ex-depot wholesale price (KShs. 116.80 per bag) was about KShs. 46 per bag
which has to be compared with the transport cost cited above. The official
retail price difference amounts to more than KShs. 50 per bag. Corresponding
price spreads in Western Kenya, for example between Kisii and Kisumu, were
KShs. 35 per bag. Actual price spreads, however, often were similar or even
much higher than those in the informal system, because the MPB agents, due
to the problems encountered at the depots, paid farmers at the market price
rather than the controlled price. Farmers in Meru District claimed that
certain MPB agents paid only KShs. 27 per bag (at the time of interview).
Taking into the account the interaction of the informal and formal sub-
systems, interregional price spreads between Meru and Kitui within the formal
channels amount to as much as KShs. 86 per bag. If one further considers that
lorry traders directly supplied wholesalers and shopkeepers, the price spreads
were even higher and considerably exceeded those within the informal sub-systems.
This indicates that the maize marketing controls create inefficiencies of oper-
ation which result in a situation in which exploitation is possible.

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45.   Schonherr and Mbugua (1976, p.29) in 1975 found price spreads between
Nyeri and Murang'a on the one hand and Embu and Kitui on the other of KShs. 140
to KShs. 185 per bag.

5.2.3 Intertemporal Pricing Efficiency. As in the case of interregional
pricing efficiency, maize and beans marketing legislation is unconducive to
high intertemporal pricing efficiency (seasonal price differences corresponding
to storage costs). As pointed out earlier, private storage though less
expensive on medium term than MPB storage is discouraged by the present
system of controls. This affects intertemporal pricing efficiency negatively
as shown in Tables 38 and 39.

Table 38: Percentage Distribution of Seasonality Indices for Maize Prices
in CBS Markets by Sample Zones.

Indices	Western Kenya	Central Kenya	Eastern Kenya[a]	Total
0.0 - 5	3.1	14.3	12.5	8.2
5.1 - 10	34.4	38.1	-	31.2
10.1 - 15	37.5	28.6	62.5	37.7
15.1 - 20	12.5	4.8	-	8.2
Above 20	12.5	14.3	25.0	14.8

Note: a Except for markets in high potential areas, e.g. Kikima (Machakos),
which were included in Central Kenya.

Source: Schmidt, Zettelmeyer, Casley and Marchant 1979.

These tables classify the seasonal pattern of time series maize and
beans price data for CBS sample markets (January 1977 to September 1978) with
regard to size of deviation from the price trend. This is expressed in a
seasonality Index (SI) which is defined as the standard deviation of the
trend-adjusted and seasonally fitted (13 weeks moving average) time series
expressed as a percentage of the mean original price:

$$SI = \frac{\sqrt{1/n\Sigma (P_{st} - \bar{P}_s)^2} \times 100}{\bar{P}}$$

where
P_{st} = seasonally fitted price

$\bar{P}_s$ = mean seasonally fitted price

$\bar{P}$ = mean original price

The index is dependent on the standard deviation and on the general price
level in one market. The higher the index, the higher the seasonal variation
for a given price level.

As can be seen from the tables, the seasonal price variation
in the majority of markets seems to be quite substantial. In more than
60% of the sample markets in the case of maize and more than 50% in the case
of beans, seasonality indices are above 10. Quite a number of markets,
particularly in Eastern Kenya, have indices above 20. Markets in Central

Table 39: Percentage Distribution of Seasonality Indices for Beans Prices
in CBS Markets by Sample Zone

Indices	Western Kenya	Central Kenya	Eastern Kenya[a]	Total
0.0 - 5	14.3	10.5	11.1	12.7
5.1 - 10	37.1	42.1	11.1	33.3
10.1 - 15	31.4	25.7	-	31.8
15.1 - 20	11.4	2.9	44.4	14.3
Above 20	5.7	-	33.3	7.9

Note: a   Except for markets in high potential areas, e.g. Kikima (Machakos),
which were included in Central Kenya.
Source: Schmidt, Zettelmeyer, Casley and Marchant 1979.

Kenya, where more secondary or terminal urban markets like Karatina, Nyeri
and Kutus are included, on average have lower indices for both crops.
Markets in Western Kenya on average have relatively higher index values
than those in Central Kenya, but lower than markets in Eastern Kenya, but
the number of CBS sample markets in Western Kenya is much higher than in other
areas.

Figures 7, 8, 9, 10 and A1 through A8 (Appendix)[46] give examples
of different seasonal patterns. They show the original price series (O),
a medium term trend (T),[47] the 13 weeks moving average fitted seasonal
values (S) and the residual values (R). Markets within or adjacent to areas
with a short- and long-rains crop usually have a bimodal pattern often with
relatively small price spreads (see Figures 8, 9 and A2 for Kiambu, Tala
and Kebirigo markets). In other areas, time series of prices have only one
peak and trough, but they tend to have larger price spreads (see Figure 7 and
A5 for Bondo and Matiliku markets).

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46.   For figures covering the other CBS sample markets see Schmidt,
Zettelmeyer, Casley and Marchant 1979.

47.   The trend was computed as a linear regression line on the original
data (not deflated). Since the time series is relatively short and does not
cover a full 2 year period, it must be interpreted with caution. The same
holds true for the other computations.

Figure 7: MAIZE PRICES IN VBS SAMPLE MARKETS 1977 AND 1978 (SEPT) MARKET: BONDO

D = ORIGINAL SERIES, T = TREND, S = SEASON (13-M-MAV), R = RESIDUALS

TREND: Y = 1.12-0.0007X, SEASONALITY INDEX: 31.01%, INSTABILITY INDEX: 18.13%

Figure 8: MAIZE PRICES IN CBS SAMPLE MARKETS 1977 AND 1978 (SEPT.), MARKET: KIAMBU
D = ORIGINAL SERIES, T = TREND, S = SEASON (13-M-MAV), R = RESIDUALS
TREND: Y = 0.84-0.0012X, SEASONALITY INDEX: 15.87%, INSTABILITY INDEX: 20.55%

Figure 9: BEANS PRICES IN CBS SAMPLE MARKETS 1977 AND 1978 (SEPT) MARKET: TALA

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP

O = ORIGINAL SERIES, T = TREND, S = SEASON (13-N-MAV), R = RESIDUALS

TREND: Y = 3.38-0.0022X, SEASONALITY INDEX: 15.20%, INSTABILITY INDEX: 17.94%

SH/KG

5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP
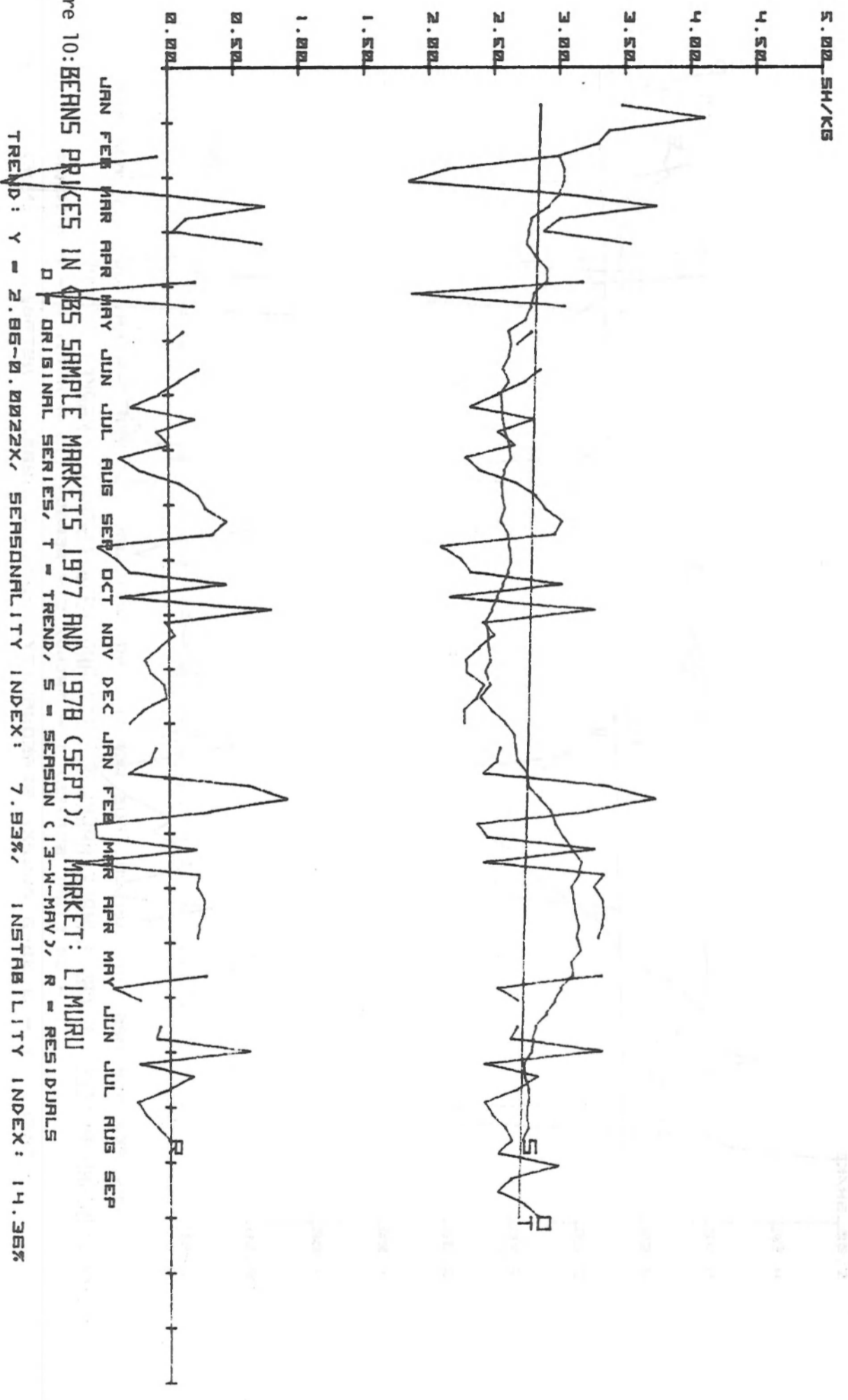
Figure 10: BEANS PRICES IN OBS SAMPLE MARKETS 1977 AND 1978 (SEPT), MARKET: LIMURU

O = ORIGINAL SERIES, T = TREND, S = SEASON (13-N-MAV), R = RESIDUALS

TREND: Y = 2.86-0.0022X, SEASONALITY INDEX: 7.93%, INSTABILITY INDEX: 14.36%

Seasonal price spreads corresponding to indices above 10 are KShs. 25 per bag of maize (Kebirigo, Figure A2) and KShs. 60 per bag of beans (Luanda, Figure A7). For indices above 20, the seasonal price spreads are KShs. 100 per bag of maize (Bondo, Figure 7) and KShs. 180 per bag of beans (Matiliku, Figure A5). Even for indices below 10, the absolute amount of the price spread may be high when the overall price level is high (above KShs. 80 per bag). For example, price spreads of KShs. 25 to KShs. 30 per bag of maize were found in some cases (Kapsabet, Figure A3) where indices were below 10. Price spreads for beans with an index below 10 may have been up to KShs. 60 per bag (Limuru, Figure 10). For indices above 20 actual price spreads of more than KShs. 140 per bag of maize (Bondo) were observed in 1977/78.[48] For beans, actual price differences of up to KShs. 360 per bag were found (Matiliku, Figure A5).

These price spreads were then compared with private storage costs which for MPB agents amounted to between KShs. 13 and KShs. 21 per bag of maize for a period of 6 months depending on the degree of capacity utilization (see Chapter 5.1.3). For a storage period of 8 months which must be considered for markets with unimodal seasonal patterns, storage cost per bag of maize ranged between KShs. 18 and KShs. 25. For beans, six months storage results in costs of between KShs. 26 and KShs. 30 per bag and for eight months it ranges between KShs. 40 and KShs. 46 per bag. According to Tables 37 and 38, temporal price differences in the majority of cases are greater and often much greater than these storage costs. Consequently, intertemporal pricing efficiency like interregional pricing efficiency is far from being achieved. The high instability of market prices shown in the figures certainly contributes along with discouragement of private storage to this lack of efficiency.

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48. Similar price spreads (Bondo) were found in Ndere and Muthithi markets (Schmidt, Zettelmeyer, Casley and Marchant 1979).

5.2.4. Excess Profits.   As suggested by the preceding chapters, due to the distortions in the maize and beans marketing system a sizable potential for excess profits exists. In this section, an attempt is made to assess the magnitude of excess profits realized within the private sector. This requires making certain working assumptions. Consequently, the resulting figures should be taken as crude estimates which suggest the order of magnitude of these profits.

Excess profits in marketing are defined here as net profits earned beyond opportunity costs of labour and working capital.[49] Three different estimates of total net profits were computed based on the minimum (optimistic) average gross margins minus marketing costs of traders.   The third estimate was based on a simple average of the average gross margins estimated under the optimistic and pessimistic assumptions minus marketing costs (see Table 41).[50]

Opportunity costs were estimated by functionary and, in the case of market traders, by volume of produce handled. For market traders handling less than 10 bags per week, the opportunity cost (shadow price) of labour was assumed to be KShs. 175 per month which is the minimum wage for permanent wage labour in the agricultural sector. In order not to overestimate excess profits for traders handling 10 or more bags weekly, double this amount or KShs. 350 per month was assumed; this corresponds to the minimum wage for the industrial sector in Nairobi. For MPB agents (produce storeholders), the salary of a Grade II MPB Produce Inspector, KShs. 1500 per month including house allowance, was taken as the shadow price of labour. Opportunity costs of labour for lorry traders were assumed to be the salary of a Grade I MPB depot manager, KShs. 3500 per month. The shadow price for working capital was taken as 10 percent per annum for all market functionaries.

The estimates, summarized in Tables 40 and A15 (Appendix), show that about 46% (pessimistic estimate) to 68% (optimistic estimate) or an average of 60% of maize and beans market traders earned excess profits.   Moreover,

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49.   For the definition of excess profits, see Schubert 1973, pp. 48-49 and Bain 1968, p. 24.

50.   Gross profit margins given by interviewees seem to be quite reasonable and correspond to those calculated from the CBS Market Information Survey. Average margins were taken for the optimistic estimate.   This estimate is assumed to be optimistic since traders who were reluctant or not able to give actual figures were asked to give the average margins they would like to make. This might have led to overstatement, but the figures compare favourably with the CBS data so not much overstatement is evident.

these excess profits seem to be quite substantial, ranging on average between KShs. 545 and KShs. 758 per month; the medium estimate is KShs. 626 per month. Excess profits amounted to between 48% and 53% (50% medium estimate) of gross profits.

