SOUTH AMERICAN AND LATIN AMERICAN ECONOMIC HISTORY

Edited by
Stuart Bruchey
Columbia University

Editorial Consultant
Herbert S. Klein
Columbia University

A GARLAND SERIES

AGRICULTURAL MARKETING AND ECONOMIC DEVELOPMENT

A Brazilian Case Study, 1930–1964

Gordon W. Smith

9/14

Agricultural Marketing and Economic Development:
A Brazilian Case Study

A thesis presented
by
Gordon Whitford Smith

to
The Department of Economics

in partial fulfillment of the requirements
for the degree of

Doctor of Philosophy

in the subject of
Economics

Gordon W. Smith

SUMMARY

(1)

This is a study of agricultural marketing and economic develop-
ment in a rapidly industrializing and urbanizing low income region, the
Center-South of Brazil. It analyzes the trends in structure and effi-
ciency of the marketing systems through wholesale of Brazil's two most
important domestically produced staple food goods, rice and beans.
The results of this study cast serious doubt on the hypothesis widely
accepted among Brazilian economists that agricultural marketing, by
increasing in gross margins considerably in the period since 1950, has
retarded the growth of food production, and thus has strongly contri-
buted to an apparent real rise in food prices in urban areas in the
late 1950's and early 1960's. Both qualitative and quantitative evi-
dence indicates that for rice and beans increases in marketing effi-
ciency have been substantial and that farmers today (1965) receive a
significantly large proportion of the whole sale price than 15 years
earlier. Trends in Marketing have thus contributed to non-inflationary
growth by increasing farm price incentives without a corresponding
rise in urban food prices.

Chapter 11 presents the basic model of price transferral from
consumers to producers used in this study. The effects upon farm
prices and distribution profits of several marketing characteristics

common in underdeveloped countries, including Brazil, are analyzed.
These include oligopsony-oligopoly, poor speculation and small carry-
overs, lags in marketing facilities and many transactions and handling
breaks.

In Chapter III the principal factors underlying these marketing
defects are discussed. The central importance of the merchant-money
lender system, poor market information and slow uncertain transportation
in determining distribution channels, market structure and the effi-
ciency of speculation are highlighted.

Chapter IV examines the production and consumption character-
istics of rice and beans in the Center-South of Brazil. Both are low
price and income elasticity products. Beans in produced principally by
small farmers, agricultural laborers and sharecroppers. In addition,
the crop is seldom a large proportion of the income of those producing
it. The crop has not been adopted by larger commercial farmers, even
though its price relative to other farm products has risen substantially
since 1948. This avoidance of concentration in beans has been due
primarily to the significantly larger yield, price and income risks
in beans, compared with potential competing crops, rice, corn, and
cotton. Rice, on the other hand, is often produced by large commer-
cial farmers. It is the principal cash crop in several areas, e.g.,
Rio Grande do Sul, Goias and the Minas Triangle. It is shown that the
probability of large speculative retention of beans, a crop which is
a small percentage of its producers' total income, is much greater than

for rice, which in many regions is 40-75% of its producers total gross

income. Greater producer retention of beans for speculation is an impor-

tant factor explaining the much greater and erratic variability of bean

prices over the season than in rice.

Chapter V, then, outlines the structure of marketing in the 1930's

and early 1940's, as a frame of reference for the analysis of later trends.

The marketing system centered on three cities located propitiously in the

rail-coastal shipping transport system: Sao Paulo, Porto Alegre,and Rio

de Janeiro. Market channels in this period were highly articulated,

characterized by many transactions and handling breaks from farmer to

consumer. Concentration in the trade was relatively high. The non-

competitive behavior of these oligopsonies-oligopolies was greatly facil-

itated by poor road transportation, bad market information and, most

importantly, by the predominance of the merchant as the farmer's source

of credit. Roundabout and slow transportation, the large number of

transactions breaks and non-competitive behavior in commerce indicate

a relatively high-cost and inefficient marketing system during the 1930's

and early 1940's.

Much of the most serious inefficiency in cereals marketing has

occurred in new producing regions. In Chapter VI, the serious bottle-

necks arising in the typical unplanned expansion pattern of agricultural

production and marketing is examined for the Minas Triangle-Goias and

North of Parana regions for the period 1945 to 1963. Farm production

during its most rapid growth far outstripped the combined transport-

storage capacity. At the same time early merchant entrants with reason-
able access to capital rose to positions of strong market power in these
regions. There is good evidence that this market power, facilitates by
marketing bottlenecks, was used to depress farm prices severely during
harvest months. However, the stimulus of high profits brought rapid new
entry, dissipating the market position of the early firms, and with the
construction of new roads, eliminated the severe manifestations of
deficientmarketing capacity. The elimination of markets in the new
regions has meant a substantial rise in farm prices in the areas relative
to wholesale prices in Sao Paulo. Private marketing investments appear
to respond satisfactorily in a new region, although with a lag of a few
years. The most serious problems have been in public transportation.

In Chapter VII the principal structural trends in marketing
1945-1963 are examined. (1) Road construction has increasingly per-
mitted direct shipment from internal markets to points of final con-
sumption. This has brought the rapid elimination of several breaks in
marketing channels, reducing handling and transaction costs. (2) Cereals
specialists and rice mills increasingly are selling directly to retailers
in urban areas, eliminating transactions costs of sales to general
grocery wholesalers. (3) In rice the decline of the merchant money len-
der under the impact of Bank of Brazil financing for cultivation has
been substantial in the principal commercial rice producing regions.
This has increased competition in farm markets. (4) In beans, the mer-
chant-trucker has absorbed an important portion of the market since 1958.

In general, he tends to pay higher prices in producing areas and under-
sells the traditional cereals dealers in Sao Paulo and other important
market centers. These trends should have reduced marketing margins
over space and vertically through the wholesale level of marketing
channels.

This hypothesis is fully confirmed for rice by the available
farm and wholesale price data. Regression analysis shows a significant
downward trend in margins through wholesale between Rio Grande do Sul
farm markets and Porto Alegre, 1950-61, and between Sao Paulo farm
prices and Sao Paulo City wholesale prices, 1948-63. Farm prices
in the Minas Triangle and Goias are a substantially larger proportion
for Sao Paulo wholesale price in the early 1960's than a decade before.
The evidence for beans is less conclusive, due primarily to poor price
information, but a downward trend in margins seems probably here also.

Chapter IX, on beans speculation, turns to the other principal
component of marketing margins, changes in price while the product is
in marketing channels. Analysis of seasonal price fluctuations com-
bined with information on stocking behavior supplied by merchants indi-
cates a substantial bias in beans speculation in favor of middlemen. In
large harvests, merchants form little or no stocks. Prices tend to be
stable or decline over the season, while farmers hold the bulk of exis-
ting stocks. In small harvests, farmers sell most of their output early
in the season, merchants hold the bulk of the stocks. Prices then rise
on the average sufficiently to give at least a 5-6% per month net real

return to speculation. When farmers speculate substantially, marginal gain from speculation are slight or negative. When merchants speculate the returns tend to be large. The large seasonal rises in small harvests are caused primarily by inadequate credit for commerce, poor crop information and the high risk of forming large stocks of beans early in the season. The erratic price behavior of beans is a significant impediment to the commercial production of the crop.

In Chapter X, it is shown that on the average speculation in rice receives little more than the marginal costs of storage. Seasonal price indices have declined in the 1950's and early 1960's in comparison with the 1930's . This has meant a decline in margins on the product after it has entered marketing channels.

Thus of the two products, marketing for rice has performed more satisfactorily, especially as regards price stability. Although efficiency in distribution over space and vertically through marketing channels has apparently improved for beans, erratic price behavior over time has been a substantial impediment to the commercial production of the crop.

Several policy measures are indicated. Financing for stocking should be modified so that the guarantee of the loan is the value of the stock rather than the net worth of the firm storing. This would introduce greater flexibility in speculation and reduce the probability that insufficient credit would severely limit the level of off-farm stocks. Research should be undertaken into the profitability of different storage

and handling techniques. If merchants could be shown the greater pro-
fitability of newer methods and technical assistance were provided,
there is little doubt that most larger merchants would adopt them.

The area of highest priority is market, crop and stock in-
formation. Until the present wholly unsatisfactory system of data
gathering and dissemination is substantially revised, the full bene-
fits of the decentralized marketing will not be realized, speculation
and storage will remian highly uncertain activities and many farmers
will continue to see with little idea of what their price should be.

i.

ACKNOWLEDGEMENTS

I am grateful to many institutions and individuals without
whose assistance this study would have been impossible.

The fundamental debt is to Harvard University. A Bliss
Fellowship in Latin American Studies made possible both the research
in Brazil and the writing in the United States.

In Brazil, I received assistance from many quarters. The
Divisao de Economia Rural of the State of Sao Paulo generously opened
its facilities to me. I am indebted to the Divisao's entire staff,
particularly to its Director, Ruebens Araujo Dias, to Constantino
Carneiro Fraga and Mauro de Souza Barros, whose wealth of insight into
the marketing system was of constant help.

The Instituto Rio Grandense do Arroz was extremely helpful in
supplying materials and directing me to fruitful interviews in Porto
Alegre. Ary Herzog of the Institute gave more of his time and know-
ledge than could be reasonably expected. Soly Machado was of valuable
assistance, as were many others of the Institute's staff.

Dr. Rui Miller Paiva of the Funcacao Getulio Vargas was very
helpful, first in directing me to fruitful inquiry early in my period
in Brazil and later as an astute critic.

Perhaps my greatest debt in Brazil is to the merchants them-
selves, whose cooperation in the study was, in general, very freely
given. In particular, I would like to thank the Bolsa de Cereais

ii.

iii

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

Lags in agriculture in underdeveloped countries today have become of increasing concern to both governments and economists. Not only is agricultural productivity very low in most underdeveloped economies, but the failure of agricultural output to keep pace with the demand generated by the industrialization and urbanization has in some countries created severe external diseconomies for the non-farm economy. Consequences often cited, for example, have been "structural" inflation, lower rates of investment in non-agricultural activities (a la Ricardo), the use of scarce foreign exchange for food imports and the constraint which low farm incomes place upon demand for manufactured products.

Analysis of the agricultural lags--low productivity and inadequate growth--has usually focused upon the structure of land tenure-- very unequal land distribution, absentee landlordism, etc.--which is supposed to reduce the price responsiveness of agriculture and to retard the introduction of more productive techniques. This approach asks why, given price incentives and the availability of more productive techniques, agriculture often responds so feebly; it answers in terms of "feudal" agrarian structures constraining production. This hypothesis has become particularly popular in explaining upward trends in real food prices in several Latin American countries, most notably Chile and Argentina.

Economic analysis of agricultural marketing systems in under-

developed countries has been sparse. Nevertheless distribution is
of considerable importance in determining the level of farm incomes,
the level of food prices and the rate of expansion of food output.
It is only through the distribution process that price incentives
are received by farmers. Marketing is the transformation over space
and time of agricultural products into final consumer goods through
the assembly of lots in farm markets, transportation to urban centers
and the successive breaking of the lots into quantities suitable for
consumption. Given the periodic nature of agricultural production,
most foods must also be stored for consumption after the harvesting.
In underdeveloped countries, these essential tasks are often performed
at high cost, both in terms of inputs and the physical loss of output
in distribution. Furthermore, markets at the various levels of dis-
tribution often suffer severe imperfections. The result tends to be
high marketing margins (for the level of services performed) and low
producer participation in the final value of his products. To the
extent that producers respond to price incentives, and there is a
growing literature in development indicating that they do,[1] inefficient
marketing may be an important factor explaining both low farm incomes
and agricultural output.

1. See, for example, Falcon, Walter P., "Farmer Response to Price in a
Subsistence Economy: the Case of West Pakistan", The American Economic
Review, LIV, 3 (May 1964), pp. 580-594, D. Gale Johnson's discussion of
this paper on pp. 594-596 and the works cited therein.

3.

The final demand for food is a demand <u>both</u> for farm production
and marketing services. The expansion of farm production and of sur-
pluses finally available to consumers may be greatly retarded by inade-
quate investment in marketing facilities. In this case, physical losses
of output in marketing channels become large and farm prices are de-
pressed because of lack of capacity to distribute the crops efficiently.

Thus quite apart from the structure of production and land
tenure, marketing lags may often be a prime factor explaining agricul-
tural lags.

The influence of marketing may be put positively. Improve-
ments in marketing efficiency, by reducing marketing costs and in-
creasing the price received by farmers for any level of production
and consumer demand, are a stimulus to additional farm production and
thus help to contain increases in food prices in period of rapid growth.
Investment in warehouseing and transportation, by reducing physical
losses of output in distribution may, even without an increase in farm
production, reduce any increase in consumer food prices.[2]

This is a study of economic development and agricultural mar-
keting through the wholesale level in post-war Brazil, a particularly
interesting economy for this purpose. Unlike many underdeveloped countries,

2. Reform of land tenure structures is not likely to increase the marketed
surplus of food for many years, even were it a politically feasible alter-
native in many countries. Action on the marketing system, where in fact
inefficiency is great, can produce significant results over a period of
a very few years.

Brazil has grown rapidly throughout most of this period, real product

per capita having increased approximately 3% per year, 1947-61.[3] Its

population growth has been among the world's highest, especially in

urban areas, where the number of inhabitants expanded at an annual

rate of 5.4%, 1949-59.[4] Thus the urban demand for food must have

risen at very high rates in the 20 years since World War II, certainly

in excess of 6% a year. Brazilian growth has made large demands on

both agriculture and the marketing system, and thus provides a good

case within which to study the contributions and impediments of agri-

cultural marketing to sustained economic growth.

Two hypotheses concerning these sectors are now accepted

in greater or lesser degree by Brazilian and foreign analysts. First,

a lag has developed in the domestic output for food, provoking a sub-

stantial rise in real food prices.[5] Through its feed-back in higher

money wages, this lag has been significant structural source of infla-

tion[6] and may have reduced the rate of investment in non-agricultural

---

3. Revista Brasileira de Economia, XVI, 1 (Marco de 1962), no page number.

4. IBGE, Conselho Nacional de Estatistica, Anuario Estatistico do Brasil, 1963, p. 32.

5. See Presidencia da Republica, Plano Trienal de Desenvolvimento Economico e Social, 1963-65 (Sintese)(Rio de Janeiro, 1962), pp. 76-95; Baer, Werner, Industialization and Economic Development in Brazil (Homewood, Ill,: Richard D. Irwin, Inc., 1965), pp. 150-62. This view has been strongly opposed in quarters, mainly on grounds of statistical ambiguity. See Smith, Gordon W., " A Agricultura e o Plano Trienal", Revista Brasileira de Economia, XVI, 4 (Dezembro de 1962), pp. 113-22; Netto, Antonio Delfim, "Nota Sobre Alguns Aspectos do Problema Agrario", Temas e Problemas, 1 (1964), p. 5-41.

6. No one, however, would argue that this has been the principal source of inflation, which is generally agreed ·to be the government deficits.

activities.[7] Unlike the structural theories developed in Chile and Argen-
tina, defective marketing is assigned by most authors a principal, if
not the principal blame for rising food to consumers and the agricultural
lag. Not only was the distribution system for domestically consumed
products (i.e. excluding such export crops as cocoa, coffee, cotton and
perhaps sugar) grossly inefficient in the immediate post-war period, so
the argument runs, but it has actually deteriorated during Brazil's
most rapid growth, so that throughout the 1950's and early 1960's the
farmer received an ever decreasing proportion of the final value of
his product.[8] The principal evdience cited is that the indices of
wholesale and retail food prices have risen much more rapidly than
indices of prices paid to farmers (see Table 1). This apparent in-
crease in marketing margins through wholesale, it is alleged, is due
to two factors. First, both public and private invesment in marketing,
transportation and storage facilities is said to be increasingly inade-
quate to meet the very rapidly increasing demand cited above. Secondly,
according to some, the middlemen, because of their market power vis a
vis the farmer, has been able to appropriate the productivity increases
in agriculture.[9] As can be seen from Table I, all of the relative

7. Plano Trienal, pp. 78, 80.

8. See Baer, Werner, op. cit., pp. 153-54; Netto, Antonio Delfim, op. cit.,
pp. 24; Chacel, Julian M., "Precos e custos Na Agricultura Brasileira",
Revista Brasileira de Economia, XVII, 3 (Setembro de 1963), pp. 41, 64-
66, Ministerio do Planejamento e Coordenacao Economica, Programa de Acao
Economica do Governo, 1964-66 (Sintese) (Rio de Janeiro, 1964), p. 96.

9. Specifically on this point, see Netto, Antonio Delfim, op. cit.,p. 24.

Table I

Price Indices of Food at the Farm,
Wholesale and Retail Levels, 1950-62*

	Index of Farm Prices of Products for the In- ternal Mar- ket	Wholesale Prices of Agricultural Products for the Internal Market	Retail Prices of Food in Rio de Janeiro	Prices of Non- Food Component of the Cost of Living, Rio de Janeiro
1950	100.0	100.0	100.0	100.0
1951	116.4	123.7	112.7	110.0
1952	129.3	144.1	134.9	126.0
1953	157.8	169.5	158.7	145.0
1954	177.0	200.0	192.1	177.0
1955	216.4	249.2	239.7	223.0
1956	265.1	298.3	296.8	272.0
1957	297.7	332.2	341.3	314.0
1958	341.6	369.5	390.5	359.0
1959	459.6	525.4	566.7	516.0
1960	616.3	742.4	739.7	677.0
1961	816.8	1025.4	905.2	922.0
1962	1299.8	1601.7	1611.1	1417.0
1963	n.a.	2727.1	2666.7	1995.0
1964	n.a.	4884.7	5234.9	3739.0

* The bulk of products for the internal market are food goods. The
non-food component of the cost of living was calculated by applying the
weights of food .43, and solving for the remainder.

Sources: Conjuntura Economica Price Indices No. 48 (wholesale) and
No. 2 (GB) for retail. Farm Prices are from Programa de
Acao, p. 95.

relative increases in food prices in the cost of living appears to have

been absorbed by increasing gross margins in distribution. Farm Prices

actually appear to have declined relative to the non-food component of

the cost of living. If true, this would have two consequences: first

farm prices and incomes would be depressed; secondly, to the extent that

farmers respond to prices, the level of production would also be reduced

and food prices further increased.

The following quotations give the flavor of the marketing lag

hypothesis as it has been maintained in Brazil.

> The exploitation, of both the producer and consumer, has
> been going on for many years. It coincides with, and
> in part explains, the growing increases in the prices
> of goods of prime necessity and in the cost of living.[10]

> The other problem behind the agricultural bottleneck
> is caused principally by Brazil's archaic methods of
> distributing its agricultural products. Its principal
> cause is the lack of investment in social overhead
> facilities, such as more adequate roads to link the
> countryside with the cities and, more importantly,
> the dearth of storage facilities for agricultural pro-
> ducts in many urban areas.[11]

The thesis regarding the marketing lag is extremely important

for policy decisions. If the principal trouble-spot is marketing

---

10. O Problema da Alimentacao no Brasil: Relatorio de Klein and Saks
(Commissao de Desenvolvimento Industrial, 1954), p. 47 (translated
into English).

11. Baer, Werner, op. cit., p. 153. In addition, the failure of
marketing to transfer price incentives to farmers is strongly empha-
sized in Joint Brazil United States Economic Development, The Devel¹
opment of Brazil, (Washington D.C.: Institute of Inter-American
Affairs, Foreign Operations Administration, 1954), p. 24.

and not the structure of agriculture, then reform of the land tenure system is of much less pressing importance for sustained economic growth although it might be undertaken on grounds of social justice. The limited human and capital resources of the Brazilian government would then be better spent in attacking marketing inefficiency, with probably large pay-offs in the short-run. On the other hand, if marketing has been performing staisfactorily, then farm production itself becomes the central problem, and land reform may be of much greater priority.[12]

In spite of its importance in these hypotheses, no serious analytical and empirical study exists for Brazilian agricultural marketing in non-export food crops, let alone of its performance over time. The present work attempts partially to fill this gap. It traces for the years 1935-63 the efficiency and structural changes in the marketing system through wholesale of two important food products, beans and rice.

The analysis directly contradicts the marketing lag hypothesis for these products and casts serious doubt upon the validity of the hypothesis in the aggregate. It wil show that the key quantitative evidence cited above, comparisons of aggegate price indices (see

---

12. It is significant that many Brazilians basically opposed to land reform in the traditional sense also cite marketing as the principal causitive factor in the increase in food prices. This includes not only large landowners but also several professional economists.

Table I), is in fact subject to strong bias in geographical and product

coverage. The aggregate indices in their present form cannot be used

to support any hypothesis about marketing margins. The study is con-

fined to marketing. It makes no attempt to evaluate the validity of

the evidence of a lag in the expansion of food production,[13] the

sources of potential or actual lags in Agriculture or the advisability

in Brazilian conditions of general land reform.

After meat and meat products, rice and beans are the most

important domestically produced food expenditure items of the urban

wage earner.[14] Besides their weight in determining the prices of

wage goods, their marketing systems have frequently been cited as

among the poorest in Brazil.[15] Thus they should show most clearly the

---

13. This is a complex statistical problem. The interested reader is
referred to Smith, Gordon W., op.cit., and Netto, Antonio Delfim, op.cit.

14. Budget studies in Sao Paulo (1952-) and Rio de Janeiro showed
the following distribution of food expenditures:

	Sao Paulo	Rio de Janeiro
Meat	16.0%	17.0%
Rice	11.4%	7.0%
Beans	5.2%	6.7%

Divisao de Estatistica e Documentacao Social, Prefeitura de Sao Paulo,
Padrao e Gusto de Vida (unpublished pamphlet), 1956; Conjuntura Economica,
XVI, 3 (January, 1962), p. 87.

15. See, for example, Klein and Saks, op. cit., pp. 59-61, 20-21. Rui
Miller Paiva, "Evolucao da Agricultura no Brasil", Agrucultura em Sao
Paulo, VIII, 12 (Dezembro de 1961), p. 9. Joint Brazil-United States
Technical Commission, Brazilian Technical Studies (Washington D.C.:
Institute of Inter-American Affairs, Foreign Operations Administration,
1955), pp. 395-97 and 415-32.

serious dificiencies in marketing which may exist in underdeveloped

countries, and which may provoke or intensify the lags in agricultural

output described above. This study focuses on the Center-South of

Brazil, the relatively self-contained market region[16] in which most

of Brazil's growth, urbanization and industrialization has been con-

centrated.[17] It is in this region, extending from Mato Grosso, Goias,

Minas Gerais and Rio de Janeiro south, where the stresses upon marketing

from the increasing demand for its services should be most apparent,

and where responses, if any, to the pressures of this demand should be

most marked.

In the course of this study, it will be seen that marketing

for both products suffered serious inefficiencies in the period 1935-

1945. First, transportation was slow, uncertain and "roundabout".

Secondly, oligopsony in farm markets was common, and non-competitive

buying and selling behavior was greatly facilitated by the merchant-

moneylender system. Marketing structure acted to depress both farm

---

16. Intra-regional trade is vigorous throughout the center-south, while
significant inter- regional shipments of beans occur only in case of
harvest failure. Thos in rice are important only for the state of
Maranhao which ships rice to the south and Rio Grande do Sul which
regularly exports rice to the north. The low inter-regionsl trade is
in large part the result of high transport costs and long delays in
shipping by boat, until the early 1960's the only means of transpor-
tation connecting north and south.

17. While urban population expanded at a rate of 5.4% in Brazil, 1949/
59, the average was 5.8% in the south and 9.8% in the center-west.
In 1960, more than 3/4 of the total value of industrial porduction
originated in the center-south. Revista Brasileira de Economia, XVI,
1 (Marco de 1962), no page number.

prices and farm output. During the period 1945-63, however, the principal trends in marketing have made significant positive contribution to the expansion of farm production of the two products, in direct contradiction to the widely accepted hypothesis. Transactions and handling breaks have been eliminated in marketing channels during the 1950's and early 1960's, both because of direct shipment by truck and because of commercial innovation, which is eliminating the assembler-wholesaler transaction in large urban centers. Buying competition has increased impressively in farm areas through new entry, improved transportation and the decline of the merchant-moneylender system. This has greatly reduced or eliminated, in many areas, the monopoly profits in distribution which had probably been large in the 1930's and early 1940's. Thus we will see that trends both in marketing channels and market structure have tended to reduce distribution margins. This is confirmed by the available quantitative evidence.

Today, for both products, distribution margins over space and vertically through the wholesale stage of marketing are probably low in the Center-South, as low or lower than for comparable relations and services in the United States. There is little indication of gross inefficiency in this activity.

It will also be seen that seasonal price movements in rice have diminished significantly since the 1930's, primarily because of the elimination of oligopsonistic buying behavior in farm markets.[18]

_____

18. Lack of data prevented similar conclusions about beans.

This reduction in seasonals has also tended to reduce distribution margins and increase average prices paid to farmers.

Private investment in marketing facilities (primarily warehousing) does not appear to be the severe and continuous problem many writers have suggested. Laps in the adjustment of marketing facilities to the growth in output in new producing regions have at certain times been acute. These were short-lived, however, and were rooted primarily in inadequate government investments in transportation. The large commercial profits created by the bottlenecks have usually been sufficient stimulus for private commercial investment, and when transportation has improved, excess capacity in storage in producing areas has sometimes been the result.

Speculation in beans remains highly inefficient. In contrast to rice, gains from commercial speculation are usually far in excess of the marginal cost of storage. The extreme price instability of beans has probably been significant retardant to the commercial production of the crop. This probably explains, in part, the large real rise in the price of the product, 1949-63.

Throughout -the study, the dependence of the structure and performance of the marketing upon the systems of transportation and credit will be highlighted. Government policy in the 1950's and early 1960's, by emphasizing road construction and by greatly expanding credit availabilities to producers (at least of rice), has contributed to the improved efficiency of the marketing system. In the

future, policy should emphasize the improvement of the wholly inade-
quate system or market, production and stock information, which has
been a serious obstacle to greater marketing efficiency. Credit
facilities for storage should be increased, both for farmers and
merchants. Since the adequacy of the combined transportation and
storage systems remains in doubt in some regions, thorough study is
required. Finally, technical assistance programs to merchants and
millers for the improvement in handling, storage and processing
techniques would probably have a large pay-off.

The study will proceed as follows. Chapter II presents the
general theoretical framework used in this study for the analysis
of price transferral from consumers to producers through the market-
ing. The impact of several marketing characteristics found in under-
developed countries upon farm prices, commercial profits and consumer
expenditures is analysed. Chapter III follows with a general dis-
cussion of these characteristics as an outline to the empirical body
of the study. In Chapter IV, we turn to rice and beans, with a dis-
cussion of their production and consumption characterisitcs in Brazil,
relating these to marketing behavior.

Chapter V, as a frame of reference for the analysis of later
trends in market structure and the distribution system, describes and
analyzes the structure and performance of the system in the late 1930's
and early 1940's. In Chapter VI, the problem of marketing bottlenecks,
investment lags and the pattern of agricultural and commerical expansion

are treated for two new regions. Chapters VII and VIII analyze, first
qualitatively and then quantitatively, trends in the marketing system
over space and then vertically through marketing channels. Completing
the picture of marketing performance, speculation in rice and beans are
treated in Chapters IX and X.

Methodology and Data Sources.

The paucity of qualitative and quantitative information on
marketing in Brazil is a serious obstacle to research. Fairly accur-
ate production statistics for rice and beans exist only for two
states, Sao Paulo and Rio Grande do Sul, and are gathered by state
agencies. TheMinistry of Agriculture data both on average prices
recieved by farmers and of total production are subject to wide
margins of error. Monthly farm prices exist only for Sao Paulo [19]
and make no distinctions in quality. Fairly accurate wholesale prices
are limited to Sao Paulo City and Porto Alegre, Rio Grande do Sul.
There is virtually no reliable information on the seasonal pattern of
sales by farmers and no monthly information on commercial stocks,
except for scattered observations for rice in Rio Grande do Sul.
Thus is it impossible, with available data, to compute total realized
margins in commerce.

Data on interstate shipments in the Center-South are limited
to rice from Rio Grande do Sul, and thus it is impossible with any
precision to establish intra-regional trade patterns.

The situation is even poorer in data about commercial firms.
The census is next to useless for this sector. Not only does in-
flation greatly distort the real value of capital carried on the
books, but the two types of firms considered, rice millers and
cereals specialists, usually show only a small proportion of their
total capital in their books. Because of widespread tax evasion,
sales figures reported by the census are always understated. In
addition, the census omits the value of purchases, rendering im-
possible calculations of margins on sales. Prior studies are of
limited help, since they have been restricted to a description of
marketing channels and impressions of marketing efficiency.

In these conditions, questionnaires, the personal inter-
view and direct observation were the principal research tools.
Two questionnaires were used in beans. The first for Sao Paulo
cerealistas (cereals specialists) was an extensive instrument pro-
bing buying, selling, stocking and financial behavior and their
trends. Merchants would not, however, provide the precise information
sought (especially about finance), and the questionnaire in the final
analysis became a framework for two one-hour open-ended interviews.
All quantitative information in them is approximate, since most
most firms had neither the accounting nor the will to give precise
figures. In general, however, cerealistas were very cooperative, and
the interviews proved a fertile source of qualitative information.
Most of the large and medium-sized firms dealing with beans in Sao
Paulo were interviewed, a total of 12. Since precise information

on quantity (which could have served for statistical analysis) on the
firms was not given and since the qualitative information from small
firms was repetitive of previous interviews and of generally poorer
quality, it was decided to interview only 4 of the some 200 smaller
cerealistas operating in Sao Paulo.

The second questionnaire dealing with beans was used in
Parana. It was filling in personally by the author with 15 cereal-
istas of varying size in the main bean producing regions of that
state, the north and the southwest. It dealt primarily with market
structure and marketing channels in the region, in addition to the
typical sales behavior of producers and merchants. Informal conver-
sation on marketing usually followed the questionnaire.

I personally interviewed 15 merchants in Uberlandia and Patos
de Minas, merket centers for the rice and beans of the Minas Triangle
region, and 8 firms in Porto Alegre, Rio Grande do Sul, mostly
rice dealers. These interviews were informal and dealth with current
marketing patterns and trends in these regions. The interviews
ranged from 1 - 4 hours in length. Both in Parana and Minas Gerais,
several producers were also interviewed informally.

Five old-line merchants were interviewed at length in Sao
Paulo specifically on the marketing system of the 1930's and early
1940's. In addition, the topic was discussed with all those inter-
viewed.

I attended the Sao Paulo Cereals Exchange (Bolsa de Cereais)

several times each week, January to October, 1963 and gained much insight into the operation of marketing.

Since credit is an important aspect of marketing, several bankers operating with cereals dealers were interviewed in Sao Paulo, Maringa (Parana), Patos and Uberlandia (Minas Gerais) and Porto Alegre (Rio Grande do Sul). Upper level officials of the Bank of Brazil were interviewed in these cities and in Rio de Janeiro.

Interviews with market participants were complemented by the information provided by the professional personnel of the Agricultural Economics Division of the Department of Agriculture in Sao Paulo (Divisao de Economia Rural) and of the Rice Institute of Rio Grande do Sul (IRGA).

The interviews, then, were the primary source of qualitative information, which provided the framework within which the available quantitative information could be organized, and the principal hypotheses which it could be used to test.

CHAPTER II

A THEORETICAL FRAMEWORK FOR THE ANALYSIS OF AGRICULTURAL MARKETING

In the most general sense, marketing is the transformation and allocation over space and time of a fluctuating supply of farm raw material. As in the use of any intermediate good or factor of production, the price received for farm output depends upon which transformations are undertaken, their marginal costs and marginal value productivities. In a very real sense, then, marketing decisions and activities determine in conjunction with consumer demand the value of farm output.[1] Deficiencies in the allocation of farm output over space and time, coupled with imperfections in the determination of prices, can powerfully affect farm income, farm profits and, to the extent that farmers respond to price incentives, the level of production; in the case of widely different marketing performances for different crops, e.g., export vs. domestic food products, the composition of output may be affected adversely.[2]

---

1. For an interesting discussion of this interdependence in the context of an input-output framework, and including processing, see Davis, John H. and Goldberg, Ray A., A Concept of Agribusiness, (Boston: Division of Research, Graduate School of Business, Harvard University, 1957).

2. In Brazil there can be little doubt that better marketing performance helps account for the preference many farmers give coffee even today. See Rui Miller Paiva, "Evolucao da Agricultura no Brasil", Agricultura em Sao Paulo, VIII, 12 (Dez., 1961), p.9.

The purpose of this chapter is to analyze through a model of price determination over space and time the interactions between the marketing system and farm production as they operate in the process of price transferral to farmers. First, the price transferral mechanism under certainty and perfect competition is examined. Then several structural and functional deficiencies which will be analyzed empirically in this study--oligopsony and the merchant-moneylender system, "lags" in marketing investment, inefficient speculation, small scale firms and a large number of breaks in marketing channels--are introduced into the model and their impact upon average farm prices received and middleman profits determined. In Chapter III, the principal factors which have generated these characteristics in Brazil at various times in the past 20-30 years are analyzed briefly as a general framework for the remainder of the study, an empirical analysis of the performance and trends of the marketing system for rice and beans.

I. Price determination under certainty and perfect competition.

Traditionally, much of the performance of an agricultural marketing system has been evaluated in terms of how closely its results approximate those of a perfect market over space and time.[3] This is a useful, although certainly not definitive exercise, and is a first step toward understanding the interrelations of marketing and farm production.[4]

_____

3. See, for example, Shepherd, Geoffrey, Marketing Farm Products (Ames, Iowa: Iowa State College Press, 1946), pp. 399-409.

4. The sources on the determination of intertemporal price equilibrium are many. Basic articles for the problem under certainty are: Williams, J.B., "Speculation and Carry-over", The Quarterly Journal of Economics,

In the present treatment, a number of simplifying assumptions are made for ease of exposition. Physical processing of the product is ruled out in order to focus more clearly upon distribution, which is assumed to have only one tier. Middlemen buy from farmers and sell to consumers. Two point space is posited, one each for production and consumption.[5] Two variants in the time horizon are considered; the first, one harvest with no carry-over in or out; the second, two harvests, a bumper crop followed by harvest failure, in order to illustrate

4. (continued) L, 2, (May, 1936), pp. 436-55; Samuelson, Paul A., "Intertemporal Price Equilibrium; A Prologue to the Theory of Speculation" Weltwirtschaftliches Archiv, Band 79 (1957), pp. 181-221; Houthakker, H. S;. "The Scope and Limits of Futures Trading", in M. Abramovitz (ed), The Allocation of Economic Resources, (Stanford, Cal.: Stanford University Press, 1959), pp. 134-159.

On the shape of the supply of storage function under risk and uncertainty with futures markets, there is also general agreement that storage is undertaken up to the point which equates its marginal cost and the expected price rise. See, Kaldor, Nicholas, "Speculation and Economic Stability", Review of Economic Studies, VII, pp. 1-27; Working, Holbrook, "The Theory of the Price of Storage", The American Economic Review, XXXIX, 6, pp. 1254-62; Brennan, Michael J., "The Supply of Storage", The American Economic Review, XLVIII, 1 (March 1958), pp. 50-72; Telser, Lester G., "Futures Trading and the Storage of Cotton and Wheat", The Journal of Political Economy, LXVI, 3 (June 1958), pp. 233-55.

5. In effect, this eliminates the problem of the allocation of farm production over space, although not its pricing over space. More complex models are possible, with many two-dimensional points in space and time, allowing for varying cost functions of storage at different locations, including intermediate points, and a cost function for spatial transfer between any two points. For discussions of spatial allocation and price equilibrium see Fox, K.A. and R.C. Taeuber, "Spatial Equilibrium Models of the Livestock-Feed Economy", The American Economic Review, XLV, 4.(Sept. 1955), pp. 584-608; Judge, G.G. and T.D. Wallace, "Estimation of Spatial Price Equilibrium Models', The Journal of Farm Economics, XL, 4 (Nov. 1958), pp. 801-820; Fei, J.C.H., "Arbitrage--An Introduction to Activity Analysis", Review of Economics and Statistics, XLVI, 3(Aug. 1964), pp. 245-259.

the effects of future harvests upon carry-over and seasonal price
fluctuations.

Distribution over space encompasses such broad activities as
handling, trading and transportation. These activities are assumed (1)
to enter in fixed proportions in distribution over space and (2) to
produce one homogeneous marketing service to consumers. Thus, both
distribution technique and its final product at any point in space and
time are invariant.[6]

The cost functions for both distribution over space and storage
are given and subject either to constant or increasing marginal costs over
the relevant range. Storage facilities are assumed existent in both the
consumption and production locations, each with its own cost function.

In symbols, the data are as follows:

(1) C_t = farm sales in period t.

(2) ξC_t = H, the given harvest size.

(3) S_t = carry-over from period t stored in consumption locale.

---

6. The service or product of distribution is the availability to con-
sumers of the farm product at a point in space and time together with
such credit, delivery and other services as may be rendered. Storage,
transport, etc. are not the services of distribution, but rather the
inputs necessary to produce the services. The composition of such ser-
vices is assumed fixed to avoid entering the Chamberlian product-as-a-
variable situation. Although it must be borne in mind that total empha-
sis on the cost of existing marketing services can be only partially
correct, determination of the optimum combination of marketing services
is beyond the scope of this study. For an interesting, but inconclusive
discussion of this latter issue see Collins, Norman R. and Richard H.
Holton, "Programming Changes in Marketing in Planned Economic Development",
Kyklos, XVI (Jan. 1963), pp. 123-136, reprinted in Eicher, C. and L. Witt
(eds) Agriculture in Economic Development, (McGraw-Hill, New York, 1964).

(4) U_t = carry-over from period t stored in production locale.

(5) $f(S_{t-1}+U_{t-1}+C_t-S_t-U_t)$ = consumer price in period t.

(6) $S_o = S_n = 0.$

(7) $C_o = C_n = 0.$

(8) $(U_{t-1}+C_t-U_t)$ = amount shipped from production point to consumption point in period t.

(9) $m(U_{t-1}+C_t-U_t)$ = cost function of distribution over space. $m' \geq 0$, $m'' \geq 0$.

(10) $u(U_t)$ = cost of storage function in production locale in period t. $u' \geq 0$, $u'' \geq 0$.

(11) $s(S_t)$ = cost of storage function in consumption locale in period t. $s' \geq 0$, $s'' \geq 0$.

(12) F_t = farm price in period t.

$\quad$ t = 1...n.

Then the supply function of distribution over space is given by $m'(U_{t-1}+C_t-U_t) = P_{mt}$. There are two supply functions of storage, one each for the two points in space $s'(S_t) = P_{st}$ and $u'(U_t) = P_{ut}$, where the P's refer to the price of carry-over out of period t.

The price <u>received</u> for distribution over space is nothing more than the difference between consumer and farm prices. Given carry-over in and out of period t at the point of consumption and the farm price, the price received for distribution over space is also a function of the amount shipped in the period. Thus $P_{mt} = f(S_{t-1}+U_{t-1}+C_t-S_t-U_t)-F_t$. Prices received for storage are clearly the changes in prices from one period to the next:

$P_{st} = f(S_t+U_t+C_{t+1}-S_{t+1}-U_{t+1}) - f(S_{t-1}+U_{t-1}+C_t-S_t-U_t)$ and $P_{ut} = F_{t+1}-F_t$.

It follows that the equilibrium conditions for the n period, one harvest case are as follows:

$$m'(U_{t-1}+C_t-U_t) = f(S_{t-1}+U_{t-1}+C_t-S_t-U_t) - F_t$$

$$s'(S_t) = f(S_t+U_t+C_t-S_{t+1}-U_{t+1}) - f(S_{t-1}+U_{t-1}+C_t-S_t-U_t)$$

(13) $u'(U_t) = F_{t+1}-F_t$

$$S_t = 0, \; U_t = 0.$$

$$S_o = S_n = U_o = U_n = 0.$$

$$t = 1...n.$$

If C_t were $\leq C_{t-1}$ throughout the year (i.e. farm sales were monotonically decreasing over the season), storage would begin immediately, and the season's low price would occur in the first period. However, the C_t's may began small, swell to a peak, and then decline again. In these conditions, no carry-over would be undertaken in the earliest periods, and in them, marginal costs of storage will be greater than their price. But once storage begins, consumption price will rise from period to period by the marginal cost of storage at the consumption point, while <u>farm</u> price will increase by that amount plus the change in the marginal costs of distribution over space.[7] $F_t = f_t - m'_t$ and $F_{t+1} = f_{t+1} - m'_{t+1}$. Therefore, $F_{t+1} - F_t = f_{t+1} - f_t - m'_{t+1} + m'_t$. It follows also that $s'_t - u'_t = m'_{t+1} - m'_t$.

Now, this is true so long as storage is undertaken in both locations. However, unit storage costs in each period are likely to be quite small relative to spatial distribution costs. And if marginal spatial

---

7. For analysis of the several possibilities see Samuelson, P.A., <u>op</u>. <u>cit</u>., pp. 184-87 and Houthakker, H.S., <u>op</u>. <u>cit</u>., pp. 138-39.

distribution costs are fairly sensitive to the volume distributed,

it may be that no storage would be undertaken at the consumption point.

That is, $m'_{t+1} - m'_t$ may be greater than $u'_t - s'_t$ at all conceivable levels,

in which case no storage would be undertaken at the consumption point.

This tendency is reinforced if the location of storage facilities is

itself in long-run equilibrium, in full adjustment to the fact that

peak loads on special distribution lead to higher, then lower marginal

costs as the season progresses. Then the great bulk of storage faci-

lities may be located in producing regions.[8] In any case if storage is

undertaken only at the production point, the inequality $s'_t > f_{t+1} - f_t$

will hold for storage at the location of consumption.[9]

---

8. There is the possibility that at certain low levels at consuming
points the marginal net cost of storage is negative, due to a positive
marginal "convenience" yield from holding stocks. The convenience yield
itself, however, is related primarily to the uncertainty of flows in and
out of the firm and reflects the opportunity cost of being caught without
sufficient stocks to satisfy customers. See Kaldor, N., op.cit.p.6; and
Brennan, M., op.cit., pp. 53-55; Working, H. op.cit., pp. 1256-60. It
would seem that this contingency is ruled out by the assumption of certainty.

9. In multi-point space, the determination of storage locations will be,
of course, more complex, influenced mainly by (1) the total costs of
transport and handling implied by the storage locations and (2) the exter-
nal economies accruing from the concentration of trading. Thus a large
quantity of storage may occur at some intermediate point, such as Chicago,
which, being the hub of a transport network serving both producing and con-
suming areas, also becomes a large trading center. The concentration of
trading at an intermediate point plus the natural break in transportation
leads to large scale storage at the point also. Ten to fifteen years ago
this was the case of Sao Paulo, Rio de Janeiro and Porto Alegre, which
were storage centers by virtue of transport breaks and trading concentra-
tion. When trading becomes decentralized, as it has in Brazil, direct
transport by-passing these intermediate centers should become cheaper and
much less storage will occur at these intermediate points. This has
happened his Brazil with the great recent development of roads.

Thus marketing operation under perfect competition and certainty leads to the familiar marginal conditions where the yields from storage and distribution over space are equated to their marginal costs if the activity is undertaken, and are less than their marginal costs if they are not performed.[10] This, of course, is an efficient solution to the marketing problem. But what is more important from the point of view of transferring price incentives, for linear and concave consumer demand functions, it also yields the maximum average farm price consistent with at least covering the marginal costs of middlemen. (See below, pp. 33-34 and Appendix I)

If all marketing facilities were in long-run equilibrium with the constant farm production assumed in the model, marketing costs would be at their absolute minimum. Distribution profits would be at their "normal" level, and no quasi-rents would be received by middlemen.[11]

---

10. For treatments of the equilibrium spatial conditions with many points in space see Judge, G.G. and T.D. Wallace, op.cit. and Fox, K.A. and R.C. Taeuber, op.cit. In this case, marginal returns are also equal to or greater than marginal costs, depending upon whether or not the transfer is performed. Furthermore, the differences between farm prices in the several regions are equated their differences in marginal costs of transfer if they both ship to the same region; when two regions do not, in equilibrium, ship to any common point, their price differences are free to vary up to the smallest difference in marginal transfer costs from each of the two regions to another region.

11. There is good reason to suspect, however, that especially under-developed countries suffer from excess capacity at all levels of marketing and that the typical firm's scale is far below its optimum. It is very doubtful that this can be explained entirely by the differentiation of the product spatially. For the provocative argument that "overcrowding" in distribution arises from lack of alternative employment opportunities, see Holton, Richard N. "Marketing Structure and Economic Development", The Quarterly Journal of Economics, LXVII, 3 (Aug 1953), pp. 344-361; Galbraith, J.K. and Richard N. Holton, Marketing Efficiency in Puerto Rico (Cambridge, Mass.: Harvard University Press), 1955, pp. 2-4.

This would indeed be an efficient solution for marketing and price
transferral.

No new difficulties are encountered when the time horizon is
extended to many harvests perfectly foreseen.[12] In fact, the same set
of equilibrium equations apply, where the time horizon is extended to
more than one harvest. The condition for carry-over out of the harvest
is, of course, that a large harvest be followed by a small one, so that
without carry-over the price level in the second harvest will be higher
than in the first harvest by more than the cost of storage. For example,
in a twelve-month harvest period, with storage generally beginning in
the first month, the equilibrium price in the first month of the second
harvest must be higher than that of the previous year by at least twelve
months' storage cost. If it is, the carry-over will be undertaken. If
not, the two harvests' prices are determined independently. In fact,
carry-over may bridge more than one harvest, if the initial crop is very
large in relation to the subsequent ones.[13]

---

12. For treatments of this see Williams, J.B., op.cit., pp. 443-449; Houthakker
H.S., op.cit., pp. 137-140; Samuelson, P.A., Op.cit., pp. 196-199 and 211-219.
Whereas Houthakker and Samuelson take the time pattern of harvests as given,
Williams quite correctly makes the size of harvests themselves dependent upon
the size of previous harvests and the carry-overs from them. That is, farmers
know how much middlemen will carry over this year's harvest and next, i.e.,
the amount which will yield the marginal cost of storage. Farmers then adjust
next year's harvest to such a level that it plus carry-over from the previous
harvest will yield their supply price. From the other side, given this year's
harvest, middlemen will carry over up to the point where their carry-over
plus farm production determined in response to the price it will receive just
yeilds the marginal cost of storage.

13. See Samuelson, P.A., op.cit., pp. 211-213, for proof of this for continu-
ous time.

The effect of efficient carry-over for a longer than one harvest time horizon in the cases of linear and concave demand functions is to yield the maximum value of farm output over the time horizon consistent with the distribution sector's at least making its marginal costs.[14] Farm receipts from a large harvest are raised by carry-over into a smaller subsequent harvest year. This, of course, lowers the receipts from the later harvest, but not by as much as the increase in the first.[15]

It is difficult to apply the concept of "derived demand" in this context. It should relate the average price received for farm output to its size. As will be noted from the equilibrium conditions (13), page 23, average price depends not only on harvest size, but also upon what proportion of it is sold in each period by farmers, what happens in subsequent harvests, and the degree to which marketing investment and facilities are in adjustment to each particular harvest size. Some insight, however, into the process can be gained by considering a one harvest time horizon in which the proportion sold by farmers in period $t(t = 1...n.)$ is fixed and independent of harvest size, i.e., $C_t/H_i = k_t$,[16] and furthermore, marketing facilities are in long-run equilibrium with the given harvest

_____

14. See pp. 34-36 below and Appendix I. For convex demand functions, it will give a local maximum of farm receipts, but it is not clear that this will be the absolute maximum.

15. When information is incomplete on next year's harvest and does not take a reasonably certain form until well after farmers have sold their output, carry-over to subsequent harvests will in fact lower farm receipts for the horizon.

16 This would be true, for instance, if the physical harvesting patterns of the product were fixed and if farmers could under no condition store more cheaply than middlemen.

size. A point on the derived demand function, then, would show the

long-run equilibrium average price farmers would receive for each

given harvest size, when storage and distribution over space are under-

taken in conditions of certainty and perfect competition. The derived

demand would be constructed by varying harvest sizes, and determining,

through the equilibrium conditions, given the consumer demand function

and the appropriate long-run storage and spatial distribution costs

functions, the average price received by farmers for each volume of

harvest. The complications introduced by varying harvest size over

time with an horizon longer than one year vitiate the concept of derived

demand for a single harvest. If some regularity could be established

in harvest fluctuations, it would be possible to construct a derived

demand for cyclical blocks of harvest, relating the size of the harvest

block to the average price received by farmers. And in fact, it may

be just some such notion of "average price" to which farmers under

uncertainty actually react.[17] But this would be straining an already

abstract model beyond its usefulness. What can be said, is that for

any harvest size and pattern over time, perfect competition and cer-

tainty in long-run equilibrium yield maximum farm receipts short of

subsidization or losses by the marketing sector.[18]

---

17. In this connection, it is important to recall the distributed
lag supply functions which Marc Marlove has estimated with some success
for many crops in the United States. See his The Dynamics of Supply
(Baltimore, Md.: Johns Hopkins Press), 1958.

18. See pp. 33-34 below and Appendix I.

II. Departures from Equilibrium Under Perfect Competition and Certainty.

In fact, as will become clearer in later chapters, departures from the competitive scheme under certainty are widespread and very important in Brazil. Seasonal price fluctuations at times appear to be much larger than the mere physical costs of storage, and carry-over from harvest to harvest seems singularly ineffective in dampening price fluctuations. Oligopoly-oligopsony elements are often present, and at many junctures, marketing investment and transportation facilities have lagged seriously behind the growth of farm production. There have been important changes in marketing channels tending toward the elimination of certain stages in the marketing process, not to mention dramatic and rapid modifications of market structure in the direction of more competition. What would be the impact of such characteristics and changes on the level of price transferred to farmers?

To answer these questions, we will operate within the assumptions needed to determine a meaningful derived demand for farm products: a one-harvest time horizon (later relaxed to two) and a fixed seasonal pattern of farm sales independent of harvest size. Each harvest is assumed to have two periods, the gross of-farm sales being made in the first, or harvest period.

The degree of non-competitive, oligopoly-oligopsony behavior by middlemen in distribution over space is assumed to be reflected in a unit profit figure above and beyond marginal costs, and which is proportional to the retail price obtaining in the period. In the two-point spatial model, oligopsonists in marketing services may operate

either through the size of the carry-over or by depressing farm price
in relation to retail price (oligopsony). Short of buying and then
destroying part of farm output, a possibility very remote in the con-
ditions which could permit oligopoly to operate in Brazil,[19] oligopo-
lists can restrict the supply to consumers in one period only by _in-
creasing_ it in another, opening the possibility of an _intertemporal_
discrimination in selling which can indeed raise middleman profits.
Spatial discrimination, however, is clearly impossible if there is
only _one_ consumption point, as in the model. This has the result that
during any one period of time, oligopoly would appear to operate only
as an oligopsony.[20]

The effects of lags in marketing investment which give rise
to marginal distribution and/or storage costs significantly above their
average will not be incorporated explicity, although their effects will
be obvious. Similarly, marketing innovation which reduces the cost
function will be clear without explicit treatment.

Thus, we have the following for the two-period, two-point
model:

19. As will be shown in Chapters VI and VI, oligopolies have tended to
be local or regional in nature, affecting primarily farm markets. In
the larger consumer centers, except in some earlier periods, the oligo-
polists tend to be so many that in agreement to destroy output seems
completely unworkable in practice.

20. Relaxing the assumption of two-point space in Brazilian conditions
it appears that oligopoly could lead to spatial discrimination between
consumer markets only with extreme difficulty, although transportation
defects may sometimes lead to a more or less equivalent behavior.

(15) $\bar{\eta}$ = oligopsonistic profit coefficient.

(16) $f(Q_t)$ = consumer demand, and Q_t = sales to consumers.

(17) C_t = sales by farmers, where $\sum Q_t = \sum C_t$ = H, harvest size.

(18) $Q_t = (S_{t-1} + C_t - S_t)$. Storage, S_t, will be assumed to occur
only at the point of consumption, for ease of exposition.

Given the assumptions of two periods, with no carryover in or
out of the harvest unit, a number of simplifications can be made.

$S_o = S_2 = 0$. Thus,

(19) $S_1 = (C_1 - Q_1)$, $C_1 \gtreqless Q$.

(20) $s(C_1 - Q_1)$ = cost of storage function.

(21) $m(C_1)$ = spatial distribution costs function, period 1.

(22) $C_2 = (H - C_1)$. Hence

$m(H - C_1)$ = spatial distribution costs function, period 2.

By assumption, the farm prices in the two periods are:

(23) $F_1 = [(1-\tau)\ f(Q_1) - m'_1]$.

$F_2 = [(1-\pi)\ f(H-Q_1) m'_2]$.

Then,

(24) Total consumer expenditures = $V_c = f(Q_1)Q_1 + f(H-Q_1)(H-Q_1)$.

(25) Total harvest value = $V_f = F_1 C_1 + F_2 C_2$.

(26) Total distribution profits = $R = V_c - V_f - m(C_t) - s_1(C_1 - Q_1)$
$t = 1,2$, where $S_2 = 0$, assuming
no carry-over out of the harvest.

In effect, then, consumer expenditures, farm receipts and dis-
tribution profits are functions of the cost curves and a number of para-
meters: π, S_1(i.e. $C_1 - Q_1$), and C_t. Unlike the model of perfect com-
petition under certainty, in which they are variables to be determined,
we now assume them to be exogenously given by other factors, and demonstrate

the effects on the price transferred of different possible levels of
these parameters. The next chapter is an analysis of the important
forces which may be decisive in influencing the level of the parameters.

A. Oligopsony

Oligopsonistic profits can have only one effect: to lower
farm prices.received and to raise total middlman profits.

$$(27) \quad \frac{\partial V_f}{\partial \pi} = \frac{\partial F_1 \cdot C_1}{\partial \pi} + \frac{\partial F_2 \cdot C_2}{\partial \pi} = -f(Q_1)(C_1) - f(H-Q_1)(C_2)$$

$$(28) \quad \frac{\partial R}{\partial \pi} = f(Q_1)(C_1) + f(H-Q_1)(C_2)$$

$$(29) \quad \frac{\partial V_c}{\partial \pi} = 0$$

As can be seen from the derivatives, the only effect of an increasing π
(with fixed harvest size) is to redistribute the value of production from
farmers to middlemen. If farmers respond to the lower prices with a
reduction in output, some of the incidence of oligopsonistic profits
will fall on consumers in the form of higher prices and lower consump-
tion, the more so the greater the elasticity of farm supply and the
lower the elasticity of demand.

B. Large Seasonal Price Increases.

Such marketing studies as are available for underdeveloped
countries indicate that for crops not directly controlled by the govern-
ment and/or not subject to the influence of sizable buffer stocks,
seasonal price fluctuations tend to be severe, of an order of magni-
tude apparently not justified by the costs of physical storage and

working capital.[21] This implies a carry-over out of the harvest

period and a consumption in the inter-harvest period significantly

smaller than that required to equate marginal costs and returns of

physical storage. The causes of such small carry-overs may be many

and will be analyzed below (see Chapter III, pages 60-66 and Chapters

IX and X). But what are their effects on price transferral and

total middleman profits?

1. Effects on Farm Receipts.

First consider the impact of wide seasonal price fluctuations

on the total value of the harvest to farmers. For certain shapes of

the consumer demand function, it can be proved that the smaller the

stocks formed by middlemen in period 1 and sold in period 2, the lower

the average farm price received.[22] This can be seen from the sign of

the first partial derivative of total farm receipts with respect to

increases in consumption in the harvest period (Q_1).

$$V_f = [(1-\gamma)f(Q_1)-m'_1]C_1 + [(1-\gamma)f(Q_2)-m'_2]C_2, \quad Q_2 = H-Q_1, \frac{dQ_2}{dQ_1} = -1.$$

---

21. See, for example, Pereira, I.F. et al., "Variacao Estacional dos
Precos Agricolas no Estado de Sao Paulo", Agricultura em Sao Paulo, X,
4 (Abril, 1963), pp. 1-67; IBRD, The Agricultural Development of Colum-
bia (Washington, May, 1956), pp. 131-132; Mehren, George L., Agricultural
Marketing in Venezuela (Caracas: Consejo de Bienestar Rural, Feb. 1954),
pp. 64-65; Madan, B.K., "Some Observations on the Essentials of a Price
Policy for Foodgrains in India", Indian Journal of Agricultural Economics
XIV, 4 (Oct.-Dec. 1959), p. 54.

22. In this chapter linear demand curves are examined. The ceses of
concave, conves and mixed demand functions are treated in Appendix I.

$$(30) \quad \frac{\partial V_f}{\partial Q_1} = (1-\pi)C_1\frac{df}{dQ_1} + (1-\pi)\frac{df}{dQ_2} \cdot \frac{dQ_2}{dQ_1} \cdot C_2$$

$$= (1-\pi)(C_1\frac{df}{dQ_1} - C_2\frac{df}{dQ_2})$$

If C_2 equals 0, i.e. farmers sell all their output at harvest time,[23] the only effect of increasing Q_1 is to lower consumer price, and therefore farm price, when producers are selling all their output, and the partial is obviously negative over all ranges of $Q_1 > Q_2$, so long as the slope of the demand curve is negative.

If the consumer demand is linear, the partial is also negative (the $\frac{df}{dQ}$'s are equal, and $C_1 > C_2$ by assumption) over the whole range. The poorer the speculation, the poorer the farmer, although, as will be proved, the richer the merchant up to a point.[24] It also follows, then, that maximum farm receipts consistent with middleman's at least covering their marginal costs are obtained in the perfect competition-under-certainty-equilibrium, where intertemporal price rises equal marginal storage costs. Smaller carry-overs, which enable middlemen to cover more than marginal storage costs (smaller carry-overs imply larger price

---

23. This is a reasonable assumption for some crops in Brazil. According-ing to information attained from the Secretaria da Agricultura of the State of Sao Paulo, farmers sell all their cotton within a four to five month period. Best available estimates from the same source and from merchants indicate that perhaps 80 to 90% of rice is sold during or soon after the harvest. Beans are much less systematic in their behavior.

24. With concave demand curves, $\frac{\partial Vf}{\partial Q_1}$ is also negative over the whole range, $C_1 > C_2$. In the convex and mixed cases, it will also be negative over a rather wide range of Q_1/Q_2. See appendix I.

rises) lower total farm receipts.

A simple example may illustrate the general order of magnitude of the loss in farm income resulting from larger seasonal price fluctuations in the linear demand case. Suppose that when marginal costs of physical storage are just covered, price would rise from 100 to 110 over the season. Now assume a decline in carry-over such that prices now rise from 90 to 120 over the season. This means, with $C_1/C_2 = 9$, that farm receipts fall from 1,010 to 930, a decline of almost 8%. As can be seen, such a decline is sufficient to cut seriously into the net income of farmers, which is, of course, considerably smaller than total farm receipts.

2. Effects on Consumer Expenditures.

The effects of distortions in storage on consumer expenditures can be shown in a similar manner:

$$V_c = f(Q_1)Q_1 + f(Q_2)Q_2, \text{ where } Q_2 = H-Q_1$$

$$(31) \frac{\partial V_c}{\partial Q_1} = \frac{df}{dQ_1} Q_1 + \frac{df}{dQ_2} \cdot \frac{dQ_2}{dQ_1} \cdot Q_2 + f(Q_1) + f(Q_2)\frac{dQ_2}{dQ_1}$$

$$= \frac{df}{dQ_1} Q_1 \frac{-df}{dQ_2} Q_2 + f(Q_1) - f(Q_2)$$

With linear demand, $\frac{\partial V_c}{\partial Q_1}$ is always negative when $Q_1 > Q_2$, meaning that any increase in Q_1 ($Q_1 > Q_2$) will lower consumer expenditures on the product.[25] Consumers will be worse off when $Q_1/Q_2 > 1$, if preference

---

25. Consumer expenditures also fall when demand is concave, but may rise should it be convex. See Appendix I.

functions are unchanged over the two period span. The fact that con-
sumer expenditures depend upon carry-over shows that to define the
"intensity" of price transferral as the percentage of average consumer
price which reaches farmers ignores the probably depressant effects
of marketing inefficiency on consumer price itself.

3. Effects on Distribution Profits

Although both farmers and consumers almost certainly are worse
off the higher the Q_1/Q_2, middlemen stand to benefit up to a certain
point from these interseasonal distortions. This can be seen by sol-
ving for that Q_1/Q_2 which maximizes middleman net profits. Maximize

$$R = V_c - V_f - \ell m(C_t) - s(C_1 - Q_1)$$

$$= \ell f_t Q_t - \ell [(1-\pi) f(Q_t) - m_t'] C_t^+ - \ell m(C_t) - s(C_1 - Q_1)$$

subject to $\ell Q_t = H$, and $Q_1 \leq C_1$; $S_2 = S_0 = 0$. $t = 1,2$.

$$(32) \frac{\partial R}{\partial Q_t} = Q_t \frac{df}{dQ_t} + f(Q_t) - C_t (1-\pi) \frac{df}{dQ_t} + (s_1')(j) + \lambda = 0. \quad \begin{array}{l} j=1, t=1. \\ j=0, t=2. \end{array}$$

$$\ell Q_t = H.$$

If demand is linear, Q_1 and Q_2 may be solved explicitly. Adding
the first two equations yields:

$$\ell Q_t \frac{df}{dQ} + \ell f(Q_t) - (1-\pi) \frac{df}{dQ} \ell C_t + s_1' + 2 \rangle = 0.$$

Substituting H for ℓQ_t and ℓC_t and solving gives:

$$\lambda = \frac{-H}{2}\frac{df}{dQ} - \frac{\Sigma\, f(Q_t)}{2} + \frac{H(1-\pi)}{2}\frac{df}{dQ} - \frac{s_1'}{2} \; .$$

Substituting this expression for λ in the first two equations gives:

$$\frac{df(Q_t-H)}{dQ}\frac{}{2}+f(Q_t) - \frac{\Sigma\, f^{(Q_t)}}{2} + \frac{df(1-\pi)}{dQ}\frac{(H-C_t)}{2} + j = 1, \; t = 1$$

$$j = 0, \; t - 2.$$

$$t = 1,2.$$

$$+ \; \frac{s_1'(j)-s_1'}{2} = 0$$

Let $a-bQ_t$ be $f(Q_t)$, the linear demand function. Then,

$$-b(Q_t-H)\frac{}{2}+a-bQ_t-\frac{(2a-b\,\Sigma\,Q_t)}{2}- b(1-\pi)\frac{(H-C_t)}{2}+s_1'(j)-\frac{s_1'}{2} = 0$$

Solving yields:

$$(33) \; \hat{Q}_1 = \frac{H}{2} + \frac{1}{2}(1-\tau)(C_1-H)\frac{}{2}+s_1'\frac{(1)}{(4b)} \; =$$

$$\hat{Q}_2 = \frac{H+(1-\tau)(C_2-H)}{2}\frac{}{2}-s_1'\frac{(1)}{(4b)}$$

Since $C_1 > H/2$, $\hat{Q}_1 > H/2 > \hat{Q}_2$, i.e. there will be some seasonal rise in prices, probably quite substantial. For example, if $\pi = .1$ and $c_1/c_2 = 4$, and storage costs are 0, then $\hat{Q}_1 = (.635)H$ and $\hat{Q}_2 = (.365)H.$ [26]

---

26. For positive storage costs, $\hat{Q}_1/\hat{Q}_2$ will be somewhat larger. The effect of the $s_1'/4b$ terms alone would be to raise prices over the season suffi- ciently to cover one-half of the marginal storage costs. $price_1 = a-b(H/2+s_1'/4b)$; $price_2 = a-b(H/2-s_1'/4b)$. $price_2-price_1 = \frac{s_1'}{2}$.

If all this should occur in an inelastic portion of the demand curve, seasonal price fluctuations would be great indeed. This is an important conclusion, for it shows that within a very wide range, the effects of larger and larger seasonal price fluctuations, whatever their cause, are to raise middleman profits, lower farm receipts and reduce consumer welfare.[27]

The situation can be depicted graphically for the linear case as in the diagram (1). Assume C_1, C_2 and π to be fixed. Then as the Q_1 rises, V_f and $V_c - s(C_1-Q_1) - \{m(C_t)$[28] will behave as shown. The linear demand may be written: $p_t = a - bQ_t$. Substituting this for $f(Q_t)$ in (30) and (31), the slopes of V_f and $V_c - s(C_1-Q_1) - \{m(C_t)$ with respect to Q_1 become, respectively, $(1-\pi)(C_2 b - C_1 b)$ and $(-4bQ_1 + 2bII + s_1')$. When the two slopes are equal, the difference between $V_c - s(C_1-Q_1) - \{m(C_t)$ and V_f is the greatest, and middleman profits are maximized. It will also be noted from the diagram that farm receipts can indeed be raised above their competitive level if middlemen take losses by stocking at such high levels that $Q_1 < Q_2$, while C_1 remains greater than C_2. This implies a systematic seasonal decline in prices, a phenomenon rarely observed in Brazil. This obviously could not be a continuing situation, since losses to speculation would lead to a mass exodus of

---

27. These conclusions hold also for concave and convex demand curves; see Appendix I.

28. I.e., gross receipts less distribution costs.

firms.[29]

Diagram (1)
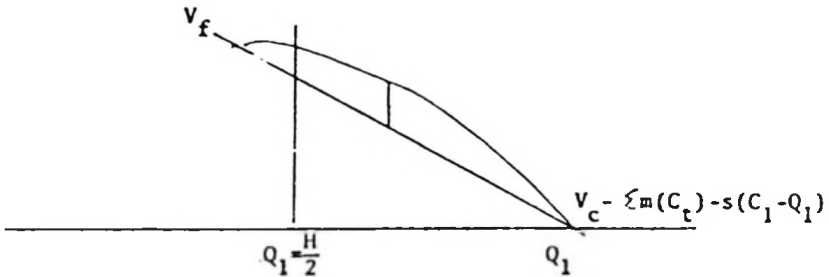
If speculators were a group _separate_ from those who performed spatial distribution, even _greater_ seasonal price rises would be required to maximize their speculative profits. For these speculators the oligopsony profit from distribution over space would be irrelevant, and the maximum conditions would become:[30]

---

29. In Chapter VIII, on speculation in beans, we will find a tendency for seasonal price declines when harvest sizes rise from one year to the next. This seems, however, to be due to large farm carry-over in hope of higher prices rather than large commercial stocks. The bulk of the losses from speculation, then, appear to be suffered by farmers, not middlemen.

30. Let $H-Q_1 = Q_2$, and C_1-Q_1 will be speculator's carry-over. Then maximize $f(H-Q_1)(C_1-Q_1)-f(Q_1)(C_1-Q_1)-s(C_1-Q_1)$ with respect to Q_1.

$\frac{dR}{dQ_1} = \frac{-df}{dQ}(C_1-Q_1)-f(H-Q_1)-\frac{df}{dQ}(C_1-Q_1)+f(Q_1)+s' = 0$.

Substituting $a-bQ_t$ for $f(Q_t)$ and regrouping terms yields:

$4bQ_1 = 2bC_1 + bH + s'$; $Q_1 = \frac{C_1}{2} + \frac{H}{4} + \frac{s'}{4b} = \frac{H}{2} + \frac{1}{2}(C_1 - \frac{H}{2}) - \frac{s'}{4b}$.

$$(34) \quad Q_1 = \frac{H}{2} + \frac{1}{2}(C_1 - \frac{H}{2}) + \frac{s'}{4b}$$

$$Q_2 = \frac{H}{2} + \frac{1}{2}(C_2 - \frac{H}{2}) - \frac{s'}{4b}$$

Comparison of (34) with (33) shows that profit maximization by speculators when they perform no distribution over space requires even smaller carry-overs and even larger seasonal price rises.[31]

This idea will be developed further in Chapter IX when we analyze the diverging interests between smaller merchants who, because of credit limitations, have a much higher Sales/Stock ratio and the larger firms which predominate in the market for stocks.

4. Effects of Greater Farmer Carry-over on Farm Receipts

Now, farmers have a partial defense against "inefficient"[32]

---

31. Lester Telser has derived similar conditions for speculative profit maximizations in a different context, seeking to demonstrate that speculative behavior which maximizes speculative profits also reduces instability as measured by the variance of prices over time. This may be true, but, as Murray Kemp later observed, although profitable speculation under certain restrictions on the demand curve (in this case linear) reduces the variance, minimum variance is attained when speculators make no profits or suffer even losses, viz. when carryover is such as to equate the prices of each period. See Telser, Lester G., "A Theory of Speculation Relating Profitability and Stability", Review of Economics and Statistics, XLI, 3 (Aug., 1959), pp. 295-301; Kemp, Murray C., "Speculation, Profitability, and Price Stability". Review of Economics and Statistics, XLV, 2 (May 1963), pp. 185-189.

32. At this stage, the words "distortion", "inefficient", and "defective" are used only for comparison with perfect competition under certainty. Clearly "defects" in this sense may be efficient if information is costly, leading to a high risk premium in speculation.

middleman speculation by carrying over more of their output them-
selves. With total commercial stocks fixed and $Q_1/Q_2 \leq \hat{Q}_1/\hat{Q}_2$, increased
farm carry-over raises farm receipts and reduces middleman profits.
That profits decline as farm sales in period 2 rise is due to two
facts: Q_1/Q_2 is moving farther from its profit maximizing level.
Even if middlemen held all the additional stocks implied in an in-
crease of C_2, their profits would decline, But secondly, they do
not receive the receipts from the additional carry-over; farmers
do, which reduces profits even more. As to farm income, let S_1,
the level of commercial stocks, be given. Then:

$$Q_1 = C_1 - S_1; \quad Q_2 = C_2 + S_1; \quad C_1 + C_2 = H; \quad \frac{dC_1}{dC_2} = -1.$$

$$V_f = C_1\{(1-\pi)f(C_1-S_1)-m'_1\} + C_2\{(1-\pi)f(C_2+S_1)-m'_2\}$$

(34)
$$\frac{\partial V_f}{\partial C_2} = \{-(1-\pi)f(C_1-S_1)+m'_1\} + \{(1-\pi)f(C_2+S_1)-m'_2\} +$$

$$+\{-(1-\pi)\frac{df}{dQ_1}+m''_1\} C_1 + \{(1-\pi)\frac{df}{dQ_2}-m''_2\} C_2$$

$$= F_2 - F_1 + B, \text{ where F is farm price and B, the sum of}$$

the last two terms, which is positive.

This is positive,[33] indicating that farm receipts can be raised

---

33. In (35), $\{(1-\pi)f(C_1-S_1)\} < \{(1-\pi)f(C_2+S_1)\}$, since price will be
higher in the second period. $\{m'_1\} > \{m'_2\}$, since $C_1 > C_2$ and m is mono-
tonically rising. Therefore, the sum of the first two terms is positive.
The sum of the second two terms depends upon the second derivatives of
the cost of spatial distribution function. Since $m''_1/m''_2 > C_2/C_1$, $(C_1 > C_2$,
$m'' = 0)$, the sum of the second two terms is also positive.

by increasing producer carry-over. This would be carried to the point

at which $F_2 - F_1 + B =$ farmers' marginal costs of storage.[34] The prob-

lem here is that the credit and physical storage facilities available

to producers may put rather narrow limits upon their retention of out-

put, as may commitments to sell to merchants in liquidation of loans.

Thus raising C_2/C_1 may not in practice be a very effective instrument

in compensating for defective middleman speculation. In addition, it

is an instrument likely to be of benefit primarily to the larger, more

affluent farmers with access to some bank credit.

5. Conflict of Interests Between Farmers and Middlemen.

The conflict of interest between farmers, consumers and middle-

men can perhaps be shown more vividly in another fashion. Which levels

of Q_1/Q_2 and C_2 maximize (1) commercial profits and (2) average farm

prices?

Clearly C_2, farmers' stocks, serves only to reduce the maximum

attainable middlemen profit level. Commerical profit maximization re-

quires, then, that $C_2 = 0$ and from (33) that

$$\hat{Q}_1 = H/2 + (1-\pi)H/4 + \frac{s_1'}{4_b}$$

---

34. It should be noted that this carry-over would be somewhat larger
than that which individual competitive farmers would choose in order to
maximize their own profits, i.e. in equilibrium the rise in prices (F_2-F_1)
will not be sufficient to cover marginal storage costs. This arises
from the B tern which takes into account the differential impact of an
increase in carry-over in raising receipts in the first period and lower-
ing them in the second. As long as $C_1 > C_2$ the marginal return of in-
creasing carry-over will be somewhat larger than the price difference
(F_2-F_1) alone.

$$(36) \quad \hat{Q} = H/2 - (1 - \pi)H/4 - \frac{s_1'}{4_b}$$

Farm income will be lower in this case than at any profit maximization
with $C_2 \geq 0$.

Intuitively one might think that farmers could gain by playing
a game similar to the middleman's, viz. more than offsetting, by holding
all stocks in the interharvest, the price declines resulting from
flooding the consumer market in the harvest period. This is not so.
Suppose, somehow, that a farmers' cooperative had a monopoly in stor-
age,but did not engage in spatial distribution. Suppose further that
it stored at the consumption point (irrationally, as it turns out,
with a montonically rising cost function of distribution over space),
subject to the same storage cost function as previously middlemen had
been. The cooperative goes ahead buying saptial distribution services
from intermediaries, paying their marginal cost. Then the problem is
to determine the carry-over which will maximize the profits of the
cooperative.

Maximize:

$$R_F = f(Q_1)Q_1 + f(H-Q_1)(H-Q_1) - m_2'H - s(H-Q_1)$$

$$(36a) \quad \frac{dR_F}{dQ_1} = 0 = f(Q_1) - f(H-Q_1) + \frac{df}{dQ} \cdot Q_1 - \frac{df}{dQ}(H-Q_1) + s_1'$$

Substituting $a + bQ$ for $f(Q)$:

$$0 = -4bQ_1 + abH + s_1'$$

Solving yields:

$$\hat{Q}_1 = \frac{H}{2} + \frac{s_1'}{4b}$$

(36b)
$$Q_2 = \frac{H}{2} - \frac{s_1'}{4b}$$

Thus a farmer storage monopoly maximizing total receipts for a given harvest will behave very differently from a middleman monopoly. The latter would lead to wide departures from efficient allocation over time, whereas the former would carry over even more than speculators under perfect competition and certainty. Only one- half of the marginal costs of storage would be covered in the total receipts maximizing equilibrium: $P_1 = a-b(H/2+s'/4b)$, $P_2 + a-b(H/2-s'/4b)$; $P_2 - P_1 = s'/2$. This arises because the farmer monopoly would take into account the depressant effects of smaller carry-over upon total receipts in the harvest and interharvest periods--the $\frac{df}{dQ} \cdot Q_1 - \frac{df}{dQ}(H-Q_1)$ terms of (36a)-- and not, as a perfect competiter, upon only a minute proportion of these receipts. Although "inefficient", a farmer monopoly would coincide much more with consumer interests than a middleman monopoly.

C. Shifts in the Cost Function, Quasi-Rents.

The influence of cost reducing innovations (or any change in costs) is straightforward. A reduction in transactions and handling costs arising, for example, from the elimination of one or more breaks in the channels of marketing, will lower marginal distribution costs at all levels and will in the model raise average farm price received, ceteris paribus. If farm production did not respond to higher prices, consumer prices would be unaffected by the improvement in marketing. The passing on of lower marketing costs in the form of lower consumer

prices depends upon their feedback through farm production. If, at the
opposite extreme, the farm supply were perfectly elastic, all of the re-
duction would ultimately accrue as lower consumer prices.

Quasi-rents do not appear explicitly, but in a country like Bra-
zil may be substantial in certain periods and certain regions. In terms of
the model, a quasi-rent implies that the weighted marginal costs of distri-
bution are greater than average costs and this will occur if there is some
lag in the level in marketing investment in relation to farm production. As
will be shown below, the lag or maladjustment need not be in the distribution
sector per se, but may originate in the transport sector. Even so, the quasi-
rent from it may be absorbed by middlemen under certain conditions (see
Chapter III, pp. 57-60).

D. Derived Demand Shifts

Summarizing the effects of the parameters, upon average price
received by farmers for any given harvest, increases in π , m, and Q_1/Q_2,
$Q_1 > Q_2$, all reduce farm income. Storage costs will have only an indirect
influence, insofar as they help determine Q_1/Q_2. Increases in π , Q_1/Q_2
and quasi-rents swell distribution profits.

Returning to the concept of derived demand, the effect of in-
creases in each of the parameters is to shift downward the derived demand
for farm products. In Diagram (2), let DD' be twice the one period con-
sumer demand function,[35] and FF', the derived demand for

35. This is only to give a point of reference, and shows the average price
consumers would pay were $Q_1 = Q_2$. If DD' were to depict, instead the average
consumer price as a function of the harvest size, it also would depend on
the parameter Q_1/Q_2.

farm output assuming perfect competition in long-run equilibrium. Then
ff' will be another derive demand, corresponding to higher levels of
π, m and Q_1/Q_2 than dictated by perfect competition. If SS' is the
farm supply curve, the effects of the lower ddrived demand are to di-
minish farm output and raise consumer prices, just how much in each
case depending upon the elasticities of supply and demand. Reduce any
one of these three parameters, and farm output will rise and consumer
price will fall.

Diagram (2)
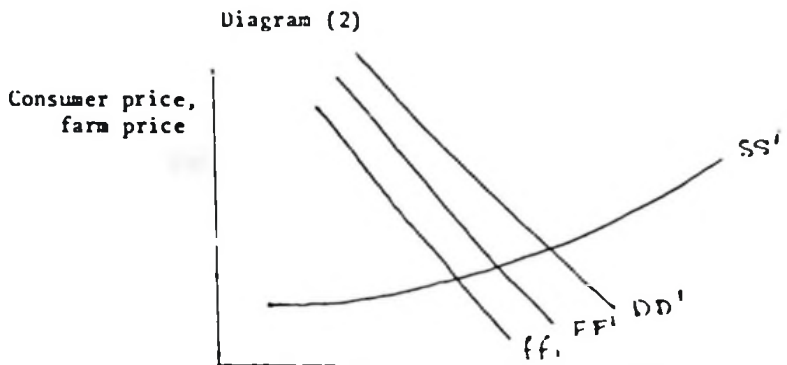
E. Two Harvest-Four Period Time Horizon

Although the concept of derived demand loses most of its valid-
ity for a time horizon longer than one harvest when crop sizes fluctuate,
much the same conclusions hold as to the effects of the parameters on
price transferred. Clearly, larger π's and higher m's will lower the
price received by farmers for their total production.

The importance of the four period case is that it allows a
smoothing out of price fluctuations from harvest to harvest. However,

middlemen <u>again</u> maximize their profits at levels of carry-over which will

cause wide increases in prices over the four period time horizon.

Maximize:

$$R = \sum_1^4 f(Q_t)Q_t - \sum_1 C_t[(1-\pi)f(Q_t) - m'] - \sum_1^3 s(S_t)^{36} - \sum_1^t m(C_t),$$

subject to $\sum Q_t = H$, the sum of the two harvests.

$$S_o = S_4 = 0 \text{ and } S_t = (S_{t-1} + C_t - Q_t).$$

$$t = 1...4.$$

(37) $\dfrac{\partial R}{\partial Q_t} = Q_t \dfrac{df}{dQ_t} + f(Q_t) - (1-\pi)C_t \dfrac{df}{dQ_t} + \sum_t^3 s_t' + = \lambda o^{37}$ $t=1...4.$

$$\sum Q_t = H.$$

Summing over the first four equations in a linear case and substituting

H for $\sum Q_t$ and $\sum C_t$ gives:

$$0 = \frac{df}{dQ} H + \sum f(Q_t) - \frac{df}{dQ} (1-\pi) H + (3s_3'+2s_2'+s_1') + 4\lambda$$

$$\lambda = \frac{-df}{dQ} H/4 - \sum f(Q_t)/4 + \frac{df}{dQ} (1-\pi) H/4 - (3s_3'+2s_2'+s_1')/4$$

Calling the s' term "z" and substituting for λ in each of the first

four equations yields:

$$0 = \frac{df}{dQ} Q_t - \frac{df}{dQ} H/4 + f(Q_t) - \sum f(Q_t)/4 - (1-\pi)\frac{df}{dQ}(C_t - H/4) + \sum_{t=t}^3 s_t' - z.$$

---

36. No cost of storage function appears for carry-over out of period 4, which is 0 by assumption. $S_1=(C_1-Q_1)$, $S_2=(s_1+C_2-Q_2)$ and $S_3=(s_2+C_3-Q_3)$.

37. $\dfrac{\partial \sum s}{\partial Q_t} = s_t' + s_{t+1}' + ...s_3'$, i.e. increases in Q_t affect storage costs only in period t and subsequent periods through period 3.

Letting $a - bQ_t = f(Q_t)$ and solving yields:

(38) $\quad Q_t = H/4 + 1/2 \, (1 - \pi)(C_t - H/4) + \left(\sum_{t=t}^{3} \right) \, s_t' - z)/2b$

Again these patterns would lead to large price increases over the four periods.[38] Suppose $\pi = .1$, storage costs $= 0$, the first harvest $= 160$ and the second, 100, with $C_1/C_2 = 4$ in both harvests. Then four period consumption pattern would be: 93.35, 50.15, 71.75 and 44.75. With marginal storage costs equal to 0, the optimum would obviously have been 65 in each period. Total carry-over from one harvest to the next is 16.5 when commercial profits are maximized instead of the 30 implied in the perfect competition-certainty model.

The effects of seasonal patterns similar to this upon average farm prices are clear--nto that one would encounter in practice fluctuations nearly so extreme as those implied in the pattern which maximize middlemen profits with linear demand. But in Brazil it seems very likely that carry-over from harvest to harvest in response to crop failures is quite reduced, and that which does occur influences prices primarily in the last half of the crop year out of which carry-over is undertaken. In addition, speculation within the lean year often tends to be highly inadequate, even with the additional carry-over from the bumper crop. (See Chapter VI, pp.   and chapter VIII) This means a deviation in consumption patterns moving toward higher levels of commercial profits

---

38. These conclusions apply again with little qualification to the convex and concave cases. See Appendix 1.

and a reduction in average farm prices.

That farm prices will be adversely affected by inflated con-
sumption in the first year can be seen by pairing the consumption of
period 1 with that of either period 3 or period 4, with the consumption
of period 2 held constant, and determining the change in total farm
receipts with respectto an increase in the consumption in the harvest
period of the large crop year (reduction in consumption in the paired
period.).

$$V_f = (1-\pi)[f(Q_1)C_1 + f(Q_2)C_2 + f(Q_3)C_3 + f(Q_4)C_4].^{39}$$

Let $\Delta Q_1 = -\Delta Q_3$. This will be represented by Q_{ij}, where i is the
period in which consumption is increased and j, the period which
suffers the corresponding reduction.

$$(39) \quad \frac{\partial V_f}{\partial Q_{13}} = (1-\pi)(\frac{df}{dQ} c_1 - \frac{df}{dQ} c_3)$$

Let $\Delta Q_1 = -\Delta Q_4$.

$$(40) \quad \frac{\partial V_f}{\partial Q_{14}} = (1-\pi)(\frac{df}{dQ} c_1 - \frac{df}{dQ} c_4)$$

In the linear demand case with $C_1 > C_3 > C_4$, both of these derivatives
are negative, indicating that a failure to carry more out of the har-
vest period of the bumper year adversely affects farm receipts regardless
of the period of the second year in which it would have been consumed.

---

39. The $m'(C_t)$ terms are irrelevant for this problem: they contain no
Q_t's and are not multiplied or divided by any Q_t. They are therefore
omitted.

Suppose, on the other hand, that all of the carry-over from the bumper crop came out of the <u>second</u> period of that year, because, say, of some unforeseen climatic calamity occurring in that period. Then farmers will gain by some middleman carry-over <u>if</u> it is finally sold in period 4, but not if sold in period 3, when they are disposing of the bulk of their harvest.

$$(41) \quad \frac{\partial V_f}{Q_{42}} = (1-\pi)(\frac{df}{dQ} C_4 \frac{df}{dQ} c_2)$$

$$(42) \quad \frac{\partial V_f}{Q_{32}} = (1-\pi)(\frac{df}{dQ}c_3 - \frac{df}{dQ} C_2)$$

(41) is positive and (42) negative, $C_3 > C_2 > C_4$.

There is no need to explore the ramifications of this four period model further. The main point is that <u>low</u> carry-over from harvest to harvest acts in the same way as low carry-over from season to season, viz., to depress farm prices and raise middleman profits. How much depends, of course, upon the values of C_1/C_2 in the two harvests. And while it is really too rigid to require them to be identical in large and small harvests, the room for variation may, for institutional reasons, be rather narrow (as in the case of rice in Brazil), or may actually lead to perverse movements in C_1/C_2 (as in a short harvest of beans in Brazil).

III. CONCLUSION

Thus the performance of the market system can powerfully affect the level of the price incentive received by farmers, and to the extent

that farm output is determined by its expected return, the level of output itself. Oligopsony, lags in marketing investment, and poor speculation all have been seen to reduce farm income in our simplified model of the market system, while cost reducing innovations will tend to raise it in dependence upon the supply and demand elasticities. In Chapter III, we turn to a summary analysis of the main elements which have been important in creating such characteristics in the Brazilian marketing system in recent decades.

CHAPTER III
STRUCTURAL FACTORS DETERMINING PRICE TRANSFERRAL
1.

In this chapter, many of the institutional and economic factors tending to create oligopsony or non-competitive behavior, inefficient speculation, small scale firms, and forces tending to increase or reduce the number of breaks in a marketing system are analyzed briefly. Although each of the factors analyzed has been important in varying degrees and different times in Brazil, the discussion is meant to be applicable to any marketing system with these characteristics.

I. Oligopsony-Oligopoly.

Three conditions common in underdeveloped countries and often present in Brazil[1] encourage the non-competitive operation of oligopsony: (1) small numbers of commercial buyers; (2) bad information on the part of the farmers about what prices should be; (3) farmers' obligations to liquidate during the harvest loans extended by middlemen. This last characteristic greatly shortens the period over which oligopsony must operate effectively.

Local farm markets are usually characterized by their small numbers of permanently established buyers.[2] Moreover, the poorer the trans-

---

1. As will be seen in later chapters, Brazil of the 1940's and even early 1950's approximated these conditions, but a tremendous effort to expand agricultural credit together with rapid construction of roads has greatly weakened them.

2. This appears to be an unavoidable consequence of economies of scale in distribution which can be largely offset by easy access to other farm markets either by truck or by phone.

port and communications systems available to farmers,[3] the fewer the local
markets economically open to them and the smaller the area which can be
served by each local market. The resulting small size of local markets,
coupled with the relative immobility of farmers in making sales, is in-
evitably conducive to oligopsony.

The oligopsony's operation would be limited by the possibility
of the sporadic entry of outside buyers when local prices were far out
of line. But outsiders suffer a distinct disadvantage in buying. They
do not know the local producers, and their costs of entry will likely
be considerably higher than the marginal operating costs of an already
established merchant. This disadvantage will be attenuated but not dissi-
pated if the road and communications systems are tolerable, thus giving
the outsider greater flexibility in shifting from one market to another
in response to price differentials. Poor transport and communications
tend to strengthen the local oligopsony and raise the threshold of price
disparity at which entry into the market becomes profitable.

If the integration of the several larger regional markets is
also weak,[4] it is probable that farm market oligopsonists will themselves

---

3. i.e. road transport, since shipment by railroad before sale or con-
signment to a merchant is an absurdly costly alternative.

4. An almost universal characteristic of underdeveloped countries. See
for example, IBRD, op.cit., pp.127-128, and FAO National Food Reserve
Policies in Underdeveloped Countries, FAO Commodity Policy Studies No. 11
(Rome 1958) p.26. This appears, more than anything a consequence of de-
ficient, i.e. very costly, transport and communications between regions.

face oligopsonists, the buyers from the few large centers of consumption served by the producing area. The local oligopsonist loses his market power in this confrontation and becomes one more competitive seller, as numerous local oligopsonists attempt to place their product. In the process wholesalers are likely to absorb some of the local oligopsonist's profit.

Several factors might tend to create oligopsony from the large consumer centers. Given the certainty of economies of scale in this field,[5] the market may be able to support but a few firms which buy regularly in farm areas (especially if the market be divided into many non-competing regions). The system of transport may be important in determining the magnitude of scale economies. If rail transport is the only feasible alternative, many smaller firms will be excluded from the markets in the "interior." Not only are carload lots considerably larger than normal truck capacity, but shipment by rail may require a more or less permanent organisation in the interior which smaller firms cannot economically maintain. For whatever the reason, oligopoloid elements are frequently characteristic of food marketing systems.[6] Given frequent farmer ignorance of harvest and market conditions elsewhere and in many cases a

5. Empirical cost functions in marketing are practically non-existent. But see Galbraith, J.K. and Richard H. Holton, op.cit., pp.86-106, and Richard H. Holton, "On the Measurement of Excess Capacity in Retailing," in Review of Economic Studies, XXIV, 1, (No. 63) 1956-57, pp.43-46.