Regionally, the percentage of traders accruing excess profits and the magnitude of the excess profits generally increases as one moves from west to

Table 40: Estimate of Excess Profits Earned in Maize and Beans Marketing, 1977[a]

			Market Trader	MPB Agent	Lorry Trader
Pessimistic Estimate	% of Traders		46	22	40
	Mean Excess Profit	in KShs. per month	545	5026	19,345
		in % of Gross Profit	47.9	31.2	61.3
Medium Estimate[b]	% of Traders		60	20	40
	Mean Excess Profit	in KShs. per month	626	9717	22,294
		in % of Gross Profit	49.4	41.4[c]	63.1[c]
Optimistic Estimate	% of Traders		68	45	67
	Mean Excess Profit	in KShs. per month	758	10,068	28,357
		in % of Gross Profit	52.9	38.3	55.2

Notes: a See text for assumptions with regard to opportunity costs and net profits.

b Mean average of pessimistic and optimistic estimate. For the MPB agents and lorry traders, a third calculation based on former margins fixed by the MPB is included.

c These values can be higher because of the different number of cases included in the calculations. In the calculations based on optimistic assumptions with regard to profit margins, more cases with marginal excess profits are likely to be included.

east (see Table A15, Appendix).[51]   Thus, on the basis of the medium estimate,
about 55% of market traders in Western Kenya on average earned excess profits of
about KShs. 326 per month corresponding to 47% of their gross profits, whereas
in Eastern Kenya 82% of the traders earned excess profits on the order of KShs.
1,380 per month corresponding to about 58% of their gross profits. For
Central Kenya, 72% of traders earned on average KShs. 896 per month excess
profits corresponding to 51% of gross profits. The oregional trend apparently
follows the size of operations recorded for the fdifferent sample zones (see
Table 13). With regard to gross profit margins, it is the opposite: they
decrease from west to east (see Table 41).

Table 41: Mean Approximate Gross Profit Margins for Maize and Beans by Sample
           Zones 1977 (KShs. per bag)

			Western Kenya	Central Kenya	Eastern Kenya	Total
Maize	Market Trader	Minimum	13.3	8.9	7.7	11.5
		Average	18.1	16.4	13.6	17.25
	MPB Agent	Minimum	5.3	4.0	6.7	5.4
		Average	10.8	6.7	11.1	10.6
	Lorry Trader	Minimum	N.A.	N.A.	N.A.	6.0
		Average	N.A.	N.A.	N.A.	11.4
Beans	Market Trader	Minimum	19.2	17.9	15.4	18.2
		Average	35.2	28.8	27.6	31.1
	MPB Agent	Minimum	13.2	6.8	9.7	11.2
		Average	23.0	11.4	17.5	20.0
	Lorry Trader	Minimum	N.A.	N.A.	N.A.	11.7
		Average	N.A.	N.A.	N.A.	20.9

Source: Own Compilation.

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51.   This does not hold for the percentage of traders under the optimistic
assumptions. In that case, the percentage for Eastern Kenya was slightly lower
than for Central Kenya (83% versus 85%).

Overall, the percentage of market traders earning excess profits over opportunity costs and the magnitude of these profits are quite high. Similarly, lorry traders, for whom the actual situation should be nearer the optimistic estimates,[52] enjoy substantial excess profits as expected. According to the optimistic estimate, more than 60% realized monthly excess profits on average of about KShs. 28,000 per month corresponding to 55% of their gross profits. Certainly those who operate on a large scale are able to derive a tremendous income from maize and beans trading within a short period.

MPB agents seem to be in a less favourable position if, as defined here, excess profits for them are earnings exceeding KShs. 1,500. However, the estimates must be interpreted with caution. Since the agents are supposed to work with fixed margins, a number were reluctant to answer the questions on margins or to give figures other than the official ones. Margins are therefore most likely understated. Nevertheless, Table 40 shows that if agents work more or less within official margins, which are less than those indicated in the pessimistic estimates, only a minority of larger agents are able to realize excess profits. This holds even if agents' profit margins are increased to the level of the medium estimate. Only if one assumes that agents pay farmers at going market rates which enables them to earn average margins (see Table 41), does the percentage of agents earning profits above KShs. 1500 per month increase to 45% (optimistic estimate). The average value for these profits is KShs. 10,000 per month, although 80% of the agents with positive excess profits realized less than KShs. 4000 per month. In terms of gross profit, this amounts on average to about 38%. Regionally, according to the medium and optimistic estimates, the magnitude of excess profits decreases from west to east reflecting the differing size of operation and margins (see chapter 3.1 and Table 41).[53]

Finally, an attempt is made to estimate total excess profits earned within in   the informal maize and beans marketing sub-system. This is done on the basis of average gross profit margins (see Table 41), medium estimates for excess profits expressed in percentage of gross profits if these are lower than optimistic estimates,[54] the relative share of marketed volumes handled by traders with positive excess profits (medium estimates) and their respective

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52.   For lorry traders, average margins on which the optimistic estimate is based are not inflated as might be the case for market traders (see Table 41). According to the interregional price spreads, they rather seem to be understated.

53.   For the pessimistic estimate, in which only extreme cases of large agents are included, the figure shows the opposite tendency. This is mainly because one extreme case for Eastern Kenya is included in the pessimistic estimate, but is missing from the optimistic one.

54.   Otherwise the figures based on "optimistic" assumptions were taken.

shares within the marketing channel systems (see Figures 1 and 2).

Marketing functionaries with positive excess profits are usually those with high turnover. The percentage of total volumes handled by them therefore even exceeds their proportion in the total trader population. Market traders earning excess profits (60% of the total) handled more than 80% of maize and beans channelled through market traders. 20% of MPB agents who earned excess profits according to medium estimates handled about 70% of maize and more than 80% of beans channelled through MPB agents. Lorry traders with excess profits marketed more than 80% (maize) and 70% (beans) of channel volumes of lorry traders. On the basis of the channel structures which are dominated by market traders, total excess profits add up to an estimated KShs. 25 million for maize and about KShs. 4 million for beans; most, about KShs. 20 million for maize and KShs. 3 million for beans, were earned by market traders. The figure for MPB agents ranges around KShs. 3 million for maize and KShs. 0.5 million for beans, whereas for lorry traders total excess profits amounted to about KShs. 2.5 million for maize and only KShs. 0.4 million for beans. All figures were based only on volumes originating from smallholders. Since lorry traders also medium and even large scale farmers, their total excess profits might be significantly higher than those shown above.

In summary, excess profits earned within the maize and beans marketing system seem to be quite substantial indicating that improved pricing efficiency could lead to major savings. Once again in this context it should be mentioned that these high excess profits are largely due to the imperfections of the marketing framework created through government imposed controls and for the most part not due to the exploitative nature of traders. This, however, does not mean that all excess profits would disappear with the relaxation of controls. Other imperfections such as low market transparency (see section 3) also contribute. Nevertheless, marketing controls are the major source of market distortions and low pricing efficiency. If government policy concerning interventions in maize and beans marketing were revised to replace strict controls with regulation, considerable savings with regard to profits is envisaged.

5.3. Security of Outlets and Sources. The provision of secure outlets for farmers and sources for consumers, particularly in the case of staple food crops, is usually viewed as an important objective of socio-economic development (Schubert, 1973, p. 41) and is generally a major concern of governments. It relates to the uncertainty or risk involved in the marketing process. Secure outlets and sources can be assumed if the marketing system provides regular marketing opportunities, if farm prices are not depressed and consumer prices

are not inflated by inadequate marketing capacities or inefficiencies, and if
marketing transactions are not impeded by highly erratic price fluctuations.

From the discussion of the channel and market structure (sections 3.2
and 3.3), it can be concluded that, except for some remote area with bad
infrastructure, regul.. marketing opportunities are provided although often
no choice exists between different types of outlets and sources. The most secure
outlet and often also source for smallholder maize and beans producers is the
effectively managed cooperative. However, cooperatives have only a small share
in the market and therefore most small farmers are left with the option of the
private trader or MPB agent.

Given the absorptive capacity of private maize and beans marketing
channels, a prerequisite for guaranteeing secure outlets, particularly for
smallholders, is the ability of the MPB to take all surplus offered by farmers
and agents without delay. This is crucial under the current system of strict
controls. The monopoly position of the MPB makes it legally responsible for
marketing all surplus beyond local requirements. The result is congestion at
depots and strain on storage capacities. Moreover, as agents complained, depots
often start accepting deliveries late because of moisture content and when
filled to capacity they stop accepting produce altogether. Additionally, if
supplies do not meet specific standards, especially with regard to moisture
content, the consignment is rejected instead of being purchased at a lower
price. For beans the situation was similar or even worse due to the priority
given maize. When the storage situation became tight, deliveries of beans
were deliberately discouraged by raising quality requirements.

The situation is reflected in the complaints of MPB agents summarized
in Table 42. Delays at the depot and the inability to deliver supplies because
the depot stopped intakes are among the major problems mentioned by 51.2% and
43.9% of agents respectively. Grading and drying (moisture content) was the
most frequently mentioned pro¹lem (83%). It resulted in delays or bribes.
Bribes, mentioned by 57.5% of agents, can in fact be viewed as a monetary e·-
pression of all the major problems encountered (see section 5.11).

If the MPB fails to accept all existing supplies, sellers have no other
legal outlet. Even under a relaxed system under which the MPB played a regulative
function its role as buyer of last resort would be important. Furthermore,
the failure of the MPB to cope with all supplies has severe implications for
the objective of guaranteeing a pre-announced producer price. Presently, by-

Table 42: Problems Encountered in Connection with Deliveries to the Maize and
           Produce Board as Stated by MPB Agents 1977

Problem	Frequency of Statements (%)
1. Delay at Depot	51.2
2. Depot stops intake	43.9
3. Grading/Drying	83.0
4. Bribes	57.5
5. Delay of Payment	7.9
6. Other	2.5
7. No Problem	3.2

Source: Own Compilation.

passing the MPB violates the marketing regulations and thus involves high
risks. As a result, insufficient drainage of supplies from surplus areas
occurs and prices are depressed in the surplus markets. This does not at
the same time benefit consumers in deficit areas who face inflated prices (see
section 5.2.2.). Even MPB agents are often in the position to pay the official
government set price since their only other alternatives are: to keep in-
ventories for a unknown period, to sell to lorry traders at the going market rate
or to bribe MPB depot officials (see section 5.11). Table 43 shows that in 1977/
78, the majority of MPB agents in fact paid farmers below the official price of
KShs. 70 per bag of maize.[55] The same pattern was derived from answers of
farmers interviewed in markets who were aware of prices paid by agents in their
vicinity. According to them, agents' prices were as much as 75% below the
official price and went as low as KShs. 27 per bag. The medium price was KShs.
63 per bag.

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55.   Table 43 does not differentiate between the agent and depot and in-
cludes prices paid during the off-season or in_deficit areas. The latter is
indicated by a few cases in which a price to farmers of more than KShs. 90
per bag of maize was recorded. If market prices rise to levels above the
MPB prices, MPB agents who also sell to consumers may even pay these if it
is cheaper and more convenient than getting supplies from the MPB depot. This
is also true for beans. If, however, prices were recorded for surplus areas
and for the main supply season only, the overall picture most likely would
have been even less favourable.

Table 43: Percentage Frequency Distribution of MPB Prices Received by
             Smallholders, 1977/78

Price per Bag	Percentage of Sales	
	1977	1978
Less than 50	27	10
50 - 69	27	64
70 - 89	44	17
90 and more	2	9
TOTAL	100	100

Source: Kenya Crop Forecast 1979. p. 4.

The evidence given in the previous chapters is sufficient to show
that government policy to control maize and beans marketing with the intention
of providing a secure outlet to farmers at a guaranteed price through the
MPB has not been effective. Instead, the control have increased uncertainty
since farmers cannot be sure of disposing of their inventories to the MPB nor
of receiving the guaranteed price. This uncertainty is further increased if
District Commissioners intervene in the marketing process by banning transac-
tions within the informal system which was the case in Kitui. The argument put
forward for these intervention is that farmers in an area should keep their
maize and beans for consumption during the off season instead of selling it
at "throw away" prices to traders who may transport it out of the district.
These actions seem to be based on an ideology of district level self sufficiency
which given Kenyan production conditions is not very rational. Furthermore, it
disregards the fact that small farmers have cash needs to satisfy especially
after a particularly good harvest. The IRS 1974/75 data showed that farmers
in drought affected areas had negative incomes. When are they supposed to
balance these out if not at the time of a good harvest? Thus, if farmers have
produce to sell, they will sell it whether or not marketing transactions are
banned. Moreover, if prices fall to the low levels claimed as a rational for
the ban, it is not the fault of market traders who are punished by the ban but
instead the inefficiency of the MPB or its agents. This being the case, farmers
are left with only these inefficient outlets which give them poorer prices than
they would receive in the markets. If the MPB and its agents are efficient,
farmers will sell to them irrespective of banned market transactions. So why
should market traders be banned from competing with the MPB agents? However,
if the MPB is not efficient then the situation under the conditions of banned
marketing transactions is much worse. Transactions are made illegally in secrecy

and will be carried out illicitly with negative consequences for the smallholder seller of maize or beans. Smallholders will still sell under these conditions because of their cash requirements.

If the banning continues until the off-season, smallholders may be affected adversely a second time. As mentioned earlier, during the survey period, illicit inflows of maize to Kitui were sold wholesale at KShs. 75 to KShs. 80 per bag to distributors and shops while at the same time the MPB sold at KShs. 116.80 per bag ex-depot Kitui. Shopkeepers were nevertheless selling at controlled retail prices instead of lower market prices which would have benefited consumers. In fact at Mwingi where maize continued to be sold in the market, it was retailed at KShs. 1 per kg. corresponding to KShs. 90 per bag.[56] In other areas of Kitui, due to the ban, consumers were forced to pay the controlled prices ranging between KShs. 1.35 to KShs. 1.45 per kilogram.[57] Therefore, in the case of distribution as well as assembly the banning of market transactions did not really help to increase the security of the community in the drought affected area.

In other areas not subject to such interventions by the District Commissioner, controls on marketing and prices seem to be ineffective means of increasing the security of consumers.[58] They are either redundant because price levels in markets are generally below controlled levels (Mukui, 1978, (106). or they are ineffective because price levels in markets by far exceed those levels.[59] One reason for this is the low integration of the formal and informal marketing system (see section 3.2). Also most probably margins fixed for distributors and retailers are too low which discourages them from buying additional supplies from the MPB (Hesselmark and Lorenzl, p. 176). Furthermore, price controls for maize in the formal sub-system are often not very effective in rural areas (Mukui, 1978, p. 107); only in the major towns were they observed to provide consumers with stable, uniform maize prices.

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56. The author does not know why maize continued to be sold in the market despite the ban.

57. For remote places, the District Commissioner allowed prices above the normal level due to higher transport cost. This was despite the fact that lorry traders also supplied these places at much lower prices than the ex-depot price at Kitui Town.

58. This can be shown only for maize for which prices at the distribution level are controlled in the formal sub-systems.

59. Busia, Bumala, Kimulot, Kiambu, Muthithi, Tala, Kalawa, Matiliku, and Kikima markets (see Schmidt, Zettelmeyer, Casley and Marchant 1979).

Nevertheless, even in the towns, prices might have been lower given a functioning interregional exchange (see section 5.2.2.) without necessarily being unreasonably unstable. Instability indices[60] calculated for maize and beans prices in Nairobi and Mombasa markets (Burmar, Majengo and Mwembe Tayari) had very low values; 3.26% for maize prices in Burmar market was the highest. However, the instability of prices, particularly in rural markets, is usually very high reflecting an erratic supply and/or demand situation[61] stemming from the impediments to arbitrage activities created by the movement restrictions.