6. Mehren, George L., Market Organization and Economic Development," Journal of Farm Economics, XLI, 5, December 1959, pp. 1307-15.

"live and let live" market sharing attitude of merchants,[7] tacit or explicit oligopsonistic agreements to depress farm prices below their competitive levels may be common. In this study abundant evidence on this count will be presented for Brazil.

Another common institution in low income market systems,[8] the merchant-moneylender system, tends to reinforce oligopsonistic behavior in local farm markets. Bank credit, especially for the smaller farmers who tend to dominate the production of food,[9] is often not available. Given a scarcity of credit in general, the slow turnover of loans for agricultural working capital and the difficulty of policing them, the possibility of sizable commercial bank loans to most farmers is excluded.

Unless official credit is extended on a subsidized basis, the advantage of the middleman in both costs of administration and lower risk is complete. His collateral is the future harvest, which in his business has a positive convenience yield in contrast to banks, for which the necessity to foreclose on collateral involves costs, not yields. His return is not only the rate of interest he charges on the loan, but also

---

7. Galbraith, J.K. and Richard H. Holton, op.cit., pp.67-69.

8. Extremely common in Brazil until very recent times when expansion of official credit to agriculture and an apparent decline in the purchasing power of middlemen's working capital have led to a substantial decline in its importance. See Chapter VII.

9. See Chapter V. for a discussion of this characteristic in Brazil. Also Bottomley, Anthony, "The Determination of Pure Rates of Interest in Underdeveloped Rural Areas," Review of Economics and Statistics, XLVI, 3, (August 1964) p.301 and the works there cited.

the farmers' commitment to sell to him and often the power to stipulate the sale price before market conditions become known.[10]   He is able to police and administer the loan through frequent contacts with the farmer, supplying him in kind as the necessity arises.

The greater the proportion of the harvest committed to middlemen through these tied loans, the greater the gain and feasibility of oligopsonistic arrangements on purchase prices. An increase in buying prices on the part of any one middleman would yield much smaller gains to him than without the loan arrangements, even if the other merchants did not retaliate. Furthermore, if farmers are committed to sell at market, rather than prestipulated prices, an individual middleman might even lose by increasing his purchase price, depending upon how much of his total sales capacity is secured by loans.

Generally these loans will come due within a rather short period of time during the harvest, so that the <u>period</u> over which an oligopsony has to function "efficiently" in order to make it profitable is relatively short, again increasing the feasibility of concerted oligopsonistic action. This does not make lower than competitive prices a certainty, but it does indicate that this is at least a strong possibility.

In addition to strengthening oligopsonies, the merchant-moneylender system may yield extraordinary direct net interest returns to middlemen above and beyond the costs of administration and the necessary

10.   Abbott, J.C., <u>Marketing Problems and Improvement Programs</u> (Rome; FAO), 1958, pp.107-11, and Chapter V.

payment for risk. Given the very high rates which such loans have re-
ceived at times,[11] it appears that the loans market may suffer from im-
portant imperfections. First, this market is itself oligopolistic. It
is virtually impossible for outsiders to enter it, although they may
operate through local middlemen. But the important precondition for an
effective oligopoly in farm loans, and which overshadows the latter's im-
portance, is that commercial working capital available for such loans
may receive a scarcity value far above its actual opportunity cost.
Credit availability to middlemen is not dependent primarily upon the
profits of the uses to which it could be put. Merchants' credit lines
at banks are limited by their collateral, which does not include farmers'
promises to sell.[12] Especially if the sector is characterized by
small, unstable firms, the credit limits of middlemen in relation to their
own capital may be quite small, short of borrowing at usurous rates of
interest. Thus, there is no guarantee or even likelihood that working
capital available to marketing firms for farm lending will reach that
level which competition in a perfect market would dictate.

---

11. For Brazil see, e.g., Klein and Saks, O Problema da Alimentacão no
Brasil, Rio de Janeiro, Comissão de Desenvoltimento Industrial, 1954,
p.75, where interest rates as high as 3-5% per month were common in the
State of Rio Grande do Sul in the 1950's; Caio Prado, Jr., "Nova Con-
tribuicão para a Analise da Questão Agrária no Brasil." Revista Brasiliense,
São Paulo, No. 43, September-October 1962, pp. 27-28, where real rates
as high as 60% are cited. See also, Chandavakar, A.G., "The Premium for
Risk as a Determinant of Interest Rates in Underdeveloped Rural Areas:
Comment," The Quarterly Journal of Economics, LXXIX, 2 (May, 1965), pp.332-5.

12. Anthony Bottomley also raises this point. Bottomley, op.cit.,pp.303-4.

Although tho interest received on farmsloans is a return to
crodit extended, it may be considored as part of the parameter II of the
previous chapter.   Chapters V,VI,VII willexamine market structure and its
relation to crodit in Brazil.

II.   Lags in Marketing Investment.

"Unbalanced" growth betwoen farm output and the supply of
marketing services and facilities--a lag in marketing investment or
entrepreneurship--may affect all the parameters in the model. It is
perhaps for this reason, and certainly because the problem is more amen-
able to straightforward treatment, that planners in undordeveloped coun-
tries have concentrated their efforts on it.[13]

Especially in a country with rapid growth in farm output on
an expanding frontier, as in Brazil, there will likely appear a signif-
icant lagfin both public and private investment in response to farm
output. The backward linkage from farm production and consumer demand
will create a quasi-rent, which then serves as a stimulus for the entry
of new middlemen and for the improvement of social overhead facilities
in transport and warehousing. Restrictions in public investment will
aggravate the disequilibrium in the private sector.

q   The nature of thh quasi-rent problem for any particular re-
gion can be better understood by relaxing the fixed coefficient restric-

13.   Collins, Norman R. and Richard H. Holton, op.cit., pp. 123-126.

tion on the distribution production function (see p.2Q, Chapter II,
above).

$$O_t = f \text{ (transactions, handling, transport, storage and farm output sold)}$$

where O_t is the volume of the region's output placed in the urban
wholesale markets in period t. Assume that the volume of farm sales
in each period is given, along with both present and future expected
wholesale prices. The problem is to determine the quasi-rent which would
accrue in a competivive market.

All of the marketing activities are to some degree substitutes
for farm output, since each, by reducing physical losses and deterioration,
can raise the effective wholesale supply of output. Given O_t and farm
output marketed, storage and transportation are primarily complements of
each other.

Now, when marketing investment lags, farm output will surpass
that level which can be marketed at minimum cost, and a quasi-rent will
be paid to one or all of the marketing activities. It is particularly
interesting to observe the effects of deficient capacities in public
transport. Suppose the railroad is the main form of transport from the
region, and that equipment is insufficient to move enough output from the
region to avoid high marginal costs of storage above the minimum average
and serious risks of spoilage in handling, transport and storage. Then,
although rail rates may be fixed independently of the degree of capacity
utilized at any particular time, risks of physical loss and delays in
transportation (which increase price risk)raise the effective cost of

transport to the middleman. (see Diagram I) In addition, these costs

may become so high as to force him to store rather than ship. If

storage is already "inadequate," its cost will rise even more.

Diagram (1)

Transport Rate
Effective cost
of transport

Effective cost
of transport
to merchants

Rate

Output transported
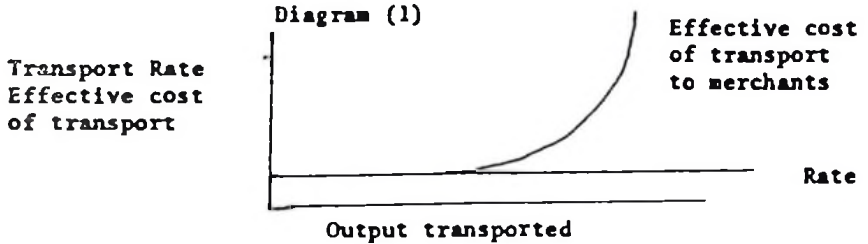
There is one curious result here. The quasi-rent arising

from deficient transport with fixed rates will accrue to middlemen,

since the other marketing activities are partial substitutes for it. If

on the other hand, road transport predominates, this will occur to a

lesser degree, since increases in the availability of truck transport

after a certain point will be possible only through increases in truck

rates. In both cases, however, there will be a quasi-rent incentive to

expand marketing facilities: in the first, for the middleman to increase

his storage capacity and in the second, an additional incentive to in-

crease the fleet of trucks available in the harvest.

Investment lags in new regions may also be associated with

a higher effective concentration in distribution itself. The early

innovators may be few in number, thus facilitating effective operation

of oligopsony. The investment lag, creating as it does, a certain

chaos in the market, may also contribute to the establishment of farm

prices below even those warranted by the quasi-rent. In Chapters V

and VI , the typical expansion pattern in Brazil will be analyzed;

(1) swarms of farmers moving in; (2) a few middleman innovators who rise
to monopoloid dominance of the area; (3) swarms of commercial innova-
tors cutting into the original firms, eliminating most of the quasi-rent
and oligopsony profits. Thus, it will be argued that private investment
"lags" are temporary and generally tend to be eliminated over time, if
public investment in transport   facilities is more or less adequate.
This does not mean they are unimportant in Brazil,where the agricultural
frontier is constantly expanding at a rapid rate.

III. Factors Tending Toward Inadequately Small Carry-Overs.

Bad market, crop, and stock information, inadequate storage
facilities and credit facilities seem to be the principal causes of
ineffective speculation in many underdeveloped countries. In Brazil,
for example, the basic information necessary for fairly decent specula-
tion under uncertainty--the level of production, the size of stocks and
their location, the area planted for next year's harvest, etc.--is
either not available (or available much too late to be useful) or of
atrocious quality, completely unreliable for purposes of estimating
future price movements. Merchants must rely on their own private
sources of information, always very tentative and crude. The marginal
cost of improving the quantity and quality of information for the indi-
vidual firm is so high that each tends to gather very little more in-
formation than accrues almost automatically in the operation of the business.

The importance of this is to raise considerably the ex ante
"risk premium" necessary to obtain a given carry-over. In spite of the

objections raised to the existence ex post of a risk premium in futures

markets in the United States by some writers (and they are by no means

convincing),[14] it is a useful tool for analysis of the behavior of the

behavior of the individual firm. Simply put, it states that the greater

the possibility that ex post results will diverge from ex ante expecta-

tions, the greater must be the ex ante risk premium. In commodity

speculation over time, the individual's supply of storage (demand for

stocks) would take the following form:

---

14. The concept of "normal backwardation" in futures markets, which is
directly tied to the risk premium, goes back to J. M. Keynes, Treatise
on Money (London, 1930), Vol. II, pp.142-44, and is employed by
J. R. Hicks, Value and Capital (Oxford, 1939), pp. 137-39. In more
recent empirical research, H. S. Houthakker, P. H. Cootner and M. J.
Brennan claim to have detected an ex post risk premium in a number of
futures markets. Houthakker, "Can Speculators Forecast Prices?", Review
of Economics and Statistics, XXXIX, 2 (May, 1957), pp. 153-157;
Brennan, op.cit.; Cootner, "Returns to Speculators: Telser vs. Keynes",
The Journal of Political Economy, LXVIII, 4 (August, 1960), pp. 396-404.

Roger Gray effectively questions some of the statistical procedures
and the necessity of using the risk premium concept to explain upward
biases in futures prices. "The Search for a Risk Premium", Journal of .
Political Economy, LXIX, 3 (June, 1961), pp. 250-60, but his ad hoc
treatment of the individual futures markets, although interesting, is
inadequate. One cannot explain a systematic upward bias in wheat
futures at Minneapolis by a consistently erroneous assumption by long
speculators that the contract will in the end be liquidated with a low
protein wheat! (p. 258).

Lester Telser first performs tests which indicate the absence of
an ex post risk premium in cotton and wheat futures. "Futures
Trading and the Storage of Cotton and Wheat", The Journal of Political
Economy, LXIV, 3 (June, 1958), pp. 233-255. Then, under attack from
Cootner, he performs more powerful tests which show the presence of risk
premia in some of the contracts for corn, wheat and cotton. "Reply", The
Journal of Political Economy, LXVIII, 4 (August, 1960), pp. 404-415.
The trend of empirical work seems to be in favor of normal backwardation.

$$P^*_{t+1} - P_t = s'(S_t) + r + c$$

where P^* is expected price, r is the risk premium and c, the convenience yield of holding stocks.

The poorer the information, the higher the risk premium, i.e. the higher must be the marginal expected return from storage. Given each individual's expectations, the greater the uncertainty with which they are held, the lower will be the total carry-over and therefore the higher the price rise over the season. There is no necessity to resort to the untenable concept of "market expectations."[15]

Consider the following one-year harvest pattern: the harvest occurs in months 1-3 and next year's crop is planted in months 7 and 8. In general, suppose the quality and quantity of information necessary for judging future prices improves over the season, i.e. that the variance of the distribution of possible returns falls. This means that the risk premium necessary for each carry-over level will fall over time, as in Diagram (2).

---

15. It really makes no sense to talk about "market expectations" in a commodity without futures contracts. Even with futures markets, the only real meaning of the term could be the expectations of the marginal buyers and sellers. But even this is very tenuous, given the possibility of offsetting differences of expected prices and ex ante risk premia in the marginal buyers and sellers. In addition, the form of expectations certainly vary from individual to individual, i.e. one may think that price will be x or above, while another may think only that it will rise "a lot", etc. See Hawtrey, R. G. "Mr. Kaldor and the Futures Market", Review of Economic Studies, VII, 3, pp. 203-205. But Hawtrey appears to be wrong when he asserts that if everyone held the same expectations, there would be no speculation. This ignores the fact that holders of physical stocks may be willing to assume this risk for a price. In this case speculators would give less weight to risk in their utility functions than would hedgers, a not unlikely hypothesis.

Diagram (2)
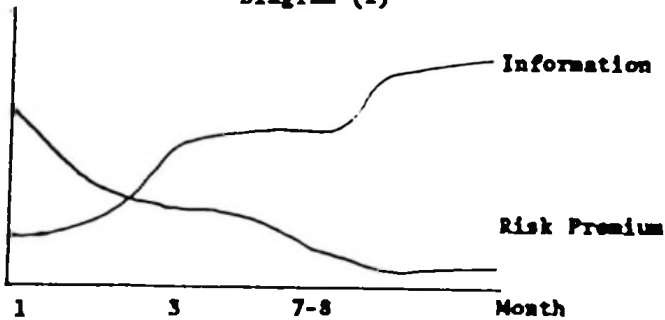
With bad production and other statistics, an idea of the rel-
ative size of this year's harvest can be had only after farmers have sold
much of their crop. In fact, the magnitude of farm sales may be the
middleman's most important indicator of harvest size. In the earlier
stages of the season, only the most tenuous estimates can be made, and
expectations as to prices as far away as the 7th or 8th month may not
even be attempted. Very few speculators will be forming sizable stocks.
The result is a tendency to reduce carry-over from the harvest into the
inter-harvest period, to delay the formation of commercial stocks until
after the average monthly availability of the crop for the restoof the
season is lower than it was at the beginning of the harvest.

Expectations concerning next year's price may not be formed
until very late. The certainty with which they can be made earlier
depends upon the characteristics of this year's harvest and the typical
behavior of farmers in response to current year prices. Area planted
and yield determine total output. Merchants may have an idea of
"normal" yield and farmers' planting in response to the previous year's
price. It might be something like Diagram (3) in which the supply

function traces out farmers' planned output in response to last year's price assuming normal weather conditions. The stochastic distribution around it reflects the yield variations in response to weather fluctuations.

Diagram (3)

Price, períòd t-1

Area x yield, períòd t
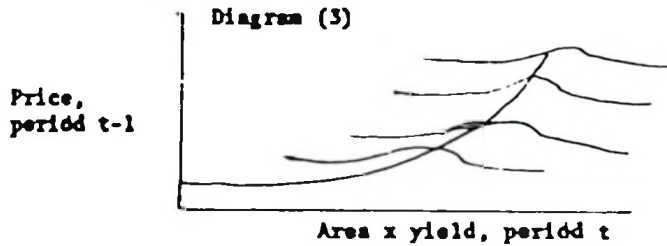
At the extremes, some estimates of the direction of change in next year's prices, although not the magnitude could be made, as soon as a reasonable idea of the relation of this year's yield to the normal and its average price in relation to the previous year's is obtained. If this year's harvest benefitted both from large acreage and abnormally high yields and price is low, middlemen could be fairly safe in predicting a price rise for next year before the crop is even planted. Or if this year's acreage and yield were abnormally low and price high, a price decline would probably be in the offing. Intermediate possibilities lead to less certain general expectations as shown in Table (1).

Table (1)

Direction of Change, Next Year's Price (t+1)

Price \ Yield Price$_{t-1}$	Low	Normal	High
High	Fall	Rise	?
Same	Rise	??	Fall
Low	?	Fall	Rise

Even in the most favorable of cases, projecting expectations as to the direction of price changes based only on this year's yield and price is risky. Neither the response to price nor future yields is known with precision, and many unforeseen climatic events may _retard_ or _speed_ up next year's crop, even though prediction of planting and yields were accurate.

Carry-over in response to next year's harvest is likely to be delayed, then, until the final months of the current year when more concrete estimates of area planted and probably yields can be made, and, except in the most extreme cases of area and yield, would involve a high _ex ante_ risk premium. On the average we would expect large seasonal and inter-seasonal price fluctuations. Especially speculation in response to harvest fluctuations is likely to be ineffective.

The most common explanation of wide seasonal price fluctuations in underdeveloped countries is storage facilities deficient both in quantity and quality. Storage capacity lower than "requirements" as determined by production, consumption and the capacity of the transport system will clearly restrict carry-over, and together with poor storage technique, will lead to large spoilage rates, again tending to augment price increase over the season.

It will be argued in this study that this explanation has been overdone, especially when gaps in storage capacity are presented merely as data in the problem, as so often occurs in official reports. Storage capacity is not independent, in fact, of the kinds and qualities of information available in making speculative decisions. A high

risk premium implies a lower equilibrium storage capacity, and most
certainly much of the deficit often encountered in physical space
for storing may be explained by the risks of speculation.

In the second place, alternative rates of return on capital
may be high in underdeveloped countries. Since storage facilities
are likely to be more capital intensive relative to farming in under-
developed countries, it would not be surprising if storage costs in
relation to food prices were high.

Finally, it will be argued in this study that in Brazil
limitations on working capital are probably more important than storage
space in deterring the formation of commercial stocks when their
expected return is high.[16]

IV. Number of Breaks in Marketing Channels and the Scale of Marketing Fin

Gross margins are profoundly affected by the number of breaks
in marketing channels and the size of the marketing firm. In turn,
these two factors are rather intimately interrelated. The greater
number of breaks in the marketing system, the higher the transactions and

---

16. Not one of the Brazilian merchants interviewed mentions lack of
storage space as a factor which has deterred his formation of
stocks. The factor always mentioned as most important was lack of
working capital. When explicitly questioned further, all middlemen said
they have never not stocked because of lack of storage space: This
contrasts strongly with the official position that storage space is
a grave problem, necessitating large investments in public warehouses
and silos.

handling costs, _ceteris paribus_. The smaller the scale of the firm in conditions of economies to scale, the higher the marginal distribution costs. Finally, the smaller the scale of the firm, the smaller will be the possibilities of cost saving through vertical integration.

The principal element determining the number and location of breaks in marketing channels is the system of transportation and communications. It is well-known, for example, that in the United States the predominance of the railroad before the 1920's was conducive to the centralization of marketing channels around a few large terminal markets which were hubs of vast rail networks, e.g. Chicago and Kansas City. Distribution channels in these conditions had breaks at least at the local assembly points, the terminal markets, and again at the points of consumption. With the development of the truck and improvements in roads, more direct procurement in producing regions by processing and marketing firms became possible, decentralizing the market, but at the same time reducing the handling, transportation and transactions costs of the less direct, centralized system.[17] In Chapter VII the profound role of road construction in Brazil during the 1950's in reducing the number of breaks, and therefore marketing costs, will be analyzed, as well as its effects upon the integration of regional markets.

The possibility of _retail_ firms' bridging one or more of the breaks in marketing channels depends upon the scale of its retail operations. A chain of stores, for example, can easily operate at a scale which

---

17. On this evolution and its impact see, Shepherd, Geoffrey, _op.cit._, pp. 38-47.

allows direct produrement in producing regions at costs at least as low
as wholesale firms specialized in this activity. This is depicted in
Diagram (3).

Diagram (3)

Long-run
Marginal
Costs

0   B   A Volume Procurred
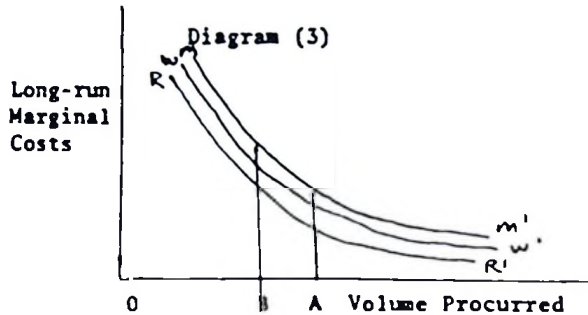
Let WW' be the long run marginal cost function (including the
transactions and handling costs of selling to retailers) of wholesale
firms specialized in buying in producing regions, drawn on the assump-
tion that existing firms operate at volume OA, below the optional long
run scale. If there are elements of oligopsony profits, the marginal
cost to retailers of buying from wholesalers will be somewhat higher,
as in MM'. Assuming that once established, a direct procurement retailer
purchase system can operate on the same cost function as specialized
wholesalers, the marginal cost of performing the wholesale operation in-
ternally will be RR' (net of the transactions and handling costs im-
plied in the break). Then if retailers operate in the product at
a scale at least as large as OB, they will be able to procure more cheap-
ly by buying directly. The threshold will be reached at lower volumes,
the smaller the scale of the typical specialized wholesale firm.

Now, the degree to which cost savings will be passed on to con-
sumers depends upon the number of firms realizing them and the degree of

competition between them.   In Chapter VII   .: · trends
in this direction in Brazil are significant in rice, beans and food mar-
keting in general.

        Finally, the scale of both retail and wholesale firms seems
typically far below that which would minimize average distribution costs,
abstracting from risk. We are interested primarily in the wholesale
firms engaged in farm marketing and distribution in urban centers,
firms to which the usual Chamberlinian arguments about product differ-
entiation (spatial location preference, subsidiary services, etc.)
apply with greatly reduced force. Why should these firms be typically
small scale?[18] It will be maintained that because of ease of entry,
distribution over space is overcrowded, reducing profit margins on this
function as traditionally performed (i.e. without integration of the
wholesale and retail functions) to fairly low levels. The frequent and
accentuated price instability in rice and beans, however, creates the
possibilities of large gains or losses from stocking, augmenting risks.
When market information is as poor as in Brazil, speculation becomes de-
pendent upon the "artistic" decisions of a Schumpeterian-type entre-
preneur, the head of the firm. Only he and perhaps a few relatives can
be trusted to bear the risk involved. This necessity for the constant
day-to-day involvement of the head of the firm in buying and selling de-
cisions puts rather strict organizational limits upon the firm's size,

---

18. Except for a very few exceptions, even the so-called "grandes",
"fortes", the big, strong firms, are small scale operations.

and also means that larger, more bureaucratic and less flexible firms
will be much less successful in the speculative game. The high risk
premium which reduces the effectiveness of speculation also is suffi-
cient to reduce the scale of the marketing firm. The optimal scale of
the firm including risk as a cost, is smaller in a highly unstable
environment.

There is a tendency for disinvestment by "cerealistas"
(cereal wholesalers) from the firm into real estate once the firm reaches
a fairly prosperous level. It would seem that this behavior might
account for the perpetuation of relatively small scale firms. But it,
in turn, can be partially explained by exactly the same factors: the
risk of marketing cereals (and thus the desire to diversify once fairly
high levels of income are reached) and the dependence of the firm's
operation upon one or a few men, upon whose retirement the firm is
likely to die.

CHAPTER IV

TWO TRADITIONAL CROPS: RICE AND BEANS

This study of rice and beans marketing focuses upon the
more or less self-contained market region in the Center-South of
Brazil, and within this region, upon the commerce of Sao Paulo,
its largest urban center, and the producing areas which are its
prime suppliers. In the present chapter, the consumption and
production characteristics of the two products in the region
will be described, highlighting, in particular, the size and
degree of commercialization of producers in the several states.

I. Two Traditional Crops.

Rice and beans are two important and traditional items
in the Brazilian diet. As staples, they are more or less com-
parable to "bread and potatoes" at an earlier stage in the Uni-
ted States, although they weigh more heavily in Brazilian budgets.
Especially in lower income

groups, they are consumed at every meal, generally mixed together, the rice being moistened by the broth of the beans. "Feijoada", Brazil's national dish (freely translated as "bean concoction") is, as the name implies, made of a black bean base, and it is always eaten with rice. Although rice may be eaten without beans for middle and higher income groups (beans have a reputation for being a poor man's dish), the contrary is almost never so.

A rough idea of their importance is given in urban budget study estimates for Sao Paulo (1951-52) and Rio de Janeiro (1959), which showed that 17% and 14% of worker food expenditures in the respective cities was spent on rice and beans.[1] This would make them more important than any other single food item, with the possible exception of meat.[2] These percentages are somewhat lower for a city such a Porto Alegre, Rio Grande do Sul, which is more similar to Uruguay than the rest of the country in that meat consumption is so much more important.[3] On the other hand, the two products, and especially beans, most certainly

---

1. In Sao Paulo, 11.4% was spent on rice and 5.2% on beans. For Rio the figures were 7.0% on rice and 6.79% on beans. The differences reflect in part higher relative prices of beans in 1959 than 1951-52. Sources: Sao Paulo: Divisao de Estatistica e Documentacao Social, Prefeitura do Municipio de Sao Paulo, Padraoe Gusto de Vida (unpublished pamphlet), 1956; Rio de Janeiro: Conjuntura Economica, XVI, 3 (January 1962), p.87.

2. 16% of total expenditures in Sao Paulo, and 17% in Rio.

3. See, Freitas Bueno, Luiz de, "Indice do Gusto de Vida do Operario Industrial de Porto Alegre" (Instituto de Estudos e Pesquisas Economicos of the Faculdade de Ciencias Economicas da Universidade do Rio Grande do Sul, Estudos e Trabalhos, No.3), pp.35-36.

weigh much more heavily in rural and small town diets than in Brazil's
two largest urban centers.

Of the two, beans is the more "inferior" good. Recently pub-
lished income elasticities of demand, computed from cross-section
data gathered in the South of Brazil in 1962, give the following
estimates. (Table I)   According to the data, beans have a very low

Table 1

Income Elasticities of Demand

	Urban	Rural	Total
Rice	.39	.47	.43
Beans	.11	.61	.36
Wheat Flour	.56	.34	.45
Beef	.56	.40	.48
Sugar	.32	.25	.29
Eggs	.80	.70	.75
Milk	.96	.49	.73

Source: Ministerio do Planejamento e Coordenacao Economica, Programa
de Acao Economica do Governo 1964-66 (Sintese) (Rio do Janeiro, 1964),
p.111,

income elasticity in urban areas and a relatively high one for rural
people, both more extreme than those for rice. This may be explained
partially by different urban-rural consumption habits, although higher
income in cities than in the countryside certainly must also be an
explanatory factor.

Neither product has close substitutes in consumption. Although
no research has been made on cross elasticities of demand in Brazil, ex-
tensive questioning of Brazilians by the author indicated that macaroni
(spaghetti) and to a lesser extent, potatoes,[4] are only remote substitutes

4. Potatoes enjoy a much narrower acceptance in Brazil than in Northern
European countries and the United States.

for rice. Beans, the principal source of vegetable protein in low income diets, has no real substitute.[5] These facts, together with the typically low price elasticities found for comparable staples in other countries,[6] suggest very strongly that rice and bean price elasticities in Brazil are low.[7]

II. Regional Supply Sources, Varieties and Production Characteristics.

A. Beans.

Brazil is the world's largest producer of dry beans, with about 20% of the world's output in 1956, and its per capita consumption of 26 kilos per year (35, when adjusted to adult-equivalents!) ranks also as the world's highest.[8] A regular importer of beans

---

5. One curious fact: it was said in Sao Paulo during a great shortage of beans in 1963 that higher income families had begun again to consume beans, because of their high price. Thorstein Veblen would have been delighted.

6. See, for example, Clark, Colin, The Conditions of Economic Progress, Third Edition (London: Macmillan and Co., Ltd., 1960), pp.471-79.

7. As a rough check, a question on price elasticity was included in one of the questionaires on beans. "If the price of beans rose 50% from June to September, how much would consumption decline?" Those merchants daring enough to hazard a guess gave the following array of answers:

Arc Elasticity (implied by the answer)	Number of Merchants giving the answer
-.1 - .3	4
.3 - .5	3
.5 - .6	3
.7 - .8	1

8. "Producao e Consumo de Feijao no Brasil", Conjuntura Economica, XI, 4 (Abril de 1957), p.25. All this data must be taken with some reservation, of course.

before World War I (mainly from Chile and Portugal), 1916 brougt

exports, and since then, the country has been "self-sufficient" in

the product, with significant foreign trade occurring only for the

greatest extremes of harvest size.[9]

1. Varieties of Beans in Consumption and Production.

Not only are lots of beans produced, but also many differ-

ent kinds of beans (excluding soybeans, which in general, are not

eaten directly by humans in Brazil). In 1963, for example, 16 var-

ieties of edible dry beans were traded on the "Bolsa de Cereais" of

Sao Paulo.[10] These varieties are divided into three groups: "preto"

(black beans), "roxo (inho, ao)"[11] ("purple beans" similar in appear-

ance but not in taste to our red bean), and other varieties "de cores"

(colored beans), the principal of which are "opaco (quinho)" (a shiny

grayish bean), "chumbinho (ao)" ("small lead" bean!), and "jalo" (a

large greenish-yellow bean).

---

9. Meijer, H., Rural Brazil at the Crossroads (Wageningen, Netherlands:
L. Veenman & Zonen, 1951), p.92; Amaral, Luis, Historia Geral da Agri-
cultura Brasileira (2nd ed.), Vol.II (Sao Paulo: Cia. Editora Nacional,
1958), pp.80-81. Apparently, regular importation of cereals easily
produced in Brazil arose from the almost complete dedication to the
coffee monoculture in Sao Paulo and parts of Minas Gerais in the 1890's
and early 1900's, although difficulties of internal transport must
have played some part also. Se Prado, Caio Jr., Historia Economica do
Brasil (7th ed.)(Sao Paulo: Editora Brasiliense, 1962), pp. 258, 294.

10. Hereafter cited as the Sao Paulo "Bolsa".

11.The Potuguese suffices "inho" and "ao" are the diminutive and
augmentative endings. Thus "roxinho" is small purple, "roxo" purple,
and "roxao", a big purple bean. It could be argued that in fact these
different sizes often amount to differences in varieties in commerce,
thus increasing enormously the number of varieties.

Different areas prefer different beans. "Preto" is the
most preferred and most frequently consumed variety in Rio de Janeiro
and Rio Grande do Sul. In Rio and surrounding parts of Rio State and
Eastern Minas Gerais, it is rare that other varieties are encountered,
except in times of shortages. On the other hand, Sao Paulo residents
eat black beans only in "feijoada", even though the two cities are only
about 250 miles apart. "Paulistas" prefer "roxo (inho, ao)", which
has a milder taste than "preto", although the greater part of the
city's consumption seems to be "chumbinho" and "opaquinho", which
sell at somewhat lower prices.[12] The interior of Sao Paulo State,
most of Minas Gerais, and the North of Parana consume mostly "de
cores" and "roxo(inho, ao)".

As such differentiation suggests, the several varieties
are imperfect substitutes, permitting somewhat independent price
variations. The probable ranking of the three possible combinations
by the degree of substitutability is as follows:

     (1) "Roxo" - "de cores"
     (2) "Preto" - "de cores"
     (3) "Preto" - "Roxo"

---

12. The situation with regard to varieties is so chaotic that
merchants' estimates of the composition of Sao Paulo"s bean con-
sumption differed greatly for the year 1963. They all agreed that
not more than 2% was black beans, but the remainder found no con-
sensus. Data on volume traded on Sao Paulo's "Bolsa" in recent
years show that the rank of the different varieties has been (1)
alternation between "roxinho (o, ao)" and "chumbinho"; (3) "opa-
quinho (o)"; (4) "jalo".

Production of beans in the Center-South region (shown in Table II), is also differentiated by region as indicated in Table III.

Table II

Bean Production (tons)

	Minas Gerais	Sao Paulo	Parana	Santa Catarina
1950	285,953	177,421	237,865	45,666
1955	298,395	209,992	274,264	73,365
1960	350,909	178,439	298,780	78,713
1961	324,280	178,952	322,879	84,953

	Rio Grande do Sul	Mato Grosso	Goias	Brazil
1950	111,862	18,658	38,644	1,248,138
1955	115,455	28,233	105,407	1,474,985
1960	144,305	49,123	76,909	1,730,795
1961	150,971	51,048	76,418	1,744,561

Source: Anuario Estatistica do Brasil, IBGE, Conselho Nacional de Estatistica, various numbers.

Table III

Production of Bean Varieties by Area

Zone	Varieties Produced
North of Parana	"de cores", mainly "chumbinho", "opaquinho".
S.W. Parana	"de cores", some "preto".
N.W. Santa Catarina	"de cores", "preto".
Minas Gerais:	
Triangle	"roxinho", some "preto".
Alto Paranaiba	"roxao", "Preto".
Goais	"roxinho", "preto" (as much as 50% in some harvests).
Rio Grande do Sul	"preto", some "jalo" ("de cores").

Source: Interviews with merchants.

Thus the bulk of "preto" is produced in Rio Grande do Sul, Western
Minas Gerais, Goias, Southwest Parana and Santa Catarina, the great
part of "de cores" in Sao Paulo and the newer zones of Parana (North,
Southwest), and "roxo (inho, ao)" in Western Minas and Goias. This
distribution is reflected in the sources of supply for Rio and Sao
Paulo. For the greater metropolitan area of Sao Paulo, the North of
Parana, Western Minas Gerais and Goias predominate as supply sources,[13]
and its commerce is oriented toward these areas. Rio, on the other
hand, receives considerable quantities from Rio Grande do Sul, in addi-
tion to Western Minas, Goias, and Parana.[14]

Given ;the minor importance of black beans in Sao Paulo commerce,
we will concentrate heavily upon "de cores" and "roxo", upon Parana,
Minas Gerais, and Goias.

2. Aspects of Technique of Production.

In many areas beans can be double cropped, as indicated in
Table IV. As will be seen in chapter IX; this double-cropping can
create serious problems for speculation over the year in a variety
such as "roxo" which is produced only once a year.

---

13. Sao Paulo State, while a large producer of beans, has only a small
surplus for shipment from the interior, and at many times of the season,
actually becomes a deficit state.

14. Statistics on overland interstate shipments are unavailable in
Brazil, and these statements are meant only as approximates.

Table IV

Planting and Harvest Times for Beans
in Brazil's Center-South

| | Wet Season | | Dry Season | | Larger Harvest |
	Planting	Harvest	Planting	Harvest	
Sao Paulo	late Sept. to Oct.	late Nov.- Dec.-early Jan.	Jan. to Feb.	April to early May	about equal
*Rio Grande do Sul	Oct.	Dec. to Jan.	Jan. to Feb.	May	dry* season
Parana	late Sept.	late Nov. Dec.-Jan.	Jan. to Feb.	April to early May	(dry season until 1963
Minas Gerais and Goias	none		Feb.	May	

* The dry and rainy seasons are reversed in Rio Grade do Sul, the Dec.-Jan. harvest occurring in the dry season.

Sources: Interviews with merchats. These dates are somewhat flexible, since weather may delay or move up planting and even lead to the necessity of replanting.

In addition since new beans are always preferred to old ones, carry-over from one harvest to another is subject to a significant discount in price.

The technological state of bean production in all areas is expressed succinctly in the following quotation (translated from the Portuguese).[15]

Beans is the cereal which finds itself in the phase of greatest backwardness; in addition to being cultivated principally by agricultural laborers and sharecroppers without resources and technical knowledge, it is still in the system of subsistence agricultur2 or

15. Thomazini Ettori, Oscar J., "Produtividade Fisica da Agricultura em Sao Paulo", Agricultura em Sao Paulo. Ano. XI, No. 7 (Julho, 1964), p. 10.

of essentially extensive cultivation. All types of land are used, in small plots spread throughout zones with widely divergent ecological conditions, and without observance of the minimal requirements of rational cultivation, such as in the preparation of the soil, good quality seed, crop rotation, use of fertilizers, control of pests and diseases, and proper spacing.

The slight interest which official agencies have given the crop both in its production and marketing phases...has contributed heavily to this calamitous situation.

One good indicator of the relative technological backwardness of bean production is the infinitesimal percentage of total area planted with selected seeds, shown in Table V. Most certainly the use of selected

Table V

Percentage of Total Seeds Planted Which
Were Selected Seeds, 1959-63.
Average.

Rice	19.0
Beans	1.5
Corn	39.0
Cotton	100.0
Peanuts	2.1
Castor Beans	32.0

Source: Ibid., p. 32

seeds is even more minute in the other States, with the possible exception of Rio Grande do Sul. Varieties become accidentally crossed and mixed in production, so that the gradations are much greater than one would think judging only by the number of varieties traded on the "Bolsa".[16]

---

16. The purity of some varieties has been lost with time. For example, in the Patos de Minas region of Western Minas Gerais it was stated many times to the author that the variety "roxao" (big purple) the highest priced bean in Brasil, was losing its distinct character. The Report of the "Comissao Tecnica de Feijao" (Teachnical Commission for Beans) of the Secretariat of Agriculture of Sao Paulo, April 1962 claimed that in fact over 100 varieties of beans were produced in Sao Paulo alone! Before any meaningful standardized system of grading can be instituted, this problem of the multiplicity and impurity of varieties must be solved.

Beans are a secondary, subsidiary crop in all areas of the Center-South. According to data from the 1950 Agricultural Census, (see Table VI below), in all but one of the States of the region (Rio Grande so Sul), over one-half of total output came from plots where beans had been interplanted with some other, more important crop, chiefly corn (Minas Gerais, Goias, Sao Paulo, Parana)and coffee (Sao Paulo, Parana). In the former case, when the corn is partly grown, generally in February, the beans are planted between its rows. As the corn becomes ripe, its ears are broken down and the stalks left, so that the bean vines cling to them. When the beans are ripe, both crops are harvested together, generally in late April and May (dry season.)

With coffee, two crops each year of beans can be cultivated between the rows,[17] although in Sao Paulo, approximately twice as many coffee trees are interplanted in the wet season as in the dry, since it is felt that coffee yields suffer less from the former practice.[18]

---

17. The author has seen as many as three crops, rice, beans, and corn planted between the same two rows of coffee at the same time.

18. Economic Commission for Latin America, Coffee in Latin America: Productivity Problems and Future Prospects of Production II Brazil, State of Sao Paulo, Part 1, E/CN.12/545, New York, 1960, p.92. The exact figures on the percent of coffee trees interplanted with various crops in Sao Paulo in 1958 were:

Maize	22.8
Beans, Wet Season	25.5
Beans, Dry Season	11.6
Rice	16.7
Cotton	.6
Castor Beans	.2
Peanuts	.6

Traditionally, coffee fazendeiros have allowed their resident laborers ("colonos", "empreteiros") the right to cultivate beans and other crops between the coffee rows as partial payment of wages, thus keeping down the "fazendeiro's" need of liquid working capital.[19]   However, there has been a decline in this practice in the last 10-15 years, due to changes in coffee technology. Most new trees are now planted so close to one another that interplanting is not practical except during years of serious frost or drought, when the leaves have fallen from the coffee trees. In this case all trees will be interplanted with cereals (including beans) by the fazenda itself in order to recuperate some income losses. The total output may then be divided on a sharecropping basis with resident laborers.[20]

But in general, the tendency is to ceding laborers for their own cultivation land apart from the coffee tress. All this means that in the past, a considerably higher proportion of coffee trees were interplanted with beans than the ECLA estimate for 1958 (see footnote 18

---

19.   The areas are quite small, however; in the 1957/58 harvest, the average plot including land apart from the coffee area, was only 1.2 hectares per colono family. This would yield little more than sub-sistence for a family of five. Thomazini Ettori, Oscar J., "Mao de Obra no Agricultura em Sao Paulo", Ano VIII, No. 12 (Dezembro, 1961), P. 33.

20. Thus frosts and droughts introduce an unexpected source of pro-duction instability to rice, corn and especially bean output; these systems of interplantings bring tremendous complications to estima-ting supply functions for beans.

above).[21]

3. Size and Degree of Commercialization of Bean Producers.

Beans is a less commercial crop than rice. Its typical pro-ducer is relatively small, often raising beans primarily for subsistence, selling such surpluses as may arise. He is most likely to be a sharecropper (Minas Gerais, Sao Paulo, Parana), an agricultural laborer (Sao Paulo, and Parana), or a small landowner. It is very rare indeed that a large commercial farmer will derive any significant proportion of his income from the cultivation of beans, although a large land owner with many sharecroppers may accumulate fairly large absolute quantities of beans for sale.[22] Given the small out/put/seller and

21. There is the real but unresolved question of the rationality of these interplanting methods. With hand cultivation methods (dominant in coffee and very widespread in corn), an argument can be made that net income per hectare may be higher with interplanting than without, even if gross income per hectare were less (something which has never been rpoved). This would be due to a reduction in labor requirements arising from the external economies of interplanting in the hoeing, cleaning and harvesting operations. On the other hand, with mechanization, especially of the harvesting process, such practices would be completely uneconomical.

22. Professor William H. Nicholls and Dr. Rui Miller Paiva have collected sample farm data in a number of areas in Brazil, including Ituiutaba, Minas Gerais, Maringa in Parana, Taubate in Sao Paulo, and Cachoeira de Sul and Erechim in Rio Grande do Sul. The sample gives disproportionate weight to large establishments, and thus illustrates the present point well. It showed the following percentages of gross farm incomes originating in beans:

	Crop Farms	Livestock-Crop Farms
Ituiutaba, M.G.	4.98%	3.86%
Taubate, S.P.	-	-
Maringa, Pr.	1.93%	1.66%
Cachoiera do Sul and Erechim, R.G.S.	.13%	11.18%

Unpublished statistical appendix to Nicholls, William H., and Paiva, Rui Miller, "The Structure and Productivity of Brazilian Agriculture", Journal of Farm Economics, XLVII, 2 (May 1965), pp. 347-361.

beans' role as a rural subsistence food, a significantly smaller pro-
portion of beans seems to enter commercial channels.

Some indication of these characteristics is given in Table VI,
drawn from data of the 1950 Agricultural Census (the 1960 Census is
still not available as of 1965).

Table VI

Production Characteristics of Beans
for Selected Brazilian States, 1949

	Area per Establishment* (hectares)		Product per Establishment* (tons)		
	Isolated	Interplanted with Annual Crops**	Isolated	Interplanted with: Annual Crops	Perennial Crops**
Sao Paulo	1.65	3.3	.9	.8	.9
Parana	1.5	4.1	.2	1.7	4.0
Rio Grande do Sul	.9	1.7	.7	.9	0
Goias	1.3	2.3	.9	1.9	1.8
Patos de Minas	3.2	5.1	2.8	2.9	-
Minas Gerais	2.2	4.5	1.3	1.5	1.

Percentage of Output Derived From:

	Isolated* Planting	Interplanted:* Annual Crops	Perennial Crops	Private Plots of Laborers Resident or Establishment***
Sao Paulo	.38	.16	.17	.29
Parana	.23	.30	.30	.17
Rio Grande do Sul	.76	.21	0	.03
Goias	.24	.57	.05	.14
Patos de Minas	.04	.87	-	.09
Minas Gerais	.35	.47	.03	.15

Sources: IBGE, Conselho Nacional de Estatistica, Censo Agricola, 1950.

* Production (area) per establishment producing beans, including share-croppers' quota, but excluding private output of laborers explained in note **.

** Total Area of both crops interplanted.

*** Output of laborers and sharecroppers on land ceded to them for their private cultivation, generally in partial payment of wages.