The percentage distribution of instability indices for maize and beans prices in CBS sample markets is shown in Tables 44 and 45. More than 70% of markets had instability indices of above 10 for maize and beans and 26.2% (maize) and 28.5% (beans) had values even higher than 20 (see Figures 7 to 10

Table 44:   Percentage Distribution of Instability Indices for Maize Prices in CBS Markets by Sample Zones

Indices	Western Kenya	Central Kenya	Eastern Kenya[a]	Total
0.5 - 5	6.3	4.8	-	4.9
5.1 - 10	18.8	23.8	-	18.0
10.1 - 15	25.0	33.3	25.0	27.9
15.1 - 20	28.1	14.3	25.0	23.0
20.1 - 25	12.5	14.3	12.5	13.1
Above 25	9.4	9.5	37.5	13.1

Note. a Except for markets in high potential areas which were included in Central Kenya.

Source: Schmidt, Zettelmeyer, Casley and Marchant 1979.

and A1 to A8). Thus, erratic movements in these cases were as strong or even stronger than the seasonal ones; they resulted in fluctuations of about 0.50 to 0.80 Kshs. per kg. of maize or KShs. 45 to KShs. 72 per bag, (see Figures A2,7,8) in the case of Kibirigo, Kiambu and Bondo (see Figures A2, 7,8) and up to more than KShs. 1 per kg. or KShs. 90 per bag in the case of Kimulot,

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60.   These were calculated similarly to those for seasonal movements.
61.   About 30% of maize and beans market traders complained about erratic supplies as one of their major problems.

62.   For more cases, see Schmidt, Zettelmeyer, Casley and Marchant 1979.

Bumala and Matiliku markets (Schmidt, Zettelmeyer, Casley and Marchant 1979).
For beans, erratic price fluctuations of KShs. 1 to more than KShs. 2 per kg.
or KShs. 90 to more than KShs. 180 per bag were observed in Tala, Limuru,
Matiliku, and Oyugis (see tables 9,10, A5, A6).[62] Regionally, the instability
of prices was highest on average in Eastern Kenya, followed by Western and
Central Kenya (see Tables 44 and 45). This supports the argument that the
source of instability is the degree of seasonal fluctuations.

Table 45:   Percentage Distribution of Instability Indices for Beans Prices
            in CBS Markets by Sample Zones

Indices	Western Kenya	Central Kenya	Eastern Kenya[a]	Total
0.0 - 5	-	5.0	11.1	3.1
5.1 - 10	27.8	25.0	-	23.1
10.1 - 15	30.6	45.0	33.3	35.4
15.1 - 20	19.4	15.0	33.3	20.0
20.1 - 25	13.9	10.0	11.1	12.3
Above 25	8.3	-	11.1	6.2

Note: a Except for markets in high potential areas which were included in
           Central Kenya.

Source: Schmidt, Zettelmeyer, Casley and Marchant 1979.

        In summary, the erratic price fluctuations result in immense uncertainty
for maize and beans farmers, consumers and traders. The objective of stabili-
zing prices for the benefit of producers and consumers through the formal sub-
system is certainly not achieved. On the contrary, all available information
suggests that the present controls on channels and movements are more des-
tabilizing than stabilizing.

62.   For more cases, see Schmidt, Zettelmeyer, Casley and Marchant 1979.

6. SUMMARY AND CONCLUSION

In this study, the functioning of the maize and beans marketing systems with special regard to the interaction of the formal (controlled) and informal (uncontrolled) sub-systems is analyzed. The marketing system has been increasingly faced with problems which raise the question of whether structures set up during colonial times remain appropriate in a changed socio-economic environment and whether they are able to cope with the present level of marketed output. This is of major concern because maize and beans are the two major staple foods of the low income sections of Kenya society. Maize and beans production, despite a rapidly growing population has in recent years slightly exceeded self sufficiency.

It has been suggested that Kenya decontrol maize and beans marketing in order to overcome major problems. This recommendation was made in the last two Development Plans and is also contained in the newly issued 1979-83 Plan. Despite this, no definite actions have been taken except for a brief period in 1977/78 for maize. It is likely that uncertainty with regard to the costs and benefits of the relaxation of controls and scepticism with regard to the performance of the private marketing sector are among the major reasons for the reluctance of the government to implement the recommended reforms. Therefore this study attempts to reduce this uncertainty by analyzing the operation and effectiveness of the present marketing systems with emphasis on the private sector, largely synonymous with the informal sub-system, and its interaction with the formal system.

The evaluation is guided by the stated objectives of the controls: to benefit producers and consumers. Achievement of these objectives requires that the marketing systems operate at lowest possible costs (operational efficiency), prevent exploitation of farmers and consumers (pricing efficiency) and provide secure outlets for producers and sources for consumers. Following a description and analysis of the framework, structure and conduct of the marketing systems, performance of the system is analyzed in terms of these subgoals. Survey information of the Central Bureau of Statistics and data gathered by the Maize and Beans Trader Survey carried out in markets with the assistance of the FAO/Kenya Government Marketing Development Project provide the empirical base for the analysis.

The results of the study can be summarized as follows:

The maize and beans marketing systems are faced with a heterogeneous production, supply and demand pattern particularly with regard to scale and regional and temporal distribution. Smallholders dominate maize and beans production. Maize is also produced to a significant degree by large scale farmers; although they account for only 30% production, they contribute about 50-55% to the total marketed maize output. The maize marketing system is therefore confronted with two groups of suppliers, almost equally important in terms of total marketed supply, but with differing needs as far as marketing services are concerned. The large scale farmers' supply is relatively concentrated both geographically and in terms of the number of producers and therefore is relatively easy to handle. This is not the case with smallholder supplies of both maize and beans which are dispersed geographically and across a large smallholder population.

The diversified production conditions in Kenya contribute to the complexity of the production and supply pattern. Maize and beans are widely grown in almost all agricultural zones and throughout the years. Harvest times differ considerably between provinces and even adjacent zones within a province or district. They are therefore complementary so that inter- and intraregional flows can contribute significantly to balancing supply and demand over the course of the year. This becomes even more important if one considers that rural demand, particularly for maize, exceeds by far the urban demand. Retained production of smallholders covers only about 60-65% of family maize consumption and about 80% of family beans consumption. Rural market demand for maize and beans therefore accounts for about 80% for maize and 60% for beans of total market demand. The regional distribution of rural demand follows more or less the distribution of production. Major production areas for maize are the High Altitude Grassland Zone of Rift Valley Province and the Coffee zones in Western and Central Kenya. Beans production is concentrated in the Coffee and Lower Cotton zones of Central and Eastern Province.

Controls imposed on maize and beans marketing prohibit free exchange between surplus and deficit areas. They give the Maize and Produce Board a legal monopoly to handle all surplus beyond local requirements. This is enforced through movement restrictions requiring movement permit for all shipments across district boundaries which exceed 2 bags.

Channel structures of the maize and beans marketing systems reflect the supply and demand pattern, the impact of controls and the general marketing infrastructure. The controls separate the marketing systems into the informal and the formal sub-systems. The major channels for smallholders and rural consumers are those of the informal sub-system. These channels consist of relatively small scale traders, mainly women, who operate locally at roadsides or in the rural markets which are easily accessible for smallholders and consumers and where prices fluctuate according to supply and demand. Of minor importance are stores and cooperatives operating as MPB agents in the formal system. Prices for these outlets and sources are controlled by the government. Large and medium scale producers usually directly supply one of the MPB depots in their vicinity or one of the depots of the KFA which act as a sub-agent for the MPB in Rift Valley Province. The MPB in turn domestically supplies mills, other processors and, to a lesser degree, distributors particularly in urban areas. In summary, the formal system largely serves large scale producers and the milling industry whereas small scale producers and rural consumers are mainly dependant on the informal sub-system.

There is theoretically a division of activities between the two sub-systems. The informal sub-system is confined to local marketing activities whereas the formal one is supposed to handle all surpluses beyond local needs and consequently to perform the intra - and interregional exchange between surplus and deficit areas. In practice, however, both sub-systems interact and overlap to a considerable extent. MPB agents go into local markets and buy at current market prices. Market traders ship significant (in aggregate) volumes across district and provincial boundaries and lorry traders (produce wholesalers), operating on a larger scale, supply mills and link more distant surplus and deficit areas with each other. All these activities constitute violations of the control regulations. In fact, lorry traders officially do not exist since there is no legal provision for their role.

Market structures in terms of number and size are fairly competitive except in the case of the MPB's legal monopoly. Usually at all channel levels one finds a sufficient number of competitors none of whom is big enough to control the actions of others. The structures vary considerably, however, with the points of sale or purchase, markets, regions and over time. Furthermore, in a significant number of places no real alternative to the informal system exists for smallholders--contrary to common assumption--since there is no active MPB agent. In these cases, the informal and formal system are more or less isolated from each other. Apart from this, market structure imperfections

are associated with market transparency rather than the number and size of competitors or market entry. Market transparency is severely restricted by the absence of uniform measurements, weights and standards in markets and uncertain- ties about weights and grades at MPB depots. The degree of market information about market conditions outside the local area of operation is low except for lorry traders. This is largely due to movement restrictions which prevent inter-actions with those areas.

Market conduct reflected the type of marketing functionary and the corresponding competitive environment. Market traders for maize and beans generally seem to have a passive attitude towards price competition, but not due to collusive behaviour. They are oriented towards getting a target margin (absolute terms) which is subject to adjustment according to the market situation. Cash payment is their most important action parameter. The majority of MPB agents, though officially not supposed to compete through prices except in the case of beans at the distribution and retail levels, also seek a target margin. But they, too, are rather passive in pricing and as in the case of market traders usually not because of collusive arrangements. Like market traders, for MPB agents cash payment is by far more important than pricing. Extension of credit to smallholders which opens the possibility of price discrimination generally has no relevance for them. The most competitive minded marketing functionaries are found among lorry traders though they were often operating in an environment unconducive to open competition. In contrast, the MPB is the most passive marketing functionary which reflects its monopoly position. To a large extent however, the MPB itself is not to be blamed for this because it is not autonomous in its actions.

The marketing systems for maize and beans are far from operating at lowest possible cost and therefore operational efficiency could be improved considerably. Major savings are predicted in assembly and distribution, transport and storage if controls are relaxed. Forcing all surplus through the MPB means that a significant proportion of marketed volumes must pass through an additional channel level which increases costs unnecessarily. Mills and distributors can often be supplied directly by MPB agents, large farmers, cooperatives and lorry traders (assemblers). The argument that under such conditions per unit costs of the MPB would increase and therefore the service of the MPB would become more expensive and require higher subsidies is not very convincing. First, only part of the MPB overheads are fixed (about 50%). Second, the current problem is insufficiency of existing capacities; major expenditures could be saved by a slower rate of capacity expansion. Third, the

MPB has in the past concentrated on handling of maize, with a relaxation of
controls, it could extend its activities for beans and other produce so far
neglected. Finally, most existing storage capacity is in the form of multi-
purpose warehouses which could be leased or used for storing other commodities.
Thus, in sum, the potential negative effects on MPB per unit costs are not
an adequate argument against relaxation of controls. The potential for
reducing total marketing costs for maize and beans by allowing direct sales
would initially be on the order of KShs.3.5 to 4 million. Savings in private
marketing costs would be much higher, because millers and distributors would
save the total margin now paid to the MPB.

Assembly and distribution costs could be further reduced by allowing
alternative channel outlets to the MPB and smoothing supplies to MPB depots.
Under present conditions, congestion at depots during peak seasons and the fact
that no other legal outlet besides the MPB exists lead to the practice of
paying bribes (equal to private opportunity costs) ranging between KShs.1 to KS
KShs. 2 per bag also had to be reckoned with for illicit transactions (those
bypassing the MPB.). Whether or not assembly costs can be reduced further by
replacing the MPB agent system with mobile assembly units employed by the MPB
can not be definitely answered. In major smallholder surplus areas, it can not
be ruled out. Generally, the decentralized agent system and the network of
markets seems to be well adapted to the dispersed supply in smallholder areas.

Another crucial area in which the present control system has negative
effects on the operational efficiency of the maize and beans marketing systems
is transport. The movement regulations discourage the use of economic modes
of transport. Volumes within limits exempted from controls (2 bags) result in
transport by bus and matatu unless other transport is approved by the MPB.
Consequently, large (in aggregate) volumes shipped within the informal sub-system
are transported on a small scale with means which on average are twice as expensive
as alternative means such as pick-ups and lorries. Even on short hauls, buses
and matatus are more expensive than the alternatives. With the relaxation of
movement restrictions, an initial saving of about KShs. 4.3. million annually,
most of it for maize (around 4 million), was estimated based on prices before
the increase in 1978/79; this is the equivalent of 5-6% of total transport costs.
Additional savings within the formal system are predicted, if its interregional flow
pattern is improved. However, the impact of this on total transport costs requires
further study.

As in the case ot transport, private storage is impeded by the control
regulations. Agents or other private storeholders are not supposed to perform

genuine storage functions. This is reflected in the uniform MPB buying price for the entire year. Moreover, no financial support is given to agents for storage. The result is that private storage capacity of agents and others is not fully utilized. From an estimated storage capacity for agents of 65,000 to 100, metric tons, only 33% was used for storing maize an average period of 8 weeks and on on average about 6% was occupied by beans for 13 weeks.

Underutilization of private storage capacity contributes to poor operational efficiency. At least in the medium term, it would be more efficient if agents were allowed and supported to store inventories of maize and beans for the off-season instead of delivering all season supplies to MPB depots and then buying them back later as presently occurs. Potential savings are estimated to be on the order of KShs. 2 to KShs. 3 million per year. Storage efficiency could be further increased if the MPB were bypassed. In that case, moisture content particularly for maize would not be as crucial since the MPB would no longer need to assume that all maize intake would be stored for a long period. Also, agents would no longer be forced to keep inventories because of full depots.

In sum, operational efficiency seems to be considerably lacking. This is mainly due to structures and operations imposed through controls. If these were relaxed, potential savings on marketing costs of more than KShs. 10 million per year are expected. In the long run, these can be assumed to be even greater.

Pricing efficiency is similarly affected by controls. Instead of preventing exploitation, the controls facilitate it to a greater extent than a decontrolled system. Mainly due to the impediments to intra- and interregional trade, markets for maize and beans are poorly integrated as indicated by low correlations between maize and beans prices in different markets. Furthermore, huge price differences are found between markets, even adjacent ones, which often considerably exceed small and large scale transfer costs. This is even true for the regional structure of controlled prices. These price differences could not occur under reasonable conditions of market integration. Similarly, large intertemporal (seasonal) price differences exceeding storage costs are found.

These regional and temporal price differences which exceed transfer and storage costs allow scope for considerable excess profits to be earned. Excess profits are defined here as profits earned beyond opportunity costs of labour and capital and therefore they are not necessarily excessive profits although this may be the case for certain transactions. Opportunity costs of

labour and capital and therefore they are not necessarily excessive profits
although this may be the case for certain transactions. Opportunity costs of
labour were assumed to be KShs. 175 or KShs. 350 per month (depending on the
size of operation) for market traders, KShs. 1500 for MPB agents and KShs.3500
for lorry traders. The opportunity cost of capital was assumed to be 10% for
all market functionaries. Based on these assumptions, excess profits are estimated
to total about KShs. 25 million for maize and KShs. 4 million for beans. Market
traders who handle most of the marketed output of smallholders earned most of
these.