The area and production of beans per establishment in all systems of cultivation is quite low, even in the County of Patos de Minas, where bean production is fairly commercial. By way of compari-son, in Sao Paulo, where average area of beans planted in isolation was 1.65 hectares, the figure for rice was 5.0 hectares, corn 6.0, cotton 10.2, and coffee 183.6. But production per establishment, in turn, overstates average output available per farm selling unit for a number of reasons. Especially in Minas Gerais and Goias, sharecropping is the most common form of land tenure arrangement in cereal crops. Each larger establishment[23] will normally have more than one sharecropping family. Thus the 50% of output which normally accrues to sharecroppers (and which in the Census is included as part of the output of the establishment) is subdivided into a number of smaller parcels. The same holds with respect to the portion of output interplanted in per-ennial crops, chiefly coffee, to the extent that it is divided between landowner and farm laborers, which is often the case. Finally laborers' production ontheir own private plots is greatly subdivided between many

23. According to the Census, a sharecropper is considered as the head of an establishment only if he is fully in charge of the cultivation, a situation which is fairly rare.

family units.

The general impression of smallness given by these statistics
was confirmed by merchants operating in the North of Parana and Western
Minas Gerais.

The North of Parana is Brazil's main producer of coffee today
and by far its most important surplus area for beans. Unlike most of
Brazil, a conscious effort was made in the colonizing process (by an
English company) to set up small, independent landowners, with the
result that properties of 10-25 hectares are very common in the area.
These "yeomen farmers" produce some coffee, but also cereal crops and
swine. Merchants in the area agreed that these farmers and agicultural
laborers working the larger coffee farms ("colonos", "empreteiros")
dominate the bean market in that area. Only rarely will the larger
landowner, devoted mainly to coffee and livestock, sell beans. The
consensus was that farmers sold anywhere from 1 to 100 sacks of 60
kilos, with the mode around 40.[24] Even 100 sacks is a small number,
and at recent average yields, could be produced on perhaps 8 hectares
or even less of land. The picture is clear: small output/establish-
ment, with a high likelihood that beans makes up a small percent of
most farmers' total income.

In the Patos de Minas area of Minas Gerais is anotherlarge

---

24. At average yields estimated in recent years for the North of
Parana by the Ministry of Agriculture, about 13-1/3 sacks per hectare,
the modal area of farmers who sell would be about 3 hectares in beans.

surplus area of beans. But there the main marketed surplus comes from
the sharecroppers and their larger landlords. The most common arrange-
ment has the landowner, devoted mainly to cattle, supplying the share-
cropper with seed and the land already plowed. If the cropper performs
all other tasks at his own expense and supplies his own working capital,
he splits 50-50 with the landowner. The result is a range of sales
of from 20-100 sacks of 60 kilos by the sharecropper, with the mode
closer to 20, and sales by fazendeiros of 300-500 sacks, when yields
are good. Obviously, area and output per establishment of those selling
on the market is considerably higher than those shown in the Census,[25]
but still relatively small, considering that in the Alto Paranaiba zone
of Minas the median area per establishment in 1950 was 50-100 hectares
and in the Minas Triangle, 100-200 hectares.

4. Risk of Beans Greatly Limits Concentration in the Crop.

Data are not available on the composition of farm output by
size of establishment, but it seems that even the small farmer will
rarely derive a considerable proportion of his income from beans alone.[26]

---

25. At the 1949 Census yields shown for Patos de Minas of about 9.2 sacks
of beans per hectare planted with annual crops, a fazendeiro selling 300
sacks would have put 32.6 hectares in corn and beans together, and 500
sacks implies an area of 54.4 hectares. A sharecropper raising 50 sacks
would have cultivated over five hectares.

26. This conclusion is based upon extensive questioning of merchants and
farmers in producing areas and the opinion of economists in Sao Paulo's
"Divisao de Economia Rural". One exception to this rule is the coffee
worker, whose planting for sale would generally include only corn, beans
and some rice. The Brazilian Census would be of much greater use if it
just organized and expanded the reporting of data which it actually has.

Why should beans be such a "despised" crop? Why are there not larger

commercial producers of beans?

The most decisive factor is probably the greater risk of

bean cultivation in comparison with alternative crops, e.g. cotton,

rice and corn.[27] Not only are its price fluctuations more violent

from harvest to harvest, but beans are more sensitive to climatic

conditions. Too much cold and wind and too little rain all affect

beans as presently cultivated more severely than most crops.[28] Given

a much higher degree of risk, farmers avoid placing much dependence

on the crop for their income.

In Tables VII, VIII, and IX data on yields, average annual

farm price, and average annual gross receipts per hectare in Sao

Paulo are given for beans, rice, corn, and cotton.[29] The crops were

---

27. Coffee is not considered. It presents its own unique characteris-
tics: the necessity of rather large initial investment in the trees, a
guarantee of government support for at least a minimal return, the pre-
dominance of large plantations, and finally, a rather irrational belief
in coffee as a prestige crop.

28. Heavy rains soon after the plant is growing will wash it out. Rains
during the harvest severely damage its quality and if the harvest is
delayed too long by rains, the beans may even begin to sprout.

29. Only Sao Paulo data used because of the certain large errors in the
estimates which the Ministry of Agriculture provides for the other states.
The years were chosen advisedly. In 1954, the Divisao de Economia Rural
instituted a system of crop estimation by sampling for the state. This
appears to have substantially lowered the yields shown for beans, indica-
ting, in all probability, a downward bias in pre-1954 area planted esti-
mates made on a subjective basis by agronomists in the field. On the
other hand, the other crops show no such marked change in yields or
area planted in 1954, indicating the agronomists were far closer to the
mark for corn, rice and cotton than for beans.

TABLE VII

Price Variability

(A)

Year	Price Deflated by Index of 23 Farm Prices in Sao Paulo	5 Year Centered Moving Average	Ratio of Price to 5 Harvest Centered Moving Average
1949	147.72		
	91.25		
1950	115.73	127.63	.9068
	152.81	126.19	1.2110
1951	130.63	140.32	.9309
	140.54	149.87	.9377
1952	161.90	176.34	.9181
	163.49	182.09	.8979
1953	285.16	171.03	1.6673
	159.35	173.87	.9165
1954	85.23	196.99	.4327
	176.14	186.42	.9449
1955	279.09	210.97	1.3229
	232.27	248.61	.9343
1956	282.14	271.84	1.0379
	273.41	251.04	1.0891
1957	292.28	234.74	1.2451
	175.09	204.96	.8543
1958	150.78	192.83	.7819
	133.23	231.18	.5763
1959	212.78	272.34	.7813
	484.02	290.15	1.6682
1960	380.87	293.71	1.2968
	239.87	289.60	..8283
1961	151.03	243.04	.6214
	192.22	274.80	.6995
1962	251.23	273.40	.9189
	539.65	301.80	1.7881
1963	232.87		
	293.04		

$s^2 = .1501663$

TABLE VII (cont.)

(B)
rice

Year	Price Deflated by Index of 23 Farm Prices in Sao Paulo	5 Year Centered Moving Average	Ratio of Price to 5 Harvest Centered Moving Average
1949	190.91		
1950	124.70		
1951	93.69	163.95	.5715
1952	162.70	168.83	.9637
1953	247.74	177.62	1.3948
1954	215.34	198.49	1.0849
1955	168.64	205.88	.8191
1956	198.02	200.66	.9868
1957	199.65	192.75	1.0358
1958	221.63	186.41	1.1889
1959	175.80	170.38	1.0318
1960	136.95	170.87	.8015
1961	117.85	167.85	.7021
1962	202.11		
1963	206.52		

s^2 = .0531059

(C)
corn

1949	88.64		
1950	63.82		
1951	69.64	79.49	.8760
1952	88.89	74.26	1.1970
1953	86.45	80.77	1.0703
1954	62.50	84.70	.7378
1955	96.36	82.57	1.1670
1956	89.29	82.46	1.0828
1957	78.25	88.59	.8832
1958	85.89	81.02	1.0601
1959	93.15	79.64	1.1696
1960	58.51	77.95	.7506
1961	82.38	69.90	1.1785
1962	69.82		
1963	45.65		

s^2 = .0300167

TABLE VII (cont.)

(D)

Cotton

Year	Price Deflated by Index of 23 Farm Prices in Sao Paulo	5 Year Centered Moving Average	Ratio of Price to 5 Harvest Centered Moving Average
1949	70.34		
1950	77.08		
1951	101.80	73.65	1.3822
1952	67.86	71.63	.9474
1953	51.16	68.57	.7461
1954	60.23	59.88	1.0058
1955	61.82	58.73	1.0526
1956	58.33	60.66	.9616
1957	62.11	60.08	1.0338
1958	60.82	60.36	1.0076
1959	57.31	62.15	.9221
1960	63.21	60.17	1.0505
1961	67.28	58.38	1.1524
1962	52.21		
1963	51.91		

$s^2 = .0244547$

Source: see Table IX.

TABLE VIII

Yield Variability

(A)

Beans

Year	Yield Sacks of 60 Kilos Per Hectare	5 Harvest Moving Average	Ratio Yield to 5 Harvest Centered Moving Average
1954	8.39		
	4.83		
1955	3.81	6.52	.4877
	8.02	6.03	1.3300
1956	8.19	6.57	1.2466
	5.94	7.61	.7806
1957	7.50	7.20	1.0417
	8.39	7.12	1.1784
1958	5.99	7.46	.8029
	7.77	7.41	1.0486
1959	7.63	7.17	1.0642
	7.27	7.44	.9772
1960	7.20	6.99	1.0300
	7.34	7.02	1.0456
1961	5.51	6.97	.7905
	7.80	6.33	1.2322
1962	6.98	6.33	1.1027
	4.02	6.51	.6175
1963	7.34	6.10	1.2033
	6.39	6.15	1.0390
1964	5.77		
	7.23		

$s^2 = .0506181$

TABLE VIII (cont.)

(B)

Rice

Year	Yield Sacks of 60 Kilos Per Hectare	5 Harvest Moving Average	Ratio Yield to 5 Year Centered Moving Average
1951	25.70		
1952	22.75		
1953	17.06	20.39	.8367
1954	18.31	17.82	1.0275
1955	18.12	17.10	1.0596
1956	12.88	16.98	.7585
1957	19.13	16.95	1.1286
1958	16.45	17.15	.9592
1959	18.15	18.65	.9732
1960	19.16	18.84	1.0170
1961	20.34	18.70	1.0877
1962	20.08	17.77	1.1300
1963	15.75		
1964	13.53		

$s^2 = .014783$

(C)

Corn

Year	Yield Sacks of 60 Kilos Per Hectare	5 Harvest Moving Average	Ratio Yield to 5 Year Centered Moving Average
1951	24.00		
1952	22.51		
1953	19.86	100.51	.9881
1954	19.69	93.71	1.0459
1955	14.45	91.24	.7918
1956	17.20	91.40	.9409
1957	20.04	95.00	1.0547
1958	20.02	102.45	.9771
1959	23.29	110.04	1.0582
1960	21.90	117.72	.9303
1961	24.79	126.18	.9822
1962	27.72	121.57	1.1403
1963	28.48		
1964	18.68		

$s^2 = .0088924$

TABLE VIII (cont.)

(D)

Cotton

Year	Yield Arrobas[*] Per Hectare	5 Year Moving Average	Ratio Yield to 5 Year Centered Moving Average
1951	35.13		
1952	48.27		
1953	45.33	736.6	.9232
1954	50.27	763.2	.9879
1955	66.53	789.4	1.2971
1956	44.00	825.2	.7998
1957	50.33	882.0	.8560
1958	63.93	894.2	1.0725
1959	69.20	945.0	1.0984
1960	70.60	1004.4	1.0544
1961	60.93	1010.0	.9050
1962	70.13	1026.8	1.0245
1963	65.80		
1964	74.80		

s^2 = .02029

[*] 15 kilos = 1 arroba

Source: see Table IX

TABLE IX

Yield x Price Variability

(A)

Beans

Year	Yield x Price	5 Harvest Moving Average	Ratio of Yield x Price to 5 Harvest Centered Moving Average
1954	715.08		
	850.76		
1955	887.51	1325.376	.6696
	1862.81	1507.172	1.2360
1956	2310.72	1775.440	1.30159
	1624.06	1891.740	.8585
1957	2192.10	1699.812	1.28968
	1469.01	1444.708	1.0168
1958	903.17	1444.598	.6252
	1035.20	1709.942	.6054
1959	1623.51	1964.592	.8264
	3518.82	2136.088	1.6473
1960	2742.26	2095.484	1.3087
	1760.65	2070.646	.8503
1961 t	832.18	1717.600	.4845
	1499.32	1603.026	.9353
1962	1753.59	1592.750	1.1010
	2169.39	1800.820	1.2047
1963	1709.27		
	1872.53		

$s^2 = .102912$

TABLE IX (cont.)

(B)

Rice

Year	Yield x Price	5 Harvest Moving Average	Ratio of Yield x Price to 5 Harvest Centered Moving Average
1950	3121.24		
1951	2407.83		
1952	3701.42	3479.96	1.6036
1953	4226.44	3466.87	1.2191
1954	3942.88	3495.40	1.1280
1955	3055.76	3518.98	.8684
1956	2550.50	3402.85	.7405
1957	3819.30	3252.43	1.1743
1958	3645.81	3166.07	1.1515
1959	3190.77	3135.38	1.0177
1960	2623.96	3183.20	.8243
1961	2397.07	3104.57	.7721
1962	4058.37		
1963	3252.69		

$s^2 = .031651$

(C)

Corn

Year	Yield x Price	5 Harvest Moving Average	Ratio of Yield x Price to 5 Harvest Centered Moving Average
1950	1540.61		
1951	1671.36		
1952	2000.91	1632.08	1.2260
1953	1716.90	1602.44	1.0714
1954	1230.62	1577.32	.7812
1955	1392.40	1488.77	.9353
1956	1535.79	1489.29	1.0312
1957	1568.13	1677.06	.9350
1958	1719.52	1654.85	1.0391
1959	2169.46	1756.14	1.2354
1960	1281.37	1829.59	.7004
1961	2042.20	1745.71	1.1698
1962	1935.41		
1963	1300.11		

$s^2 = .031933$

TABLE IX (cont.)

(D)

Cotton

Year	Yield x Price	5 Harvest Moving Average	Ratio of Yield x Price to 5 Harvest Centered MOving Average
1950	1947.81		
1951	3576.23		
1952	3275.60	2829.30	1.1577
1953	2319.08	3262.31	.7109
1954	3027.76	3160.37	.9893
1955	4112.88	3030.45	1.3572
1956	2566.52	3344.28	.7674
1957	3126.00	3531.89	.8851
1958	3888.22	3601.84	1.0795
1959	3965.85	3908.41	1.0147
1960	4462.63	4015.51	1.1113
1961	4099.37	3921.00	1.0455
1962	3661.49		
1963	3415.68		

$s^2 = .035894$

Source: Divisao de Economia Rural da Secretaria do Agricultura do
Estado de Sao Paulo.

TABLE IX (cont.)

(E)

F Tests for Differences in Variability

Price

(1) $\frac{Beans}{Rice}$: F(25,10) = 2.8276 (significant 5% level)

(2) $\frac{Beans}{Corn}$: F(25.10) = 5.0027 (significant 1% level)

(3) $\frac{Beans}{Cotton}$: F(25,10) = 6.1405 (significant .5% level)

Yield

(1) $\frac{Beans}{Rice}$: F(17,9) = 3.42407 (significant 5% level)

(2) $\frac{Beans}{Corn}$: F(17,9) = 5.6922 (significant 1% level)

(3) $\frac{Beans}{Cotton}$: F(17,9) = 2.49473 (not significant)

Yield x Price

(1) $\frac{Beans}{Rice}$: F(.5,9) = 3.2539 (significant at 5% level)

(2) $\frac{Beans}{Corn}$: F(15,9) = 3.2252 (significant at 5% level)

(3) $\frac{Beans}{Cotton}$: F(15,9) = 2.8693 (not significant)

Source: Tables VII - IX.

tested for significant differences in variability in each of the three

categories through the use of the ratio of each observation to its

five-harvest centered moving average (for beans this means a 2-1/2

year period and for the other crops, a five year period). The vari-

ances of these ratios were considered as the measure of instability,

and the F test was applied for significant differences between beans

and the other crops.[30] Beans are significantly more unstable than

all three crops in harvest to harvest price changes.[31] Its yields

and gross receipts per hectare fluctuate significantly more than rice

and corn, although its F ratios with cotton were significant only at

the 10% level.[32]

30. There is no really satisfactory method of measuring instability in this
context. If all fluctuations were completely random, then the variance around
the means could be used. The present data have trends and cycles to varying
degrees. Through the five year moving average, much of the trends and cycles
are captured. While the variance around the mean would overestimate the in-
stability of a crop with trends in it (a 5% annual rise in yields will not
make the crop riskier), the variance of the ratio of observed values to five
year moving averages may underestimate the instability which increases risk,
since cycles may themselves be due to cyclical, but for that fact, not less
risky, climatic, insect, plant disease and other influences.
     In addition, the data are aggregated for the whole State of Sao Paulo
and obviously will understate the variability at the farm level of all crops.
On this point see, Eisgruber, L.M., and Schuman, L.S., "The Usefulness of
Aggregated Data in the Analysis of Farm Income Variability and Resource Allo-
cation", Journal of Farm Economics, XLV, 3 (August 1963), pp. 587-591.

31. As will be shown in Chapter IX, · season price patterns for beans are
also considerably more unstable than for the other crops, increasing rela-
tive risk even more.

32. Cotton is a totally commercial crop, a sizable portion of which is ex-
ported. As a result, effective minimum price programs have been maintained
by the Federal Government greatly reducing the risk of losses in cotton.
Given this price floor, it is quite possible that farmers approach cotton
as a crop with considerably less risk--in spite of the inconclusive F test!

It will also be noted from the tables that <u>extreme</u> losses are much more common in beans than in the other three crops. Fully one-half of the deviations of gross receipts per hectare below the moving average are at least 30%, while none of these for the other crops was so large. None of the yields for the other crops lie at least 30% below the trend line, whereas 11% of them do for beans. Similar results occur for prices.

This, in great part, explains why farmers whose income depends primarily on the sale of crops (i.e. larger commercial farmers) would avoid large scale cultivation of beans. Even with higher expected returns than in other crops (evidence on relative profitabilities is lacking), the possibilities of extreme losses militate against significant concentration in beans.

The smaller farmer (of say less than 25 hectares) is more limited in the composition of what he produces for sale, to the products he consumes--beans, corn, rice, manioc, etc. True, he may produce some crop primarily for commercial purposes, but he will usually find it profitable to cultivate his own food consumption to the highest degree possible (avoiding marketing costs). Whether rational or not, he will usually plan to produce some surplus of each for sale also, diversifying his risk to some extent. Naturally, this will depend in part upon the types of soils at his disposal. In general, then, production for subsistence will lead to some production for sale, explaining in good part why small farmers, sharecroppers and laborers are more important to a risky crop like beans. But even the small farmer, according

to this argument, would not find himself in a situation of great dependence upon beans for his money income.

5. Implications for Farmer Retention of the Crop.

These two characteristics of beans production--the predominance of the small seller (often landless) in the market and the relative unimportance of beans in the income of anyone--have important implications for markting patterns. First, in Brazilian conditions the small farmer (especially when not a landowner) has little power to resist pressures to sell immediately in the harvest.[33] On the other hand, since beans form a relatively small proportion of his total cash income, he is better able to withold a large proportion of beans from the market than other crops without significantly reducing his income availabilities. Those landowners who receive the percentage share from sharecroppers and who often buy the croppers' output find themselves better able to wait out the market, especially in beans, which will be an even smaller proportion of their income.[34]

That a crop which forms a smallish proportion of most farmers' income can become ceteris paribus the object of greater withholding (speculation) by farmers can be seen as follows. Assume, as in Chapter II, a two-period harvest cycle. The farmer is assumed to have certain

---

33. He is more likely to be in debt to merchant and landowner alike and must sell to liquidate debts. He will also have poor collateral for bank loans.

34. Landowners in Minas Gerais, Sao Paulo and Parana derive much income from products not sharecropped with those who produce beans, e.g. cattle and coffee.

debts to be repaid in the first period and the need, above this, for

income to finance current consumption of sugar, clothes and other items

he must purchase). He can withhold from sale some of the crop only

at increasing marginal costs after some rather low percentage retained,

since he will have to pay high interest to avoid debt payment, he will

have some storage costs, and he may have to go further into debt to

finance current expenses. Thus the marginal cost of withholding as a

function of the proportion withheld of his total currently realizable

income will be something as shown in Diagram I.

Diagram I

Marginal
Cost of
Withholding

Proportion Withheld of
Total Realizable Income
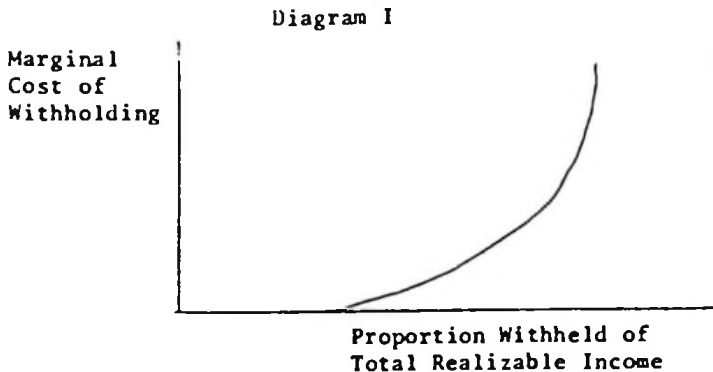
Now, the farmer's expected return from withholding depends

upon the crops withheld and their expected price rises, expressed as

follows:

Total Expected Return $= \sum r_i a_i Y p_i$

where r_i is the expected unit rise, a_i the proportion of present reali-

zable income (Y), and P_i the proportion withheld for sale in the second

period, all of the ith crop. Let $f(a_i p_i Y$ be the cost function of

retaining present realizable income from market. Maximizing total net
expected return from withholding:

$$\text{Max. } \textstyle\sum r_i a_i Y p_i - f(a_i p_i Y) \text{ subject to } p_i \doteq 1.$$

The solution is obviously

$$r_i a_i Y \geq (a_i Y) f'$$

$$r_i \geq f'$$

The greater than sign obtains when a farmer withholds in equilibrium
all his output of some crop. Now, since f' is rising, it is more
likely that farmers will withhold a greater proportion of a minor crop
when its expected return is high than they will for a more important
crop. That is, for any given $r_i > r_j$, the smaller the a_i (the propor-
tion of present realizable income derived from the crop), the greater
possibility there is that r_i will be greater than f' when all the
crop is retained. This would be especially true for smaller farmers
and sharecroppers who reach a prohibitive level of marginal costs of
retention at a much smaller percentage of income withheld than large
farmers.[35] This is depicted in Diagram II, where two crops are
assumed, beans and a much more important one, say rice. In Diagram
II(A), the expected price rise of beans is higher than rice, and all
beans and some rice are retained. In II(B) the situation is exactly

---

35. Agricultural laborers who are important in the bean market in
Parana may find that even very small retentions are impossible,
selling practically all their surpluses in the Harvest despite any
expectations they may have.

reversed, and not all of rice and no beans are retained.

Diagram II(a)

Marginal Cost,
Marginal Expected
Return from With-
holding

Proportion withheld of Total
Realizable Income

Diagram II(b)

Marginal Cost,
Marginal Expected
Return from With-
holding

Proportion Withheld of Total
Realizable Income
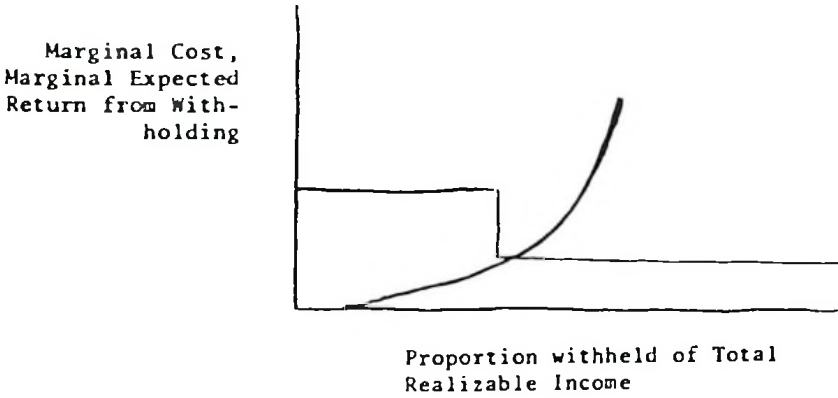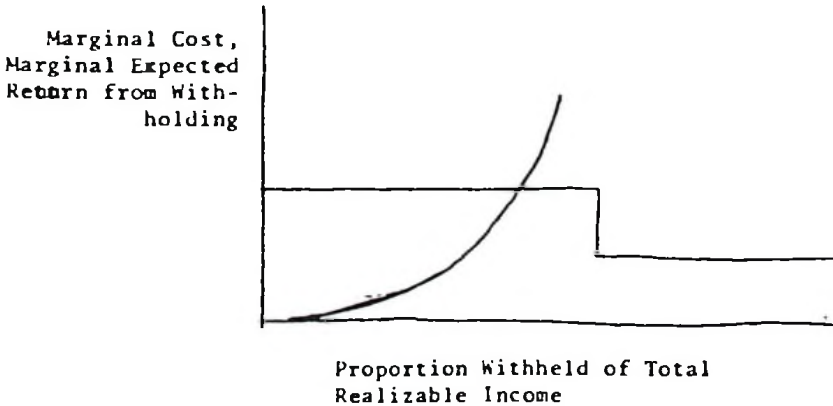
Uncertainty about expected returns will tend to create some

diversification in the products retained, rather than committment to

full retention of any one crop. The farmer would sell more of his

beans and less of other crops, even though the certainty-equivalence

model above would dictate total retention of beans. The net result
would be less total carry-over and greater diversification of that
carry-over. But even so, it is likely that a greater proportion of
beans would be carried over for a higher given expected price rise
than for other more important crops. In terms of the model of Chap-
ter II, C_2, carry-over by farmers, is likely to be more flexible as
a function of expected return for beans than for other crops.

Against this factor must be placed the fact that the small
farmers who dominate bean production will in general have less stay-
ing power, and will thus be able to withhold a smaller proportion of
their total realizable income than larger producers. The net result
will be a combination of both factors. On balance, interviews with
merchants indicate that in fact farmers tend to retain greater pro-
portions of beans than of the more "commercial" product, rice. This
greater flexibility along with farmers' formation of expected prices
will become an important factor in explaining seasonal price patterns
in large and small harvests (see Chapter IX).

Another consequence for marketing of the high degree of frag-
mentation in farmers' sales is probably higher transactions and hand-
ling costs in the initial stages of the marketing process. Significantly
more labor and buyer time is required per sack to join car and truckload
lots, since many more farmers must be dealt with than, say, with rice
where each farmer will, on the average, be selling several truckloads.

B. Rice.

Brazil is the largest producer of rice outside the Far East,
ranking seventh in world production behind Burma.[36]   Throughout the
1930's and 1940's she was a regular exporter of the product, her over-
seas sales having reached a peak of 218,423 tons in 1947.   Since 1952,
however, exports have occurred only when large domestic surpluses
accumulated,[37]   as government exchange rate and export license poli-
cies for the cereal became oriented primarily by the desire to limit
increases in food prices in the inflationary process.

1.   Production and Varieties.

The distribution of rice production by states for recent years
is given in Table X.   The principal surplus areas are Rio Grande do
Sul, Goias, the Minas Triangle, Santa Catarina and Mato Grosso in the
Southern region, and Maranhao and Para in the North.   Sao Paulo, which
during the 30's at times produced almost 50% of Brazil's rice, became
a deficit area in the early 1950's as its population expanded rapidly,
and it is now increasingly dependent upon imports from other states.[38]

36. In 1961 Brazil produced 5,392,000 tons; Burma, 6,789,000; the United
States, 2,476,000.   Instituto Rio Grandense do Arroz, Anuario Estatistico
Do Arroz, Saf ra 1961/1962, no.18, Porto Alegre, 1963, p.101.   The "Insti-
tuto" will hereafter be cited as "IRGA".

37. These surpluses have been accumulated almost entirely in Rio Grande do
Sul by the State's Rice Institute (IRGA) in its efforts to maintain compen-
satory minimum prices.   See Chapter X,

38.   Moyses, Malton Alberto, and Thomazini Ettori, Oscar J., "Aspectos
Economicos da Producao de Arroa em Sao Paulo", Agricultura em Sao Paulo,
Ano.IX, No.10 (Outubro 1962), pp.17-18; Ellis, Alfredo, Jr., A Evolucao
da Economia Paulista e Suas Causas (Sao Paulo: Cia. Editora Nacional, 1937),
p. 479.

Table X

BRAZIL

Production of Rice By States
(tons)

	Minas Gerais	Sao Paulo	Parana	Goais	Mato Grosso
1950	693,327	992,772	122,157	317,116	62,463
1955	700,350	934,617	151,750	424,011	100,452
1960	940,077	918,905	268,370	724,497	220,056
1961	928,885	915,553	308,728	762,380	262,056

	Santa Catarina	Rio Grande do Sul	Maranhao	Brazil
1950	82,190	585,027	115,954	3,217,690
1955	99,488	794,456	262,760	3,737,471
1960	135,698	888,675	277,741	4,794,810
1961	155,905	1,090,099	491,500	5,392,477

Source: Servico de Statistica de Producao, Ministerio da Agricultura as published in various issues of the Annuario Estatistico do Brasil.

Most of its rice output is consumed in the "interior" itself.

There are no statistics on overland interstate ship-
ments in Brazil. However, it seems clear that the Sao Paulo metropoli-
tan area and its commerce are supplied principally by the Central States
(i.e., the Minas Triangle, Goias, and Mato Grosso) and Rio Grande do Sul,
with Sao Paulo State, Santa Catarina and Maranhao all of considerably
lesser importance. The same picture holds for Rio de Janeiro, except
that there Rio Grande do Sul and Maranhao are more important suppliers
than in Sao Paulo, due to the lower prices of rice from these States
coupled with the generally lower incomes of the masses served by the
Rio commercial area. Moreover, until the last few years, transporta-
tion to Sao Paulo from the Central States was much easier and cheaper
than to Rio.

As usual, the basic varieties are divided into long,
medium and short grain. The production of the Central States is of
a long-grain type called "Amarelao" ("Large yellow"). Sao Paulo pro-
duces for the most part a medium grain called "Agulha" ("needle"),
whereas Rio Grande do Sul cultivates all three in the proportion of
about 50% short grain, 30% medium grain and 20% long grain. Maranhao
rice is primarily medium and short grain.[39]

There is also differentiation in the trade between rice
of the same length from different states. For each grain size, consumers

---

39. IRGA, op. cit., No. 18 (1963), p.65.

in Sao Paulo and Rio Janeiro find gaucho[40] rice less desirable than that
from the Central States and Sao Paulo. It is felt that the gaucho
product is less fluffy and yields less volume of cooked rice per unit
weight. Gauchos deny this, saying that Paulistas and Cariocas[41] just
do not cook it enough and use too much water. Be that as it may, Rio
Grande rice receives a lower price for each grain length. Preferred
even less is the rice from the North, which, because of more backward
drying and milling methods, is of a poor appearance. Some idea of
the relative consumer preferences is reflected in Table XI, showing
the average rice prices on the Sao Paulo "Bolsa" for 1963.[42]

Table XI

Average Annual Bolsa Price, 1963

(Cr.S per sack of 60 kilos, grade "extra")

Long Grain	Central States	Cr$	10,691.20
" "	Rio Grande do Sul		9,595.30
Medium Grain	Sao Paulo		8,911.40
" "	Rio Grande do Sul		8,446,70
Short Grain	Rio Grande do Sul		7,903.00

Source: Bolsa de Cereais, Sao Paulo.

The result of this price structure is that Rio Grande do Sul and Maranhao

---

40. The natives of Rio Grande do Sul are known as Gauchos, because of
the relative similarity of their cowboy to the Argentine.

41. Residents of Rio de Janeiro.

42. Rice from Maranhao is traded so sporadically on the Bolsa that it
is impossible to make yearly comparisons with other types. In general,
it sells for the same price grade for grade as Rio Grande rice. But
its grade tends to be lower on the average.

rice are consumed much more by the poorer classes[43] than that from the Central States, which accounts, in part, for Rio Grande do Sul's rather large annual exports to the poorer North of Brazil, mainly of short grain rice.[44] It also explains why Rio Grande do Sul always ships more rice to Rio than Sao Paulo from which it is distributed to poorer areas in Rio State and Eastern Minas Gerais.

2. Rice as a Commercial Crop: Size and Income Concentration of Producers.

In a number of areas, rice is the single most important cash crop.[45] It is a much more commercial crop than beans in Brazil, with the typical subsistence-cum-cash-crop farm weighing much less and

---

43. One exception is the preference of the large Japanese and Nippo-Brazilian population of Sao Paulo for short grain rice.

44. In 1961, for example, Rio Grande do Sul was the only Southern State to ship significant quantities to the North, with exports of 42,367 tons by coastal shipping. Rio followed with 167 tons. Ministerio do Fazenda, Servico de Estatistica Economica e Financeira, Comercio de Cabotagem do Brasil, 1961, Rio de Janeiro, p.66.

45. In Goias, the Minas Triangle, Rio Grande do Sul, and Mato Grosso.

	Income from Rice 1962 Cr. $1000	Income from 2nd Cash Crop
Rio Grande do Sul*	26,500,353	26,714,224
Goias	25,000,993	5,536,986
Mato Grosso	7,967,467	1,894,570
Minas Gerais*	29,385,467	27,140,630

*The Minas Triangle and Rio Grande do Sul's rice zones earn a much greater proportion of total gross income from rice than indicated for the states as a whole.

Source: Anuario Estatistico do Brasil, 1963

apparently declining in importance.[46] There are several indications
of this higher degree of commercialization.

1. State averages of output and area planted per establishment
producing rice were significantly larger than for beans in the 1950
Census as shown in Table XII. But more important, and unlike beans,
there are several regions--in the table: The Minas Triangle, Barretos,
Ribeirao Preto and the three counties included for the Paraiba Valley
in Sao Paulo; the rice zones of Rio Grande do Sul[47]--where average
area planted per establishment producing rice reaches fairly high
levels for Brazil (for crops other than coffee), and farms with hundreds
of hectares planted in rice are not uncommon.[48]

2. In such important rice regions as the Minas Triangle, Southern
Goias, Sao Paulo's Paraiba Valley and the rice zones of Rio Grande do
Sul, a sizeable part of the producing farm's total income is likely to

---

46. Thomazini Ettori, Oscar J., "Produtividade Fisica da Agricultura em
Sao Paulo", Agricultura em Sao Paulo, Ano XI, No. 7 (Julho 1964), p.9.

47. State census Data for other states were unavailable to the author at
the time of writing. Most certainly, such regions also exist around
Goiana and Anapolis in the South of Goias and today in Souther Mato Grosso.
In Sao Paulo, new important rice areas have been expanding all through
the regaon bordering on the Parana River near the boundary with Mato Grosso.

48. In Rio Grande do Sul in the 1961/62 harvest, fully 50% of total
area planted and 11.6% of rice producers in the rice zones were
accounted for by units planting 100 hectares or more in rice. Nineteen
farms, accounting for 4.4% of total area planted, cultivated 500 hectares
or more in 1961/62. See IRGA, op. cit., No. 18, 1963, p.67. In Sao
Paulo and the Central States, due to the generally greater diversifica-
tion of agriculture, large plantings would be rarer, but this does not
mean that many farms producing rice are not at least as large as the
biggest of Rio Grande do Sul. For Sao Paulo see Moyses, Milton Alberto
and Thomazini Ettori, Oscar, J., op.cit., p. 18.

Table XII

Production Characteristics of Rice,
Selected Brazilian States, 1949.

	Area per Establishment* (hectares)		Product per Establishment* (tons)		
	Iso-lated	Inter-planted with annu-al crops**	Iso-lated	Interplanted with** Annual Crops	Perennial crops
Sao Paulo	4.99	6.40	6.23	4.11	3.67
Parana	1.92	5.97	2.29	2.29	3.19
Rio Grande do Sul	2.95	.99	6.61	.68	-
Goias	3.85	2.83	5.93	2.32	9.96
Minas Gerais	3.73	4.18	4.08	2.87	2.33
Triangulo Minejro	14.19	20.72	22.83	27.25	-
Barretos,Sao Paulo	14.10	14.66	21.19	12.84	2.86
Ribeirao Preto,S.P.	13.93	15.53	18.35	8.97	3.72
Vale do Paraiba,S.P.					
Pindamonhangaba	40.68	11.33	67.55	8.00	-
Taubate	24.65	3.70	57.04	1.52	-
Tremembe	63.97	-	61.68	-	-
Rio Grande do Sul: Rice Zones (1961)					
Total	39.69		106.84		
Farms planting above 9 Hectares	68.21		183.75		
Farms planting below 9 hectares	4.75		12.59		

Table XII (continued)

Percentage of Output derived From:

	Isolated Planting	Interplanting	
		Annual Crops	Perennial Crops
Sao Paulo	85.84	7.23	6.93
Parana	64.97	11.80	23.22
Rio Grande do Sul	99.44	.56	-
Goias	84.59	13.57	1.82
Minas Gerais	93.51	5.96	.53
Triangulo Mineiro	90.91	9.09	-
Barretos, S.P.	94.41	5.14	.45
Riberao Preto, S.P.	96.65	2.38	.96
Vale do Paraiba,S.P.			
Pindamonhagaba	99.12	.88	-
Taubate	99.33	.67	-
Tremembe	100.00	-	-
Rio Grande do Sul: Rice Zones (1961)			
Total	100.00	-	-
Farms planting above 9 hectares	100.00	-	-
Farms planting below 9 hectares	100.00	-	-

Sources: IBGE, Conselho Nacional do Estatistica, Censo Agricola, Brasil, Sao Paulo, Minas Gerais; IRGA, Annuario Estatistico do Arros, Safra 1961/62, No. 18.

* Production (area) per establishment producing rice, including share-croppers quota, but excluding private output of laborers on own plots-- in the case of rice, 0.

** Total Area of Both crops interplanted.

be derived from rice.   The Nicholls Paiva data on this subject are

summarized in Table XIII.

Table XIII

Percent of Gross Income from Rice
(Numbers in parenthesis are the number of farms.)

	Crop-Live- Stock Farms	Crop Farms	Total
Ituiutaba (M.G.)	40.64 (6)	58.47 (7)	-
Taubate (S.P.)	13.92 (3)	40.98 (5)	-
Cachoeira de Sul, (R.G.S)	n.a.	n.a.	73.09 (9)

Source: Nicholls, W.H. and Paiva, R.M., op. cit. , unpublished appendix
tables.   The Cachoeira do Sul figure includes livestock farms.

It is important to note that farmers received a greater proportion of

their incomes from rice in Cachoeira do Sul than they did from coffee

(45.36%) in Maringa, Parana, one of Brazil's largest coffee centers.

An ECLA study of coffee farms in Sao Paulo in 1958 estimated in that

other important coffee state that only 51.6% of total farm gross in-

come came from coffee itself.[49]   In this sense, rice in Rio Grande do

Sul (and perhaps in the Minas Triangle) is even more a "monoculture"

than is coffee today in Sao Paulo and Parana.

There are two reasons for this tendency to larger concentra-

tion by farmers of their income in rice. First, as was seen above (pp.

$l \simeq c - lcl$), rice cultivation is considerably less risky than beans,

and not significantly more so than corn and cotton. The income risk is

thus among the lower ones, especially in Rio Grande do Sul where effec-

tive minimum price guarantees coupled with irrigation minimize the

49.   ECLA. op. cit., p. 87   .

possibilities of large income losses from rice. But second, it appears
that the comparative advantage of humid, clay lowlands in relation to
other soils is much greater in rice than the comparative advantages of
the best lands for beans and corn in relation other soils.[50] This
is conducive to greater concentration of rice production in these low
areas (as in Rio Grande do Sul, the Minas Triangle and Goias) and
within them, stronger emphasis upon rice than is given to corn and beans
in other areas.

3. Contrasts Between Rio Grande do Sul and the Central States and
Sao Paulo.

Although Sao Paulo, the Minas Triangle and southern Goias on the
one hand, and Rio Grande do Sul on the other are somewhat similar in
the larger size and higher income concentration of their rice producing
establishments, there are many striking and important differences between
the two groupings.

a. Technology Employed.

(1) Irrigation.

Rice in Rio Grande do Sul is irrigated, whereas, except for the
Paraiba Valley in Sao Paulo, non-irrigated lowland rice and dry upland

---

50. If rice is cultivated upland, sandy soils should be used if defici-
encies in moisture are likely to be encountered. Beans and corn can be
raised to good advantage on sandy and clay soils, if they are fertile,
See Graner, E.A. and Godoy, E.D. Jr., Culturas da Fazenda Brasileira.
(2a edicao) (Sao Paulo: Cia. Melhoramentos de Sao Paulo, 1962), pp. 7S-
79, 309, 391.

rice are cultivated in the other regions of the Center South.[51] Thus

rice production on this count alone is more capital intensive in Rio

Grande do Sul.

One important result of irrigation in Rio Grande do Sul is that

yields per hectare there are considerably above those for other states

(see Table XIV).

TABLE XIV (a)

Rice Yields in Sao Paulo and Rio Grande do Sul

(Selected years)

(sacks of 60 kilos of paddy rice)

	Non-Irrigated and Irrigated Paraiba Valley, S.P.	Upland Sao Paulo	RGS
1950	58	61	98
1955	80	43	102
1960	77	45	105
1962	75	49	n.a.

Source: Moyses, A.M. and Thomazini Ettori, O.J., op. cit., p. 8.

---

51.   In Sao Paulo, 78.3% of total area planted was upland in 1961-62,
and only 2.6% was produced using controlled irrigation. The remainder
was planted on the flood plains of rivers and streams. See Moyses,
A.A. and Thomazini Ettori, O.J., op. cit., p. 8.

Table XIV (b)

Yields per Hectare of Rice, 1949 (isolated cultivation)

	Tons
Parana	1.19
Rio Grande do Sul	2.24
Goias	1.54
Minas Gerais	1.10
Minas Triangle	1.61
Barretos, S.P.	1.50
Taubate, S.P.(Irrigated)	2.31
Sao Paulo	1.25

Source: Computed from data of IBGE. Censo Agricola, 1950.

Furthermore, irrigation considerably reduces variations in yields due to rainfall fluctuations. Although upland rice is planted at the beginning of the wet season in Sao Paulo and the Central States (October and November), the grain is still forming at a time when rainfall is variable (February, part of March). The result of this is generally greater yield variability. In verification of this difference the variance of the ratio of yields to their five-year centered moving

Table XV

Rice Timetable

Planting	October-November
Harvest	March-April (RGS)
	March-May (S.P., Central States)

averages was found significantly greater for Sao Paulo (1951-64) than

for Rio Grande do Sul (1949-62) (see Table XVI).

TABLE XVI

Variances of the Ratio of Rice Yields to
Their Five-Year Centered Moving Averages

Sao Paulo (1951-64)   .014783   (Mean .9978)

Rio Grande do Sul (1949-62)   .003834   (Mean 1.0019)

F(9,9) = 4.117, significant at the .025 level.

The greater variability in yields in Sao Paulo and the Central

States[52] means that they contribute proportionately much more to har-

vest and price fluctuations than Rio Grande do Sul.

(2) Fertilizers are used much more extensively in the extreme

Southern State. In Sao Paulo it appears that for the 1960-61 harvest

2,300 tons of chemical fertilizers were used in rice on an area of

644,000 hectares, while 47,570 tons were used in Rio Grande do Sul in

1961-62 on an area of 290,000 (farms planting more than nine hectares).[53]

---

52. Similar results would, no doubt, be found for Minas Gerais, Goias
and other states producing upland rice, if data on yields sufficiently
precise to estimate variability were available for them.

53. Source: Sao Paulo: Moyses, M.A. and Thomazini Ettori, O.J., op.
cit. , p. 10; Rio Grande do Sul: IRGA, op. cit, No. 18 (1963), p. 9.
The Sao Paulo figure is a very tentative estimate. Although the use
of fertilizers has increased somewhat in Rio Grande do Sul, the
decline in the supply of virgin lands led to a decline in yields dur-
ing the 1950's.