In view of these excess profits, traders might be blamed for being
exploitative, unscrupulous and so forth. However, fairly high pricing
efficiency at channel interfaces does not support such views. A regression
analysis of maize buying and selling prices confirmed the expectations derived
from analysis of market conduct. Traders work with constant profit margins in
absolute terms and thus tend to pass on price changes to other channel levels.
Therefore, excess profits must be explained largely by the distortions in
interregional trade and storage. The assumption that producers and consumers
under a relaxed and undistorted marketing system would be left to the mercy of
unscrupulous traders is certainly not justified.

Finally, controls do not help to increase the security of smallholders
and rural consumers. Instead, they do the opposite. Smallholders can not rely
on getting paid the government fixed producer price. Furthermore, farmers and
rural consumers (during the off-season these two parties may be identical) who
largely depend on markets as the outlet and source of maize and beans are faced
with highly erratic price fluctuations which also affect traders. The resulting
uncertainty, therefore, is tremendous. Banning of maize and beans marketing
does not protect producers and consumers from the uncertainties of free marketing.
To the contrary, it is detrimental to their interests.

In summary, the analysis of the maize and beans marketing systems
suggests that the objectives of controls are not being achieved and in fact
the present system of controls contributes to marketing inefficiencies. The
analysis shows that the control legislation has created a marketing framework
which is conducive to low operational efficiency reflected in high marketing costs,
low pricing efficiency reflected in poor market and seasonal integration and high
excess profits, and high instability of market conditions.

The population affected by these inefficiencies is smallholder maize
and beans producers and rural consumers. These two groups are in many ways
identical since only a part of consumption needs are met by a producer's

retained production. In addition, urban maize and beans consumers who
primarily belong to the low income groups must pay higher prices than those
which would prevail if the parastatal marketing organization, the Maize and
Produce Board, competed with private marketing channels. Those who benefit from
the present regulations are large scale farmers and the milling and other maize
and beans processing industries. This is because large scale farmers usually
have direct access to MPB or KFA depots, and the processing industry has no
problem passing on higher buying prices to consumers in the case of maize and
maize meal through controlled selling prices. Therefore, the inefficiencies of
the maize and beans marketing system have severe negative income distribution
effects. The rural and urban poor, supposedly the beneficiaries of controls,
are actually paying for a scheme which largely favours those who are already
better off. This is in effect an inequitable tax.

        In order to achieve the stated government objectives, controls on
maize and beans marketing should be relaxed as envisaged in the three Development
Plans and as suggested by previous studies. (See Kenya Co-ordinating Summary
of Major Technical Studies, Committee of the Marketing Development Project, 1978.
pp. 66-69 and other sources cited page 66) The relaxation of maize and beans
marketing controls is the first step and a pre-condition for improving marketing
effectiveness. Concommitantly, other changes should be considered. Farmers,
traders, storeholders and cooperatives should be free to sell either to the
MPB or to any other outlet they think fit. Nobody should be granted a monopoly
and movement controls should be removed completely without introducing any kind
of new permit system even on a short term basis. With such a relaxation, the
role of the MPB would change. It would run a stabilization buffer stock scheme
with floor and ceiling prices. It would have to accept all surpluses which
the private sector cannot absorb at the minimum guaranteed producer price and
would have to supply the private sector with maize and beans at the ceiling
price when private channels were unable to meet demand. In addition, the MPB
would be responsible for maitaining a strategic maize reserve in the national
interest.

        The margin fixed by selling and buying prices is crucial to running
a buffer stock scheme. The MPB should therefore be in a position to react more
flexibly to market conditions than in the past. Also, it must perform the
stabilization function efficiently. If it cannot, no major improvements will
be achieved; this was the case during the temporary relaxation in 1978. At that
time, farm and market prices for maize were depressed due to the inability of
the MPB to take all surplus supplies offered. The MPB must play a more active
role in the marketing of maize and beans and should increase its integration
with the informal system. In this regard, training programmes for MPB staff would

be helpful. Furthermore, the elimination of corrupt practices at depots
is required.

        In order to smooth out supplies to and consequently prevent congestion
at depots during the peak seasons, the introduction of temporal price differences
(storage premiums) should be tested. Such price differentiation must be designed
very carefully. Due to overlapping zonal production conditions, it might only
be appropriate for specific zones and depots or for a limited time. With free
movement of maize and beans between areas, the situation at depots might be
sufficiently eased without introducing price differentials.

        Free movement of maize and beans might also affect the efficiency
of private storage since interregional exchange may be more economical than
holding inventories, this depends on the area. Whenever appropriate, private
and cooperative storage on medium term should be encouraged so as to use
currently underutilized storage capacity and to increase storage efficiency.
To this end, financial support and training in efficient storage management
should be provided. The bonded warehousing system suggested elsewhere (See
Kenya 1976, Maize and Pricing in Kenya,p.90) might be an appropriate solution
to the financial problems and should be tested.

        For an improved integration of the formal system, mobile teams
employed by the MPB in conjunction with a network of small stores at strategic
market centres might be worth considering. They could buy directly from major
markets at guaranteed prices and bring in supplies if required during the off-
season. However, whether the costs of such a scheme could be met out of its
operations remains to be analysed and tested.

        The functions of the proposed mobile teams could also be performed
by cooperatives. If effectively operated, cooperatives seem to be the most
secure outlets and sources for smallholders. All support should therefore be
given to the development of effective cooperative maize and beans marketing.
Cooperatives should, however, not be given a monopoly position as an agent of
the MPB because smallholders would then have no alternative outlets if cooperatives
failed to meet their requirements.

        In order to intensify competition within the informal and between
it and the formal system, market transparency should be improved through the
introduction of uniform weights and measurements. As an initial step, traders
operating in the markets could come together and agree on two or three different
sizes of tins presently used as standard measures. Other measures or manipulations

of the measures would be prohibited. Such a step would immediately improve the situation since certain tines are e easily related to standardized metric measurements.

The suggestion that traders meet to resolve problems in their market raises the possibility of forming market committees in which producers, traders and consumers would be represented. Such market comittees are found in Pakistan and India. They might help to improve market conditions through participation of all affected groups. Banning of maize and beans transactions is no solution to the problems of the affected population and should therefore be stopped.

Finally, freeing of prices (at the distribution and retail level) and possibly maize meal should be considered. Controlled maize prices have been a major cause of distortions. They would increasingly become so under a freed marketing system. The benefits of increased marketing efficiency are not likely to be fully passed on to consumers if inappropriately high prices justified by controls continue since buying prices of wholesalers, retailers and millers probably are lower than assumed when determining the controlled prices.

In summary, the course of action suggested above is expected to significantly improve the maize and beans marketing efficiency. It would have particularly positive effects on incomes of smallholder maize and beans producers and rural and urban low income consumers and thus would be in concurrence with the objective which received highest priority in the new Development Plan 1979-83: to alleviate rural and urban poverty.

Table A1: Smallholder Maize and Beans Production by Size of Holding 1974/75

Size of holdings (ha)	MAIZE						BEANS		
	% of holdings[a]		Mean Area (ha)[b]		% of Production[c]		% of holdings[a]	Mean Area (ha)[b]	% of Production[c]
	Local	Hybrid	Local	Hybrid	Local	Hybrid			
Below 0.5	14.34	12.21	0.43	0.27	.95	8.16	12.13	0.38	10.02
0.5-0.9	17.84	15.55	0.63	0.34	22.76	10.41	17.41	0.52	15.89
1.0-1.9	28.13	23.81	0.85	0.45	26.87	16.05	29.92	0.72	30.47
2.0-2.9	15.95	15.51	1.09	0.58	16.48	11.31	15.02	0.75	11.61
3.0-3.9	8.54	11.01	1.28	0.63	5.69	6.62	9.04	0.96	11.58
4.0-4.9	7.65	6.80	1.12	0.88	13.51	8.85	7.41	0.95	.74
5.0-7.9	5.20	10.08	2.09	1.53	6.07	20.19	6.27	1.37	9.86
8.0 and above	2.72	5.42	1.76	2.05	2.67	18.41	2.75	1.43	1.86
TOTAL	100.00	100.00	0.93	0.67	100.00	100.00	100.00	0.75	100.00

Notes: a. Total number of holdings ('000) is local maize 1,277.8 (86.1%) hybrid maize 745.1 (50.2%) and beans 1,021.1 (68.8%).

b. Includes crop in pure and mixed stand.

c. Total production ('000 MT) is local maize 953.24, hybrid maize 549.88 and beans 147.44.

Source: Derived from Kenya, Integrated Rural Survey 1974-5, pp. 83-84.

Table A2: Maize Production Large Farms 1976 by Province

	Area (ha)	Production (MT)
Central and Nairobi	1,171	4,332.7
Coast	13	48.1
Eastern	381	1,409.7
Nyanza	296	1,095.2
Rift Valley	72,339[a]	267,654.3
Western	127	469.9
TOTAL	74,327	275,009.9

Note: a Trans Nzoia, Uasin Gishu and Nakuru on average account for
          about 90% of total large scale maize production.

Source: Derived from Statistical Abstract 1977, pp. 128-129, and
         O. Hesselmark, 1976, Maize yields in Kenya 1975.

Table A3:   Maize Harvest Times

PROVINCE	DISTRICT	ZONE	J	F	M	A	M	J	J	A	S	O	N	D
CENTRAL PROVINCE	KIAMBU	Upper						LH						
		Lower	K	H						K	KLH	LH		
	MURANGA	Upper	LH	LH	LH									
		Middle	LH	LH										
		Lower	K	KH	HL				K	KLH	LH			
	KIRINYAGA	Upper									LH	LH		
		Middle		LH	LH						LH	LH		
		Lower							K	KLH	LH			
	NYERI	Upper	LH											LH
		Middle		LH	LH						LH	LH		
		Lower		K					K	KLH				
	NYANDARUA	–	L	L										
EASTERN PROVINCE	EMBU	Upper									LH	LH		
		Middle	LH	LH					LH	LH				
		Lower	KLH	LH					KLH	LH				
	MERU	Upper							LH	LH				
		Middle	LH	LH						LH	LH			
		Lower	LH	LHK	K			LH	LH					
	MACHAKOS	Upper			LH				LH	LH				
		Lower	K		K			K	KLH					
	KITUI	–			K	KLH		K	KLH	LH				
RIFT VALLEY PROVINCE	NAKURU	Upper										LH	LH	
		Lower									LH	LH	LH	
	ELGEYO/ MARAKWET	Upper	LH									LH	LH	LH
		Lower										LH	LH	
	UASIN GISHU	Upper											LH	LH
		Lower											LH	LH
	NANDI	–										LH	LH	
	KERICHO	Upper							LH	LH	LH			
		Lower							LH	LH	LH			
	TRANS NZOIA	–										LH		LH
WESTERN PROVINCE	BUSIA	–	LH						LH	LH				LH
	BUNGOMA	Upper		LH							LH			
		Lower		LH							LH			
	KAKAMEGA	Upper	LH							LH			LH	LH
		Lower	LH							LH	LH		LH	LH
NYANZA PROVINCE	SIAYA	–							LH	LH			LH	LH
	KISUMU	–	LH							LH				LH
	SOUTH NYANZA	–	LH					LH	LH					LH
	KISII	Upper	LH	LH					LH	LH	LH			
		Lower	LH	LH					LH	LH	LH			

L = Local Maize
H = Hybrid Maize
K = Katumani Maize

Source: Derived from Kenya Crop Calendar

Table A4   Beans Harvest Time

PROVINCE	DISTRICT	ZONE	J	F	M	A	M	J	J	A	S	O	N	D
CENTRAL PROVINCE	KIAMBU	Upper									xx			
		Lower	xx					xx						
	MURANGA	Upper	xx											xx
		Middle	xx	xx				xx	xx					
		Lower	xx	xx				xx	xx					
	KIRINYAGA	Upper	xx						xx	xx				xx
		Middle	xx					xx	xx					xx
		Lower	xx	xx				xx	xx					
	NYERI	Upper												
		Middle	xx	xx				xx	xx					
		Lower	xx	xx				xx						
	NYANDARUA	-	xx	xx				xx	xx					
EASTERN PROVINCE	EMBU	Upper	xx	xx					xx	xx				
		Middle	xx	xx					xx					
		Lower	xx						xx					
	MERU	Upper	xx					xx						
		Middle	xx					xx						
		Lower												
	MACHAKOS	Upper		xx										
		Lower						xx						
	KITUI	-	xx	xx				xx	xx					
RIFT VALLEY PROVINCE	NAKURU	Upper						xx	xx					
		Lower	xx	xx				xx	xx					
	ELGEYO/ MARAKWET	Upper	xx	xx	xx									xx
		Lower	xx					xx	xx					xx
	UASIN GISHU	Upper								xx	xx			
		Lower								xx	xx			
	NANDI	-						xx	xx					
	KERICHO	Upper										xx		
		Lower										xx		
	TRANS NZOIA	-										xx	xx	
WESTERN PROVINCE	BUSIA	-						xx	xx		xx		xx	
	BUNGOMA	Upper							xx	xx			xx	xx
		Lower						xx		xx	xx			xx
	KAKAMEGA	Upper						xx	xx		xx	xx		
		Lower						xx	xx		xx	xx		
NYANZA PROVINCE	SIAYA	-						xx	xx				xx	
	KISUMU	-						xx	xx				xx	xx
	SOUTH NYANZA	-				xx	xx					xx	xx	
	KISII	Upper	xx	xx		xx	xx							
		Lower						xx	xx					

Source: Derived from Kenya Crop Calendar

Table A5: Average Value per Holding Consumption By Per Capita Household
Income Groups: IRS 1974/75

	Average Rural KShs.	Low Income 0-499 KShs.	Medium Income 500-1499 KShs.	High Income over 1500 KShs.
Home Produced Items				
Maize	386	258	399	566*
Millet	17	16	17	22
Sorghum	43	38	48	36
Beans	164	97	178	299
Potatoes	115	48	126	262
Other Crops	152	100	168	222
Beef	25	22	26	30
Other Meat and Poultry	95	76	101	126
Milk	300	136	325	663
TOTAL Consumption of Home Produce	1,297	791	1,388	2,226*
Purchased Items				
Dairy Products and Eggs	46	38	48	57
Grains, Flour and Roots	498	435	539	514
Meat and Fish	236	204	239	317
Fats and Oils	83	51	92	136
Sugar and Sweets	172	132	181	248
Fruit and Vegetables	88	75	98	85
Drinks and Beverages	140	116	134	228
Salt and Flavouring	35	32	37	36
TOTAL Food Purchases	1,297	1,083	1,368	1,621
Clothing	324	222	355	486
Appliances and Utensils	25	13	32	38
Furnishings	40	28	45	55
Miscellaneous	158	291	483	896
TOTAL Non-food Purchases	547	554	915	1,475
TOTAL FOOD EXPENDITURE	2,595	1,874	2,756	3,847*
TOTAL CONSUMPTION EXPENDITURE	3,450	2,429	3,671	5,452
Number of Households	1,483,422	538,732	752,325	192,362
Average size per Household	6.97	7.45	6.88	5.98

Source: M.M. Shah 1978.

Table A6: Average Value per Holding of Consumption of Home
Produced and Purchased Grains, Pulses and Roots by Province

1974/75a

Food Crops	Central		Coast		Eastern		Nyanza		R/Valley		Western		Total	
	KShs.	%	KShs.	%	KShs.	%	KShs.	%	KShs.	%	KShs.	%	KShs.	%
Home Produce														
Maize	366	38.59	328	21.51	330	19.57	420	50.24	628	67.31	370	43.22	386	31.56
Beans	240	25.31	33	2.16	382	22.66	24	2.87	6	0.64	70	8.18	164	13.41
Other Grains, Pulses, Roots c	268	28.26	-	-	248	14.71	163	19.5	59	6.32	62	7.24	175	14.31
Purchased Grains, Pulses and Roots	610	41.11	1,164	76.33	726	43.06	229	27.39	240	25.72	354	41.36	498	40.72
Total Consumption of Grains, Pulses and Roots	1,484	100.00	1,525	100.00	1,686	100.00	836	100.00	933	100.00	856	100.00	1,123	100.00

Notes: a.   Excluding pastoral and large farm areas.

          b.   Valued at market prices.

          c.   Includes millet, sorghum, potatoes, etc.

Source: Derived from Kenya 1977. Integrated Rural Survey, p. 58.

Table A7: Point of Purchase for Major Marketing Functionaries During the Supply Season by Sample Zones (%)

	Point of Purchase	Market	Trader	Produce Stores	
		Maize	Beans	Maize	Beans
Western Kenya	Holding	13.8	2.3	22.1	17.4
	Roadside	2.4	1.5	-	-
	Market	89.7	96.4	31.6	50.9
Central Kenya	Holding	24.0	31.6	2.0	-
	Roadside	0.6	0,7	-	-
	Market	79.6	75.7	11.4	12.9
Eastern Kenya	Holding	3.7	2.6	18.4	17.6
	Roadside	8.3	35.5	0.8	0.8
	Market	96.3	67.5	8.0	8.4

Source: Own Compilation.

Table A8: Knowledge of Marketing Functionaries about Market Prices by Sample Zones^a (%)

Criteria of Degree of Price Information	Maize Trader			Beans Trader			Produce Store (Agent)		
	Western	Central	Eastern	Western	Central	Eastern	Western	Central	Eastern
Knowledge about Prices in (other)^b Markets	67.5	39.4	38.1	55.7	37.2	56.7	48.1	53.7	42.4
Radius of Price In-formation									
Adjacent Markets	48.6	86.3	68.1	76.0	85.3	84.3	80.0	96.3	77.4
Not adjacent, other districts	51.4	13.7	13.1	24.0	14.7	6.4	20.0	–	22.6
Not adjacent, other provinces	–	–	18.8	–	–	9.3	–	3.7	–
Method of obtaining Price In-formation									
Observation	65.5	84.8	90.6	96.7	61.6	43.4	52.2	48.1	77.4
Personal Communication	34.2	15.2	9.4	2.4	38.4	56.6	26.7	44.2	22.6
Both	0.3	–	–	0.9	–	–	26.1	7.7	–

Notes: a. For totals See Table 17.

b. Market traders were asked whether they knew prices in markets other than the one in which they were interviewed.

Source: Own Compilation.

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Table A9: Perception of Market Traders about the Motivations of Suppliers and Buyers by Sample Zones (%)

| Motivation | MAIZE TRADERS | | | | | | BEANS TRADERS | | | | | |
| | Suppliers | | | Buyers | | | Suppliers | | | Buyers | | |
	Western	Central	Eastern	Western	Central	Eastern	Western	Central	Eastern	Western	Central	Eastern
Price	36.2	18.4	25.7	36.0	4.9	-	21.2	17.4	20.0	34.8	6.6	-
Cash Payment	69.2	68.7	81.5	N.A	N.A	N.A	70.4	66.9	63.4	N.A	N.A	N.A
Credit	1.9	11.8	-	20.0	23.5	13.7	6.0	11.9	-	20.1	17.3	7.5
Quality of Produce	N.A.	N.A	N.A	17.1	30.0	16.6	N.A	N.A	N.A	21.1	35.4	10.3
"Fairness"a	4.0	4.1	16.1	N.A	N.A	N.A	7.1	4.7	12.3	N.A	N.A	N.A
Socially with Customers	N.A	N.A	N.A	64.4	75.2	47.4	N.A	N.A	N.A	90.4	71.4	41.8
Personal Relations	19.6	12.0	16.1	0.2	6.8	7.9	47.2	13.6	35.0	3.6	6.8	5.8
Arrangements	9.4	7.8	-	12.1	1.4	17.9	9.0	10.7	-	8.1	1.7	13.1
Lack of Supply	N.A	N.A	N.A	-	7.4	11.1	N.A	N.A	N.A	1.0	8.0	37.5
Other	-	1.2	-	-	-	7.2	-	1.3	-	-	-	5.3

Notes: a. Trader is charging reasonable price if supplier is customer during off-season.

b. Not applicable.

Source: Own Compilation.

Table A10: Percentage of Market Traders Using Price as Action Parameter in Buying and Selling Competition by Different Motives and Sample Zones

Motives for Pricing Actions	MAIZE TRADERS						BEANS TRADERS					
	Buying[a]			Selling[b]			Buying[a]			Selling[b]		
	Western	Central	Eastern	Western	Central	Eastern	Western	Central	Eastern	Western	Central	Eastern
Market Situation	26.7	33.1	32.6	49.9	72.9	40.5	23.6	30.9	17.5	48.5	59.0	70.4
Large transaction	N.A.[c]	N.A	N.A.	32.9	13.1	13.5	N.A	N.A	N.A	30.1	14.0	5.5
Increase of Sales	0.3	-	-	41.2	45.7	25.7	-	1.9	-	35.9	54.9	16.0
Long Standing business relation	19.0	1.7	21.3	34.8	12.4	37.2	15.3	1.9	11.5	35.0	14.1	18.6
Quality of Produce	55.0	65.3	46.1	0.5	11.0	2.8	76.6	65.4	18.7	0.4	23.8	1.7
Credit	10.2	-	-	N.A	N.A	N.A	3.7	-	-	N.A	N.A	N.A
Other	1.7	-	-	-	-	-	-	-	52.3[d]	-	-	-
% of Traders with Pricing Actions	64.7	70.7	48.3	98.2	78.5	54.1	41.1	76.5	61.6	86.8	75.2	63.6

Notes: a. Higher buying prices.

b. Lower selling prices.

c. Not applicable

d. Farmers know prices (market transparency).

SOURCE: Own Compilation

Table A11: Percentage Distribution of Correlation Coefficients of Weekly Seasonally Fitted Maize Prices in CBS Sample Markets[a]

Coefficients	Correlations Between Markets In															
	Western Kenya[b]				Central Kenya[b]				Western and Central Kenya[b]				Total Kenya			
	Significance level[c] (%)				Significance level (%)				Significance level (%)				Significance level (%)			
	Above 5	5-10	Not Sig.	Total	Above 5	5-10	Not Sig.	Total	Above 5	5-10	Not Sig.	Total	Above 5	5-10	Not Sig.	Total
Positive 0-0.29	0.4	2.8	8.5	11.7	0.7	4.4	12.2	17.2	0.4	5.3	10.3	16.0	0.4	4.4	10.2	15.0
0.3-0.69	18.0	2.7	3.4	24.0	28.7	1.6	0.5	30.8	17.8	1.9	2.1	21.8	20.2	2.1	2.1	24.4
0.7-1.0	16.6	-	3.2	19.8	13.6	-	1.4	14.9	7.2	-	5.4	12.6	11.1	-	3.9	15.1
Negative 0-0.29	0.3	2.5	7.8	10.8	0.2	5.7	8.7	14.7	0.8	7.6	10.4	18.8	0.6	5.8	9.3	15.7
0.3-0.69	12.6	3.2	2.1	17.9	12.6	1.4	0.5	14.5	17.7	1.3	1.4	20.4	15.2	1.8	1.4	18.5
0.7-1.0	8.9	-	6.8	15.7	4.1	-	3.6	7.8	7.9	-	2.5	10.4	7.4	-	4.0	11.3
Total	57.0	11.2	31.8	99.9	59.9	13.1	26.9	99.9	51.8	16.1	32.1	100	54.9	14.1	30.9	100
Number of Market Pairs	320	63	179	562	261	57	117	435	538	167	334	1039	1119	287	630	2036

Notes: a. Total number of markets was 65 including markets with incomplete time series.

b. The zone of Western Kenya includes Rift Valley markets and Central Kenya includes those of Eastern Province.

c. Significance levels assume randomness though price series are autocorrelated. They therefore have to be taken as approximations.

Source: Derived from Schmidt; Zettelmeyer, Casley and Marchant 1979.

Table A12: Percentage Distribution of Correlation Coefficients of Weekly Residual Maize Prices in CBS Sample Markets[a]

Coefficients	Correlations Between Markets In															
	Western Kenya[b]				Central Kenya[b]				Western and Central Kenya[b]				Total Kenya			
	Significance level (%)				Significance level (%)				Significance level (%)				Significance level (%)			
	Above 5	5-10	Not Sig.	Total	Above 5	5-10	Not Sig.	Total	Above 5	5-10	Not Sig.	Total	Above 5	5-10	Not Sig.	Total
Positive																
0-0.29	2.2	7.4	36.3	45.8	-	11.9	40.1	52.1	1.8	4.8	37.9	44.6	1.5	7.1	38.0	46.5
0.3-0.69	1.6	4.2	4.9	10.6	1.8	3.7	1.4	6.9	0.9	3.2	3.0	6.9	1.3	3.5	3.1	8.0
0.7-1.0	0.2	-	3.2	3.4	-	-	1.0	1.0	-	-	2.4	2.4	0.1	-	2.3	2.3
Negative																
0-0.29	3.2	2.7	25.0	30.9	0.2	4.4	31.3	35.9	1.0	4.4	33.0	38.4	1.4	4.0	30.4	35.8
0.3-0.69	0.4	3.1	3.1	6.7	0.7	1.4	1.8	3.9	0.7	2.2	2.6	5.6	0.7	2.3	2.5	5.5
0.7-1.0	0.2	-	2.3	2.5	-	-	0.2	0.2	-	-	2.0	2.0	0.1	-	1.7	1.8
Total	7.8	17.4	74.8	99.9	2.7	21.4	75.8	100	4.4	14.6	80.9	99.9	5.1	16.9	78.0	99.9
Number of Market Pairs	44	96	414	554	12	93	329	434	46	152	836	1034	102	341	1579	2022

Notes: a Total number of markets was 65 including markets with incomplete time series.

b The zone of Western Kenya includes Rift Valley markets and Central Kenya includes those of Eastern Province.

Source: Derived from Schmidt, Zettelmeyer, Casley and Marchant 1979.

Table A13: Percentage Distribution of Correlation Coefficients of Weekly Seasonally Fitted Beans Prices in CBS Sample Markets[a]

Coefficients	Correlations Between Markets In															
	Western Kenya[b]				Central Kenya[b]				Western and Central Kenya[b]				Total Kenya			
	Significance level[c] (%)				Significance level[c] (%)				Significance level[c] (%)				Significance level[c] (%)			
	Above 5	5-10	Not Sig.	Total	Above 5	5-10	Not Sig.	Total	Above 5	5-10	Not Sig.	Total	Above 5	5-10	Not Sig.	Total
Positive																
0-0.29	0.4	4.7	10.2	15.3	0.8	6.9	10.0	17.4	1.0	7.4	12.4	20.8	0.8	6.6	11.2	18.6
0.3-0.69	14.0	3.8	4.9	22.7	31.0	2.6	1.1	34.7	20.0	3.4	2.2	25.6	20.9	3.4	2.6	26.9
0.7-1.0	9.5	-	4.0	13.5	16.4	-	2.1	18.7	5.6	-	4.0	9.7	9.0	-	3.6	12.7
Negative																
0-0.29	0.2	2.8	13.5	16.6	2.4	4.3	10.2	17.0	0.4	6.0	12.1	18.4	0.8	4.7	12.1	17.6
0.3-0.69	15.5	2.7	3.6	21.8	5.9	1.7	1.5	9.1	12.0	2.6	2.4	17.0	11.6	2.5	2.5	16.6
0.7-1.0	7.0	-	3.1	10.1	2.1	-	1.1	3.2	6.0	-	2.4	8.4	5.4	-	2.3	7.7
Total	46.6	14.0	39.3	100	58.6	15.5	25.9	100.1	45.0	19.4	35.5	99.9	48.5	17.2	34.3	100.2
Number of Market Pairs	259	78	210	555	271	72	118	461	478	207	380	1065	1008	357	716	2081

Notes: a Total number of markets was 65 including markets with incomplete time series.

b The zone of Western Kenya includes Rift Valley markets and Central Kenya includes those of Eastern Province.

c Significance levels assume randomness though price series are autocorrelated. They therefore have to be taken as approximations.

Source: Derived from Schmidt, Zettelmeyer, Casley and Marchant 1979.

Table A14: Percentage Distribution of Correlation Coefficients of Weekly Residual Beans Prices in CBS Sample Markets [a]

Coefficients	Correlations Between Markets In															
	Western Kenya [b]				Central Kenya [b]				Western and Central Kenya [b]				Total Kenya			
	Significance level (%)				Significance level (%)				Significance level (%)				Significance level (%)			
	Above 5	5-10	Not Sig.	Total (%)	Above 5	5-10	Not Sig.	Total (%)	Above 5	5-10	Not Sig.	Total (%)	Above 5	5-10	Not Sig.	Total (%)
Positive																
0-0.29	1.8	3.8	34.7	40.4	0.9	8.0	35.4	44.4	1.7	4.9	32.6	39.2	1.6	5.3	33.8	40.6
0.3-0.69	1.2	5.7	5.5	12.4	2.4	5.0	1.8	9.2	1.4	4.3	3.3	9.1	1.6	4.8	3.6	9.9
0.7-1.0	-	-	3.2	3.2	-	-	1.5	1.5	0.1	-	1.8	1.9	0.0	-	2.1	2.2
Negative																
0-0.29	2.6	2.0	29.4	34.0	0.4	6.8	30.2	37.4	1.4	6.0	33.9	41.2	1.5	5.0	31.9	38.4
0.3-0.69	0.3	3.0	4.4	7.6	2.0	1.5	3.1	6.6	1.0	2.4	3.5	6.9	1.1	2.3	3.6	7.1
0.7-1.0	0.1	-	-	2.5	-	-	0.9	0.9	0.1	-	1.6	1.7	0.1	-	1.7	1.8
Total	6.0	14.5	79.6	100	5.7	21.3	72.9	100	5.7	17.6	76.7	100	5.9	17.4	76.8	100
Number of Market Pairs	34	79	436	547	26	98	333	457	61	182	806	1049	121	359	1575	2055

Notes: a   Total number of markets was 65 including markets with incomplete time series.

b   The zone of Western Kenya includes Rift Valley markets and Central Kenya, includes those of Eastern Province.