Data on the Minas Triangle and Goias are not available, but the use of
fertilizers there is very small, partly because the lands are, in
general, newer. There is a certain bias in this measure of techno-
logy, since much of the Gaucha land has been under cultivation for
many years. But the same can be said of Sao Paulo, and thus only
a small part of the difference between the two states in the use of
fertilizer can be explained by soil exhaustion.

(3) Mechanization of operations up to the harvesting is wide-
spread in Rio Grande do Sul, as it is on larger farms in other areas.
Comparisons on the degree of mechanization are impossible, given
available data, but it is unlikely that either Sao Paulo or the Minas
Triangle can approach the Gaucho ratio of approximately one tractor
per 50 hectares, one threshing machine per 113 hectares, and even one
combine per 475 hectares shown in Rio Grande do Sul for the 1961-62
harvest.[54] Thus it is likely that rice production in Rio Grande do
Sul is considerably more capital intensive, using irrigation and more
machinery.

6. Systems of Land Tenure and Labor Arrangements.

There is also a marked difference in land tenure and labor
arrangements between Rio Grande do Sul and other rice producing

---

54. IRGA, op. cit., No. 18 (1963), p. 62. The Nicholls-Paiva sample
shows Reio Grande do Sul leading by far in machinery per worker, labor
productivity, and crop land per man-year, clear indications of more
capital-intensive techniques above and beyond the added investment
in irrigation. Nicholls, W.H. and Paiva, R.M., op. cit., pp. 356-357.

regions.[55] The clearest contrast exists between Rio Grande do Sul

and the Minas Triangle.[56] Generally speaking, the rice producer in

Rio Grande do Sul rents lowlands, often from an owner specialized in

livestock on the higher lands of his property, and employs daily or

monthly salaried labor. In the Minas Triangle, rented land is ex-

tremely rare, but on the farms large enough to support (and there

are many), sharecropping is an almost universal characteristic.[57]

Tables XVII and XVIII show these characteristics, first for the

rice zones of Rio Grande do Sul, then for the Minas Triangle and two

rice areas in Rio Grande do Sul accounting for well over one half of

the State's output in 1949. Rented land, which was approximately 70%

of the area planted in rice in Rio Grande do Sul in the years near 1950,

accounted for only 6% of the farm land in the Minas Triangle in the

---

55. Available data make this somewhat difficult to show directly. First,
the 1950 Census data is far out of date for such relatively new rice
producing areas as Goias and Mato Grosso, where crop production has
been increasing at a much more rapid pace than livestock with increasing
settlement and improved transportation facilities. Data on working
arrangements in the aggregate for these states in 1950 would give a
very distorted picture of rice farms today. And second, in the Census
it is impossible to distinguish rice producers from other farmers. Ten-
ure and labor relations on livestock farms will generally be quite dif-
ferent from those on crop farms.

56. Given the proximity and similarity of types of exploitation of
farm land in Southern Goias and the Minas Triangle, it is probably that
tenure and work relations are also rather similar, although no statis-
tical evidence exists on this count.

57. As it is also in the neighboring "Alto Paranaiba" region in Minas,
which produces a considerable surplus of beans. It will be recalled
that the median area per establishment is 100-200 hectares in the Minas
Triangle and 50-100 hectares in the "Alto Paranaiba".

Table XVII

Rice: Rio Grande do Sul*

	Percentage of Culti-vated Rice Land Rented	Average Cultivated Rented Land per Establishment (hectares)
1946/49	68.8	80.5
1960/61	74.9	73.2
1961/62	76.3	72.9

Source: IRGA, Anuario Estatistico do Arroz, various numbers.

* Data refer to farms planting more than 9 hectares in rice.

Table XVIII

All Farms, 1950 Census

	Area: Hectares		Establishments with:	
	Own lands	Rented Lands	Own Lands	Rented Lands
Minas Triangle	4,045,814	241,746	9,609	1,254

	Total Number of Sharecroppers	Total Number of Other Workers		Ratio of Share-croppers to other permanent workers
		Total	Permanent	
Minas Triangle	22,574	23,627	7,038	3.21
Rio Grande do Sul:				
Depressao Central	4,820	34,376	7,995	.60
Litoral Legunar	1,302	18,737	6,936	.19

Source: IBGE, Conselho Nacional de Estatistica, Censo Agricola, Minas Gerais, Rio Grande do Sul, 1950.

same year.   In the Minas Triangle the ratio of sharecroppers and their

employees to permanently employed labor (excluding sharecroppers) was

3.21 in 1949, while it was no higher than .60 in the Depressao Central

and only .19 in the Litoral Lagunar, the two most important rice areas

of Rio Grande do Sul.

The Nicholls-Paiva data support this general labor picture for

two large rice producing counties.   For a sample of 14 farms in Ituiu-

taba, Minas Gerais (50,12% of gross income from rice), 75% of the

permanent resident families were sharecroppers,[58] while in two counties

in Rio Grande do Sul with 15 farms, only 3% of permanent families were

sharecroppers.

At the author's request, direct estimates of the output of

rice in Sao Paulo accruing to the several rural classes was made

through the sample technique of the Divisao de Economia Rural of that

State,[59] the results of which are presented in Table XIX.

Table XIX

Rice, Sao Paulo, 1962-63
(sacks of 60 kilos)

Sacks produced for the fazenda	7,108,814
Sacks produced for the sharecropper	2,739,725
SAcks produced for renters	1,413,187
Sacks produced for laborers	624,080
Total production	11,885,816

---

58. Nicholls, W.H. and Paiva, R.M., op. cit., pp. 354-355.

59. A similar attempt for beans gave bad results.

Note that the proportion proportion produced by laborers on their own private plots (less than 6%) is considerably lower than the 29% shown for beans in the 1950 Census for Sao Paulo State, another index of rice's level of commercialization. If we assume a division of 50-50 between the landowner and the sharecropper on the average,[60] one-half of total output in the state, 5,480,000 sacks of 11,886,000, appears to have come from sharecropping arrangements, probably less than in the Minas Triangle, but considerably more than in Rio Grande do Sul.[61]

There is some similarily between these two arrangements-- renting with hired labor and sharecropping--in that in neither does the landowner take full responsibility for rice production. Indeed, the renter in Rio Grande do Sul most often pays after the harvest in kind, as does the sharecropper. But the contrasts are most important.

The typical renter in Rio Grande do Sul is highly capitalized, with large investments in irrigation and cultivation machinery. He has excellent access to official bank credit both for working and some fixed capital. He is, by and large, a specialist in rice, deriving the

---

60. This seems to be the most common arrangement, but sharesmay vary widely depending upon what is supplied the sharecropper.. In the Minas Triangle, if the landlord supplied just the land, his share was 1/3, but with the plowed land and seed, it was 1/2. If the land owner advanced food in kind or perhaps tools, the share was even more for the landlord.

61. In the Paraiba Valley, sharecropping is very rare indeed, but this irrigated region produces less than 10% of Sao Paulo State's total rice output.

bulk of his sometimes considerable income from it.

In the typical Minas Triangle sharecropping arrangement, the landowner delivers the land to his sharecroppers already plowed and frequently seeded. The sharecropper is responsible for all states of cultivation after that, including the harvesting which may, however, be performed by the machinery of the landowner at some further cost. The most frequent split is 50-50 between landowner and sharecropper. The latter, having little or no collateral, generally cannot get bank credit without the co-signature of the landowner, and is thus usually dependent upon either the landowner or less frequently, the rice mill ("maquinista") for his capital needs. Large outstanding debts, added to the fact that rice makes up a goodly part of their incomes, mean that for a significant number of rice sellers in theMinas Traingle waiting very long before selling is practically impossible. But the result of the indebtedness of croppers to landowners and the latter's greater access to more distant market centers is that the cropper very often sells, not to a miller or a merchant, but to the fazendeiros themselves, who then frequently speculate with the product.[62]

This is not unlike the situation with beans in the Minas Triangle and the Alto Paranaiba region, with one exception: since the

_____

62. Especially now that bonded warehouses have increased considerably in number and that official bank credit to farmers has expanded so much (see Chapter X below). Judging by the common tales, the system of advances to sharecroppers is subject to frequent and severe exploitation by the landowner.

landowner's rice holding are considerably more important in his gross income than his bean holdings, it is more difficult and costly for him to retain a given percentage of rice than of beans (see pages 102-106 above). But the system does mean that retention by "farmers" (fazendeiros) is higher than might appear likely judging from the importance of sharecroppers.

In general, then, it should be kept in mind that sharecroppers of Minas, Goias and even Sao Paulo are usually a different species from the renters of Rio Grande do Sul, even though they may both pay rent in kind. The former are usually much closer to agricultural laborers, paid wages for given tasks, varying with the yield of rice in price. The Rio Grande do Sul renter is often likened to an agricultural "capitalista".

Chapter V

MARKET STRUCTURE AND PERFORMANCE:
THE 1930's AND EARLY 1940's

The Brazilian cereals marketing system has undergone a profound evolution in the last three decades. There has been a trend towards fewer transaction breaks in distribution channels. Regional and interregional markets have become more integrated, accompanying the expansion of roads and truck transportation. The farm credit system, especially in the last 15 years, has undergone modifications of the greatest significance for the operation of the marketing system, with a massive expansion of official bank credit and the dramatic decline in the importance of the merchant-moneylender system. And finally, both farm and urban markets have become considerably more competitive.

These trends have almost certainly increased the efficiency of the price transferral system, ceteris paribus, acting to reduce oligopsonistic profits and the level of the marketing cost functions. Ideally, it should be possible to correlate these structural changes with the development of marketing margins and their components over time for the several alternative marketing channels. In Brazil this is impossible. Except for information on average farm prices and wholesale prices in a few urban areas, the necessary elements for such a correlation do not exist. In general, however, the comparative trends of wholesale and farm prices will be shown to behave as expected from the qualitative evidence: farm prices have risen relative to those at wholesale in Rio Grande do Sul, Sao Paulo, Minas Gerais, Goias and Parana.

This chapter treats of the rice-bean marketing system for the
Center-South during the late 1930's and early 1940's as a point of reference
or "ideal type" from which later developments can be viewed. First,
it describes the centralization of marketing activity in a few centers
located propitiously in the system of rail and coastal shipping (Sao Paulo,
Porto Alegre and Rio de Janeiro) together with the marketing channels re-
volving around them. Then it turns to the relatively (to later years)
high degree of concentration in the commerce of these cities and its
probable causes, rooted in the case of Rio Grande do Sul, in the
process of commercial expansion in response to the rapid growth in farm
output in a new region. The importance of the merchant-moneylender sys-
tem is highlighted as a key factor, along with geographical immobility,
permitting oligopsonistic profits in Rio Grande do Sul and the Sao
Paulo region. In particular, the behavior of the rice oligopsony in
Rio Grande do Sul, aided by the presence of a dominant leader and the mer-
chant-moneylender system, is analyzed in detail because of the greater
availability of (price) data relevant to it. This oligopsony acted to
depress prices below competitive levels during the harvest months when,
because of credit compromises with merchants, farmers were selling the
bulk of their output, and then it provoked rather large seasonal price
rises in the interharvest months. This action depressed farm incomes
and probably raised commercial profits. It will be seen that by 1945-
49 evidence of this oligopsony behavior had disappeared, the first im-
provement in the marketing system in the period under consideration
(1935-63).

The central characteristics of the 1930's and early 1940's, then, were: (1) marketing channels centralized in a few cities; (2) "articulated" (i.e. "roundabout") market channels characterized by many transactions between farmers and consumers; (3) high concentration relative to later years which, together with the merchant-moneylender system,often seems to have stimulated non-competitive oligopsony behavior.

I. Principal Surplus Areas of Rice and Beans

As was seen in the last chapter, the production frontier of rice and beans has been expanding rapidly in the post war period. But in the late 1930's, the principal surplus areas for the two products (excluding purely local consumption) were still Rio Grande do Sul, Sao Paulo State and parts of the South and Forest Zones of Minas Gerais.[1] The surge of settlement in the North of Parana bad not yet begun, and the Minas Triangle and Goias were of relatively minor importance (see Table I).

Table I
Production of Rice, Corn and Beans (tons)

	Rio Grande do Sul, Sao Paulo Minas Gerais	1920 Sao Paulo	Goias	Minas Triangle	Brazil
Rice	634,000	348,000	37,000	25,000	983,000
Corn	3,623,000	1,192,000	133,000	51,000	5,000,000
Beans	489,000	214,000	11,000	5,000	725,000
		1939			
Rice	1,156,000	468,000	89,000	41,000	1,488,000
Corn	3,733,000	1,320,000	204,000	76,000	5,394,000
Beans	513,000	180,000	24,000	5,000	790,000

Sources: Recenseamento Geral do Brazil, 1920: Agricultura and IBGE, Conselho Nacional de Estatistica Annuario Estatistico do Brasil, 1941. Data rounded to nearest 1,000 ton.

---

1. Sul de Minas and the Zona da Mata.

Given the high cost of transport relative to the price of the two commodities and the considerably smaller proportion of people living in urban areas, marketed surpluses entering longer distance channels of marketing were a considerably smaller percentage of total output than they have become in recent years.

II. System of Transportation and Market Centers

Coastal shipping and the railroad were almost the sole means of transport for the two cereals over any considerable distance. The use of the truck was slight indeed. There were no road connections between Rio Grande do Sul and Sao Paulo and Rio de Janeiro to the North.[2] Although Sao Paulo State had by far the best road network in Brazil, it was limited in 1939 to 7 kilometers of concrete highways, 14 of asphalt and 44 of macadam--all near the city of Sao Paulo. Approximately 90% of the State's 47,000 kilometers was composed of unimproved dirt roads.[3] In all of Brazil in 1932, there were only 244 kilometers of paved highway. Well over 95% consisted of unimproved dirt roads.[4] Although road construction had made sizeable strides during the administration of Washington Luiz (1926-30), highway development was neglected in the Vargas period (1930-45).[5]

---

2. Work was begun on the road from Porto Alegre in 1940, and as of 1939, the stretch between Sal Paulo and Curitiba in Parana was still unfinished. Observador Economico e Financeiro, XXXVI (Janeiro de 1939), p.76.

3. Ibid., XXXVIII (Marco de 1939), p.35.

4. Ibid., CXVI (Setembro de 1945), p.61)

5. Wythe, George, "Brazil: Trends in Industrial Development" Economic Growth: Brazil, India, Japan, ed. Kuznets, Simon, (Durham, N.C.: Duke University Press, 1955), p.52.

The dirt roads were of very low quality. Maintenance was poor, and they were often impassable in the rainy season and full of ruts in the dry season. Given the low bulk unit value of cereals, the low carrying capacity of the trucks of that period in Brazil,[6] and their high rate of depreciation over such poor roads, truck transportation over any considerable distance must have been prohibitively expensive.[7]

It was primarily in adjustment to the transport network that the system of marketing channels revolving around a few large central markets--Porto Alegre, Sao Paulo, and to a lesser extent, Rio de Janeiro-- developed. All were transport centers for larger trading regions and, in addition, enjoyed the external economies of scale accruing to the largest urban centers of their respective regions.[8]

A. Rio Grande do Sul

Porto Alegre was the natural transport break between the interior

6. Heavier trucks appeared only with the FNM (National Motor Factory) after World War II.

7. The author was unable to encounter records of truck rates in this period. In Brazil, fixed rate scales are still the exception. Trucking is a field dominated by the small operator with a few trucks, and rates are primarily a result of the supply and demand at the moment at any particular place. All merchants interviewed, however, agreed on the high relative cost of transport for the period.

8. Thus they were the largest concentrations of consumption of their regions--a fact which in itself would create an active commerce-- and had the most extensive and sophisticated banking facilities. For a description of market centralization in the United States arising primarily because of rail transportation, see Shepherd, Geoffrey, op.cit., pp. 31 - 46.

producing zones and export from the state.. The main rail line from the
interior terminated in Porto Alegre, as did one of the State's principal
rivers (also important for the transport of cereals at that time). Al-
though many ocean-going vessels cannot dock there,[9] Porto Alegre was
Rio Grande do Sul's principal port.[10] Until the 1960's practically all
of Rio Grande do Sul's exports of rice and beans to the rest of Brazil
left the state by sea.[11] Thus Porto Alegre was the physical point of
confluence for production from the interior and for shipment from the state.
Logically enough, it was here that merchants specialized in the different
marketing functions concentrated their trading activities, furthered in
this by the financial facilities of the city and its relatively good
communications with the rest of Brazil.

P. Sao Paulo

Sao Paulo was the hub of the rail network penetrating the inter-
ior of the State, the South and Triangle Zones of Minas Gerais, the
older parts of the North of Parana (Norte Velho), and extending to Rio de
Janeiro. These rail lines were constructed primarily to meet the needs
of overseas export, i.e. to channel coffee from the interior to the Port

---

9. Primarily deep-sea ships, for which barges were used to ship across
the lake, Lagoa dos Patos, on which Porto Alegre is located, to Rio
Grande, the State's seaport.

10. In 1957, for example, 2,284,359 sacks of rice were shipped from
Porto Alegre compared with 886,351 from Rio Grande. IRGA, Op.cit., No. 13
(1958), p.116.

11. In 1960, for example, 214,252 tons of rice went by sea, 26,551 by rail,
and 16,165 by truck. Boletim Estatistico Mensal da Associacao Comercial de
Porto Alegre, CCCXXXVI (Abril de 1963), p.62.

of Santos. They radiate from Sao Paulo like the spokes of a wheel in four directions, with the result that there was no way, except through Sao Paulo, to ship from the interior of Sao Paulo State (the Minas Triangle and Parana) to Rio de Janeiro or the eastern parts of Minas Gerais. Furthermore, during the journey to Rio, transfer from one freight car to another was required in Sao Paulo: the track guage of the Central do Brasil (1.6 meters between Sao Paulo and Rio) was larger than that of most of the lines serving the interior (mainly of 1 meter). This peculiar characteristic strengthened even more the tendency toward a break in market channels in Sao Paulo. Indeed, because of the radial layout of the rail lines, shipments from one part of the interior to another usually required passage through the Capital. Thus Sao Paulo enjoyed almost classic conditions for an entrepot or central market: a natural transport break in a developed urban center, conveniently located in relation to both producing and consuming areas. In the 1940's, as the Minas Triangle, Goias and the North of Parana became important surplus producers of cereals, Sao Paulo's importance as a transport and trading center would grow even more.[12]

C. Rio de Janeiro

Rio de Janeiro was not so fortunately situated in relation to important producing areas, but as the principal port city of its region

12. In fact, rice from the Minas Triangle was usually sent to Belo Horizonte, the capital of Minas Gerais, via Sao Paulo. Observador Economico e Financeiro, LII (Maio de 1940), p. 36.

and the rail center for deficit areas in Minas Gerais and Rio State, it
too became a market distribution center for cereals, but without the
extensive ties to producing regions which characterized the commerce of
Sao Paulo and Porto Alegre. Rio de Janeiro's trade will be considered
only as it affects important aspects of Sao Paulo and Porto Alegre.

D. General Quality of Transportation.

The system of rail and coastal shipping for cereals, although
varying greatly from line to line and region to region, was often precar-
ious and subject to frequent disruption. The Brazilian rail system has
suffered from a chronic shortage of freight cars, which in the late 1930's
was becoming severe.[13] Coordination of operations between the several
railroads was (and is) poor, aggravating this deficiency. As a result,
cereals often rotted waiting available freight cars, since warehouse
space in the interior was inadequate at that time for large harvests.[14]
Locomotives were obsolete, and roadbeds were sometimes in bad condition,
making for slow and tortuous journeys.[15]

---

13. Wythe, George, Brazil: An Expanding Economy (New York: Twentieth
Century Fund, 1949), p.198; Report of the Joint Brazil-United States
Technical Commission (Washington, 1949), p.101; The Development of Brazil:
Report of the Joint Brazil-United States Economic Development Commission
(Washington, 1953), pp. 32-35.

14. A large portion of total commercial stocks which would be consumed
outdide the local market area were held in the central market cities.

15. The transportation problem in the 1930's and early 1940's appears
minor, however, in comparison with the great bottlenecks which arose in the
late 1940's and early 1950's in such rapidly expanding regions as the Minas
Triangle, Goias and the North of Parana, See Chapter VI.

There also existed a serious problem of communications in that period. Interurban telephone service to the interior was generally poor, when it existed. Commerce had to rely principally on the telegraph, an inferior and, in Brazil, slow means of communicating meaningful market information.[16] Poor communications added to uncertain transportation must have increased price risks considerably.

III. Market Channels: Rio Grande do Sul and Sao Paulo[17]

As we have seen, Porto Alegre and Sao Paulo were the market centers for the two principal surplus regions in the Center-South of Brazil. The distribution channels revolving around each were highly articulated (in relation to later developments), i.e. there were many transaction breaks between producer and consumer. Although there are many similarities between the two, each will be considered separately.

A. Rio Grande do Sul

Most farmers did not have direct access to the Porto Alegre market. In beans, it is clear that for the typical small producer (see Chapter IV), sale outside his own local market was completely uneconomical, given the absence of cheap truck transport, his ignorance of the

---

16. Today, most larger merchants communicate with their buyers and branch offices through private radio sets, a measure of the still inadequate public communications systems. Radio communication between points as distant from each other as Porto Alegre and Sao Paulo is not uncommon.

17. The commerce of Rio de Janeiro was not studied extensively by the author and will be introduced only as it bears upon market channels for other regions.

Porto Alegre market, and the small lots which he could consign to mer-
chants in that city. Some of the larger rice producers could profitably
ship to Porto Alegre and sell directly through consignment or even on
their own. Although this did happen, indications are that it was fairly
rare.[18] Not only were there the frequent commitments to sell to the rice
mill which had financed him (a practice discussed in detail below), but
the rice producer often ran into trouble selling on consignment in Porto
Alegre, with frequent mistatement by the consignee of the time and price
of sale. It was common for the consignee to claim immediate sale when
prices were rising (even though he retained possession of the good) and
to claim that the product was warehoused when prices were falling, even
though he had already sold the good. This would lower his commission
(2-3% of sales price), but would give him the whole difference between
actual and declared sales prices.[19]

In any case, the great bulk of rice and bean sales by farmers
was made in the interior itself to local mills and merchants or to the
buyers of large rice mills in Porto Alegre. A few of the large mills
bridged the gap in Porto Alegre, buying from farmers, processing the
product, and selling through commission agents ("representantes"--to be
distinguished from consignment sales where the consignee normally

---

18. Observador Economico e Financeiro, L (Marco de 1940), p. 113.

19. Ibid., p. 113. It will be seen below that this was also a frequent
complaint about the somewhat different consignment system in Sao Paulo.

operated his own business in addition to his commission work) or selling

branches in Rio de Janeiro (Porto Alegre's principal market), in Sao

Paulo and in the North of the country.[20] But these firms, although bulking

large in volume, were few in number. Most of the mills in the interior

were not organized for sales in distant centers. Rather, they disposed

of their output in Porto Alegre, often on its Bolsa de Mercadorias,[21] to

a class of middlemen ("exportadores") specialized in placing cereals in

other large market centers, mainly through commission agents.

Beans, produced in a different part of the State,[22] underwent

a similar chain of transactions. Small local merchants buying from far-

mers sold in Porto Alegre to exporters or in the interior itself to buyers

from some of the larger export firms. Of the latter, a few bought directly

from farmers in certain areas.

In Rio and Sao Paulo, exporters, through their selling agents

("representantes") generally dealt with wholesalers specialized in cer-

eals ("cerealistas") who in turn supplied the general grocery wholesaler

dealing with retailers and the smaller wholesalers operating in the cities

in the interior (e.g., Campinas, S.P., Juiz da Fora, M.G.) While there

---

20. Rio Grande do Sul's significant foreign exports, 25-30% of the total in normal years, are beyond the scope of this study.

21. Commodity Exchange. It was a pure spot market, as was the Sao Paulo Bolsa, futures contracts being unknown to this day in cereals in Brazil.

22. In the northern "colonial" region, which derives its name from its settlement by Italian and German immigrants in communities known as "colonias".

were cases of direct transactions between exporters and general wholesalers (the larger ones), these were apparently less common.[23]

Market channels are shown graphically in Diagrams I and II.

<table>
<tr><td>Diagram I</td><td>Diagram II</td></tr>
<tr><td>Rio Grande do Sul Rice
Marketing Channels</td><td>Rio Grande do Sul Bean
Marketing Channels</td></tr>
</table>
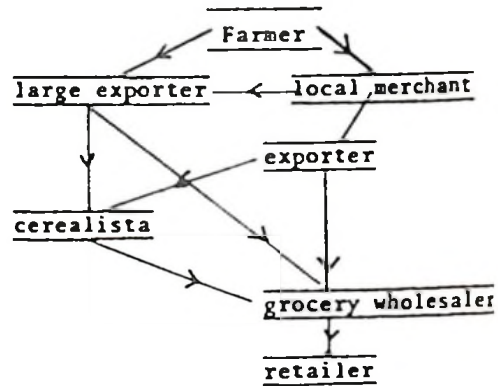
B. Sao Paulo

Sao Paulo's market channels were somewhat different in that none of the Capital's large cereals firms were also "maquinistas" (millers). All were pure middlemen. In the 1930's, and early 1940's direct farmers sales in the Sao Paulo market were extremely rare. Rather, output passed

---

23. This appears to have been primarily a question of the size lots transacted. The cereals specialist supplying many wholesalers would, on the average, buy considerably larger lots than the general wholesalers.

through the hands of at least one local middleman or miller.[24]   The

latter in turn had two alternatives in dealing with the Sao Paulo

market: either sell _in loco_ to the 4-6 firms from the capital which

procured any sizeable lots in producing areas or send their "surplus"

in consignment ("consignacao") to these same large firms or less com-

monly, to some of the smaller ones operating only in Sao Paulo.

Exactly because of their selling power and their network of buyers in the

interior, the relatively small number of large firms had a distinct ad-

vantage in the consignment business also.[25]

These 4-6 Paulistano firms procuring directly in the interior

maintained substantial numbers of buyers.   Although purchases from far-

mers were common, these buyers made the greater part from local merchants,

the local assemblers of farm output.   Payment was almost always in cash.

The great majority of the cerealistas and grocery wholesalers operating

in Sao Paulo did not buy directly in the interior, however, and were

dependent either upon the consignment business or more importantly

upon purchases from the few large firms which bought in the interior and

sold in Sal Paulo.   The latter sold almost entirely to general whole-

salers and to the numerous other cerealistas too small to support an

_____

24. It is still common for very small farmers and agricultural laborers
to sell their surpluses to small town retailer--wholesalers. These in
turn commonly sell to their wholesale suppliers in the interior who might
then sell to Sao Paulo's commerce.

25. See pages 152-8 below for an analysis of the operation of the consign-
ment business.

extensive buying operation in the interior, often on Sao Paulo's Bolsa

de Cerais. Sales from large cerealista to retailer were extremely rare.[26]

Direct consignment from one part of the interior to another or

from firms in producing regions to market centers other than Sao Paulo

was rare. Cerealistas and wholesalers from Rio de Janeiro or other parts

of the country did not maintain buying organizations in Sao Paulo and

the new regions--in the Minas Triangle and the North of Parana. This

meant that the surplus of the Sao Paulo region generally passed through

the capital's commerce. That part which was exported from the State was

either purchased in the Sao Paulo market or sold in Rio de Janeiro and

the North of the country by the selling agents of these same large

cerealistas. It was through the commerce of Sao Paulo that the surpluses

of Sao Paulo State, southern Minas and what production there was in

western Minas and the North of Parana were distributed to final con-

sumption points.

IV. Market Structure: Oligopoly-Oligopsony and the Merchant-Moneylender System.

With an interpretation of the operation of markets and market

structure, we enter treacherous terrain. No quantitative data which might

---

26. Large, of course, is a relative term. The author has no information
on the absolute volume of these firms. Today the largest rice mills rare-
ly reach a production of 500,000 sacks of 60 kilos per year. Most
"large" mills produce considerably less. One of the largest cerealistas
in Sao Paulo today worked with about 750,000 sacks of rice, corn and beans
in 1963. Another may have reached 1,000,000, due to the exceptional corn
harvest. These figures imply yearly sales of less than $5,000,000. Total
capital of more than $1,000,000 would be extremely rare. The big cerealista,
then, is not big business, and cannot compare with the size of marketing
firms in coffee and cotton in Brazil.

give an indication of the concentration in commerce in this period are
available. We must rely upon the consensus of informed merchants who
were operating at that time, and this may be fraught with exaggeration
and misinterpretation. However, the agreement of certain points, e.g.
the high degree of concentration in the trade (much higher than today,
at least), is so complete that these opinions must be given considerable
weight. It is the best information available in reconstructing the mar-
keting system of that earlier period. In addition, trends observed in
later years, especially the ascendancy of a few firms in a new region
followed by thier decline under the impact of new competitors, lends some
support to information on the 1930's and 1940's supplied by the mer-
chants interviewed.[27]

A. Degree of Concentration

According to merchants, the commerce of these two central
market (or entrepot) cities was concentrated amongst a few firms. The
4-6 Paulista cerealistas buying sizeable quantities in the interior formed
large stocks both in Sao Paulo (much more important) and the interior,
and almost certainly held the bulk of existing stocks of beans in the

---

27. In Sao Paulo, five old-hand merchants were interviewed specifically
on this subject, and in Porto Alegre, four. In addition, the opinions
of funcionaries of IRGA and the Divisao de Economia Rural in Sao Paulo
were useful in this connection. Many other merchants interviewed
expressed opinions on this earlier period, although it was not the prin-
cipal subject of the interview.

interharvest periods. They suffered little competition in the interior
from cerealistas from other large centers, since the latter almost
never bought directly in the Sao Paulo interior. In certain areas and
for certain minor products, e.g. onions and garlic in the Paraiba Valley,
these firms sometimes achieved almost a corner on output. Their position
was weakest in rice. A few large mills sold in Sao Paulo directly. In
addition, there were the Rio Grande do Sul exporters. Given these facts
and the sheer size of the harvest, their market power must have been
significantly smaller in rice, although they still bought and sold a good
proportion of the output of the smaller mills in the interior.

Thus the market in the Sao Paulo region for rice and beans
narrowed greatly for that part which left the interior of the State or
was transferred from one part of the interior to another (usually via
Sao Paulo).

Concentration in Porto Alegre was even greater, at least for
the earlier years of the period. Although there were many exporters and
rice millers, few bridged the gap of the Porto Alegre market. In rice
one firm with selling agents throughout the main cities of Brazil is
said to have "dominated" the market. According to one reliable source
in the trade, this firm regularly bought up 500,000 sacks of rice in the
late 1920's, giving it perhaps 20% of the State's output and about 1/3
of its exports.[28] By the early 1930's, its market share had already

---

28. Exports in the late 1920's fluctuated between 1 and 1.5 million sacks
of milled rice. IRGA, op.cit., No. 18 (1963), p.95.

begun to decline. But no firm compared with its size--even then.

B. Factors Underlying Concentration

How can the concentration in both market areas be explained?
Economies of scale in milling and commerce combined with small markets
are important but not sufficient. The pattern of concentration followed
by diffusion occurs repeatedly in new production regions: first Rio
Grande do Sul, then the Minas Triangle, and finally Parana (see Chapter
VI'). Large firms do not continue so large, even in absolute terms
(a prima facie requirement for the sufficiency of an economies of scale
explanation).[29] And their relative share always declines.

1. Rio Grande do Sul

The principal explanation seems to lie in the dynamic process
by which agricultural and commercial expansion occurs in Brazil. In
Rio Grande do Sul, rice production began only at the turn of the century,[30]
but by 1919 output had reached 113,000 tons. The 1920's saw a doubling
of production, which rose another 41%, 1929-39 (see Table II).

---

29. No firm in Rio Grande do Sul today seems to buy as much as
500,000 sacks of rice. In the Minas Triangle, the largest firms today
work with 100,000--150,000 sacks of rice per year where as in the
early 1950's, the largest mills bought as much as 500,000 sacks. In
Parana, there seems little doubt that the volume of the two or three lar-
gest firms today cannot match what they reached in the middle or late
1950's.

30. Shipments out of the State totaled only 201 tons in 1907. IRGA,
op.cit., No. 18 (1963), p.95.

Rice Production:
Rio Grande do Sul (tons)

1919	112,727
1929	232,200
1939	326,082

Source:
IRGA, op.cit., no.18 (1963), p.66.

A more appropriate and statistically more accurate indicator
of the pressure upon capacity in rice processing and commerce (given the
frail nature of agricultural production estimates of that period) is
the growth of exports from the State. As can be seen from Table III,
rates of growth of exports were generally substantial except in the
early 1930's, Brazil's depression years. Growth in the 1920's (10.2%
per annum) was particularly rapid, exactly during that period when
concentration was said to have been highest.

Table III

Exports of Rice from Rio Grande do Sul

	Exports (sacks of 60 kilos)	Average Annual Rates of Growth from Previous Period	Cumulative Annual Rate of Growth from 1919/21
1919/21	653,377		
1926/28	1,287,173	10.2%	10.2%
1929/31	1,435,448	3.7%	8.2%
1932/34	1,432,897	-	6.2%
1936/38	2,320,756	12.8%	7.6%
1939/41	2,899,716	7.7%	7.7%

Source: IRGA, op.cit., No.18 (1963), p.66.

No data are available on storage, milling and transport capa-
cities in Rio Grande do Sul during the 1920's and 1930's, let alone on

their rates of utilization. However, given the rapid rate of growth in
the 1920's, it is almost inconceivable that excess capacity developed on
any continuing basis in those years, and indeed it seems probable that
capacity was generally inadequate for an efficient channeling of the
harvest.[31]

The outlines of the process of growth in commerce seem to be
as follows. In new frontier zones even today net profit margins are
considerably higher than in areas previously settled.[32] Both non-
competitive and quasi-rent factors are involved, as commerce, financed
almost entirely by new entry and retained earnings,[33] tends to lag
somewhat behind the growth in farm output. Thus large profits accrue
to early entrants (e.g. the dominant firm in Rio Grande do Sul), es-
pecially if they have some sizeable initial working capital. The process
feeds on itself as high profits are retained, financing additional ex-
pansion and buying capacity. Some early firms grow rapidly, rising to

31. The problem of commercial capacity was aggravated by the credit system
which in general forced farmers to sell during the harvest in order to li-
quidate loans from millers. This created an extreme peak-load problem,
for off-farm warehousing and transportation.

32. A question was included in the beans questionnaire asking whether there
were producing areas which, allowing for additional costs, gave significant-
ly higher profit margins. All answered, the new regions, those more removed
from the market centers. Most agreed that this was because of less com-
petition and the lack of market alternatives and information by farmers.
Also, firms in Uberlandia were clear in their belief that profit margins
were significantly higher buying in Mato Grosso where competition is con-
siderably weaker.

33. Long-term bank financing for cereals is rare even today.

positions of high relative weight in the market as output grows. But
such obvious profitable opportunities attract imitators, often willing
to give better buying and lending conditions to farmers. This incentive
coupled with the decline in the rate of growth in output (as observed in
the 1930's) gradually erodes the relative and absolute position of the
original firms. Graphically the process described would be something
similar to Diagram III.

Diagram III

farm output

marketing capacity

concentra-
tion index

time
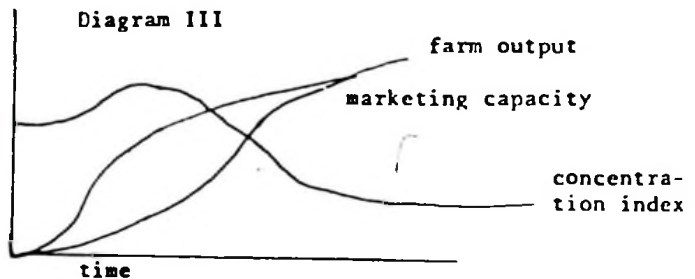
Higher rates of concentration seem to correspond, then, to periods when
output is growing most rapidly in the earlier years and are accompanied
in general by constant pressure upon the ability of the commercial system
to absorb them. The largest firms need not be the oldest in the region,
but are always amongst the first with sizeable capital resources to
enter the market in its phase of rapid growth. High profits both through
quasi-rents and the exercise of market power tend to increase their share
until, after a period of lag, new entry and additional investment begins
to overtake the already slower growth in the output curve.

There is one other important piece of evidence for this inter-
pretation of Rio Grande do Sul: the average volume of the rice mill
in the State in 1919 (the only year for which there are data) was <u>four</u>

times what it had become by 1958 (see Table IV).

Table IV
Average Output of Milled Rice per Urban Mill*
Rio Grande do Sul

	Production per Mill	Number of Mills
1919	26,000 sacks	23
1958	6,500 sacks	875

Sources: Recenseamento do Brasil, 1920: Industrial. IBGE, Conselho Nacional de Estatistica, Producao Industrial Brasileira, 1958. Data rounded to nearest 100 sacks.

* Urban mills exclude milling machinery placed on rural properties, i.e. agricultural establishments. The same criterion was applied in both cases. For 1920, the original data were for paddy rice processed. This was converted into milled rice by assuming a .6 yield by weight from the paddy rice. This is probably a little bit on the low side.

It should also be noted that in 1919, there were only 23 rice mills off the farms in the whole State. The decline in the average volume per mill and the dramatic rise in the number of mills lend some support, then, to the argument presented above.[34]

In the absence of detailed quantitative evidence, this can be only a tentative hypothesis, but one which corresponds with the broader facts about Rio Grande do Sul, Minas Gerais and Parana (see chapter VI). Especially in periods when short-term bank credit is easier for new entrants in the field (as in the 1950's) and road transport furnishes an additional element of flexibility, the period over which a few early firms can exercise sizeable market power in a producing region may be relatively

---

34. No census was taken in 1930, and that of 1940 did not present rice milling as a separate industry. Thus it is impossible to trace the size and number of mills in the period which most interests us here.

short. However, in the 1920's, bank credit was not easy for small new firms, and the process of dispersion seems to have been prolonged somewhat in Rio Grande do Sul for this reason.

2. Sao Paulo

The Sao Paulo situation was more complicated and probably impossible to explain adequately with available information. By 1920 the State was already a large producer of rice and beans (see Table I above). The 4-6 large cerealistas had all begun operation as small firms a little before or after 1920 and were all founded by immigrants from the South of Italy.[35] By 1935-40 they had risen to their position of dominance. Exactly why and how this happened remains unclear from the interviews.

First, all agreed that these firms were generally successful speculators and heavily reinvested their profits in their earlier years. It was also maintained that the transport system militated against many smaller buyers in the interior--an economies of scale factor. Brazilian rail cars carried 20-30 tons of cereals; small firms could not regularly turnover this quantity, something necessary for the maintenance of a profitable buying organization in the interior.[36] So it might be argued that the surplus passing to the Sao Paulo market was too small

---

35. Even today, individuals of Italian descent dominate Sao Paulo's cerealista trade. This is a curious specialization; first and second generation Portuguese form the large majority in grocery wholesaling.

36. See Chapter III, pp. 67-69. Good roads would later permit sporadic buying trips to the interior by small firms.

economically to support many firms buying in the interior with rail

transport--a point of view sustained by most of those interviewed.

Some also maintained that once the firms had become large, a chronic

shortage of rail cars worked heavily in their favor, as they "manipulated"

the requisitions for such cars.[37] This is probably true, but it is not

clear why other firms could not also bribe railway employees.

Innovation may also be a factor explaining the Sao Paulo

structure. An examination of data on the formation and reviews of firms in

Sao Paulo State in the early 1920's indicated that specialists in cereals

per se were relatively rare. Only 13 firms (of which two are the large

firms in question) of the 65 dealing with cereals which were formed or

revised October, 1919--June 1921, were specialized in cereals. The others

joined cereals with groceries, coffee, cotton or some other combination.[38]

Information on this early period is obscure, but it does seem that the

"cerealistas" who later became large were amongst the first to devote

their whole effort to cereals. This is a form of innovation which itself

could lead to higher profits, especially in speculation, and may account

for part of their success. But clearly this is not the same lag-

---

37. This meant bribery of officials for assigning scarce cars to them.
The author was also told that in times of shortages, Brazilian railroads
have resorted to a rationing system based upon past usage, a fact, if true,
which would have strengthened the position of the already established lar-
ger firms.

38. Secretaria da Agricultura, Commercio e Obras Publicas do Estado de Sao
Paulo, Boletim da Directoria de Industria e Commercio, various issues, 1919-
1921. Unfortunately, the Boletim in 1922 ceased publishing data on the
formation and revision of firms.

concentration-dispersion phenomenon that occurred in Rio Grande do Sul and later in other areas.

To summarize, although the details of the growth process are not clear, it seems that the rise of the dominant firm in Rio Grande do Sul was a result of the early innovation, high profit, high reinvestment rate typical of new firms in new areas. The oligopoly in Sao Paulo cannot be fully explained, but economies of scale and early innovation in marketing forms seem to be two important elements.

C. The Merchant-Moneylender System

The 1930's and 1940's mark the peak in the extension of tied credit by middlemen to farms. Loans to farmers for working capital needs have never been attractive to commercial banks in Brazil, because of their slow turnover and high risk.[39] The great bulk of bank credit going to agriculture has come from official sources, chiefly the Agricultural and Industrial Credit Department of the Bank of Brazil (CREAI). But this department began operations only in 1938,[40] and in 1940 but 7,218 loan operations were undertaken financing the cultivation expenses of agriculture, compared with the 1,904,589 agricultural establishments shown in the 1940 Censo Agricola.[41]

---

39. With Instructions 247 and 273 of SUMOC (the monetary control agency) permitting commercial banks to satisfy their reserve requirements with loan paper from small producers working their farms for food production, this situation has changed somewhat. See, Antonio Guedes B. Campos, "Credito Rural: Instrucoes 247 e 273 Como Fatores de Disseminacao", Agricultura em Sao Paulo, XI, 8-12 (Agosto a Dezembro,1964), pp. 41-45.

40. Banco do Brazil, Relatorio: 1938 (Rio de Janeiro), p.34.

41. Banco do Brazil, Relatorio: 1942, p.52. IBGE, Conselho Nacional de Estatistica, Censo Agricola, 1950.

In cereals, only the rice producers of Rio Grande do Sul bene-
fitted to any degree from the Bank's operations in the agricultural
credit field during the period under consideration in this chapter.
Even so, as late as 1945/49, only 38.1% of the area planted in rice in
Rio Grande do Sul was financed by the Bank of Brazil.[42] Curiously, the
Bank of Brazil, often not operative in many producing areas in the Center-
South,[43] extended credit to rice mills for the express purpose of their
relending it to farmers.[44]

The most common form of financing was credit from the middleman
and rice mill, and this formed a very important element in the operation
of marketing.[45]

---

42. IRGA, op.cit., No. 18 (1963), p.84.

43. In 1938 the distribution of the Bank's agencies in the relevant
States was:

Sao Paulo	19
Parana	3
Rio Grande do Sul	8
Minas Gerais	11
Goias	1

Source: Banco do Brasil, Relatorio: 1938, p. 39.

44. According to conversations with officials of the Bank of Bra-
zil's central offices, Rio de Janeiro, and with the Director of its
Porto Alegre Branch (June and August, 1963, respectively).

45. As late as 1954, a technical commission studying the problem of
food supply in Brazil estimated that 10% of the total outside financing
for farmers came from the Bank of Brazil, 8% from other banks, 20% from
private lenders, and 62% from merchants. Klein and Saks, O Problema
da Alimentacao no Brasil (Rio de Janeiro: Comissao de Desenvolvimento
Industrial, 1954), p.75.

D. <u>Market Operation in the Sao Paulo Region</u>

Quantitative evidence on this period which would aid in
interpreting market operation in the Sao Paulo commercial region is
virtually non-existent.[46] However, its structural characteristics per-
mit the inference of certain probabilities about its behavior and effici-
ency.

Given the general immobility of most producers due to the poor
road system in the interior, the majority were probably limited to a
single important market outlet. In addition; the producer of rice was
generally financed by the local maquinista (miller) frequently, it
seems, on the condition of the advance commitment of the whole crop at
pre-stipulated prices. Now merchants all agreed that advance purchase
at pre-stipulated prices as a condition for credit worked against
the farmer, since prices were usually heavily discounted below their
expected harvest levels. Other loans came due at the peak of the harvest.
The tied sale of output during the harvest as a condition for credit,
coupled with the farmer's pronounced ignorance of market conditions
elsewhere,[47] could serve as an effective instrument for the creation of
oligopsonistic profits during the harvest period in each local market.
Thus in both cases--advance purchases and tied sales--it is probable that

---

46. There are no data on farm prices and quotations from the Bolsa
de Cereais de Sao Paulo seem to have been lost in the process of moving
to their new location in 1959. In any case, they are not available.