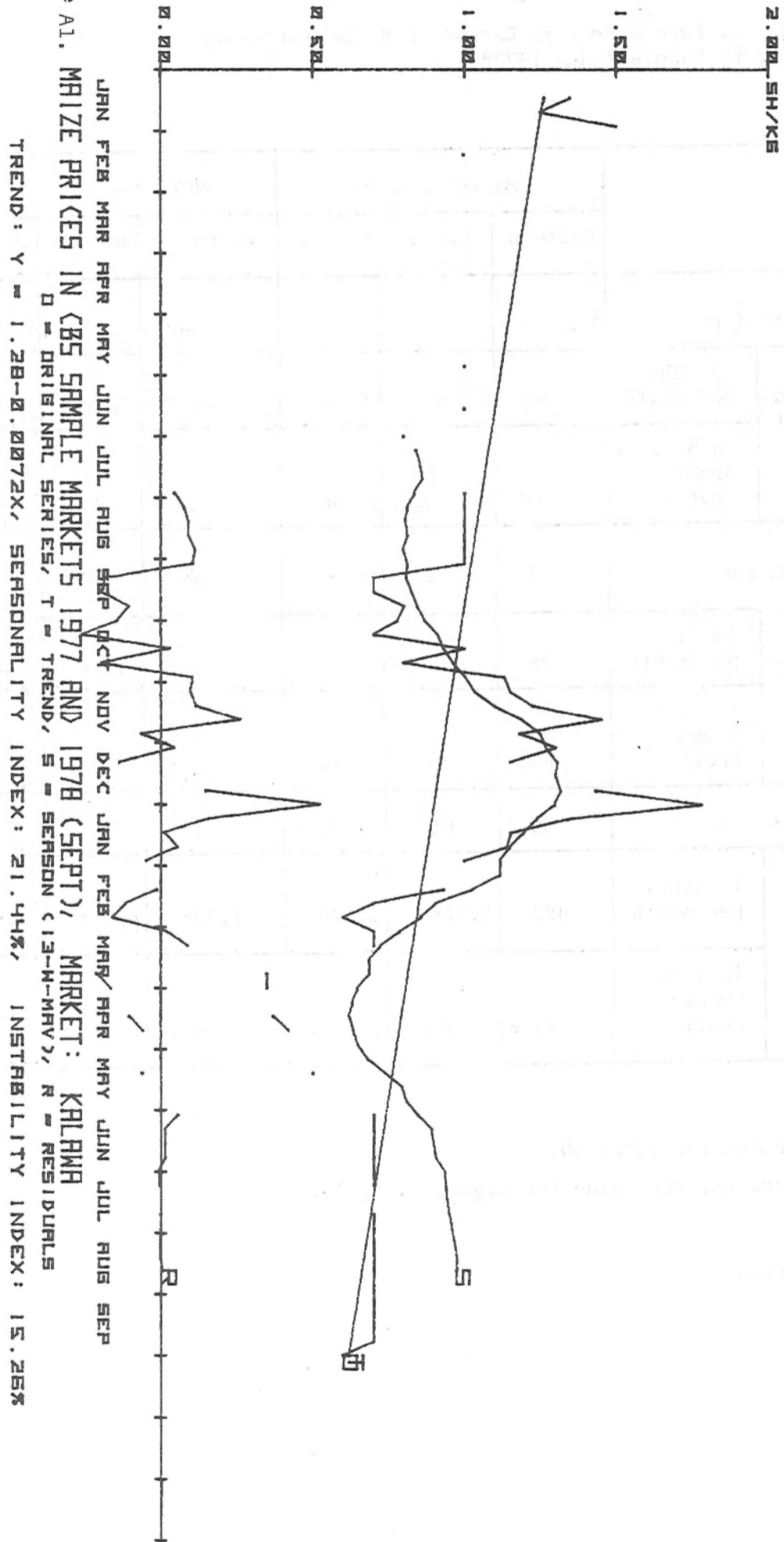Source: Derived from Schmidt, Zettelmeyer, Casley and Marchant 1979.

Table A15: Estimates of Excess Profits Earned in Maize and Beans
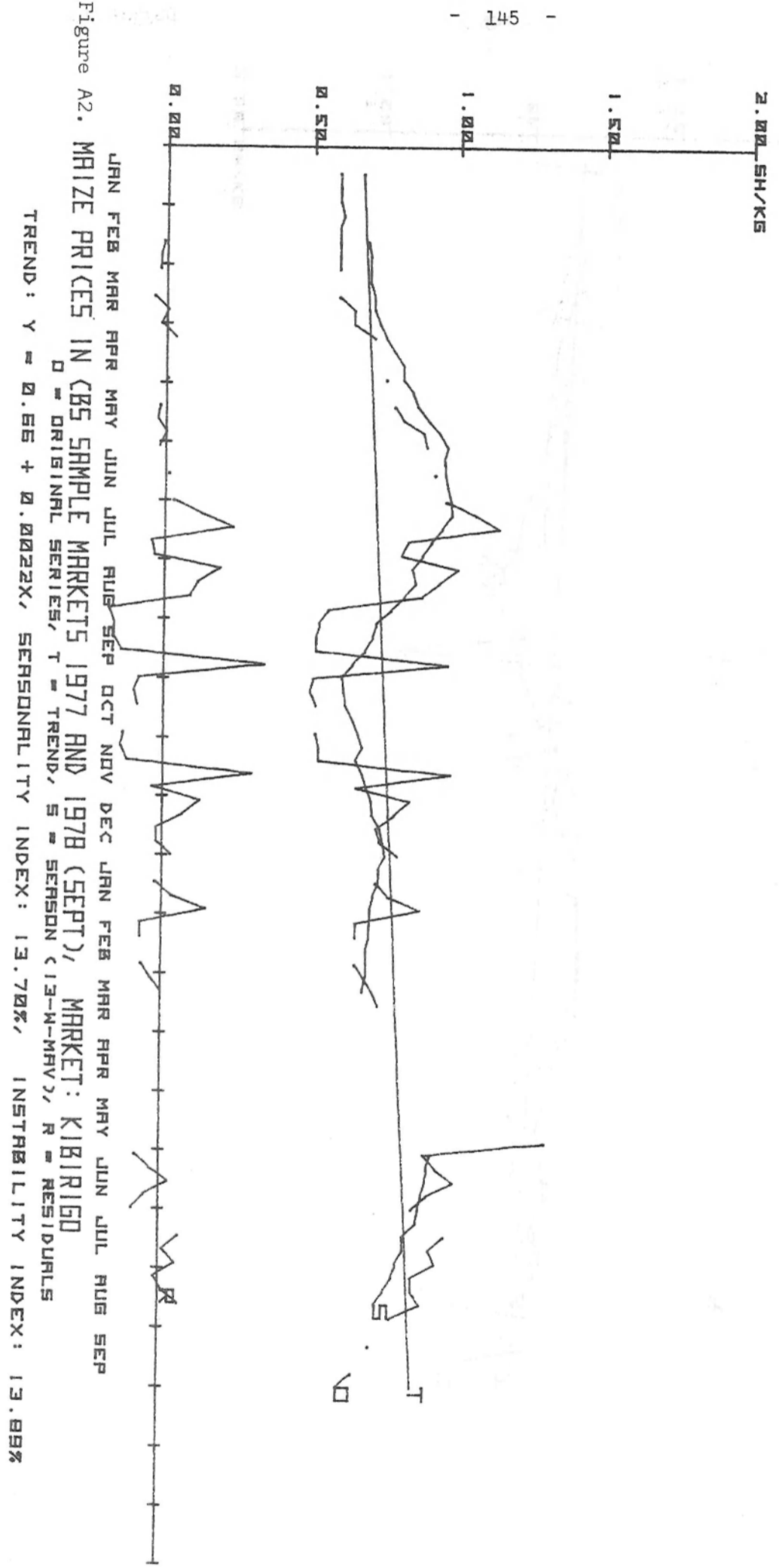Marketing by Sample Zones 1977[a]

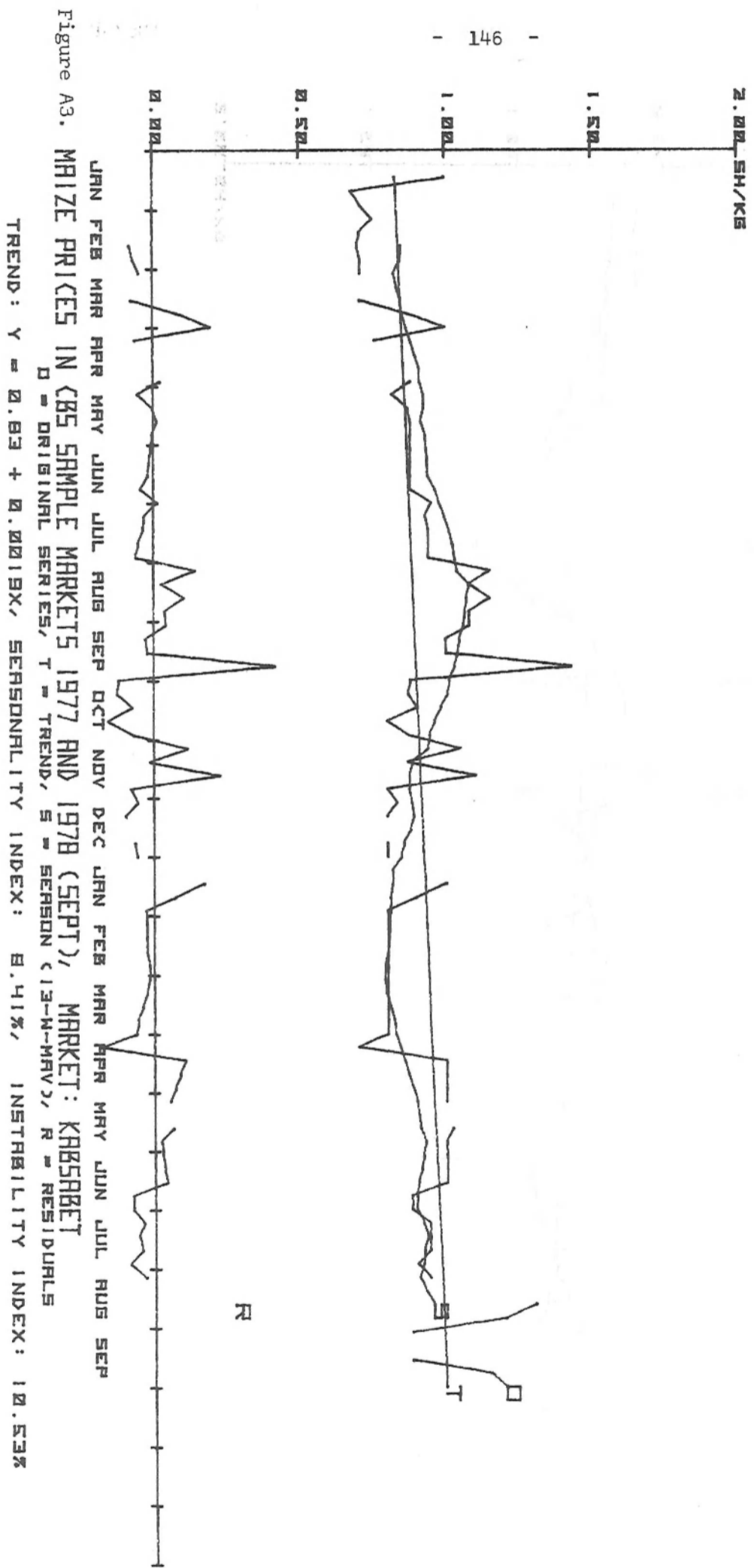|			Market Trader			MPB Agent		
			Western	Central	Eastern	Western	Central	Eastern
Pessimistic Estimate	% of traders		39	56	73	26	27	13
	Mean Excess Profit	in KShs. per month	290	768	1,042	3,089	7,184	21,617[b]
		in % of Gross Profit	47.5	48.1	49		28.8	49.2	37.4
Medium Estimate	% of traders		55	72	82	20	30	20
	Mean Excess Profit	in KShs. per month	326	896	1,378	10,835	7,576	5,641
		in % of Gross Profit	47.3	50.9	57.6	44.1	50.5	23.2
Optimistic Estimate	% of traders		59	85	83	51	64	45
	Mean Excess Profit	in KShs. per month	422	1,026	1,779	11,738	7,333	2,366
		in % of Gross Profit	49.6	55.3	65.3	40.5	39.5	26.0

Notes: a   See footnotes for Table 40.

b   Without one extreme value the figure is 4,636.

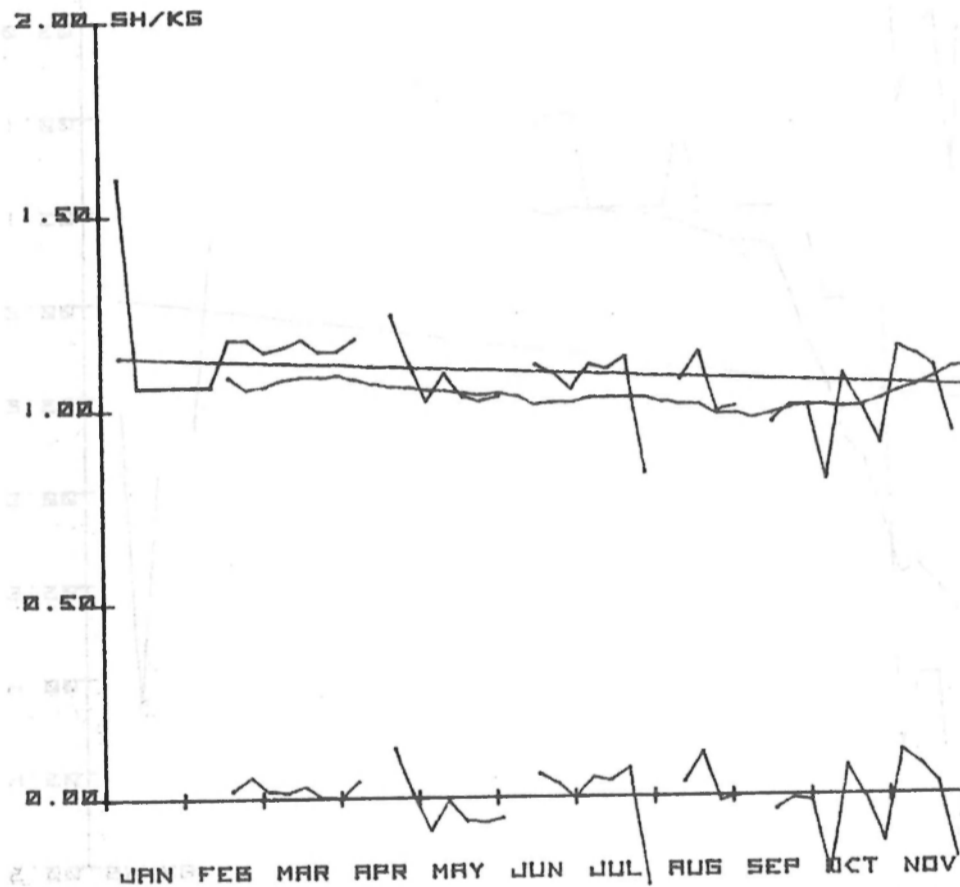Source: Own compilation.