47. Cerealistas, with a certain nostalgia, claim that it was relatively
easy to fool the farmers about prices in this period.

maquinistas received somewhat more than the marginal product for their services.[48]

At that time, beans production was principally in the hands of colonos and other agricultural laborers. Given their low incomes, complete ignorance of Sao Paulo market conditions and their geographical immobility, they tended to sell the great bulk of their output immediately after harvest, again creating favorable conditions for oligopsonistic profits.

In turn, the competitive situation of most of the interior merchants in selling outside of their local market was seriously limited. None but the few larger rice mills sold directly in Sao Paulo. The rest had to sell to the few Sao Paulo cerealistas with buying organizations in the interior (and all did not operate in each important market center) or consign their output to cerealistas of that city, often the same large firms (see page 139 above). In either case, access to the Sao Paulo market was imperfect.

---

48. There is some evidence in favor of this oligopsonistic profits hypothesis. Although monthly farm price data begin only in 1948 for Sao Paulo State, there is a clear tendency throughout the 1950's and early 1960's for paddy rice prices paid to farmers to increase relative to those for the milled product. This is an important indicator of changing market conditions, since the producer who can mill his own rice will generally be larger and better informed. If it can be assumed that his competitive position has not declined vis a vis the maquinista (and surely it has not), then it is probably that such a trend in paddy rice prices derives from an increase in competition in the interior, primarily from greater dissemination of market information, a decline in the merchant moneylender system and the great improvements in truck transport. See Chapter VIII.

First, interior merchants without selling branches in Sao Paulo had only the vaguest information on the Sao Paulo market and must have had serious difficulties in forming some crudely accurate forecasts on prices. This must have often given wide margin for oligopsonistic profits (both over time and space) for the large Sao Paulo firms in buying in the interior.

In addition, consignment gave very imperfect direct access to the Capital's market. Consignment was almost always to cerealistas buying and selling on their own account, most frequently to these same few large firms. Generally the system was as follows. The product was shipped from the interior to be sold for at least a stipulated minimum price within a fixed period of time after arrival (say 21 days). The consignee received a commission of 2-3% on the sales price. The system was particularly interesting for the consignee. The consignor had no way of verifying the time and price of sale. Suppose, for example, that after shipment the price began to rise above the stipulated minimum. According to cerealistas interviewed, the consignee would inevitably claim sale early in the consignment period and at a low price. In fact, he may have held to the end or even taken over the good himself for his stock. Since accounts were liquidated only after the consignment period, the consignee (cerealista) in effect could be forming stocks on the credit of the interior merchant. If the price began to fall after con-signment, no harm was done to the consignee, since he could not place the product at the required minimum. Then the interior merchant would have

to give new instructions (which might delay several days if sent by
telegraph) either to sell at a lower price or store the good, with the
consignor bearing all expenses. Even if the consignment went well, the
system implied an extension of credit to the consignee,who sold in cash
and settled accounts only after a delay, in many cases of several weeks.

The system, then, was heavily biased against the consignor.
He bore most of the risk of a price decline, and in practice, the consignee
bore most of the "risk" of a price rise. The interior merchant received
very little market orientation from the consignee. Once the good was
shipped from the interior, the merchant lost most of his effective con-
trol over its disposition.[49]

Consignment, then, as a method of spatial arbitrage, was
seriously limited in its impact. Should the large cerealistas attempt
to maintain their buying prices too low in the interior or attempt to
create a short-term shortage in Sao Paulo--several cerealistas in
Sao Paulo said that this was done, using "transport difficulties" as

---

[49]. It seems peculiar to the economist that competition for the con-
signment business should not have eliminated such a system. But the
cerealista in Sao Paulo was primarily interested in his own short-run
business rather than profits on consignments. Gains from price rises
could far offset any losses on commission in the short-run. As was so
often pointed out in interviews, the cerealista is an "imediatista", i.e.
he thinks with a very short-run time horizon. Seemingly long-run
irrationality may, of course, be completely rational in the short-run.
The consignment system suffered from many of the same defects in the United
States, one of the principal reasons for its gradual decline. See
Thomsen, F.L., Agricultural Marketing (New York: McGraw-Hill Book Co.,
Inc., 1951), pp. 106-109.

an excuse[50]--consignment in response to the price differentials was
generally feeble in the short-run.

Thus there was ample scope for oligopsonistic profits in the
market system as it existed in the late 1930's and early 1940's. A
few interviewees claimed that the large firms at times forced seasonal
price declines and rises through more or less concerted buying and
selling practices in the interior and Sao Paulo. Although a possibil-
ity, there are no price data at our disposal which would permit a ver-
ification of this assertion.

The system of consignment and concentrated oligopoly in Sao
Paulo was doomed to decline. It was predicated on rail transport and
the small size of the great bulk of the merchants in the interior of
Sao Paulo State.[51] With the rapid production increases in the Minas

---

50. This enabled the big firms with the bulk of the stocks in Sao Paulo,
especially of beans, to make significant "speculative" profits on them,

51. After an initial period of relatively large average size in the early
years of this century (in 1919 the average production per urban mill was
20,000 sacks per year compared with Rio Grande do Sul's 26,000), the
continual new entry of firms led to a great fragmentation of the market as
indicated by the following figures for 1958:

Average Output per Establishment of Milled Rice

	Number of Mills More than 5 Employees	Average Output (tons)	Number of Mills Less than 5 Employees	Average Output (tons)
Sao Paulo	85	439.2	1775	81.4
Rio Grande do Sul	135	2,172.4	740	61.8
Minas Gerais	96	883.5	894	62.8

Source: IBGE, Conselho Nacional de Estatistica, Producao Industrial
Brasileira, 1958.

Triangle, a number of new independent large firms developed in the inter-
ior and formed the original nucleus for the introduction and extension
of an independent commission agent system which gave the interior mer-
chant more effective and direct access to the Sao Paulo (and Rio) market.

E. Market Operation: Rice, Rio Grande do Sul

1. Statement of the Hypothesis

Oligopsonistic market behavior predicated on the merchant-
moneylender system characterized the regional rice market centered on
Porto Alegre in the 1920's and 1930's. Rice mills in Rio Grande do
Sul extended loans to producers to be liquidated most frequently by
the end of June (the harvest begins in late March) and tied to the
commitment to sell all output to the lender.[52] This system was a basic
element in an effective oligopsonistic operation against producers.

According to merchants interviewed, the largest firm (see
page 142 above) attempted to maintain the price low in Porto Alegre and
the interior (by selling as necessary and withdrawing at crucial times
from the market in the interior) while it and the other firms were
making the bulk of their tied and untied purchases from farmers. Then
as the harvest season ended (usually·August or September), it would
begin a bull movement on the Porto Alegre Bolsa de Mercadorias, both
buying as necessary and refusing to sell except at higher prices. Most

---

52. The direct interest charges on these loans do not appear to have
been high in most cases. By 1940, rates were about 15% per annum, a year
when inflation was about 10%. Observador Economico e Financeiro, L
(Marco de 1940), p. 112.

other mills are supposed to have followed the movements of the larger leader.

If an accurate description,[53] this was a case of the functioning of a farm buying oligopsony over a relatively short period of the year, facilitated by the widespread use of tied farm loans in rice and the presence of a dominant leader. The possibility of actual price agreements between the largest firms under some conditions cannot be ruled out, but it is impossible to prove.[54]

The behavior described would operate on prices and consumption in the following manner. The oligopsony's buying policy would reduce wholesale and(probably even more) farm prices below their competitive levels during the harvest months. This in turn, would tend to increase consumption of rice somewhat during these months, how much depending in part upon the degree to which retail prices in the large consuming centers were arbitraged with respect to Porto Alegre prices. Stocks carried

53. And there is no reason to doubt the honesty, at least, of the merchants interviewed. This general description of firm behavior minus the detail of the leading firm is also found in official documents. See Grupo de Trabalho do IRGA, Economia Orizicola bo Rio Grande do Sul, Primeira Parte: Situacao Atual (unpublished report, 1961), p. 19, and Alvaro Ornelles de Souza, Alguns Aspectos da Economia Arrozeira no Rio Grande do Sul (apresentado no I Seminario de Comercializacao Agricola da America Latina e do Caribe, Jamaica, 1959), p.2.

54. The Joint Brazil-United States Economic Development Commission was explicit in its charges of price conspiracy producing much the same kind of behavior in Minas Gerais as described above. Brazilian Technical Studies (Washington, 1954), pp. 420-421. The Klein and Saks report (op. cit., pp.46-48)cites many cases of explicit conspiracy by middlemen in lines other than cereals in Rio de Janeiro, e.g. fruits, vegetables and fish,but all are based on rumor and the Hke.

out of the harvest months would be somewhat smaller than in a competitive situation, provoking higher prices in the interharvest months.[55]

But not only this. As farm sales taper off to very low levels in September, the oligopsony ceases to operate as such against the farmers. Stocks are formed in commerce and prices may now seek levels consistent with their relation to demand. The market, led by the largest firm, reacts to this situation fairly quickly with higher prices, eliminating most of (or even more than, if the reaction is too great as often happened) the oligopsonistic profit to storage implied by the low prices during the harvest months. After this adjustment, prices should behave in much the same manner as in a competitive market. Not only are the basic conditions of leadership-followship gone--i.e. the concentration of purchases from farmers in a relatively short period of time--but once stocks are formed, it may not, depending upon the shape of the demand curve, be in the interests of commerce as a whole to provoke seasonal price increases

---

55. If this arbitrage were poor commercial stocks would not be significantly affected by the lower prices during harvest months in Rio Grande do Sul, and although the wholesale and farm seasonals might be large, not so much with consumption and retail prices. This, of course, would be so much the better for the Rio Grande do Sul rice mills.

Another aspect of the problem is the "normal" pattern of rice prices from other States in the major markets. If they normally would not undergo seasonal price rises as large as the "gaucho" product under oligopsony, stocks in Rio Grande do Sul might be seriously depleted by the attempt to depress prices in harvest months. If, however, similar increases, perhaps because of comparable non-competitive structures, characterized the Sao Paulo region as well, no such problems would occur. This is a likely possibility given the market structure in Sao Paulo.

greater than the marginal cost of storage.[56]

Graphically, the competitive (AB) and oligopsonistic (CD) seasonal price patterns are shown in Diagram KK. The oligopsonistic profit to storage is the difference between the seasonal price increases in the two patterns.

---

56. Prices can be increased in later months only by reducing them in the earlier months of the interharvest, unless carry-over is undertaken into the following harvest, not likely unless independently of the oligopsony a smaller harvest is expected next year. Assuming a one tier distribution system, the problem of commerce once all consumption comes from its stocks is to maximize consumer expenditures on the product net of storage costs. Assuming a two period interharvest, with S the level of stocks carried into the first period, Q_1 the consumption in the first period, $S-Q_1$ the consumption in the second, $s(S-Q_1)$ the cost of storage function and $f(Q)$ the consumer demand function,

Maximize

$$R = Q_1 \, f(Q_1) + (S-Q_1) \, f(S-Q_1) - s(S-Q_1)$$

$$\frac{dR}{dQ_1} = \frac{df}{dQ_1} \cdot Q_1 + f(Q_1) - \frac{df}{d(S-Q_1)} \cdot (S-Q_1) - f(S-Q_1) + s_1' = 0$$

$$f(Q_1) - f(S-Q_1) = s_1' + \frac{df}{dQ_1} \cdot Q_1 - \frac{df}{d(S-Q_1)} \cdot (S-Q_1)$$

When $f(Q)$ is linear or concave, this will be maximized when prices rise by less than the marginal cost of storage (the sum of the $\frac{df}{dQ}$ terms is negative). With the more inelastic convex demand functions, total profits are maximized when prices rise above by more than the marginal costs of storage.

Diagram IV

Oligopsonistic and Competitive Seasonal Price Patterns

Price

A

C

D

B

AB=competitive pattern
CD=oligopsonistic pattern

End of farm
sales :

time
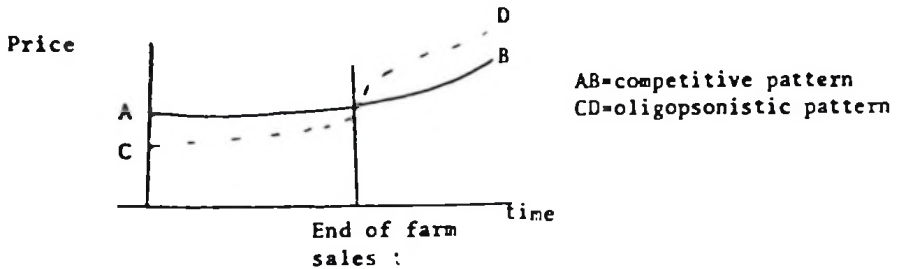
As was seen in Chapter II (pp.34-$\mathcal{S}$), large seasonal price

fluctuations reduce total farm incomes when farm sales are concentrated

in the earlier months, and if the rises are not rooted in higher storage

costs--which they are not in the case of the oligopsony described above--

tend to raise total profits of the middleman class. In Rio Grande do Sul,

these profits would have accrued primarily to the larger firms which held

the bulk of the stocks.[57] Such an oligopsony could have been a signifi-

---

57. In Chapter II, pp.$\mathcal{H}$-$\mathcal{S}$ assuming a two period, no carry-over in or
out harvest unit, with farm sales $C_1 > C_2$ and Q_1 the consumption in period
1, the derivative of farm receipts with respect to increased increased
consumption in period 1 (i.e. smaller stocks and higher seasonals) was
seen to be:

$$\frac{\delta V_f}{\delta Q_1} = (1-\pi) \left(\frac{df}{dQ_1} \cdot C_1 - \frac{df}{dQ_2} \cdot C_2 \right)$$

where   is the spatial oligopsony coefficient. This derivative is neg-
ative over the whole range $(Q_1 > Q_2, C_1 > C_2)$ with linear and concave de-
mand curves and negative over a broad range with convex demand functions.
With profits, it was seen that they are maximized with large seasonal
distortions in consumption with all three types of demand curves. Up
to this profit maximizing point, larger seasonals imply larger profits.
See Chapter II, pp.37.6 and Appendix I.

cant depressant on the level of rice production in Rio Grande do Sul.

2. Empirical Evidence on the Hypothesis

The paucity of statistical data limits the possibility of testing the oligopsony hypothesis as outlined above. Price data are available for the Porto Alegre Bolsa de Mercadorias beginning only in 1930. This is unfortunate, since the 1920's should have shown the most striking evidence of this behavior. Monthly farm price data for Rio Grande do Sul are not collected even today. We are limited to the period beginning with 1930 and to Bolsa prices in Porto Alegre.

To test the oligopsony hypothesis, price behavior is compared between two periods:[58] 1931, when the oligopsony was still active and functioning and the immediate post-war years, 1945-49, when price controls had in effect ended on rice and before the Rice Institute of Rio Grande do Sul (IRGA) began actively to support minimum prices for

---

58. These periods were chosen for a number of reasons. First, 1930 was excluded as the first and most severe year of the Depression in Brazil, accompanied by general price deflation. This must have abnormally affected price behavior in the rice market. Second, 1938 saw an unmatched increase in rice output in Rio Grande do Sul of more than 45% over its previous peak. This must have greatly taxed marketing capacity, and the almost continual decline in prices over that season must have had its origin in great backlogs of rice accumulated in the interior and the ports. 1939 marks the beginning of the war, and rice prices increased 50% in September of that year, a speculative reaction to the German attack on Poland. 1942 through the early months of 1945 saw a serious effort to enforce price control in Brazil, which fell into disuse soon after the end of the war in Europe. See Observador Economico e Financeiro. CXVI (Setembro de 1945), p. 7, and CXXXI (Fevereiro de 1946), p. 4.

rice in the state (1950).[59] By 1945-49, the former leading (largest)

firm had been eclipsed as a potential price leader, several firms having

grown to comparable size during the period 1937-45. The market was

still oligopsonistic in that concentration in milling was still rel-

atively high, but the conditions of price leadership had disappeared.

In addition, although the Bank of Brazil financed only 38.1% of the

area planted 1945-49, this must have made a strong impact upon the com-

petitiveness of the market in producing areas,[60] reducing considerably

the relative importance of tied sales. If there are differences in

seasonal price behavior between the two periods, they should be due

primarily to these two factors: the decline of both the oligopsony

and the practice of tied loans. Market information did not change sig-

nificantly in quality or quantity between the two periods, and if any-

thing, the system of transport had deteriorated due to shipping losses

during World War II and the increasing obsolescence of both rail and

merchant marine equipment.

The data used are average monthly prices for short-grain

rice (the bulk of the production) on the Porto Alegre Bolsa as de-

flated monthly by the cost of living index of the Ministerio do

Trabalho, Industria e Comercio, 1931-37, and by the Sao Paulo cost of

---

59. The 1950 harvest saw the first significant purchases by IRGA under
this program (30.5% of the total harvest according to data supplied
the author by IRGA). Although minimum prices were fixed first in 1943,
little was done by IRGA to maintain them.

60. IRGA, op.cit., No. 18 (1963), p. 84.

living index, 1945-49.[61]

The process of deflation by the non-seasonally adjusted price indices will tend to <u>underestimate</u> real seasonal price rises in rice, since with the considerable weight of food in the cost of living indices in Brazil, the latter, too, show seasonal movements. The seasonally adjusted cost of living index should be somewhat higher during the harvest and somewhat lower during the interharvest months than the unadjusted indices. Since deflation had already been per-formed in the source, corrections for seasonality in the deflator were impossible. This should not, however, introduce serious bias into the comparison, since seasonality in the deflators is common to both periods and is thus largely offsetting.[62]

Two main differences between the two periods under examina-tion should be expected if oligopsonistic behavior characterized the first much more than the second: larger seasonal price increases be-tween the harvest and interharvest months in the earlier period and more abrupt price rises when they do occur. As the bull movement begins in the rice trade, prices should rise to eliminate most of the oligopsony

---

61. The data were linked in 1939 and are from Burger, Ary, <u>As Flutuacoes na Economia Orizicola do Rio Grande do Sul</u> (Porto Alegre: Edicao Sulina, 1955), pp. 80-85.

62. When inflation rates of 10-15% per year are common, undeflated pri-ces are seriously biased as a measure of seasonality and of the pro-fitability of speculation. On the other hand, deflation may itself introduce bias, especially if the monetary demand for the particular product in question does not accompany the general price level. In ad-dition, inflation may tend to incerase the level of carry-over through a kind of money illusion or inventory speculation, quite apart from the structure of the market. There seems to be no wholly satisfactory pro-cedure.

margin in the temporal price differences, and increases from that time

should be more in accord with the competitive model.

Results

As predicted by the oligopsony hypothesis, the average

seasonal rise in price is larger in the 1931/37 period than in 1945/49,

19.4% as compared to 13.4%, June-December (see Table V). For the quar-

terly indices, the rise from April-June to October-December (the rise

most important for the hypothesis, because it is mostly independent

of future harvest prospects) is 16% in the "oligopsony" years and

8.6% in the others (see Table IV).[63] Furthermore, as expected given

the relatively greater importance of merchant loans to farmers, the

---

63. Seasonals are calculated as the ratio of each month's price (de-
flated) to the average price for the given harvest. This is probably
a better measure of the seasonal instability in which we are interested
than the traditional methods employing the ratios of prices to their
12 month centered moving averages. The latter gives no indication
of the profitability of storage. If prices rise greatly from one
harvest to another and observed prices also rise rapidly in the late
months of the season to meet the new level, the seasonal rise in price
may yet be quite small as measured by ratios to moving averages, since
the moving average should capture most of the 12 month trend in prices
that is also reflected in the rise of observed prices. Conversely,
prices may fall over the whole season, but show seasonal price increases
as measured by the ratio to the moving average, if the subsequent har-
vest's prices are even lower. Finally, future prices may affect the
moving average even though they have little or no influence upon current
prices. In rice, often it is not until after December that future
harvest prospects begin to affect current prices. Yet the 12 month moving
average for months after September includes prices from the next
year's harvest. This is economically senseless if prospects of the next
harvest's prices are not influencing behavior in the months October-
December. Since it is principally these months which are important
for the oligopsony hypothesis, 12 month moving averages are inappro-
priate.

Table IV
Average Quarterly Seasonals of Rice Prices, Porto Alegre

	1931-37	1945-49	Mann-Whitney U Statistic and level of significance
April-June	91.57	95.86	9(.101)
July-September	95.98	96.25	9(.101)
October-December	106.25	104.14	9(.101)
January-March	106.20	103.75	14(.319)
Percentage Rise:			
April-June to Oct.-Dec.	16.0%	8.6%	
July-Sept. to Oct.-Dec.	10.7%	8.2%	

Sources and comments, see footnote at end of Table X.

Table V
Average Monthly Seasonals of Rice Prices, Porto Alegre

	1931-37	1945-49	Mann-Whitney U Statistic and level of significance
April	90.76	98.33	13(.265)
May	92.63	94.61	15(.378)
June	91.35	94.64	9(.101)
July	93.34	98.05	13(.265)
August	94.20	94.29	15(.378)
September	100.40	96.39	13(.265)
October	101.90	101.01	12(.216)
November	107.64	104.10	11(.172)
December	109.20	107.31	18(.562)
January	108.96	106.18	17(.500)
February	107.11	104.72	18(.562)
March	102.51	100.37	14(.319)
Percentage Rise:			
June-December	19.4%	13.4%	

Sources and comments, see footnote at end of Table X.

Table VI

Annual Quarterly Seasonals Rice Price, Porto Alegre

	1931	1932	1933	1934	1935	1936	1937
April-June	105.23	82.94	84.98	96.40	101.97	78.76	90.78
July-September	86.87	93.45	93.48	96.84	95.76	109.53	95.94
October-December	105.23	107.26	117.44	101.95	105.07	107.70	99.10
January-March	102.68	116.36	104.11	104.82	97.21	104.00	114.19

	1945	1946	1947	1948	1949
April-June	98.07	107.90	90.90	87.65	94.78
July-September	97.53	100.20	98.56	86.57	98.37
October-December	100.54	102.10	102.57	106.46	109.05
January-March	103.87	89.80	107.97	119.32	97.80

Sources and comments, see footnote at end of Table X.

Table VII

Annual Monthly Seasonals Rice Price, Porto Alegre

	1931	1932	1933	1934	1935	1936	1937
April	101.60	80.13	81.65	99.98	108.85	70.53	92.59
May	107.78	84.60	87.13	96.22	101.00	81.32	90.37
June	106.31	84.10	86.17	92.99	96.05	84.43	89.37
July	89.82	80.88	92.84	91.11	92.85	113.68	92.18
August	83.04	86.58	93.08	94.06	96.34	108.29	98.02
September	87.76	112.88	94.51	105.35	98.08	106.63	97.62
October	101.01	107.17	100.22	103.47	98.08	104.35	99.03
November	109.25	103.21	121.41	101.59	108.56	108.39	101.04
December	105.42	111.39	130.69	100.78	108.56	110.36	97.22
January	102.77	123.80	112.84	104.55	99.25	106.22	113.22
February	103.66	117.35	102.60	106.43	96.63	105.18	117.95
March	101.58	107.91	96.87	103.48	95.75	100.61	111.40

Table VII (continued)

	1945	1946	1947	1948	1949
April	97.42	108.61	91.90	91.11	102.62
May	96.13	108.61	89.64	86.25	92.42
June	100.65	106.48	91.15	85.60	89.30
July	99.35	101.15	97.55	85.60	106.59
August	97.10	98.31	99.06	86.57	90.43
September	96.13	101.15	99.06	87.54	98.09
October	98.71	100.09	97.55	102.13	106.59
November	100.65	102.22	100.56	105.38	111.69
December	102.26	103.99	109.60	111.86	108.86
January	106.45	90.15	108.47	120.94	104.89
February	106.45	90.86	108.10	118.35	99.79
March	98.71	88.38	107.34	118.67	88.73

Sources and comments, see footnote, end of Table X.

Table VIII

Percentage Quarterly Price Rises

	April-June to October-December	July-September to October-December
1931	0	21.1%
1932	29.3%	14.8%
1933	38.2%	25.6%
1934	5.7%	5.3%
1935	3.0%	9.7%
1936	36.7%	-1.7%
1937	9.1%	3.3%
1945	2.5%	3.0%
1946	-6.4%	1.9%
1947	12.9%	4.1%
1948	21.5%	22.9%
1949	15.1%	10.9%
Average: 1931/37	16.0%	10.7%
1945/49	8.6%	8.2%

Sources and comments, see footnote, end of Table X.

Table IX

Largest One Month Price Rise: Early Months (April-October)

	Percentage Price Rise	Months
1931	15.1%	September-October
1932	30.4%	August-September
1933	7.7%	June-July
1934	12.0%	August-September
1935	3.7%	July-August
1936	34.6%	June-July
1937	6.3%	July-August
1945	4.7%	May-June
1946	2.9%	August-September
1947	7.0%	June-July
1948	16.7%	September-October
1949	8.7%	September-October
Average: 1931/37	15.7%	
1945/49	8.0%	

Mann Whitney U Statistic = 11 (significant at .172 level)
Sources and comments, see footnote at the end of Table X.

Table X

Largest One Month Price Rise: All Months (April-March)[64]

	Percentage Price Rise	Months
1931	15.1%	September-October
1932	30.4%	August-September
1933	21.1%	October-November
1934	12.0%	August-September
1935	9.7%	October-November
1936	34.6%	June-July
1937	16.6%	December-January
1945	4.7%	December-January
1946	2.9%	August-September
1947	9.0%	November-December
1948	16.7%	September-October
1949	8.7%	September-October
Average: 1931/37	19.9%	
1945/49	8.2%	

Mann-Whitney U Statistic = 3 (significant at .009 level)

64. Original data are from Burger, Ary, op.cit., pp.80-84, and are deflated
monthly average quotations of short-grain rice on the Bolson de Mercadorias
de Porto Alegre. The seasonals are computed as ratios to the average price of
each year, April-March. The harvest begins to flow into Porto Alegre in April.
The Mann-Whitney U statistic is employed because of indications of non-normality
in the data and is explained below, p.172 footnote 66.

major upturn in the monthly seasonal occurs one month earlier in the
1930's than in the immediate post-war years, in September instead of
October; in the quarterly seasonals, prices are rising more in the July-
September quarter in 1931/37 than in 1945/49, again consistent with the
picture of earlier sales for the oligopsony period, forced by loan li-
quidations (see Tables IV and V).

The largest single month percentage price increase for 1931/37
are about double their 1945/49 counterparts, both for "early" months
and all months[65] (see Tables IX and X). The figures of 15.7% (early
months) and 19.9% (all months) are large and indicate a substantial
degree of instability and market thinness in the 1931-37 period.

Besides the large early month price rises, there is other
evidence supporting the hypothesis that in the 1930's prices tended
to react quickly to eliminate an "oligopsonistic" profit to storage
after farm sales had ended. In the monthly seasonals both sets of
years tend to react strongly in one month, September in the 1930's and
October in the immediate post-war years. After that reaction, however,
the average arithmetic monthly rates of price increases differ little,
except in March and perhaps February, months primarily under the in-
fluence of future harvest expectations (see Table XI). In addition, the
differences in the price rises from the July-September to October-

---

65. October is used as the last "early" month. This should be the last
month in which the kind of reaction of the market described by mer-
chants could take place. After this month, large price rises may be in-
fluenced by future harvest prospects.

December quarters are not large, 10.7% and 8.2% for the two sets of years, whereas those from the April-June quarter are almost double in 1931-37, what they were in 1945-49 (16.0% and 8.6%--see Table IV). Again this seems to point to an oligopsony functioning primarily during the harvest months, subsequently behaving in a more competitive manner.

Beyond this, in three of the early years (1932, 1934, and 1936) prices react strongly in near-end harvest months only to decline for several months thereafter. This pattern is wholly absent from the 1945-49 period, and is consistent with the hypothesis of a non-competitive wave of bull increases which may overshoot the mark in many cases.

But problems appear when tests of statistical significance are applied. Inspection of the data indicates that the assumption of normality in the underlying distributions is not generally warranted--there are too many extreme values in several cases (see Tables VI-X). Thus, non-parametric tests are in order, and the most powerful two-

Table XI

Average Arithmetic Monthly Rates of Real Price Increases of Rice, Porto Alegre Bolsa de Mercadorias

	1931-37	1945-49
	September to:	October to:
November	3.6%	3.1%
December	2.9%	3.1%
January	2.2%	1.7%
February	1.3%	.9%

Source: Table VII.

sample method, the Mann-Whitney U Test, was employed.[66] This yields

inconclusive results at the conventional acceptance levels, except in

the case of the largest single-month price increases (see Tables IV-X).

The statistical insignificance arises from the high dispersion of the

several values about their means and, in the cases of the seasonal

price indices, an apparent bi-modality in the distributions (see Tables

VI-VIII), especially marked in the percentage quarterly price rises

(see Table VIII). Bi-modality, where there are two central tendencies,

cannot be adequately treated with the conventional tests for significance

in distributions with one central tendency. In addition, if there are

systematic forces creating the two modes, the bi-modal distribution will

not satisfy the random requirements necessary for the use of any statis-

tical test (see pages below for one suggested hypothesis explaining the

two modes).

Bi-modality apparently characterizes the most important set of

data for testing the hypothesis: the quarterly seasonal price indices.

The quarterly data, more than the individual monthly indices, express

---

66. This test for differences in central tendency. The alternative hy-
pothesis against which the null hypothesis of no differences between means
is tested is that one mean is greater than the other. All observations
are pooled and ranked. The U statistic is computed by summing over
each observation in the group with the hypothesized larger mean the num-
ber of observations of the other group ranking higher in value. For
samples taken from normal distributions, the U test approaches a power-
efficiency in relation to the t test of 95.5% as the sample size increases
See Siegel, Sidney, Nonparametric Statistics for the Behavioral Sciences
(New York: McGraw Hill Book Co., Inc., 1956), pp. 116-26.

the seasonal for generally distinct periods of the year. In April-June, the gross of farm output tends to enter commercial channels, although substantial farm sales are still made in July-September. October-December is the full interharvest where prices depend on stocks and generally before any large impact of future harvest expectations is felt. In January-March, expectations are usually of decisive importance. Thus the appropriate periods for testing the oligopsony hypothesis are April-June to October-December. Not only should the price reactions caused by the oligopsony be most apparent in these months, but the effects of future expectations is minimized in this period.[67]

Given the bi-modality of the distributions, pairing the three largest observations for the two periods and the two smallest is en-lightening (see Table XII). The rationale of part (C) of Table XI is to allow for differences in timing of price troughs in different years. For each year it includes the percentage price rise to October-December from April-June or July-September, whichever is greater. Inspection of Table XII shows that the three largest price rises to the October-December quarter all occur in the 1930's (with one exception in the July-September to October-December rises). This fully supports the oligopsony hypothesis. However, the three largest price rises in the 1945-49 period are all greater

---

67. It should be noted that the differences between the two seasonals is least significant for the months January-March (see Tables IV andV). This would indicate the predominance of future harvest expectations in these months in both periods over the paritcular market structure. This is to be expected given the description of the behavior of the oligopsony.

Table XII

Percentage Price Rises in the Quarterly Seasonals

(A)

April-June to October-December

Three Largest		Two Smallest		Two Intermediate
1931/37	1945/49	1931/37	1945/49	1931/37
38.2%	21.5%	0	-6.4%	5.7%
36.7%	15.1%	3.0%	2.5%	9.1%
29.3%	12.9%			

(B)

July-September to October-December

Three Largest		Two Smallest		Two Intermediate
1931/37	1945/49	1931/37	1945/49	1931/37
25.6%	22.9%	-1.7%	1.9%	5.3%
21.1%	10.9%	3.3%	4.1%	9.7%
14.8%	4.1%			

(C)

April-June or July-September to October-December
whichever is larger

Three Largest		Two Smallest		Two Intermediate
1931/37	1945/49	1931/37	1945/49	1931/37
38.2%	22.9%	5.7%	1.9%	9.7%
36.7%	15.1%	9.1%	3.0%	21.1%
29.3%	12.9%			

Source: Data in Table VIII.

than the two smallest for 1931/37, which explains the insignificance of
the U test. If the distributions are bi-modal, the more appropriate
test is for differences between the modes of the two sets of years rather
than between their overall means. Now, the upper mode in 1931/37 is
clearly larger than that for 1945/49. It is unclear from the data
whether there might be any significant differences between the lower
modes. The combined data (part (C) of Table XII) lend some support to
the hypothesis that the smallest seasonal increases in the 1930's were
larger than their immediate post-war connterparts.

Seen in this way, the data suggest a somewhat modified view of the
Rio Grande do Sul rice oligopsony. First, it did not function every
year in such a way as to give large profits to storage to the third
quarter of the season. Perhaps it did in the 1920's--we have no way of
knowing. Rather only 4 of the 7 years show the large price rises from
a harvest quarter to the October-December interharvest quarter predicted
by the hypothesis.[68] The apparent bi-modality of the two distributions
suggests other forces creating the two modes, clearly dividing larger
seasonal price rise years from the smaller ones,[69] and within which the

---

68. It may be significant that 3 of these 4 occur consecutively 1931-33
(see Table VIII). The leadership power of the dominant firm was declining
throughout the 1930's and we would have expected the oligopsony to have
functioned better in the earlier years of the decade. This is pure guess.

69. As will be seen in Chapter IX, similar bi-modality is even more
striking in beans seasonals.

oligopsony operated considerably amplifying the extreme price rises.

One tentative hypothesis explaining the two modes can be presented: stickiness in the adjustment of price expectations from harvest to harvest due to poor harvest information. Many market participants' expectations (probably including the leader at times) would not adjust sufficiently to the new situation--creating "too low" harvest month prices in a short year and conversely, "too high" prices during the harvest of a larger crop year, thus leading to the dichotomy of large and small seasonal price rises. This would be expected to act with greatest force upon farmers themselves, with their lack of broad market information. This hypothesis, if true, would facilitate the oligopsony leader in small harvest years in its attempt to depress farm and prices and hinder it in larger harvest years--where large and small are understood solely in reference to the previous year.

Table XIII presents the relevant information for this hypothesis. The real price during the harvest months (April-September) is a crude indicator of expected market conditions in Brazil as a whole, while production data worthy of consideration are available only for Rio Grande do Sul for the 1930's. One of the 7 years in the 1930's (1937) is misclassified by the direction of change in real price, as is one of the post-war years (1947).[70] Harvest size in Rio Grande do Sul alone,

---

70. A rise in real price during the harvest months in comparison with the previous year will be associated with large seasonal price increases, if the hypothesis of price stickiness is valid.

does badly (as would be expected), misclassifying two years in the 1930's
(1936 and 1937) and two of the five post-war years (1945 and 1947).
More importantly, however, only one of the large seasonal price rise
years (1947) is characterized by low harvest month prices in relation to
the years immediately preceding it, and only one of the smaller rise years,
by high prices in relation to earlier years (1937). This is in direct
contradiction with the hypothesis which would ascribe large seasonals
to inadequate physical storage facilities. If physical storage costs
and capacity were decisive, seasonals should have been higher for years
of lower harvest month prices, when production was presumably higher than
in the preceding years and the marginal costs of physical storage, there-
fore greater.

Table XIII
Rice, Rio Grande do Sul

	Largest Percentage Price Rise from a Harvest Quarter	Real Price during Har- vest Months	Harvest Size (tons)
1930		32.22	232,000
1931	21.1%	32.28	228,790
1932	29.3%	37.22	206,640
1933	38.2%	37.48	192,470
1934	5.7%	35.95	207,540
1935	9.7%	33.97	208,590
1936	36.7%	45.38	228,540
1937	9.1%	46.38	222,400
1944		33.85	516,069
1945	3.0%	30.32	389,130
1946	1.9%	29.32	626,833
1947	12.9%	25.15	566,598
1948	22.9%	26.87	515,627
1949	15.1%	34.07	548,016

Sources: Table VIII above; Burger, Ary, op.cit., pp.80-84; IRGA, op.cit.,
No. 18 (1963), p.66.

Expectations will not in general behave according to some such simple rule as ennunciated above, but it does seem that changes in harvest size through the stickiness in expectations may be an important element determining the two modes of the seasonal distributions.[71]

The evidence, then, limited as it is to but 12 observations must be treated with a certain skepticism. In general, however, it supports the modified oligopsony hypothesis. Seasonal price rises are higher on the average and seem to be significantly above the cost of storage (probably about 1% a month plus interest at that time).[72] Single month price rises do appear larger and more abrupt for the oligopsony period.

---

71. In Sao Paulo, 1946-52, there are also two modes in the seasonals, also corresponding to smaller and larger harvests in relation to the previous year (see Table). Only 1951 is misclassified.

	Percentage Price Rise Amarelao Especial (Bolsa de Cereais de Sao Paulo) April-June to October-December	Rice Production Brazil (tons)
1945		2,146,965
1946	-1.7%	2,759,026
1947	·9.1%	2,586,374
1948	14.2%	2,554,334
1949	.4%	2,720,159
1950	-13.2%	3,217,690
1951	3.5%	3,182,080
1952	20.8%	2,931,110

Sources: Bolsa de Cereais de Sao Paulo, deflated by method described in Chapter X. IBGE, Anuario Estatistico do Brasil,(Conselho Nacional de Estatistica), various numbers.

72. But there is also a positive convenience yield to rice mills stocking rice, since this permits more efficient and continuous operation of the machinery.

The seasonal upturn does occur earlier in the 1930's, as predicted by the hypothesis. Higher storage costs do not seem capable of explaining these differences between¯ the 1930's and the immediate post-war period. In the 4 large price rise years in the 1930's, all increases were much greater than any conceivable cost of storage.[73]

Several factors seem to have permitted oligopsony behavior in Rio Grande do Sul. In essence, non-competitive behavior depends upon the absence of effective counter-arbitrage over space and time. Now the credit system greatly limited the farmers' role as arbitragers. The probable high rates of capacity during the period examined in Rio Grande do Sul (see above, pp.143-45) facilitated a leader-follower relation. The marginal gains from not following were relatively small (rapidly rising marginal costs), and especially for the larger firms, the losses from not following in the form of a collapse of the oligopsony were high. There can be no doubt that "mutual dependence" was recognized. Operation near capacity seems to have provided a mechanism for division of the marketing without great problems.

If several larger firms went along with the leader, then smaller mills and middlemen with poorer market information might be inclined to follow in the belief that the larger firms were right in their assessment

---

73. The convenience yield of stocks for rice mills is significant in an uncertain world, guaranteeing continuous working of the machinery. Data for the early 1960's from public warehouses suggest a storage cost of less than 1% per month. Bankloans, in the 1930's received about 1% per month, probably less. In some years in the 1930's, interest rates may have been negative due to inflation.

of the market and that they would be successful in their maneuvers.

The success of the Rio Grande oligopsony in certain years implies either that spatial arbitrage between Sao Paulo, Rio de Janeiro and Porto Alegre was highly imperfect (thus preventing the lower Porto Alegre prices from reflecting in proportionately lower prices in these markets also), or that similarly defective speculation in rice occur·ed in these markets, too. In the 1950's, the Porto Alegre and Sao Paulo markets were fairly well arbitraged, judging from price movements on the two Bolsas. There is no reason to believe that the situation between central markets was much different in the 1930's, since coastal shipping was at least as good. It is possible, of course, that Rio Grande firms were able to open an oligopoly profit between Sao Paulo, Rio and Porto Alegre during the harvest months. But most probably, price movements in the first two markets were also extreme in many years. This suggests the possibility of a similar oligopsonistic-oligopolistic price pattern in the Sao Paulo interior, rooted in the structural characteristics analyzed above (see pp.152-56).

Whatever its exact basis of operation, the significant decline of oligopsonistic behavior in the Rio Grande do Sul rice market increased the price transferred to producers in many years, and it must have been one factor stimulating the further growth and capitalization of the crop in that State.[74]

---

74. For evidence that the oligopsony permanently disappeared, see Chapter X on rice speculation and Chapter V II where further structural changes in Rio Grande do Sul are analysed.

Summary

Market channels in the 1930's and early 1940's revolved around two or three central market cities by virtue of their key locations in the transport system. The lay-out of the transport system tended to create a number of transactions breaks in the channels of marketing, the typical sequence from farm to Sao Paulo or Rio being: producer--interior merchant--exporter or cerealista--wholesaler--retailer. Each break involved handling and transactions costs, but, given the transport system, seemed to be a more or less efficient adjustment to given conditions.

Efficient price transferral was greatly inhibited by a number of factors: oligopsony and the merchant-moneylender system, by poor market information and, in the case of Sao Paulo, lack of effective access by the generally small interior merchant to the Sao Paulo market. One example of the behavior of oligopsony in combination with the merchant-moneylender system, rice in Rio Grande do Sul was examined in detail, but it seems likely that similar patterns existed throughout the region.

In the next two chapters the principal trends away from this market system are analyzed: the creation (and then decline) of new oligopsonies in the Minas Triangle and Parana which, by multiplying the number of large firms, also had the effect of increasing competition in the large centers; the growth of the system of the independent commission agent, giving interior merchants more effective access to the principal market centers; the rise of the truck, bringing decentralization in market

channels and more direct procurement, eliminating one or more of the transactions up to the retailer; the initiation and rapid expansion of direct sales from the interior merchant and the Sao Paulo cerealista to the retailer; finally, at least in rice, the significant decline in the scope of the merchant-moneylender system. In most cases it will be seen that the efficiency of price transferral over space and vertically through marketing channels (as measured by marketing margins) has increased, sometimes considerably.

CHAPTER VI

DIMINISHING BOTTLENECKS AND THE PROCESS OF COMMERCIAL
EXPANSION IN THE MINAS TRIANGLE, GOIAS, AND PARANA REGIONS

In this and the following chapter the principal trends in the
market structure and distribution channels in the 1950's and early 1960's
are examined. This analysis is relevant to an important hypothesis
gaining acceptance in Brazil: that distribution, by absorbing an ever
increasing proportion of final food prices has retarded agriculture in
its response to an expanding demand (arising from industrialization,
urbanization and population growth) and thus has contributed to a
rising trend in real food prices.[1] Almost all of the evidence, both
qualitative and quantitative, presented in this and the following chap-
ters point to exactly contrary tendencies in the marketing margins over
space and vertically through distribution channels between the Sao Paulo
and any given production zone in the Center-South. In later chapters
it will be seen that there are no apparent trends in the efficiency of
speculation of the two products. In other words, in the regions examined,
far from diminishing the response of production to rising consumer demand,
the changes in the marketing system seem to have been a stimulus to farm

---

1. See, for example, Baer, Werner, Industrialization and-Economic Devel-
opment in Brazil (Homewood, Illinois: Richard D. Irwin, 1965), p. 153
and Chacel, Julian M., "Precos e Custos na Agricultura Brasileira",
Revista Brasileira do Economia, VIII, 3 (Setembro de 1963), p. 65

production. In the terminology of Chapter II, it will be seen that in
the remainder of this study that in the regions considered there have
probably been declines, through the stage of sale to retailers, in π
(the oligopsonistic profit coefficient), in the cost function of dis-
tribution over space and inquasi-rents, while there is no reason to
believe that seasonal price distortions have increased significantly
over the period in question (ca. 1945-63). This is not to say that
the marketing system has eliminated all of its major problems, as we
shall see when we turn to beans speculation and gross defects of in-
formation in a decentralized market. But the trends have been favor-
able, not negative.

There are two major sources of these markting improvements:
the elimination of bottlenecks in newer producing regions and changes
in marketing channels and structure which have affected all regions
considered. In this chapter, the expansion of production and market-
ing in two new regions--the Minas Triangle and Goias and Parana--is
described. Both regions show the same pattern of rapid farm expansion--
marketing lags--commercial concentration (accompanied by quasi-rents and
oligopsony)--and competization that characterized rice in Rio Grande do
Sul. Both regions have typified the bottlenecks and stresses, parti-
cularly in the public transportation sector, arising in the virtually
unplanned settlement of new regions in Brazil, and consequently in
both regions the price transferral mechanism suffered serious defects.
The most important of the "bottleneck" items, transportation and ware-
housing have been largely corrected by new entry and truck transport,

particularly in the Minas Triangle and Goias and this has greatly in-
creased farm prices received in these areas relative to prices in Sao
Paulo and other consuming centers. This pattern of expansion, however,
was temporarily wasteful of farm resources (mainly through the spoil-
age of large portions of the crops in certain years) and could be
avoided in the future through more enlightened government colonization
and investment policies.

The rise of new production regions created other large firms
in competition with the Old Sao Paulo oligopsonists and independent
fo the Paulista commerce. More importantly, the rise of new and larger
interior firms was the stimulus for the spread of the system of the
independent commission agent ('representante') which gave interior
firms more effective access to the Sao Paulo and Rio markets than was
possible under the old system of consignment to cerealistas. Coupled
with truck transport, it permitted, as it developed, even small interior
firms to seel directly in the Sao Paulo market.

In the next chapter other significant trends (independent of
bottleneck elimination) in market channels and structure in the 1950's
and early 1960's are examined: (1) the rise of the truck and the mer-
chant-truckers ("ambulante")--increasing competition leading to decen-
tralization of marketing (i.e. increasing direct procurement in pro-
ducing areas) and stimulating the elimination of one or more breaks in
market channels; (2) the initiation and rapid spread of direct sales to
retailers by the interior merchants and Sao Paulo cerealistas buying

directly in the interior; (3) the significant decline in the merchant-moneylender system. After the qualitative discussion, quantitative evidence on trends in markting margins in the Center-South will be examined, indicating in general that farm prices of rice and beans have risen relative to wholesale prices in Sao Paulo and Porto Alegre. This is true not only for areas where severe bottlenecks have been eliminated but also for the older producing States of Sao Paulo and Rio Grande do Sul.

Brazil more than doubled its food output, 1946-1963,[2] principally through the oncorporation into production of new virgin lands ever more removed from the principal consumption centers. Two of the most important in cereals, the Minas Triangle and Goias, have brought significant changes in market structure and distribution channels and rpdvide a vivid example of the process of growth in agriculture and marketing in Brazil.

A. Growth in Output.

As shown in Table I, the spurt of production in this region began in the years ca. 1940.[3] Although rice output in the Minas Triangle rose less than 66%, 1919-39, it more than quadrupled, 1939-49, while at the same time Goias almost tripled its rice production. These rates of

---

2. According to index no. 39, the agricultural food production index, of Conjuntura Economica.

3. Two "representantes" specialized in these areas dated the spurt in the Tirangle from about 1940 and in Goias, in the immediate post-war period.

growth exceeded by far those of most areas, as output in Brazil as a
whole less than doubled, 1939-49. The increase of bean output in the
region is less spectacular, but still large when compared with the
rest of Brazil (excluding Parana, which was also opening up big at
about the same time.).

TABLE I

Production of Cereals (tons)

	Minas Triangle	Alto Paranaiba	Goias
Rice			
1919	25,105.8	12,000.4	37,428
1939	41,206.0	19,524.0	
1949	179,964.0	48,833.0	256.069
Beans			
1919	4,789.3	6,908.3	10,948.0
1939	4,945.0	7,767.0	
1949	10,533.0	19,653.0	39,283.0
Corn			
1919	51,192.5	50,765.5	133,823
1939	69,052.0	59,621	
1949	75,753.0	80,666	235,979

Sources: Recenseamento do Brasil, 1920: Agricultura; IBGE, Conselho
Nacional de Estatistica, Censo Agricola, 1940 and 1950.

In 1935, according to Sao Paulo merchants, the Minas Triangle
and Goias were "nothing". Uberlandia, Minas Gerais, was a small town.
By 1950 it had become a city, and by virtue of its location on the only
railroad leading from Southern Goias and the Triangle to Sao Paulo and
its connections by road with the principal rice and bean producing

counties of the Triangle (and extreme Southern Goias), it became by

far the most important market and rice milling center in the two

state area.[4]

B. Marketing Bottlenecks

The rapidly mounting farm output began to create serious

problems of transportation and storage. In the 1940's severe periodic

shortages of rail cars began to appear, aggravated by faulty cooperation

between the three companies serving the area.[5] Transportation problems,

in turn, put abnormal demands on private warehouse capacity (95% of

the total in the Triangle). In large harvests, backlogs of cereals

waiting to be shipped by rail piled up in Araguari, Uberlandia, and Uberaba.

---

4. It possessed more than 1/2 of the total private total storage
facilities in the Triangle and about 40% of the total for Goias and the
Triangle combined. Joint Brazil-United States Economic Development
Commission, "Warehousing and Other Factors Influencing Food Production
in Certain Sections of the States of Minas Gerias and Goias", Brazilian
TEchnical Studies (Washington: Institute of Inter American Affairs,
Foreign Operations Administration, 1955), pp. 415-432. This short
study is invaluable for the student of marketing, representing the
only serious quantitative attempt to evaluate storage facilities in
Brazil for cereals other than wheat. In addition it presents many
details of market operation at an earlier period, which because of
their objectivity, are almost unique.

5. The Estrada de Ferro Goias (federally administered) served Goiania
and Anapolis, the two cereals centers in Goias, but it terminated in
Araguari, Minas Gerais, near the border with Goias. There the Mogiana
(owned and operated by the government of Sao Paulo), with lines to
Sao Paulo, picked up. In the south of the Triangle, connections were
made between the Mogiana and the Rede Mineira (federally adminstered)
which went (with great difficulty) to Rio. Both Araguari and Uberaba
were bottleneck points where cereals had to be unloaded and ware housed,
waiting for available cars: there was little interchange of cars between
the three lines even though all were administered by governments.

In 1950 and 1951, both bumper rice crop years, delays as long as one year in shipping by rail were common.[6] By 1953, perhaps 25% of the crop left the area by truck, but the capacity of road transport at that time was far too small to avoid these rail bottlenecks.

In response to the precipitous rise in output and the appearance of a transport bottleneck (thus increasing the demand for storage), there was a great flurry of entry into rice milling in the late 1940's and early 1950's,[7] so much so that the Joint Commission concluded in 1953:[8]

> All factors indicate that there is ample storage space and processing equipment for rice, corn and beans in the Minas Triangle... Considering all factors it is concluded that existing storage capacity...plus current construction...is sufficient to meet Goias [sic] storage requirements in the immediate future.

With greatly improved roads to Sao Paulo and later Rio de Janeiro and with the rapid increase in the number of available trucks-- in the 10 years after 1953 the position of rail-truck transport reversed, the truck now accounting for 75-80% of shipments from Uberlandia--

---

6. According to one (probably overestimated) source, 3 million sacks of rice of a total production of 10,000,000 in the Triangle and Goias in 1951 were still remaining to be shipped from Uberlandia, Uberaba, and Araguari at the beginning of the 1952 harvest. Faissol, Speridao, "Desenvolvimento Agricola do Sudeste do Planalto Central", Revista Brasileira de Geografia, XIX, 1 (Janeiro-Marco de 1957), p. 61. For those who possessed stocks, good profits were obtained, since the 1952 crop was much smaller.

7. Private (i.e. rice miller) warehouses capacity increased by 15-20% in 1953 alone in the Triangle. Joint Brazil-United States Economic Development Commission, op.cit., p.423.

8. Ibid., pp. 428, 430.

all indications are that the Joint Commission was right in its predic-
tions. In the Triangle, where the growth in output has slackened,
excess storage and milling capacity in private hands is a fact in normal
harvests.[9]

The primary responsibility for the appearance of such severe
bottlenecks in this region lay with the governmental authorities con-
trolling the operation and investment policies of the railroads. As
was seen in Chapter III (pp. 59 - 60), an absolute rail bottleneck nor-
mally gives rise to a substantial quasi-rent for middlemen with storage
and access to the limited transportation, even in a competitive market.[10]
This quasi-rent was a powerful stimulus for private investment in
storage both by "maquinistas" (rice millers) and, in the case of Goias,
private warehouses companies; when the transport bottleneck was relieved,
excess capacity was the result.[11]

---

9. A report of the Sao Paulo Technical Group (made up of agricultural
economists from the State's Divisao de Economia Rural) to the Conselho
Nacional de Abastecimento (National Good Supply Council) concluded
as early as 1957 that private warehouse capacity in the areas was more
than ample, that transportation was good by and large, competition very
severe and margans between the regions and Sao Paulo small, giving no
more than a "normal" profit. "Situacao dos Cereais no Triangulo Min-
eiro e Sul de Goias" (unpublished report from the Grupo Tecnico de Sao
Paulo to the Conselho Nacional de Abastecimento, July 1957).

10. It will be recalled that a transport bottleneck willthrust merchants
into the rapidly rising segment of marginal storage and effective trans-
port costs, creating a wide divergence between average and marginal
storage costs, the essence of quasi-rent. With fixe' rail rates, all
of the quasi-rent goes to middlemen

11. The Joint Commission (op. cit., pp.424, 427) hinted that were the
bottleneck in the transport relived, warehouse capacity would be much
too great for the size of the crops.

Evidence of the rapid elimination of the most severe aspects of the bottleneck can be seen in the downward trend in the ratio of the average Sao Paulo Bolsa price of "Amarelao Especial" during the harvest months,[12] April-September, to the average farm prices of paddy rice in Goias[13] (see Table II). The drop in the ratio begins after 1951 and is precipitous to 1955, as warehousing and trucking expanded rapidly. The downward trend after 1955 is probably due to other factors to be analyzed in the context of changes in market-channels.[14]

C. Concentration in Commerce.

Concommitant with the development of production and the severe pressures on transportation and storage was the rise of a few firms to a position of dominance in the Minas Triangle. The larger Sao Paulo cerealistas did not open rice mills in the area, although several did establish buying posts to purchase milled rice from the maquinistas. All of the more important mills were local to the area.

Two firms, both established in Uberlandia in the 1930's,

---

12. The most common grade of the rice variety produced in Goias and the Minas Triangle.

13. Unfortunately, farm prices are not available for the Triangle.

14. Indices of this sort have many limitations. First they do not necessarily cover comparable periods. Most farm sales do occur in April-September, but the monthly weights vary from year to year. Second, the quality of paddy rice fluctuates from year to year, while the Bolsa price is for a fixed grade of milled rice. Finally, the criteria used by SEP in estimating average farm prices are not really fixed. Attempts by the author to discover such criteria in Londrina, Pr. and Uberlandia, M.G. met with little success. Such strong trends in the price ratios, especially when the trends are as predicted by qualitative information, must, however, have some real basis in fact.

Table II

Ratio of the Index of the Price of "Amarelao Especial"
on the Bolsa de Cereais (April-September)* to AverageGoias
Farm Price of Rice

1955=100

1946	120.69
1947	113.19
1948	120.77
1949	133.86
1950	130.37
1951	130.85
1952	127.96
1953**	
1954**	
1955	100.00
1956	95.66
1957	105.31
1958	99.30
1959	86.57
1960	91.32
1961	89.01
1962**	
1963	92.72

* The Sao Paulo turnover tax, which rose from 2.5% to 4.8% of selling
  price during the period has been deducted from the Bolsa price.

** Ceiling prices fixed by the government were too low to permit trading.

Sources: Bolsa de Cereais de Sao Paulo (average monthly prices of trans-
actions registered on the Bolsa) and IBGE, Conselho Nacional de Estatis-
tica, Anuario Estatistico do Brasil, various numbers.

became considerably larger than the rest. Through reinvestment of the high profits accruing in new areas[15] (quasi-rent and oligopsony), they grew rapidly in size during the 1940's. What was, at its peak, their combined market share in the region's rice and beans cannot be determined with the evidence available. At the end of the harvest months in 1951, the two firms had combined stocks of 1,030,000 sacks of paddy rice.[16] If the two firms possessed warehouse space sufficient for this quantity of rice, they would have accounted for about 25% of all the private capacity in the Triangle and about 1/5 of the total capacity for all cereals in the Minas Triangle and Goias combined.[17] Assuming that the rice stocks of these two firms constituted all their purchases for the year (which is not likely), their share would have been more than 20% of the total output of the Triangle and more than 10% of that for the combined regions.[18] The 20% figure is a better indicator of

---

15. Today maquinistas in Uberlandia say that the best place to buy rice is in southern Mato Grosso, an even newer region. It is less 'explorado' (exploited), less "apertado" (crowded), in a word there is less competition, and this permits higher profits.

16. The source for this figure, corroborated by the Uberlandia office of the IBGE (the Federal Government Statistical agency) was a reliable maquinista in Uberlandia who had been operating since 1947. The inventory had been taken by the Army, acting for COFAP (the Federal Commission for Food Supply and Prices).

17. Ibid., p. 417, shows about 5,500,000 sack capacity for both areas in 1953, but at least 500,000 had been constructed in the previous year, and no doubt some had gone into operation in 1951.

18. Data on production are from Ibid., p. 424, and 427. The Triangle produced in 1951, 5,100,000 sacks of rice and beans and Goias, 5,2000,000 sacks of rice. These statistics are very approximate, and there is a tendency for SEP to overestimate farm production, which if true here, underestimates the market position of these two firms. See Baer, Werner, op.cit., p. 218.

the two firms' market power, since the Goias maquinistas did not
compete with them for the output of the Triangle.[19]

The figures for the two firms refer to stocks at the end
of the harvest period, approximately September, when almost half of
the agricultural year had already passed (and after which, in the
bumper crop year of 1951, farmers still held much of their production
for later sale). The data on Stocks must greatly underestimate their
market share in sales. And, in turn, the relative importance of these
two firms in stocks was considerably more than their share of sales.
The larger maquinistas always have higher stocks in relation to sales
than their smaller counterparts,[20] and there is a tendency for the
former to make the bulk of their sales after August, in the interhar-
vest months.[21] Thus the market power of these firms to produce oligop-
sonistic seasonal price declines and rises (by varying the supply of
storage) if they acted in concert was much larger than might be indi-
cated by their market share in sales alone.

Regardless of the exact concentration in the rice trade in

---

19. Goias firms did not buy in the Triangle and shipment by farmers from
the Triangle to Goiania or Anapolis was out of the question.

20. This was universally agreed on by merchants in all areas visited.
Uberlandia, for example, had about 80-85 rice mills in 1963 according
to the IBGE director, but only about 15 of these are still in operation
by December. The stocks have either moved into wholesale channels in
the consuming areas or, more importantly, are in the hands of the greatly
reduced number of maquinistas.

21. Joint Brazil-United States economic Development Commission, op.cit.,'
p. 420.

1951, one fact stands out. After the early 1950's the large firms began to decline in rice, and no firm since that time has approached their volume. By the early 1960's these same two firms were both operating at levels of 100,000 to 150,000 sacks of rice per year, [22] still the highest in the region, but now a region with more than double the output of the early 1950's. Their large volume of the late 1940's and early 1950's does not, then, appear to have arisen from economies of scale in rice trade and processing as practiced in Brazil, else their absolute volume would have continued. Rather it was primarily the result of a singificantly smaller number of competitors per unit of output, a situation erased by rapid new entry in response to high profit levels. [23]

D. Behavior of the Oligopsony in the Triangle.

Several merchants interviewed claimed that these (and other) firms often combined and led oligopsonistic price declines and rises in the Triangle similar to those encountered earlier in Rio Grande do Sul. The Joint Brazil-United States Commission report on the area

---

22. By statement of one of the firms involved and by common agreement of other merchants interviewed both in Sao Paulo and Uberlandia.

23. In 1953 (after a two year period of sizeable new entry), the Joint Commission found 127 maquinistas in the four most important market centers in the Triangle: Uberlandia, Uberaba, Araguai i and Ituiutaba. In 1963, there were approximately 160-165 in Uberlandia and Ituiutaba alone, according to information supplied by merchants.

was also specific in its charges.[24]

> ...as production increased, a number of large grain merchants
> moved in and, with heavy capital backing, constucted large
> warehouses, and machinery for rapid processing of rice in
> volume. These operators, in many instances, combined to con-
> duct wide-scale purchases at low prices and subsequent with-
> holding activities to force prices up. The withholding of
> from 200,000 to 500,000 bags of rice by several maquinistas
> at one time has not been an uncommon occurrance in the Tri-
> angle during the past several years [written in 1953]. Com-
> petent rice authorities and bank officials in the Triangle
> area felt that this combined action on the part of some
> maquinistas had seriously affected small farmers. What was
> even more alarming was the fact that this action on the part
> of the minority was forcing the traditional old maquinistas,
> who had always been considerate of the small farmer, into
> similar practices in order to maintain their businesses.

As apparently was the case in Rio Grande do Sul in the 1930's, the
report implies that this behavior was a phenomenon of smaller
harvest years.[25]

As in Rio Grande do Sul, an important element in this
system was the merchant-moneylender relation, which, according to
merchants and bankers interviewed by the author in Uberlandia,
reached its peak in the late 1940's and early 1950's and was similar
to that already described for other areas (see Chapter VI).

There is no series of farm prices for the Triangle which
would permit independent verification of these assertions about mar-
ket behavior for any extended period ot time. Many of the purchases
were made while the crop was still in the field and would not have
been reflected in price statistics in any case. Seasonal price indices

---

24. Ibid., p. 421.
25. Cf. Ibid., p. 420.

for 'Amarelao Especial" on the Bolsa de Cereais de Sao Paulo, the most common grade of rice produced in the Triangle, do not seem to indicate the presence of strong oligopsonisitc sction in seasonal prices of the product (see Table III), although the larger seasonal price rises (1947, 194S, and 1952) all correspond to smaller rice harvests in Brazil in relation to the previous year's (see Chapter VI, p. 177)--some indication of price and expectations stickiness.

However, the absence of such evidence in Sao Paulo whole-sale prices is not conclusive for the pattern of farm prices. It is likely, given the serious problems of transportation out of the Triangle in these years, that the two markets were very badly arbi-tragdd over space. Even in smaller crops, if near absolute capacity in shipping were reached during the harvest months, putting the marginal cost of shipping function in near vertical regions, an oligopsony could function in the Minas Triangle and its effects not be reflected fully in the Sao Paulo price. If the marginal cost of spatial transfer is vertical, then the Sao Paulo and Triangle market are independent of each other over space at that moment. Suppose farmers had to sell a fixed proportion of their crop during these months (as a result of the merchant moneylender system). Then in competition under certainty farm prices would have to satisfy the following equality:

$$P_{t+1} - P_t - m'_{t+1} = \text{Farm price} - s'_t$$

where the P's are Sao Paulo prices, m^- is the marginal cost of spatial

Table III

Seasonal Price Indices (deflated) of the Price of Rice,
"Amarelao Especial", Bolsa de Cereais de Sao Paulo*

	April to June	July to September	October to November	January to March
1946	101.92	101.31	100.14	96.64
1947	91.32	92.82	99.67	116.19***
1948	89.85	94.49	102.61	113.04***
1949	101.68	101.41	102.06	94.85
1950	110.93	102.70	96.27	90.09
1951**	91.86	91.34	95.03	121.96***
1952**	344.29	403.13	415.76	no trading

Percentage Rise in Seasonals

April-to-June to October-to-December

1946	-1.7%
1947	9.1%
1948	14.2%
1949	.4%
1950	-13.2%
1951	3.5%
1952	20.8%

* Seasonal computed in relation to average (deflated) price for the harvest year April-March. The data have been deflated quarterly by a method described in Chapter X which devides annual price rises into four geometric quarterly rates of increase.

** The figures for 1952 are actual prices expressed in the cruzeiros of the April-June quarter of that year.

*** The January-March rises in 1947, 1948, and 1951 are clearly in anticipation of higher prices in the subsequent harvest.

Source: Bolsa de Cereais de Sao Paulo and Conjuntura Economica,price index no. 2.

transfer and s' is the marginal cost of storage. That is, the price paid in the harvest months for rice would have to equal the Sao Paulo price in the interharvest months net of marginal shipping and storage costs. However, this "future market" operates almost totally through the buying practices of the Triangle's maquinistas during the harvest months. Should there be an oligopsonistic combination, it could function in almost complete spatial independence to depress farm prices during these harvest months below their "competitive levels" as expressed in the equation.[26] Backlogs of milled rice to be shipped at the beginning of a small harvest provide the necessary element for the vertical portion of marginal shipping costs (as in 1952). The oligopsony could provide the rest.

The 1951 and 1952 harvests provide a good example. Table IV gives rough data on the price of paddy rice in Uberlandia in relation to the price of Amarelao Especial in Sao Paulo net of shipping costs, the sales tax in Sao Paulo and the 2% sales commission to the selling agent ("representante") in that city. The subtractions were made to enable comparisons with the ratio of paddy and milled rice prices paid to farmers in Sao Paulo State, a relation not affected by any of these expenses.

---

26. Competition form the smaller Goias merchants in these circumstances could not be expected, since farmers from the Triangle could not ship to that region, which also was suffering from the same bottlenecks.

Table IV

Ratios of Paddy to Milled Rice Prices*

	Triangle Rice Price as Percentage of Net Bolsa Price of "Ama-relao Especial"	Paddy Rice Price as Percentage of Milled Rice Price: paid to Farmers in Sao Paulo State, Apr.-Sept. Average
1951	.3941 lowest farm and Bolsa Prices	.5975
	.3715 Highest farm and Bolsa Prices	
1952	.4800 June average	.5700
	.4683 July average	
	.6600 Late. August, after farmers had sold their output	
1963	.6009 April-November 15 average	.6447

* Data on Triangle farm prices for 1951 and 1952 are from Ibid.,p. 420 and transport costs for these years, Ibid., p. 418. Transport costs for 1963 were gathered by the author from merchants and farm prices in the Triangle from Bolsa de Cereais de Sao Paulo, Boletim de Setor de Observacao de Mercados, 1963, various numbers. All paddy rice prices appear to refer to rice which yields 2 whole grains for one broken. Even so there is a margin of variations for quality. Sao Paulo farm prices are from Divisao de Economia Rural.

1951 was a year when great backlogs of rice accumulated
at shipping points. This bottleneck clearly made itself felt in
depressed farm prices (cf. in Table IV the Sao Paulo State farm
price ratio of paddy to milled rice for the same year.). When the
small 1952 harvest began, much rice remained in rail warehouses to
be shipped. In the early months of the harvest, farm prices in
the Triangle were higher in relation to net Sao Paulo Bolsa prices,
but still considerably below the relation of paddy to milled rice in
Sao Paulo State (where there were no important transport bottlenecks).
When prices began to react (Agust, 1952) and most farmers had already
sold their rice, farm prices rose considerably in relation to the
net Sao Paulo Bolsa price and even surpassed the average ratio in
Sao Paulo State. Thus the farm price seasonal was much greater
than that of wholesale prices in Sao Paulo. This appears to be clear
evidence of the sort of oligopsonistic behavior described by mer-
chants and the Joint Commission, although it was not reflected in
the Sao Paulo wholesale price. It is very possible that if com-
parable data were available for Rio Grande do Sul farm prices in
the 1930's, similar patterns of margins between farm and wholesale
prices would be encountered there, strengthening the case for the
oligopsony hypothesis.

According the merchants interviewed from the Minas Triangle,
1953 was the last year in which the oligopsonistic combination to
depress farm prices operated effectively. This is not surprising,

since after 1951, the transportation bottleneck was rapidly eliminated,
and new entry, significant throughout the early 1950's, undermined
the relative position of the two largest firms in the market. A group
of marketing technicians, reporting on the Minas Triangle in 1957,
concluded, in marked contrast to the situation just five years before,
that: transport was easy; competition among firms accentuated; and
"it is scarecely possible for the merchants of the Triangle to force
a fall in price during the harvest period."[27] The basic conditions
for such a regional action, concentration and a transport bottleneck
had diminished considerably. Today such oligopsonistic behavior
is almost inconceivable in the Triangle with the significant excess
capacity in milling and warehouseing and the ease of transport between
the area and the major consuming centers (including, now, Belo
Horizonte, the Capital of Minas Gerais).

E. Summary

Thus the pattern of development in the Triangle seems to
have been: rapid expansion of farm output, outstripping the potential
of maquinistas and, even more importantly, of the transportation sys-
tem to market it efficiently. This generated high quasi-rents and
probably oligopsonistic profits as well. A few firms with good ini-
tial financing rose to large relative importance in the market. Such

---

27. Grupo Tecnico de Sao Paulo, op. cit., p. 5.

high profit stimulated new entry which, along with improvements
in road and rail transportation rapidly eliminated the quasi-rent,
diminished the volume of the largest firms, and actually seems to
have generated excess capacity in milling and storage. Again the
highest degree of concentration was associated with lags in
marketing investment and the most rapid rates of growth in farm
production, and it seems to have led to non-competitive movements
to depress farm prices during the harvest below their competitive
levels.

II. The Minas Triangle, Goias, and the Development of the Com-
     mission Agent in Sao Paulo.

        In the 1930's and early 1940's, most interior merchants
wishing to sell in the Sao Paulo market had to consign their goods
to a cerealista of the city who usually bought and sold on his
own account, creating serious conflicts of interest. The interior
merchant had to ship before time of sale and thus lost, under the
system, effective control of the sale over a wide range of sales
prices. The development of many new and relatively large firms in
the Minas Triangle and Goias led to a significant innovation in
the Sao Paulo (and Rio) cereals market, the institution of the
commission agent ("representante"), which in a short time became
by far the most important market channel for sales from the Minas

Triangle and Goias in the Sao Paulo (Rio) market.[28]

The "representante" is a pure commission agent, operating under close instructions from those he represents. He consoldiates sales for a number of firms (the larger "representantes" may work with as many as 100 firms from the Minas-Goias region), thus permitting the organization of a sales corps for the retail trade and other economies of scale. Receiving only on the basis of a commission (2.3%), his interests lie in obtaining the highest possible price for his customers. The "representante" is also able to advise on market conditions in other producing areas and Sao Paulo City about which the interior merchant would otherwise be ignorant.

The rise of the commission agent system must have reduced distribution costs, since there is one less transaction in the distribution process. The expenses of maintaining a buying network in the interior are avoided. Dominant market channels were modified from the older farmer- interior merchant-cerealista-wholesaler chain to farmer-interior merchant-wholesaler, through the "representante". The expenses of the interior merchant-cerealista transaction were

---

28. Not that the institution of commission agent was new in Brazil, even in Sao Paulo cereals, where Rio Grande do Sul firms had long been selling through "representantes". However, the late 1940's mark the first time it was used for the production of the Sao Paulo region.

were mostly eliminated by the newer system.[29] Whereas in the earlier days of the Triangle and Goias (well into the 1950's), many Sao Paulo cereals firms maintained buyers in these areas, they have all but disappeared in recent years partly because of the commission agent, who has expanded his operations more and more with the smaller firms from which the Paulistas used to make the bulk of their purchases in these areas. If an important market channel practically ceases to function, this is a strong indication that the new one is more efficient.

The commission agent introduced a number of other changes in Sao Paulo. First, he began sales on credit to wholesalers (30-60 day "duplicatas", in essence but not in form, a bill of exchange), a new practice in cereals produced in the Sao Paulo region. The commission agent, knowing the buyer in Sao Paulo, was able to guarantee the credit, allowing the maquinistas in Minas and Goias, who had good bank credit, to sell on time in Sao Paulo. This facilitated the process of entry of new firms, allowing newcomers to operate far beyond their own resources even though they themselves had no access to bank financing.

Second, the maquinista could now sell, ie. FOB the interior, on the basis of samples. This was obviously facilitated by the

---

29. It is not altogether clear that this must imply a reduction in effective marketing margins, since competition is necessary for a transferral of the lower costs in the form of lower prices.

development of truck transport.

Third, the commission agent, given his large sales volume and the obvious gross profit advantage involved (when it is a fixed percentage of sales price), pioneered in the 1950's with direct sales to retailers, a point discussed in more detail in Chapter VII..

Besides these advantages, sale through a commission agent legally avoids one payment of the turnover tax (4.8% in Sao Paulo in 1963) in comparison with old market channels, since the transfer of the good to the 'representante' does not pay the tax, whereas a sale to a cerealista in the interior does. This is a powerful advantage, which, however, has no relation to economic costs.

The commission agent, then, seriously cut the potential business of the large Sao Paulo cerealista and in the process appears to have increased the degree of competition in the Sao Paulo market. In Rio de Janeiro, where cerealistas had weaker ties with producing regions, the wholesaler specializing in cereals on his own account has been practically eliminated from the market by the "representante. The principal reason for the continued existence of the cerealistas in Sao Paulo has been the expansion of agriculture in the North of Parana for which he has become the local assembler in addition to his more traditional function of moving output from interior market to Sao Paulo. (See pp. 212-213 below).

A rough idea of the rise of the 'representante' pari passu with Minas Gerais and Goias is given in Table V.

Table V

Number of Members of the Sao Paulo Bolsa de Cereais ·
Clearly Identifiable by Firm Name as "Representantes"

1945	? (very few)
1951	19
1954	29
1958	43
1959	73

Source: Bolsa de Cereais de Sao Paulo.

II. The North of Parana: Beans.

What the Minas Triangle and Goias were to rice, the North
of Parana has been to beans. The tremendous growth of cereals produc-
tion, mainly of corn and beans, in Parana since World War II has
brought its own problems and marketing modification, while making
the state Brazil's most important surplus region for beans. The
bulk of the rapid growth in output (see Table VI) took place in
the North of Parana, and the main expansionary force has been coffee,
of which Parana now produces about twice as much as the traditional
leader, Sao Paulo. The North of Parana is frontier country. Maringa,
a modern city of 50,000 was founded in 1949. Londrina, the coffee
capital with well over 100,000 inhabitants is only 32 years old (as
1965)[30] Today, however, the limits of coffee expansion seem to have

---

30. As settlement has proceeded to the Parana River hostile Indians
have taken to killing the settlers!

Table VI

Production of Corn and Beans in Parana

Bean Production
(tons)

	Parana	Brazil
1939	31,499	789,722
1946	133,801	1,075,955
1950	237,865	1,248,138
1954	336,964	1,544,228
1959	306,997	1,549,644
1963	472,660	1,942,364

Corn Production

	Parana	Brazil
1939	358,081	5,393,553
1946	800,572	5,721,372
1950	881,406	6,023,549
1954	1,123,602	6,788,794
1959	1,220,779	7,786,739
1962	1,339,958	9,036,237

Crop Area in Parana
(hectares)

1940	764,370
1950	1,358,222
1960	3,471,131

Source: Production data, IBGE, Conselho Nacional de Esta-
tistica, Anuario Estatistico do Brasil, various
numbers; Crop area data, Censo Agricola, 1950, 1960.

been reached in the state. The land par excellence of coffee in Brazil is the "terra roxa".[31] As coffee moved farther to the west of Maringa "terra branca" (white land") was encountered, unsuitable for coffee. And as it pushed south and southwestward from Maringa. it became subject to more frequent and severe winter frosts, a serious problem for the tropical tree. With the slowdown in coffee expansion, the growth of bean output has also slackened, production remaining more or less stable 1954-62.

A. Transportation and Warehousing Bottlenecks and Coffee.

The association of cereals, especially beans. with coffee created serious problems for marketing.

Transportation out of this region was inadquate from the beginning. The "trunk" road running through the North was of dirt, difficult to negotiate during the rainy season. Farm to market raods were quite poor (and still are in many sections), and shipments to the important local assembly markets--Apucarana, Maringa, Bandeirantes, Cornelio Preopio, etc.--were paralyzed by heavy rains. Thus downpours in the North of Parana often led to wide price fluctuations there and in Sao Paulo as the regularity of shipments in harvest periods, before significant stocks were formed, was interrupted.

---

31. "purple land", in color a dark orangeish red.

The presence of coffee aggravated the situation in the 1950's,
especially when its prices were relatively high (ca. 1950-57). With
its excellent world market, coffee was given shipping priority on the
wholly inadequate railroad line serving the North of Parana, the
Estrada de Ferro Parana-Santa Catarina[32] (federally operated). Delays
of up to 90 days in rail shipments to Sao Paulo were common in bum-
per crop years.[33] Coffee, at least three of four times the price per
unit volume as beans, was better able also to compete for the insurfi-
cient truck transport.

As in the Minas Triangle and Goias, poor transport seriously
magnified the problem of warehouse space created by an investment lag
in response to the precipitous expansion of output.[34] But Parana, be-
cause of coffee, had its own unique aspects: the rapid rise and sub-
sequent decline in the output of beans (and corn) as the new coffee

---

32. This line suffered tremendous freight car shortages, poor management,
obsolete locomotives and a roadbed so poor that low speeds were manda-
tory. On this miserable railroad see Klein and Saks, op. cit., pp. 117-
121 and Comissao Mista Brasil-Estados Unidos para Desenvolvimento
Economico: Projetos: Transportes, Volume VII (Rio de Janeiro, 1953),
pp. 98-105.

33. Grupo Tecnico de Sao Paulo, "A producao e o Mercado de Cereais no
Norte do Parana" (unpublished report to the Conselho Nacional de Abaste-
cimento, August, 1957), p. 4.

34. See Klein and Saks, op. cit., p. 61; Joint Brazil-United States
Economic Development Commission, "Grain Storage Needs in Brazil (With
Particular Reference to the States of Parana and Santa Catarina)",
Brazilian Tecnical Studies, pp. 396-400; "Warehouses and Silos in Brazil--
Requirements and Prospects", Conjuntura Economica (International Edition),
VII, 4 (April, 1960), pp. 35-42.

lands are cleared and put into production. The cycle began with the clearing of the land of usable trees, then the burning of the scrub. The land is planted in cereals (mainly beans and corn) in the first year. The next year the coffee seedlings are put in, cereals still being produced at about the same level. But after the trees grow to early maturity in three of four years, the cultivation of cereals is seriously cut back to interplanting between the rows of the coffee trees, and increasingly, as the new technique ('nove tecnica') of coffee planting has spread, to much smaller separate plots on the farm.[35] Especially when coffee prices were high in the mid 1950's, interplantings of cereals were greatly diminished between the rows of mature coffee trees (to raise coffee yields),magnifying the rise and decline of cereals production in the new areas of Parana. However, in the year after frost, when the trees lose their leaves and do not yield, cereals are put back into the coffee to salvage some cash income, creating a considerable exogenous source of production instability in cereals,[36] which in turn taxes the marketing system.

But quite apart from the influence of frosts, this tie with coffee led to a short time horizon in the marketing sector as concerns the construction and location of warehouses. Not only was the production

---

35. Large spaces used to be left between coffee rows. With the new technique, the spacing was diminished so that interplanting is normally impossible.

36. Frosts have occurred in 1953, 1955, 1962, and 1963, the 1962 frost being rather mild.

frontier of cereals rapidly expanding, but within a relatively few
years, cerealistas could expect rather abrupt and substantial declines
in cerals behind the frontier as coffee began to yield. Thus Londrina,
a cereals center 15 years ago, has practically no trade today. Commerce
shifted to Apucarana, then Maringa, then Paranavai, etc., continually
to the west.[37] Since farm to market roads were very bad, a cerealista
with his warehouses and buying office situated farther from producing
areas could expect a concommitant decline in volume. This appears
to have been a powerful force restraining the private construction of
warehouses both by merchants and warehousing companies, as cerealistas
tried to move the crop rapidly from Parana to be stored elsewhere.
The government took very little action, except in the ever dominant
coffee sector.[38]

Thus the task of cereals storage was put almost entirely in
private commercial hands and rapid output growth, the shift in its
location and shortages of longer term investment funds[39] opened up
a lag in fixed marketing facilities in the area, considerably accen-
tuated by the inability of the transport system to move the crops

---

37. Although production continues to shift, as do the market centers,
Maringa at the end of the rail line in the North of Parana has become
the principal market city for cereals.

38. There are, for example fairly new IBC (Brazilian Coffee Institute)
warehouses in Maringa with a capacity of over 1,000,000 sacks, while
there are no government operated warehouses open to cereals.

39. Cerealistas have to invest out of retained earnings, by and large,
since it is very difficult indeed for operators in this field to obtain
long-term bank credit.

efficiently.

In this situation, profits to the early comers with capital were high. One Curitiba firm of moderate size (previously special-ized in potatoes), opened a buying branch in 1952 with a 100,000 sack warehouse capacity in Apucarana. In a very few years this firm be-came the largest cereals dealer in Brazil, principally on the basis of its operations in beans in the North of Parana.[40] Several of the laregest cerealistas operating in Sao Paulo today developed in the 1950's because of the great profit opportunities existing for those with financial resources in the North of Parana.[41]

Unlike the Minas Triangle--Goias region, firms from Sao Paulo are important in the local cereals trade in the North of Parana, operating with farmers as local assemblers. Parana has been settled principally by Paulista farmers, and the area economically is an ex-tension of Sao Paulo State. Similarly, with few exceptions (cf. the Curitiba firm above), the larger cerealistas buying directly from farmers in the region have their home offices in Sao Paulo. They are

40. It is difficult to give exact dates, but by 1958, according to its head, this firm sold 500,000 sacks of beans in the Northeast alone, 1958 being the severe drought year which led to the creation of SUDENE (Northeast Development Authority). Already in 1958, the owner was known as "O Rei do Feijao"--the king of beans. In most years this firm sells well over 1,000,000 sacks of cereals.

41. On the basis of personal observation and opinions expressed by mer-chants, 3 of the 5 largest firms would fit this category. Another began in 1943 and operates very little with Parana products. The other, a suc-cessor to one of the earlier Paulista oligopolists, is based primarily in Parana today.

a new generation of cerealistas. With only one exception, all of the 4-6 large firms from the early 1940's had ceased to function by 1955, including the 3 largest.

The movement into the North of Parana with direct ties with farmers is the principal factor preserving the Sao Paulo cerealista from elimination (as has occurred in Rio) in .competition with the 'representante''.

But as with the commission agent system, one transaction has been eliminated in the dominant market channel in comparison with the situation in the late 1930's and early 1940's (see Chapter V, pp. 154-142 above): the transaction between the Sao Paulo cerealista buying in the interior and the local assembler. This changeover has not been complete. Firms with buying branches in Parana do buy there from merchant truckers (but the latter would have sold to local assemblers in any case), and several smaller and medium-size firms from Sao Paulo buy from small interior merchants in Parana by telephone and telegram. But in general the expenses of maintaining a network to buy from interior merchants and the handling costs involved in this transaction (beans are shipped direct from Parana to the final customer in many cases) have been eliminated.

B. Concentration.

As in our previous examples of rapid settlement in new regions, concentration became high, especially in beans, corresponding more or less to the time of greatest presssure on marketing facilities. Merchants

interviewed usually responded that one, at most three, firms domi-
nated beans in the region as late as 1959 or 1960, dwarfing their
competitors in volume and market power. Some merchants interviewed
in the North Of Parana in 1963 still believed that two firms make
the bean market in that whole area, the others being mere followers.
If warehouse capacity is any indication, three or four firms were
still quite large in relation to the rest.[42] Concentration, however,
probably reached its climax in the middle to late 1950's. New entry
has been constant, the rate of growth of cereals production has slowed
considerably as new coffee plantings tapered off (cf. Bean production
after 1954, Table VI above), and most important, improved roads, the
truck and the merchant-trucker ('ambulante'), which will be discussed
in Chapter VII , introduced important new elements of competition and
flexibility in the market.

How this market power was exercised is not clear. Combina-
tions and leadership-followership are less likely in beans due to
the greater uncertainty of the product and the volatility of its prices
over relatively short periods, and most merchants claimed that in beans
such concerted oligopsonistic-oligopolistic behavior did not occur.
This is important, because they would admit such behavior in rice.

---

42. Warehousing of three firms was 100,000 sacks or above, another had
capacity for 40,000 sacks. The rest were all 10,000 sacks or below.
At least one other firm not normally working in beans had over 100,000
sack capacity.

The typical oligopsonistically large seasonal price swings therefore
seem much less likely than in rice. The most frequent assertion
about the large firms was that they often dumped on the Sao Paulo Bolsa
forcing the market down in harvest months in order to panic reluctant
farmers into larger sales at lower prices. Although analogous to
certain tactics employed in Rio Grande do Sul earlier, the real im-
pact of such moves is impossible to establish with the information
available.

Although there is no doubt that the storage-transport bottle-
neck has been considerably alleviated in recent years, it is hard to
evaluate the current adequacy of the combined marketing facilities
for cereals in the North of Parana, since there are no data on the
subject. One thing is certain: off-farm storage facilities for far-
mers are very rare. When they desire to hold a large proportion of
their output for some time before selling, they must almost always
store on the farm using frequently poor methods on the farm. It does
seem likely that during large harvests, commercial capacity in Parana
is still inadequate in combination with the transport system to market
beans anc corn efficiently. But the situation is much better today than
it was even five years ago.

Summary

In both new regions substantial marketing bottlenecks accom-
panied the expanding of cereals output, inadequate transportation being
a prime factor. As production expanded at its most rapid pace and

pressures on marketing facilities were the greatest, concentration in the trade became high, a few early-comers with good initial capital resources rising to substantial size, given the high profits (quasi-rents and other wise) at that stage. Improvement in transportation coupled with new entry and, in Parana, the merchant-trucker, reduced concentration and greatly alleviated the marketing bottleneck, substantially raising farm prices. In the Minas Triangle, there is evidence that some rice millers acted in concert to depress farm prices oligopsonistically in the harvest months, but this behav ior was eliminated by the same factors rectifying marketing bottleneck.

This sequence of growth seems inevitable when other new regions are opened up, unless (and there are good indications that this will be done much more than in the past) intelligent government policies in transportation and storage overhead are undertaken.

Market channels employed in both new regions involved a change-over from the older methods. In Parana, Sao Paulo cerealistas procured directly from farmers instead of interior merchants, while in the Minas Triangle-Goias region, merchants sold darectly in the Sao Paulo market through the new "representante". Both methods involved an elimination of the expenses of the interior merchant-Sao Paulo cerealista transactions in the interior.

CHAPTER VII

FALLING MARKETING MARGINS: THE 1950'S AND EARLY 1960'S (I)

In this chapter, the impact of several structural changes
in marketing is analyzed. The truck and new roads, by opening the
possibility of direct shipment from the interior to final consumer
markets, have practically eliminated the Porto Alegre transaction
in rice and beans and have provoked a great decline in the Sao
Paulo transaction between producing regions on the one hand and Rio
de Janeiro and several larger interior cities, on the other. These
changes appear to have significantly reduced both transactions and
handling expenses, shifting the cost of marketing function downward.
Second, the truck has created a new dealer in cereals, the merchant
trucker, who, with lower overhead costs than the traditional cerealista,
is able to operate on smaller margins. In beans, by increasing the
competition in the interior and underselling cerealistas in Sao Paulo,
the merchant-trucker seems to have brought a significant increase
in farm prices relative to effective wholesale and retail prices in
Sao Paulo. In rice, the merchant-trucker has been limited to the mar-
ket for paddy rice in the interior, but this seems to have increased
competition and efficiency in this market also in areas farther re-
moved from the larger market centers.

There has been a substantial increase in direct sales to
retailers by rice mills (through representantes) and Sao Paulo

cerealistas buying in the interior. This has greatly reduced the
grocery wholesaler transaction in cereals for all but the smaller
retailers. Since cerealistas and commission agents consistently
appear to undersell grocery wholesalers, this structural change should
have reduced the effective margin between retail and wholesale prices.

Finally, primarily because of increasing official credit
to farmers, there has been a substantial decline in the merchant-
moneylender system in commercial rice producing areas, accompanied
by a softening in its terms of operation for that which remains. This
has been an important force increasing competition in the interior and
reducing oligopsony profits. Beans, however, with its typically
smally producer, has been little affected by farm credit changes.

In confirmation of the impact of these changes, it will be
seen in the next chapter that all quantitative evidence available
indicates substantial increases in the farm prices of rice relative
to wholesale prices both in Rio Grande do Sul and between Minas
Gerais, Goias, Sao Paulo State and the Sao Paulo wholesale market.
The quantitative evidence for beans is more ambiguous due to the
lack of effective wholesale and retail price data in Sao Paulo (the
merchant trucker sells below the Bolsa price). But price trends in
Goias, Parana and Sao Paulo State seem to support the hypothesis .
that farm prices have risen in relation to both wholesale and retail
prices. It will be shown that margins in beans between Parana and
Sao Paulo today are probably minimal, indicating a reasonably effi-
cient system of distribution over space and vertically through market
channels.

These trends in marketing should have stimulated the growth
in farm output and do not support the currently accepted hypothesis
that distribution, by progressively increasing its gross margin, has
reduced the response of producers to rising consumer demand.

I. The Truck.

The construction and paving of roads in the 1950's and early
1960's coupled with the initiation of domestic truck production has
bought important modifications to cereals marketing (see Table I). In
the last decade and a half, paved highways have been constructed con-
necting all of Brazil's major market cities in the Center-South: Porto
Alegre with Sao Paulo and Rio de Janeiro, the North of Parana with Sao
Paulo, and the Minas Triangle and Goias with Sao Paulo and Rio. In Sao
Paulo State, all areas now have access to the Capital by paved road.
In addition, many non-trunk highways have been improved and made perma-
nently passable.