Figure A1. MAIZE PRICES IN (B5 SAMPLE MARKETS 1977 AND 1978 (SEPT), MARKET: KALAWA
D = ORIGINAL SERIES, T = TREND, S = SEASON (13-M-MAV), R = RESIDUALS
TREND: Y = 1.28-0.0072X, SEASONALITY INDEX: 21.44%, INSTABILITY INDEX: 15.26%

Figure A2. MAIZE PRICES IN CBS SAMPLE MARKETS 1977 AND 1978 (SEPT), MARKET: KIBIRIGO

O = ORIGINAL SERIES, T = TREND, S = SEASON (13-M-MAV), R = RESIDUALS

TREND: Y = 0.66 + 0.0022X, SEASONALITY INDEX: 13.70%, INSTABILITY INDEX: 13.89%

Figure A3. MAIZE PRICES IN (BS SAMPLE MARKETS 1977 AND 1978 (SEPT), MARKET: KABSABET
D = ORIGINAL SERIES, T = TREND, S = SEASON (13-M-MAV), R = RESIDUALS

TREND: Y = 0.83 + 0.0019X, SEASONALITY INDEX: 8.41%, INSTABILITY INDEX: 10.53%
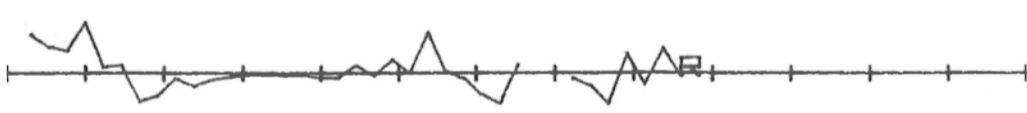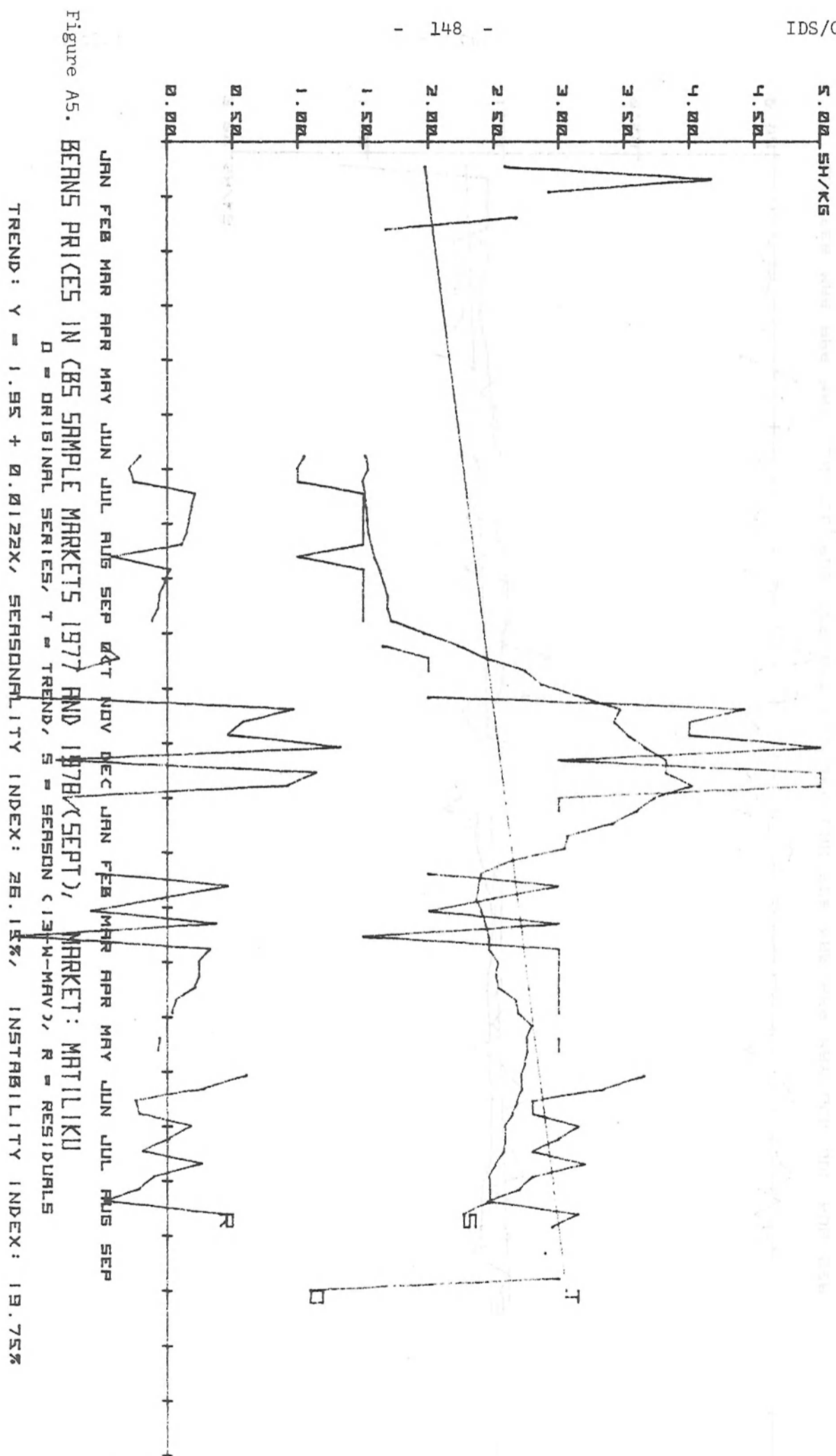
Figure A4. MAIZE PRICES IN CBS SAMPLE MARKETS 1977 AND
D = ORIGINAL SERIES, T = TREND,
TREND: Y = 1.14-0.0019X, SEASONALITY

DEC JAN FEB MAR APR MAY JUN JUL AUG SEP
1978 (SEPT), MARKET: NYERI
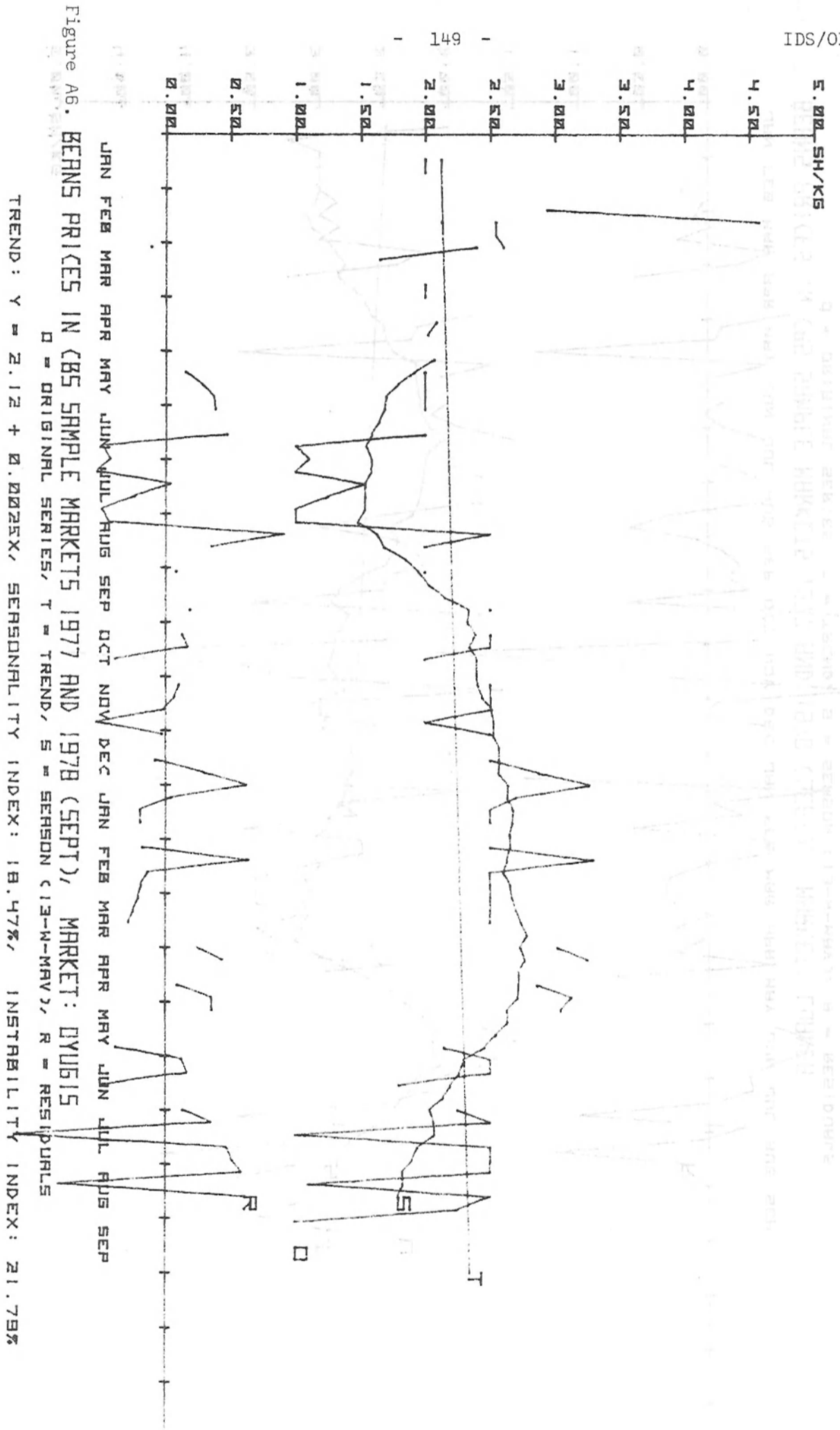S = SEASON (13-W-MAV), R = RESIDUALS
INDEX: 3.27%, INSTABILITY INDEX: 6.26%

Figure A5. BEANS PRICES IN (BS SAMPLE MARKETS 1977 AND 1978)(XSEPT), MARKET: MATILIKU

O = ORIGINAL SERIES, T = TREND, S = SEASON (13-W-MAV), R = RESIDUALS

TREND: Y = 1.95 + 0.0122X, SEASONALITY INDEX: 26.15%, INSTABILITY INDEX: 19.75%

SH/KG

5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP

Figure A6. BEANS PRICES IN CBS SAMPLE MARKETS 1977 AND 1978 (SEPT), MARKET: NYUGIS

O = ORIGINAL SERIES, T = TREND, S = SEASON (13-N-MAV), R = RESIDUALS

TREND: Y = 2.12 + 0.0025X, SEASONALITY INDEX: 18.47%, INSTABILITY INDEX: 21.79%
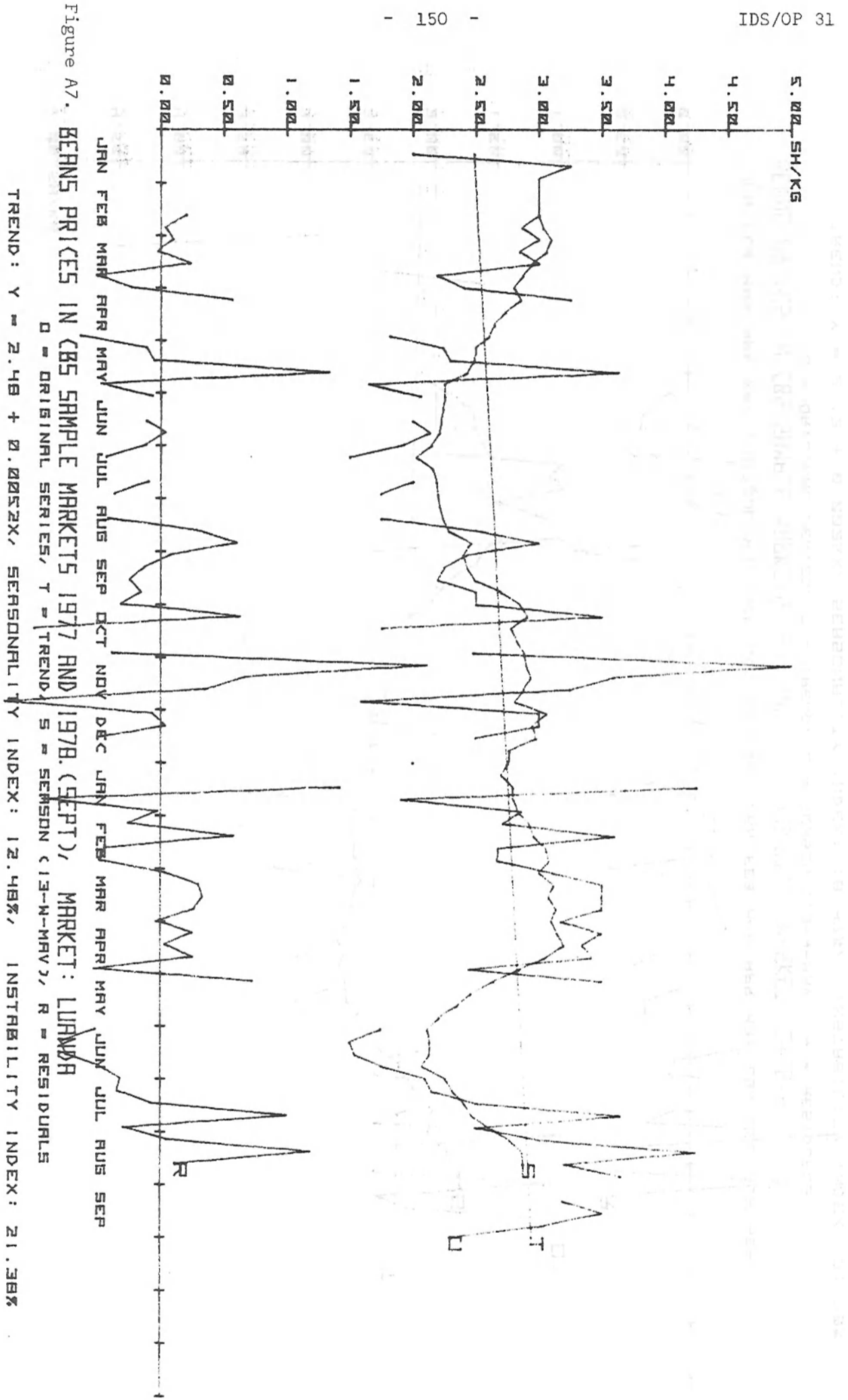
Figure A7. BEANS PRICES IN CBS SAMPLE MARKETS 1977 AND 1978. (SEPT), MARKET: LUANDA
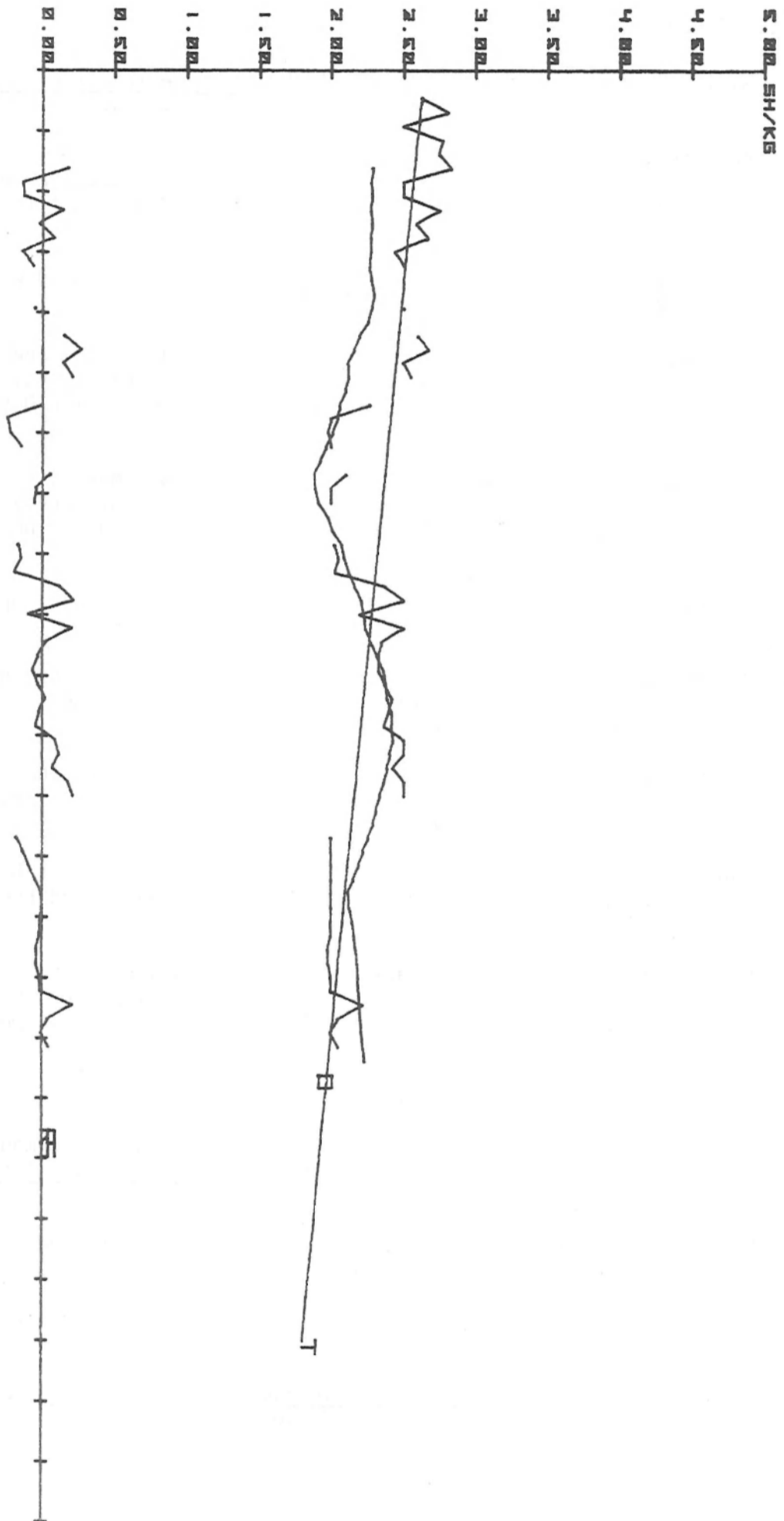O = ORIGINAL SERIES, T = |TREND| S = SEASON (13-N-MAV), R = RESIDUALS

TREND: Y = 2.48 + 0.0052X, SEASONALITY INDEX: 12.48%, INSTABILITY INDEX: 21.38%

SH/KG
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP

Figure A8. BEANS PRICES IN CBS SAMPLE MARKETS 1977 AND 1978 (SEPT), MARKET: SAGANA

O = ORIGINAL SERIES, T = TREND, S = SEASON (13-W-MAV), R = RESIDUALS

TREND: Y = 2.64-0.0092X, SEASONALITY INDEX: 5.99%, INSTABILITY INDEX: 5.40%

Bibliography

1. Alvis, V.A. amd Temu, P.E. 1968. Marketing Selected Staple Foodstuffs in Kenya. West Virginia University, Morgantown.

2. Anderson, D.G. and Pfost, D.L. 1978. Smallholder Grain Storage in Kenya: Problems and Proposed Solutions. Grain Storage, Processing and Marketing Report No. 72. Food and Feed Grain Institute, Kansas State University, Manhattan, Kansas.

3. Bain, J.S. 1968. Industrial Organization. wnd Edition. New York: John Wiley and Sons.

4. Casley, D.J. and Marchant, T.J. 1978. Smallholder Marketing in Kenya: Presentation of data from the Integrated Rural Surveys and Marketing Survey: 1974-78. Draft FAO/GK Marketing Development Project, Nairobi.

5. Casley, D.J. and Marchant, T.J. 1979. Smallholder Marketing in Kenya: Presentation of data from the Integrated Rural Surveys and Marketing Surveys: 1974-78. Revised Edition. FAO/GK Marketing Development Project, Nairobi.

6. de Graaff, J. 1978. The Marketing of maize and beans by cooperatives in Kenya. Draft Field Document, Marketing Development Project, Nairobi.

7. Gsaenger, H.G. 1975. Ansaetze zur Leistungsbeurteilung von Agrarvermark-tungssystemem in Entwicklungslaendern. Ph.D. thesis. Technische Universitaet, Berlin.

8. Tsaenger, H.G. and Schmidt, G. 1977. Decontrolling the Maize Marketing System in Kenya. Discussion Paper No. 254. Institute for Development Studies, University of Nairobi.

9. Hanrahan, M. 1974. Experimental Maize Marketing Scheme at Luanda Market, Kakamega District. Draft Final Report. Maize and Produce Board, Nairobi.

10. Hesselmark, O. 1977. The Marketing of Maize and Beans in Kenya: A Proposal for Improved Effectiveness. Working Paper No. 300. Institute for Development Studies, University of Nairobi.

11. Hesselmark, O. 1975. Maize Yields in Kneya. Unpublished. Maize and Produce Board, Nairobi.

12. Hesselmark, O. and Lorenzl, G. 1976. Structure and Performance of the Maize Marketing System in Kenya. Zeitschrift fuer Auslaendische Landwirtschaft. 15 (2), pp. 171-179.

13. Hunt, G.L.T. 1978. The Cost of Grain Storage. Unpublished manuscript. Kenya Ministry of Agriculture, Nairobi.

14. Ireri, E.K. 1977. Structure, Conduct and Performance of Kutus Maize Market. M.Sc. thesis. University of Nairobi.

15. Jones, W.O. 1972. Marketing Staple Food Crops in Tropical Africa. Ithaca and London: Cornell University Press.

16. Kariungi, F.T. 1976. Structure, Conduct and Performance of Kitui Local Maize Market. M.Sc. thesis. University of Nairobi.

17. Kenya. 1966. The Maize Commission of Inquiry. Nairobi: Government Printer.

18. Kenya. 1967. The Agricultural Produce Marketing Act. Laws of Kenya, Cap. 320. Nairobi: Government Printer.

19. Kenya. 1970. Development Plan 1970-74. Nairobi: Government Printer.

20. Kenya. 1972. Final Report of the Working Party Studying the Maize and Produce Board in Relation to the Expected Crop Production in the 1970's and 1980's. Nairobi.

21. Kenya. 1972. (1962) "The Maize Marketing Act'. Laws of Kenya, Cap. 338. Nairobi: Government Printer.

22. Kenya. 1972. 'The Price Control Act'. Laws of Kenya, Cap. 504. Nairobi: Government Printer.

23. Kenya. 1973. Report of the Select Committee on the Maize Industry. Nairobi.

24. Kenya. 1974. Development Plan 1974-78. Nairobi: Government Printer.

25. Kenya, Co-ordinating Committee of the Marketing Development Project. 1978. Summary of Major Technical Studies and Recommendations for Agricultural Marketing Development. Final Technical Report, Nairobi.

26. Kenya. 1977. 'Integrated Rural Survey 1974-75. Basic Report'. Nairobi: Government Printer.

27. Kenya. 1978. Maize and Pricing in Kenya. FAO/UNDP Marketing Development Project. Preliminary Draft. Prepared by V.B. Mannarelli. Nairobi.

28. Kenya. 1979. Development Plan 1978-83. Nairobi: Government Printer.

29. Lele, Uma J. 1968. Working of Grain Markets in Selected States, India, 1955-56 to 1964-65. Occasional Paper No. 12. Department of Agricultural Economics, Cornell University.

30. Maritim, H.K. 1978. Maize Marketing in Kenya: An Optimal Commodity Flow Pattern and Policy Strategies in the Marketing of the Country's Staple Crops: A Research Proposal. Institut fuer Sozilaloekonomie der Agrarentwicklung, Technische Universitaet, Berlin.

31. Mukui, J.T. 1978. Price Controls in Kenya. M.A. thesis. University of Nairobi.

32. Odingo, R.A. 1977. Decision Making in Food Marketing in Kenya with Special Reference to Maize and Sugar. M.B.A. thesis. University of Nairobi.

33. Ruttan, V.W. 1968. 'Agricultural Product and Factor Markets in Southeast Asia.' In K.G. Anschel, R.H. Brannon and E.D. Smith (eds.). Agricultural Cooperatives and Markets in Developing Countries. New York: Praeger.

34. Schmidt, G. 1979. Effectiveness of Maize Marketing Control in Kenya.
Paper prepared for Seminar on Price and Marketing Control in
Kenya. Institute for Development Studies, University of Nairobi.

34. Schmidt, G. and Mbugua, E.S. 1976. Aspects of Marketing Effectiveness
for Selected Food Crops in Kenya: Proposals for Further Research.
Working Paper No. 287. Institute for Development Studies,
University of Nairobi.

36. Schubert, B. 1973. 'Some Considerations on Methods for Evaluating
Marketing Systems for Agricultural Products'. Eastern Africa
Journal of Rural Development. 6 (1 & 2), pp. 39-54.

37. Schmidt, G.; Zettlmeyer, W.J.; Casley, D.J.; and Marchant, T.J. 1979.
Time Series Analysis of Basic Commodity Prices (2 vols.).
Working Document. Market Development Project.

38. Shah, M.M. 1978. 'Food Demand Projections Incorporating Urbanization
and Income Distribution (1975-2000). FAO/GK Marketing Development
Project. Nairobi.

39. Shah, M.M. and Fronhberg, H. 1979. The Nutritional Status in Kenya
1974-77. forthcoming.

40. Smith, L.D. 1977. 'The Kenya Integrated Rural-Phase I'. Mimeo.
FAO/GK Marketing Development Project. Nairobi.

41. Smith, L.D. 1977. 'Low Income Small-holder Marketing and Consumption
Patterns - Analysis and Improvement Policies and Programmes',
FAO/GK Marketing Development Project. Nairobi.

42. Spliet, J.A.M. 1978. The Role of Small Businesses in Domestic Food
Distribution. Preliminary Field Document. Ministry of Commerce
and Industry, FAO/GK Marketing Development Project. Nairobi.

43. Van Rheenen, H.A. 1976. Types of Food Beans in Kenya. Mimeo. Grain L
Legume Project. National Horticultural Research Station, Thika.
Maize and Produce Board.

44. Zettelmeyer, W.J. 1979. Horticultural Marketing in Kenya. Coordinating
Committee of the Marketing Development Project, FAO/GK. Nairobi.
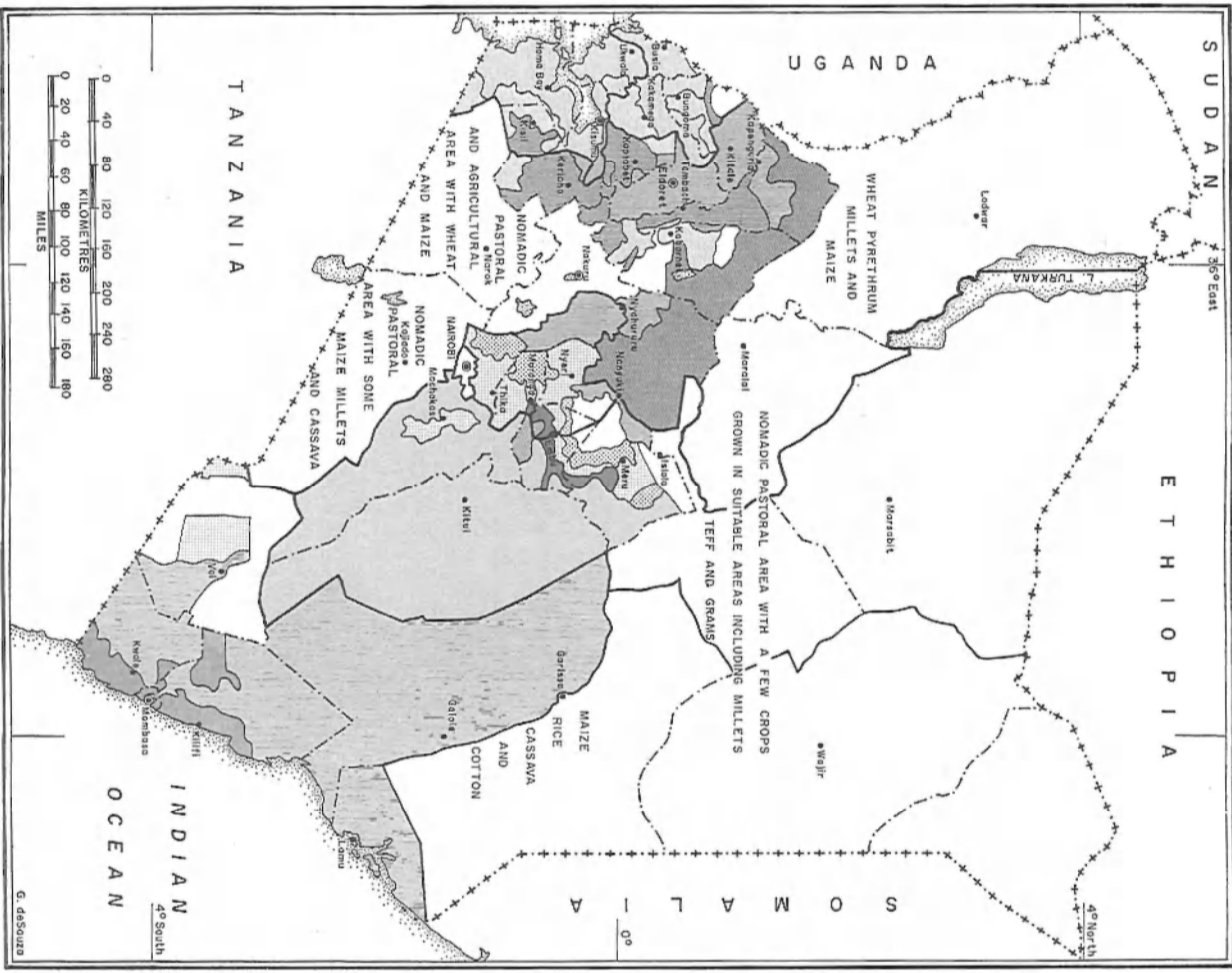
Map A1. Agro-Ecological Zones Used for Sample Stratification of The Kenya Intergrated Rural Survey, 1974 — 75.

L E G E N D

COAST RAIN MORE THAN 40 INCHES........
COAST RAIN LESS THAN 40 INCHES ....
COFFEE EAST OF RIFT VALLEY ....
COFFEE WEST OF RIFT VALLEY ....
TEA EAST OF RIFT VALLEY.....................
TEA WEST OF RIFT VALLEY......................
IRRIGATION.............................
TAITA HILL ZONE ....
RANCHING ....
HIGH ALTITUDE GRASSLAND..................
SUGARCANE ....
LOWER COTTON EAST OF RIFT VALLEY ....
LOWER COTTON WEST OF RIFT VALLEY ....
UPPER COTTON WEST OF RIFT VALLEY........
UPPER COTTON EAST OF RIFT VALLEY........
CROPPING ZONE DIVISIONS..................
INTERNATIONAL BOUNDARIES................
PROVINCIAL BOUNDARIES...................
DISTRICT BOUNDARIES....................
CITY TOWNS.............................
OTHER TOWNS ....

SOURCE: Kenya, Intergrated Rural Survey 1974 - 75, 1977.