By the early 1960's, the truck had replaced both the railroad
and coastal shipping as the principal means of transport employed in
rice and beans. This changeover has affected cereals marketing on three
fronts. First, the transactions and handling breaks in the large
central market cities, based primarily on the lay-out of the rail and
coastal shipping system, were greatly reduced. Direct shipments from
local assemblers to major consuming areas without the intervention of
a central market city are becoming far more common. Second, different

Table I

Brazilian Road System and Trucks in Traffic

	Brazil		Sao Paulo	
	Road Networks in Traffic (kms)	Number of Trucks in Service*		Federal and State Paved Roads (kms)
1952	302,147	244,941	1944	64
1960		307,656	1954	735
1962	519,452		1964	7,780

*The rise in truck capacity is understated grossly by these figures because of a large rise in the average size of the truck in Brazil.

Sources: IBGE, Conselho Nacional de Estatistica, Anuario Estatistics do Brasil. Sao Paulo data: Conjuntura Economica, XIX, 7 (julho do 1965), pp. 73-75.

market areas have become more closely linked as the probabilities of transport bottlenecks were reduced and the rapidity of shipment was enormously increased. The possibility of a regional oligopsony facilitated by poor arbitrage between markets over space has dissappeared in most areas. Finally, anew type of commercial operator developed in beans, the merchant trucker who, buying beans in the producer or interior merchant and selling to wholesalers and retailers in consumer centers, has seriously cut the business of both cerealista and 'representante'. The truckers, by reducing the profitability of the cerealista's sales to whole salers, has given strong impetus to direct sales to retailers and thus has tended to eliminate one transaction in the dominant market channel.

A. The Decline of Central Market Cities and Market Decentralization.

The Porto Alegre trade has been most hurt by road transport.[1] By 1963, the truck had supplanted the ship, almost totally in beans.[2] Not only was truck shipment more rapid to Rio and Sao Paulo (2-3 days compared with 60-70 days in 1963 to Rio by boat,[3] but often, as in April, 1963, it is also cheaper to ship by truck when all expenses

---

1. Porto Alegre was connected to Sao Paulo by paved road in 1960.

2. Improved rail transport has also increased relatively, but cannot compare with the truck in volume.

3. The Brazilian coastal shipping companies are, like the railroads, Federal Government enterprises and are plagued with many operating difficulties. The extreme congestion in the ports of Santos and Rio contribute to the delays usually encountered in shipping.

are included (see Table II).[4]

Table II

Shipping Costs from Porto Alegre, April, 1963

	Sao Paulo	Rio de Janeiro
Coastal Shipping	Cr. S2,593	Cr. S2,571
Truck	Cr S2,342	Cr, S2,564

Source: Instituto Rio Grandense do Arroz. Costs include freight, handling and insurance based on an established minimum price for short grain rice.

The possibility of direct truck shipment from the interior mills and cerealistas to the north has speeded the disappearance of the Porto Alegre and transactions break in rice and beans. Instead of selling to exporters in Porto Alegre, interior firms increasingly send direct to the final consumer markets, either selling there through commission agents or in the interior to buying representatives of the Sao Paulo and Rio firms.[5] Thus the expenses of one transaction, between the local assembler and exporter, are rapidly being eliminated by the new system together with the costs of shipping to and handling the product in Porto Alegre for transport by sea.

4. Port expenses account for almost 1/2 of total costs, while losses in transit are common.

5. Several representantes who used to sell for the mills in Porto Alegre to the exporter are now switching to the function of buying agent for Rio and Sao Paulo.

One extraneous, but significant factor contributing to this
development has been the increase in the turnover tax[6] paid on each
transaction from farmer to consumer (see Table III). Direct sale

Table III

Turnover Tax Rates, Rio Grande do Sul

1950-54	3.3%
1955-56	3.6%
1957	4.38%
1958-59	4.32%
1960	6.00%

through a commission agent in consumer markets avoids one payment of'
the tax in the distribution chain. But even without this tax stimulus,
the exporter in Porto Alegre and the city's active commerce would have
declined enormously. There is no longer an economic reason for the
Porto Alegre transaction. The market center and the pure middlemen
operating there have lost their function. In rice, traders without
mills are disappearing. In beans, most exporters without direct
purchases from farmers have left the field,[7] as the smaller interior
assemblers either sell increasingly to merchant truckers from consumer
centers or place their sales directly through commission agents.

---

6. Called a sales and consignment tax, but it must be paid on each
transaction.

7. Or which have not differentiated their product through processing
and the use of brand names. The largest bean exporter has successfully
entered this field with high quality brand name products which he markets
in packages in many areas around Sao Paulo and Rio.

All these changes, made possible by the truck, should have reduced marketing margins on gaucho products.

2. Sao Paulo Market Area.

By speeding up shipments and relieving the severe pressures on inadequate rail transport, the truck has significantly increased the efficiency and flexibility of shipping throughout the area and in all zones, has supplanted the train as the dominant mode of transport for rice and beans. Truck and rail tariff, when all expenses portal to portal are included, often are not significantly different (see Table IV). Delivery time is reduced, diminishing the need for working stocks. In a product as unstable as beans, more rapid transportation means reduced price risk. While the truck takes at most 1 and 1/2 days to reach Sao Paulo from the North of Parana and the Minas Triangle, the train delays one to two weeks from Parana and about a week from the Triangle.

The paving of roads coupled with a greated supply of truck space in relation to demand has brought a large fall in the real price of truck transportation between Sao Paulo and the important market centers in the interior (see Table V), although because of the switch from rail to road transport, direct freight rates paid by cereals to Sao Paulo do not appear to have fallen significantly.

The possibility of direct shipment by truck has brought increasing decentralization in the Sao Paulo region, cutting heavily into

Table IV

Selected Truck and Rail Rates for Rice and Beans, 1963[*]
(per sack of 60 kilos)

	Truck	Rail
Apucarna-Sao Paulo (2/63)	Cr$280	Cr$170
Maringa-Sao Paulo (7/63)	Cr$300	Cr$280-290
Maringa-Sao Paulo (9/63)	Cr$400	Cr$290
Uberlandia-Sao Paulo (10/63)	Cr$240	Cr$220

[*] Including all expenses portal to portal

Source: Interview with merchants.

Table V

Indices of Truck Rates to Sao Paulo from Selected Interior Cities*

	Maringa	Uberlandia	Goiana
1949	-	133	-
1952	100	100	100
1956	130	-	-
1957	160	-	-
1958	200	-	-
1962	400	-	-
1963	800	833	720

	General Price Level	Field and Lubricants Prices
1949	69	90
1952	100	100
1956	203	241
1957	232	353
1958	263	426
1962	975	1595
1963	1693	2828

* The figures are presented only to give an approximate idea of the evolution of truck rates. In most years there is only one observation on truck rates, and because of the sources may not give an accurate picture of the market over the whole year.

Sources: Pedrinho Labate, Boletim Informativo (market news service bulletin of a Sao Paulo Commission Agent), various numbers and Conjuntura Economica, indices nos. 2 and 62 converted to 1952 = 1oo.

the transactions break in Sao Paulo and the city's entrepot function.

First, road transport and the improvement of the railroad connecting the Minas Triangle with Rio de Janeiro has completely eliminated the Sao Paulo break from the Triangle and Goias to Rio and Belo Horizonte. Today the rice and beans from this region go direct to these cities and are sold there through representantes, whereas in the middle and late 1940's, the greater part went via Sao Paulo's commdrce.

More and better roads have permitted direct shipmentof beans from the North of Parana to interior cities of Sao Paulo State and Minas Gerais, including Belo Horizonte. Two trends have resulted: some Parana cerealistas are increasing their sales in the larger interior cities (through representantes); more important, wholesalers and even retailers from many cities in the Paulista and Minas interior are buying primarily in Parana itself and shipping direct by truck. This was inconceivable 10-15 years earlier, when such merchants nor- mally obtained the Parana product in the Sao Paulo market.

Finally, truck transport has enabled millers in Goias and the Triangle to sell rice directly through representantes in many interior cities, again eliminating the Sao Paulo break.

Each of these developments had decentralized the cereals market in the Sao Paulo region. The shift has been substnatial, and merchants agree that Sao Paulo has lost most of its entrepot function under the impact of the truck. More direct procurement, by eliminating

the additional handling, shipping and transactions expenses should
have reduced marketing costs to cities which formerly bought princi-
pally in the Sao Paulo market. Available data, however, do not per-
mit the testing of this hypothesis.

C. The Merchant Trucker.

The truck created a new kind of dealer in beans, the merchant
trucker ('ambulante'). The "ambulante" has developed in rice only in
the market for rough rice, primarily because it must be processed
by millers before it is sold in urban areas. This sale the mills under-
take directly. The ambulante is any person with a truck, but without
an established business house, who buys and sells in cereals. This
includes a variety of types: a trucker hauling freight in need of a
return trip from the interior; a farmer with a truck who buys his
neighbor's production and sells it in an interior market-center or in
Sao Paulo; a small interior retailer or retailer-wholesaler with a
truck who, settling accounts with his customers in kind, sends spor-
adic truckloads of beans to several market centers. Most often
ambulantes are "wheelers and dealers" owning a truck specializing,
at least during the harvest months, in the buying and selling of
cereals.

1. The North of Parana.

Even in the early and mid-1950's, truckers in search of
return loads were beginning to buy from farmers and local merchants

in Parana, for sale principally in Sao Paulo. But their impact was
negligible. By 1963, however, cerealistas estimated that anywhere from
30 to 80% (the mode at about 50%) of the beans arriving in Sao Paulo
from Parana were brought by the ambulante.

There appear to be two groups of ambulantes for Parana.
First, there are the hundreds operating out of Maringa, Apucarana and
the other market centers of the North of Parana who buy from farmers
at the locale of production.[8] Before the ambulante, farmers had to
sell to two or three local merchants or to the few buyers from the
larger cerealistas operating in the region who might appear now and
then or transport their products to the market centers which in some
cases were quite distant over the dirt roads.

Especially in the newer zones, the small number of buyers led
to exploitation of the producer by middlemen. Now farmers in these
newer areas wait for the ambulante and are much more reluctant to
sell locally.[9] Merchants and farmers alike feel that the ambulante
has greatly increased competition in farm areas, and producers think

---

8. The largest cerealista in the area claimed that there were about
a thousand, probably an exaggeration.

9. This situation and feeling were encountered in all the small towns
visited by the author between Maringa and the Foz do Iguacu in the
extreme southwest of the State of Parana.

they normally get a better price from the ambulante.[10]

This first group of ambulantes sells more in the market centers of Parana itself. There are scores of small cerealistas in Maringa, Paranavai, Apucarna, etc. whose main activity is buying from the Parana ambulante and selling as quickly as possible to other ambulantes and buying agents from Sao Paulo, Belo Horizonte, Rio de Janeiro, and other areas. In addition, direct sales from one ambulante to another are common in Parana. Many merchant-truckers bridge the gap from producer in Parana to the Sao Paulo market, and this possibility serves as an effective spatial arbitrage between the two markets. On balance, merchants could not agree whether ambulantes buying from producers in Parana sold more in the market centers there or more directly in Sao Paulo.

A second group of ambulantes, including truckers hauling for freight, operates between Parana and Sao Paulo (and other cities to a much smaller extent), buying mainly from the small interior cerealistas or other ambulantes. Many of these so-called ambulantes

---

10. During the wet season harvest, the bulk of the production is located in the newer areas of Parana and most of it leaves the farm via the ambulante. Traditional cerealistas in Maringa and Apucarana all bought 80-100% of the 1963 wet season harvest from the ambulante. In the dry season, the picture is approximately reversed as production occurs closer to these centers. Even so, most firms reported at least 20% of their purchases in the dry season were also from ambulantes.

Some of the larger cerealistas make purchase agreements with the more trusted ambulantes, although this arrangement does not seem to be very important.

are really selling agents from small interior firms, especially from
Sao Paulo State.[11] In Sao Paulo, the ambulante has several selling
alternatives: it seems he sells most to grocery wholesalers and
cerealistas without direct purchase systems in the interior. But
even the larger cerealistas frequently buy from him, since the ambu-
lante's price is often lower than the cerealista's procurement price
in the interior plus shipping! However, direct sales to "feirantes"
(street fair vendors)[12] and "varejoes" (larger good retailers who
may combine this with wholesaling), who would normally buy in near
truckload lots anyway, are commong and of increasing importance,
although there was no consensus in the trade on how important they
might be. Estimates ranged from 20-60% of the ambulante's sales,
but are pure guess, since it is impossible to accompany the ambulante's
activities throughout the city. Some ambulantes make use of the
services of an informal set of "brokers" who have filled the task of
making contact between buyers and ambulantes who may not be familiar

11. Amost all the beans produced in Sao Paulo State which reach the
Capital come in by truck seller.

12. The "feirante" sells in the mobile street fairs which are the lar-
gest retail distribution outlet for fruits, vegetables, and cereals in
Sao Paulo. Most fairs operate in a different location each day, and it
is common for one feirante to sell in as many as four fairs each day.
Since there is little overhead (the streets are provided free of charge)
and rapid turnover, prices in the fairs are generally below those of the
typically small grocery store and even of the growing super market chains.
On the fair and its generally lower prices see Taylor, Donald A., "Re-
tailing in Brazil", Journal of Marketing, XXIV, 3 (July, 1959), pp. 54-
58; Knoke, William, "Brazilian and U.S. Supermarkets Compared and Con-
trasted", (unpublished paper, 1963); Stilman, Meyer, O Comercio Varejista
e Os Supermercados no Cidade de Sao Paulo (Sao Paulo: Faculdade de Cien-
cias Economicas e Administativas, Universidade de Sao Paulo, 1962), pp.
58-63.

with the Sao Paulo market. According to cerealistas, the sales price
of the ambulante (from all areas, not only Parana) is normally 5-10%
below the comparable product of the Sao Paulo Bolsa de Cereais, which
reflects the selling price of the traditional cerealista in Sao Paulo.
By stealing much of the cerealista's traditional business with
wholesalers (specialized or not in cereals), the ambulante has pushed
the cerealista increasingly into direct sales to retailers.

Alto Paranaiba, Minas Gerais and Other Regions.

Parana is the most striking example of the development of
the merchant-trucker in beans, but he is on the rise in most areas.
Patos de Minas was the commercial center for the roxao variety
of beans produced in much of the Alto Paranaiba region of Minas
Gerais. There were several moderate-size cerealistas in operation,
selling both there to Sao Paulo buyers and through representantes
in Sao Paulo itself. In the five years, 1957-63, the traditional
commerce of the city has been severely shaken by the ambulante,
generally a local resident (farmer, trucker, even dentists). In
Patos estimates run from 50-90% the percentage of total production
which now leaves by ambulante, and the reason is clear (elder mer-
chants admit this): the ambulante pays higher prices to the farmer.
In many cases, the ambulante is a more prosperous farmer who buys
(or perhaps receives "on consignment") from his sharecroppers and

neighbors and ships to Sao Paulo for sale.[13] Sometimes, the ambulante
is an outsider who makes his contact with farmers in the city. Tradi-
tional cerealistas are finding it almost impossible to compete with
this system. Increasingly it is the landowner who is becoming the
merchant holding stocks, principally because of the ease of truck
shipment.

Thus far the merchant-trucker system has made less impact
in the Triangle and Goias, where traditionally the rice miller has
also been the bean merchant. However, dealers see signs of an increase
in the ambulante's activity there, too.

Finally, with the opening of the paved Br-2 in 1960, ambu-
lantes have assumed considerable importance inchanneling the beans of
Rio Grande do Sul northward,[14] and bean dealers in Porto Alegre are
convinced that the trucker will come to dominate that area much as
they have already in Parana and Patos de Minas.

In both farm and urban areas, then, the ambulante has been
a potent force tending to reduce margins up through the wholesale
stage of distribution. He has raised competition in farm areas and
at the same time sells at prices below the traditional cerealista.
Once farmers have sold their output and stocks are mainly in the hands

_____

13. It is common in the Alto Paranaiba for "fazendeiros' (large land-
owners) to buy most of their sharecroppers' quote, sometimes in liqui-
dation of debts.

14. Here estimates by merchants vary widely--from 10-50% of the total
entering Sao Paulo.

of the larger, traditional firms, the potential volume of the ambulante declines. But there is still some margin for operation since, according to merchants interviewed, farmers seem to be holding a greater proportion of the stocks of beans in the interharvest than in earlier years. In any case, in normal and large crops, producers will generally have at least 20-30% of the crop still to be sold in the last half of the crop season.

One factor clouds the interpretation of the ambulante as a force reducing marketing margins and costs. Evasion of the turn-over tax ("Imposto sobre vendas e consignacoes") seems to give the ambulante some competitive advantage compared with the traditional cerealista. How much accrues from this source alone is pute conjecture, since traditional cerealistas also evade this tax as much as possible.[15] The methods used by the ambulante to avoid payment of the tax are many, but all resolve into bribing the tax men at the borders between states. (The sales tax is due the state of origin when the sale was supposedly made before shipment--the usual pose

---

15. One Porto Alegre exporter claimed that the Sao Paulo cereals trade lives off of tax evasion. Estimates of turnover tax evasion rates given the author by merchants range from 33% to 75%. As of 1963, the rates were:

Sao Paulo	4.8%
Parana	5.95
Minas Gerais	5.4
Rio Grande do Sul	6.0

of the ambulante.[16]) It is not clear why the ambulante should be more successful in bribing than the cerealista, who also sells considerable amounts F.O.B. Parana. When, however, the cerealista transfers the good from his branch in Parana to Sao Paulo without previous sale, the tax is due to Sao Paulo State at the time of sale.[17] In this case, the cerealista with an established place of business and some accounting records usually has more difficulty avoiding full payment of the tax than the ambulante.

The tax alone does not appear decisive. The ambulante avoids all of the organizational and overhead expenses of the traditional cerealista with buying branches in the interior. All the operations the ambulante performs--assembly, buying and selling--must also be undertaken by the cerealista, but with additional organizational expenses. The ambulante should be able to sell more cheaply without the advantages of tax evasion. For a product that need not be processed or packaged, that is sold by farmers in small lots (less than

---

16. In Minas Gerais, for example, three copies of the tax note are required for each sale out of the state. One is kept by the seller, one is left at the tax barrier on the border and the other goes to the buyer. Then the notes collected at the border are sent to each county to be checked against the notes paid by the seller. The bribe, then, is to avoid leaving the note at the tax barrier using the same set of three several times. Overloading sacks, understating price, selling direct in the name of the farmer are techniques employed by cerealistas and ambulante alike to avoid full payment.

17. Information on the legal aspects of the sales tax were supplied both by merchants and a Sao Paulo lawyer. The basic laws governing this tax are Article 19 of the 1946 Brazilian Constitution, the Sao Paulo Decree-Law 28,252 (4/29/57).

a truckload in almost all cases) and which need undergo no transformation before it reaches retailers, the merchant-trucker system does appear more efficient and less costly.

Cerealistas were asked their opinion about the effects of the ambulante upon the established system of cerealistas. All answers were unambiguous: net profit margins (excluding speculative profits) have been reduced, considerably according to some. The volume of all cerealistas, especially the smaller ones, has been adversely affected. When we couple this fact with the striking porportional increase in the cerealistas sales to retailers (see pp. 236 -238 below) it seems certain that, for whatever reason, the ambulante has been a strong force in effecting lower distribution costs.

II. The Rise of Direct Sales to Retailers.

It will be recalled that traditionally cerealistas buying in the interior and firms operating in Sao Paulo through representantes sold in the city either to general food wholesalers or to other cereal-istas who in turn supplied the several kinds of retailers. Exceptions were of little importance. In the early and middle 1950's, following the example developing in grocery items,[18] the representante (commission

---

18. American firms led the way with route salesmen selling to larger gro-cery retailers at prices considerably below those charged by wholesalers. Several local processing firms were prevented from this method by whole-salers' threats to drop their product lines. But the large domestic firms overcame this resistance, and by 1965, the grocery wholesaler had been restricted to the smaller retailers in most items. Based on an inter-view with Wanderley Bocchi, President of the Retail Foods Syndicate of Sao Paulo, October 9. 1965. See also Stilman, Meyer, op..cit., p. 297.

agent) pioneered in the direct sales of rice and beans to the consumers'
main source of cerals, the street fair seller (feirante) and the large
retailer (varejao)(see footnote 14, p.233 above). By the early 1960's
direct sale from the interior assembler and miller had become the
feirante's and larger food retailer's principal source of rice and beans.
The grocery wholesaler has been increasingly restricted to the small
retailer, who because of his low volume, buys most efficiently (and
with credit) by consolidating his purchases with one wholesaler.[19]
This switch in marketing channels is itself evidence of the greater
efficiency resulting from the progressive elimination of the costs of
the transaction with the grocery wholesaler and Sao Paulo cerealistas.[20]
This was a true innovation--it was always feasible, but was not under-
taken by traditional cerealistas for lack of imagination and organiza-
tion, In cereals, one or two man firms have always been the rule, and
the efforts of management have been directed mainly to procurement and

---

19. The transformation in Rio de Janeiro has been even more complete.
While Rio Grande do Sul rice mills stillsell primarily to cerealistas
and wholesalers in Sao Paulo (supposedly because the rice must be pol-
ished in Sao Paulo), they sell almost entirely to retailers in Rio
through representantes, by and large.

20. Again, the turnover tax may be important, since direct sale to
retailers avoids, in market channels, one payment of the tax. But it
seems certain that marketing costs are also reduced. The feirante
buys only cereals. The representante's cost of selling to him should
not be higher than the grocery wholesaler's, in addition to which the
representante-wholesaler transaction is avoided. For the large retailer,
there is no advantage from consolidating sales with a wholesaler, since
he can buy grocery items and cereals both more cheaply from other
sources.

assembly in the interior and speculation (from which the large pro-
fits can be made). The commission agent, on the other hand, is a
specialist in selling in Sao Paulo. His profits are increased by
better sales methods. Therefore, it is not surprising that the
innovation of direct sales to retailers should have been initiated
by the commission agent and not the traditional cerealista.

No attempt was made to estimate the proportion of sales
from the merchants of the Minas Triangle and Goias which pass direct-
ly to retailers through respresentantes. Of the 9 firms interviewed
in the Minas Triangle area, 7 reported that in 1963 most of their
sales were directly to retailers, mainly feirantes. Just five years
before, all said they had sold principally to wholesalers of all
types (including cereals specialistas). The two firms selling pri-
marily to wholesalers said their sales to retailers were on the rise
and bound to increase in the future. In Sao Paulo, the representantes
interviewed agreed that there has been significant changeover in
their sales patter. Ten years ago (ca. 1953) their sales were over-
whelmingly to wholesalers. By 1963, the split had become approximately
50-50 between retailers and wholesalers, perhaps more in favor of the
retailers.[21] More important than these individual firm statistics
was the complete agreement on the trend: direct sales to retailers

---

21. Only large representantes were interviewed. The smaller firms
sell considerably more to retailers.

are large and destined to become more important.

The Sao Paulo cerealista buying beans directly in Parana has adopted a similar sales pattern,[22] partly because of the competition from the ambulante for the business of the grocery wholesaler and the smaller cerealista operating only in Sao Paulo. Eleven of the Sao Paulo cerealistas were interviewed, including all but one of the largest firms operating in the beans of Parana.[23] Most reported a rapid changeover from transactions with the grocery wholesaler and smaller cerealista to direct sales to retailers, primarily the feirante (see Table VI).

In addition, all thought that the cerealista increasingly will have to sell to retailers, if he is to survive with decent profits. It should be noted that among the small firms, the trend is less pronounced. These firms do not have buying branches in the interior and have traditionally supplied themselves from the larger cerealista and representante.

A rough indication of the decline in the sales to wholesalers

22. There is one important difference. Many representantes now have a corps of route salesmen, whereas cerealistas sell only at their warehouses in the cereals district in the center of the city.

23. Although the other large cerealista operating in Parana beans refused to respond to the questionnaire, he stated informally that feirante sales were an increasingly important part of his business. The criteria adopted in classification are based on personal observation and the opinions of cerealistas. Explicit questions on sales volume were avoided. Some cerealistas volunteered their approximate sales volume (quantity), but the author is certain that exact figures would have been universally refused, and a request for them could have impaired the cooperation of some of the merchants.

Table VI

Percentage of Total Sales of Beans
Made by Cerealistas to Retailers

		1963	1953-58
Large firms:			
	(1)	90-95%	very little
	(2)	90-100%	always high
	(3)	50%	very little
Medium Firms:			
	(4)	90%	very little
	(5)	90%	much less
	(6)	80%	very little
	(7)	60%	much less
Small Firms:			
	(8)	80%	less
	(9)	90%	less
	(10)	98%	not operating
	(11)	100%	always has been

Source: Personal interviews.

by commission agents and cerealistas (buying in the interior) and
the rise of the ambulante can be seen in the large fall in the vol-
ume of beans and "amarelao" rice (from the Triangle and Goias) traded
on the Sao Paulo Bolsa de Cereais (see Table VII), where retailers
do not normally buy. The downward trend in rice has accompanied a
large increase in the production of this variety. The fall in beans
corresponds exactly to the rise of the ambulante.

The trends toward the ambulante and direct sales to re-
tailers imply two important conclusions: the effective net profit
margin on the sales of beans to wholesalers has been reduced;[24] the
effective average price of both rice and beans to retailers has also
fallen through competition.[25] Wholesalers in Sao Paulo have traditionally
worked with mark-ups of approximately 10% to retailers, but the cereal-
istas interviewed on Beans reported mark-ups of between 0 and 7% above
Bolsa price on their sales to feirantes and larger retailers (depending
on the size of the lot purchased). In neighborhoods where there are
both street fairs (feiras) and larger retailers, benefitting from lower
costs of acquisition, it is probably that price competion has caused
some of this reduction to be reflected in lower prices to consumers.[26]

24."Effective," because the Bolsa price appears to be increasingly out
of line with actual prices of transactions, a symptom of which is the
precipitous decline in the volume traded on the Bolsa. (see TAble VII).

25. This would follow from the rapidly declining importance of the gen-
eral wholesaler in supplying retailers of all types.

26. Cerealistas dealing with feirantes were of the opinion that they do
pass on the lower prices, i.e., that their mark-up over cost have not
risen.

Table VII

Volume of Transactions on

the Sao Paulo Bolsa de Cereais

(sacks of 60 kilos)

	Beans	"Amarelao" Rice*
1949	545,388	311,917
1950	473,519	277,447
1951	460,033	330,298
1952	622,315	474,726
1953	254,241	-
1954	484,316	-
1955	540,019	290,624
1956	406,101	254,164
1957	460,426	-
1958	673,022	-
1959	-	183,234
1960	236,738	280,837
1961	315,742	260,600
1963	101,192	78,062

* from Minas Gerais and Goias

Source: Bolsa de Cereais de Sao Paulo; only years with year-round
trading were included.

II. The Decline of the Merchant-Moneylender System.

The dependence of the farmer upon merchants for credit facilitated non-competitive buying behavior and limited farmers' selling alternatives in both time and space. Although direct interest charges do not usually appear to have been "excessive" in rice, the advantage of the middleman has been (1) a guarantee of much of his supply during a fixed period of time and (2) the power in many cases to pre-stipulate prices at low levels before the harvest.

In the last decade, there has been a striking decline in this type of loan in the rice producing areas considered in this study. In an effort to stimulate the production of foodstuffs, the Bank of Brazil has greatly expanded its agricultural loans for cultivation expenses at highly negative rates of interest.[27]

A. Rio Grande do Sul.

The state where merchant financing in rice has fallen most is Rio Grande do Sul. Table VIII presents the available data on the sources of finance to defer cultivation expenses in Rio Grande. The trend away from self-finance and the mills (the bulk of private financing) is clear. The low total of area financed by the mills in 1950' is surprising. This arises from the form in which the data are presented in the original source: the total area of any particular farm was

---

27. The rate in cereals in 1963 was 4% per year on the first Cr$1,000,000 (about $1,000 at the black market exchange rate) and 7% on the remainder. Inflation exceeded 70% per year in 1963.

Table VIII

Rio Grande do Sul: Rice.

Sources of Finance for Cultivation
and Harvesting Expenses as Percentage
of Total Area Planted*
(Farms of 9 Hectares or Above)

	Self-Financed	Private (Principally the Mills)	Bank of Brazil	Other
1950	36.5	18.6	43.3	1.6
1951	31.9	16.6	50.6	.9
1952	28.2	13.2	54.9	3.7
1953	27.3	11.5	58.1	3.1
1954	30.0	8.7	59.2	2.0
1955	26.6	6.3	66.0	1.1
1956	24.4	4.9	70.6	.1
1957	24.8	4.1	70.3	.8
1958	19.1	3.4	77.2	.2
1959	18.3	3.3	78.2	.2
1960	13.4	2.3	84.2	.2
1961	11.5	2.4	85.7	.4
1962	8.3	3.8	87.8	.1

* The total area of each farm planted in rice is included under the
category of its main source of financing.

Source: IRGA, op. cit., No. 17 (1962), p. 91 and No. 18 (1963), p. 84.

included under the category of the producer's single most important

source of finance. Innumerable farms which were financed mainly out

of own capital or by Bank of Brazil loans supplemented these sources

with loans from the mills tied to sales preferences. This was still

true to a certain extent in 1962. Although, for example, IRGA reports

only 174 rice farmers (larger than 9 hectares) receiving credit pri-

marily from private sources, one large mill alone informed the author

that it had made about 120 cultivation loans for farmers in that year.

Although the mills have declined as the principal source of finance,

they retain an important role for smaller supplementary loans.

The most common explanation for this continued reliance

on the mill is that the Bank of Brazil's limits on financing per hec-

tare in rice are not sufficient to cover all out-of-pocket expenses.[28]

It does seem, however, that in the majority of cases farmers could

---

28. This is probably true, but is usually exaggerated by farmers and
their official government organ, the Rice Institute of Rio Grande do
Sul (IRGA). For the 1961/62 harvest, for example, IRGA calculated
the average cost of rice per quadra (1 quadra = 1.742 hectares) at
Cr$66,836.20, while the Bank of Brazil's credit ceiling was Cr$37,189
per quadra. This overstates the gap in working capital. If taxes,
shipping costs to the mills and sacks, expenses generally financed by
the mill, rents, which are usually paid in kind after the harvest, and
interest, which comes due at the expiration of the loan, are excluded,
out-of-pocket expenses per quadra fall to Cr$51,400.20. This means
that the Bank of Brazil loan was sufficient to cover almost 3/4 of
money expenses. Even here there may be some understatement, since
some of the expenses--raod repair, fence maintenance and canal impro-
vement--are often postponeable until the period immediately after the
sale of the product. Data from Banco do Brasil, Porto Alegre Branch
and IRGA, Departamento de Obras e Assistencia Tecnica, Custo de Una
Quadra de Arroz. (Porto Alegre, 1962).

make up the difference out of their own funds--in 1950, over 1/3 relied principally on their own money to finance cultivation. For most farmers, there is no necessity (i.e. for lack of other alternatives) of recourse to the mills. However, some seem to persist in borrowing from the mills because it is profitable. Inflation in the late 1950's averaged 25-30% per year, and in 1963 reached about 75%, whereas many mills in competition for business charge the farmer only the cost of credit to them plus the administration costs (in 1963, about 2.5-3.0% per month). This implies a negative real rate of interest to the farmer, who may prefer a sales compromise to the mill under the conditions it currently operates (see pp.) to holding liquidity during the inflation.

It is generally agreed in Rio Grande do Sul that although they persist, loans by millers to finance cultivation expenses are on the decline. The millers interviewed expressed the intention of diminishing these loans even further in thr future. As Table VIII makes clear, these loans are increasingly merely supplements to other sources. The most common form of financing extended by the mills today is for the expenses of getting the paddy rice from the farm to the mill--freight, sacks and taxes. This is a competitive service performed by the mills (time of sale cannot be forced, in general) and cannot be interpreted as a use of market power.

The loan ceilings per quadra from the Bank of Brazil have in recent years been fixed at 60% of the minimum price of rice in the

state (as set by IRGA, see Chapter X, below), assuming a yield of 60

sacks per quadra (actual yields average about 90 sacks of 50 kilos).

The loans are due June 30 or July 31, depending on the zone. Post-

ponements in repayment of 120 days (i.e. until the end of September)

have been relatively easy to obtain in recent years. Even liquida-

ting the loan on time would normally take no more than 1/3 of the

producer's rice output. With the remainder, he is free to choose his

own time of sale.[29]

The alternative of attractive Bank of Brazil financing, the

increasing competition from rice cooperatives, which in 1963 absorbed

about 1/3 of the state's rice output,[30] and possible excess capacity

in the commercial sector (see Table IX) has led the mills to more

lenient credit practices. Today, it seems most common that the loan

must be liquidated only in August or September when new financing

is sought. The farmer can deposit his rice in the mill (at no charge)

and wait before selling, if he chooses.

---

29. There appears to be ample on-farm warehouse space in Rio Grande do
Sul. In 1957/58, when production was 15,252,524 sacks of 50 kilos, ware-
house capacity on rice farms was 7,585,250. Alvaro Ornellas de Sousa,
op. cit., p. 13.

30. According to data from IRGA. This is the only important example of
the use of cooperatives in cereals in Brazil. Unfortunately the
author was unable to study their operations in detail. The number of
rice cooperatives affiliated with the Federacao de Cooperativeas de
Arroz do Rio Grande do Sul has rise n as follows:

1960	15
1961	16
1962	27
1963	33

Table IX

Warehousing Capacity Devoted to
Rice, Rio Grande do Sul, 1957/58

(sacks of 50 kilos)

Production	15,252,524
Warehouse Space in Rice Mills	16,237,708
Warehouse Space on Rice Farms	7,585,250

Source: Alvaro Orbellas de Souza, op. cit., p. 13.

Today the rice market in Rio Grande do Sul appears to approximate a competitive structure. In 1957, 45 mills processed more than 100,000 sacks of paddy rice, including 8 cooperatives.[31] The use of credit for non-competitive buying has mostly disappeared, while the threat of the further growth of cooperatives restrains the mills even further.

Given the increased competitive pressure, the larger mills are turning increasingly to supplying their needs for rough rice through their own farms. Larger mills have often produced rice on their own lands in the past, employing variations of a sharecropper-partnership system.[32] But in the late 1950's and early 1960's this system was increasing rapidly. The largest mill in the state now produces about 1/2

31. IRGA, op. cit., No. 13 (1958), p. 133.
32. Burger, Ary, A Conjuntura da Economia Orizícola no Rio Grande do Sul (Porto Alegre: Institute Rio Grandense do Arroz, 1952), pp. 55-57.

of its own rice and in the next few years hopes to be <u>completely</u>

free of the "whims of the farmer". If present trends continue, there

will be two parallel systems of marketing in Rio Grande do Sul.

Most farmers will process and market their rice through cooperatives,

and the remaining mills will meet their raw material needs primarily

from their own lands. The vertical integration of the crop will then

be complete. It is not too far fetched to predict for the future

market channels which will pass directly from the farm through the

representante to retailer in the major urban centers.

B. <u>Sao Paulo Region</u>

Similar trends in credit were found in the Minas Triangle.

In the late 1940's and early 1950's, accoring to bankers and merchants

there, tied loans from the mills were the most important form of fin-

ance. By 1963, while the system persisted, it had declined greately

in importance. All millers interviewed reported a large decline in

their financing of cultivation.[33] As in Rio Grande do Sul, credit

had become mainly a competitive instrument to get the farmer's busi-

ness after harvesting by financing the costs of transporting the rice

to the mill. Again the main factor in this decline was the increased

activity of the Bank of Brazil. Table X presents the trends in loans

for cultivation expenses for the <u>whole</u> of Minas Gerais. The percentage

_____

33. The largest made 60-70 cultivation loans in 1953-54, in 1963 these
were reduced to 6 or 7.

Table IX

Warehousing Capacity Devoted to
Rice, Rio Grande do Sul, 1957/58

(sacks of 50 kilos)

Production	15,252,524
Warehouse Space in Rice Mills	16,237,708
Warehouse Space on Rice Farms	7,585,250

Source: Alvaro Orbellas de Souza, op. cit., p. 13.

Today the rice market in Rio Grande do Sul appears to approximate a competitive structure. In 1957, 45 mills processed more than 100,000 sacks of paddy rice, including 8 cooperatives.[31] The use of credit for non-competitive buying has mostly disappeared, while the threat of the further growth of cooperatives restrains the mills even further.

Given the increased competitive pressure, the larger mills are turning increasingly to supplying their needs for rough rice through their own farms. Larger mills have often produced rice on their own lands in the past, employing variations of a sharecropper-partnership system.[32] But in the late 1950's and early 1960's this system was increasing rapidly. The largest mill in the state now produces about 1/2

31. IRGA, op. cit., No. 13 (1958), p. 133.
32. Burger, Ary, A Conjuntura da Economia Orizicola no Rio Grande do Sul (Porto Alegre: Institute Rio Grandense do Arroz, 1952), pp. 55-57.

of its own rice and in the next few years hopes to be completely
free of the "whims of the farmer". If present trends continue, there
will be two parallel systems of marketing in Rio Grande do Sul.
Most farmers will process and market their rice through cooperatives,
and the remaining mills will meet their raw material needs primarily
from their own lands. The vertical integration of the crop will then
be complete. It is not too far fetched to predict for the future
market channels which will pass directly from the farm through the
representante to retailer in the major urban centers.

B. Sao Paulo Region

Similar trends in credit were found in the Minas Triangle.
In the late 1940's and early 1950's, accoring to bankers and merchants
there, tied loans from the mills were the most important form of fin-
ance. By 1963, while the system persisted, it had declined greately
in importance. All millers interviewed reported a large decline in
their financing of cultivation.[33] As in Rio Grande do Sul, credit
had become mainly a competitive instrument to get the farmer's busi-
ness after harvesting by financing the costs of transporting the rice
to the mill. Again the main factor in this decline was the increased
activity of the Bank of Brazil. Table X presents the trends in loans
for cultivation expenses for the whole of Minas Gerais. The percentage

---

33. The largest made 60-70 cultivation loans in 1953-54, in 1963 these
were reduced to 6 or 7.

Table IX

Warehousing Capacity Devoted to
Rice, Rio Grande do Sul, 1957/58

(sacks of 50 kilos)

Production	15,252,524
Warehouse Space in Rice Mills	16,237,708
Warehouse Space on Rice Farms	7,585,250

Source: Alvaro Orbellas de Souza, op. cit., p. 13.

Today the rice market in Rio Grande do Sul appears to approxi-
mate a competitive structure. In 1957, 45 mills processed more than
100,000 sacks of paddy rice, including 8 cooperatives.[31] The use of
credit for non-competitive buying has mostly disappeared, while the
threat of the further growth of cooperatives restrains the mills even
further.

Given the increased competitive pressure, the larger mills
are turning increasingly to supplying their needs for rough rice through
their own farms. Larger mills have often produced rice on their own
lands in the past, employing variations of a sharecropper-partnership
system.[32] But in the late 1950's and early 1960's this system was in-
creasing rapidly. The largest mill in the state now produces about 1/2

---

31. IRGA, op. cit., No. 13 (1958), p. 133.

32. Burger, Ary, A Conjuntura da Economia Orizicola no Rio Grande do
Sul (Porto Alegre: Institute Rio Grandense do Arroz, 1952), pp.55-57.

of its own rice and in the next few years hopes to be completely

free of the "whims of the farmer". If present trends continue, there

will be two parallel systems of marketing in Rio Grande do Sul.

Most farmers will process and market their rice through cooperatives,

and the remaining mills will meet their raw material needs primarily

from their own lands. The vertical integration of the crop will then

be complete. It is not too far fetched to predict for the future

market channels which will pass directly from the farm through the

representante to retailer in the major urban centers.

B. Sao Paulo Region

      Similar trends in credit were found in the Minas Triangle.

In the late 1940's and early 1950's, accoring to bankers and merchants

there, tied loans from the mills were the most important form of fin-

ance. By 1963, while the system persisted, it had declined greately

in importance. All millers interviewed reported a large decline in

their financing of cultivation.[33] As in Rio Grande do Sul, credit

had become mainly a competitive instrument to get the farmer's busi-

ness after harvesting by financing the costs of transporting the rice

to the mill. Again the main factor in this decline was the increased

activity of the Bank of Brazil. Table X presents the trends in loans

for cultivation expenses for the whole of Minas Gerais. The percentage

---

33. The largest made 60-70 cultivation loans in 1953-54, in 1963 these
were reduced to 6 or 7.

Table XI

Percentage of Total Rice Area Planted

Financed by the Bank of Brazil and the

Bank of the State of Sao Paulo

1955	18.1
1956	25.0
1957	23.2
1958	26.9
1959	39.9
1960	30.3
1961	33.0
1962	38.8

Source: Agricultura em Sao Paulo, VIII, 1 (Janeiro
de 1961), p. 32 and X, 7-12 (Julho a Dezembre de 1963), p. 60.

Table XII

Loans by Bank of Brazil for

the Cultivation Expenses of

Rice: Brazil

	Total Number of Loans	Area Planted (hectares)	Area Financed (hectares)
1950	2,189	- -	n.a.
1955	7,862	2,511,689	437,148
1957	8,918	2,490,167	494,023
1958	11,407	2,514,490	631,993
1959	15,042	2,682,871	773,169
1960	16,661	2,965,879	841,629
1961	25,037	3,174,037	915,034
1962	47,906	3,349,810	1,421,035
1963	66,039	-	n.a.

Sources: CREAI, Banco do Brasil, and SEP.

The implications of this decline in dependence upon the mill for credit are clear. Liquidation of the Bank of Brazil loan, especially with the negative rate of interest, requires a small part of the total value of production in normal years, perhaps 30-40%. In all cases, the farmer is free to choose the place of sale, and with a considerable proportion of his output, the time of sale. We have seen how both in the Rio Grande do Sul and the Minas Triangle the producer may now deposit his output in the mill and wait before selling, usually with no direct warehouse fee. There may be somepressure to liquidate the transport-freight-sack-tax loans, but competition keeps this to a low level.[37] Thus, according to millers in the Triangle, the temporal pattern of sales by farmers has changed. Whereas in earlier years practically output had been sold by the end of September, the figure today would be close to 70%.

This alone has almost eliminated the possibility of concerted oligopsonistic buying practices in important rice areas. It also implies a change in the distribution of stocks between commerce and the farmer, and to the extent that there are seasonal price increases, average prices transferred to farmers have probably risen (see Chapter X).

---

37. One miller interviewed in Uberlandia had extended about Cr$70,000,000 in such loans (about $70,000 at the then black market rate of exchange), but by the middle of October (the harvest begins in March), Cr$28,000,000 were still outstanding.

The change applies primarily to medium and large scale farmers. The sharecropper remains in good part dependent on the landowner for such credit advances as he may require. Only with the co-signature of the landowner can the sharecropper receive credit from the Bank of Brazil. Usually this is not given. In the Minas Triangle, and Sao Paulo, the landowners often assume the role of merchant-moneylender, advancing Bank of Brazil money to sharecroppers which in turn is usually liquidated in kind.

Beans

The Bank of Brazil has made insignificant strides in financing the planting of beans. This arises principally from the subsidiary nature of the crop (coffee of corn may be financed, but not the beans interplanted with them) and the predominance in total production of sharecroppers, agricultural laboreres and small landowners. The merchant moneylender system as described for rice never developed to the same extent in beans. Laborers and sharecroppers are often in debt to the landownder or the small retailer or retailer-wholesaler in the interior, but loans from larger cerealistas and millers to finance cultivation expanses were never very important. Cerealistas and millers have limited their loans to reliable and settled laborers and sharecroppers, and they were always restricted in number. The risk involved in such bans is greater than in rice, both because of crop fluctuation and the more frequent unreliability of the producer. Even this small proportion seems on the way out, judging from the

statements of the cerealistas in Parana and Patos de Minas who have made such loans in the past.

The most important source of such outside financing (i.e. excluding the landowner) as exists for most bean producers is the local general store where they may buy on credit, liquidating in kind during the harvests. These small merchants may in turn receive supplies on credit from a large urban wholesaler, partially settling accounts in beans. Although indebtedness to the general store may force many producers, especially the landless agricultural laborer, to sell most of his output during the harvest, he usually has a choice of selling outlets, i.e., the indebtedness is not usually tied to a sale in kind by the farmer.

In Parana, the small local retailer plays an important role in channeling bean output to the larger commercial centers, something extremely rare in rice. This is to be explained by (1) the small lots sold by many farmers and (2) the dependence upon the local general store for credit in kind. Until beans becomes a more commercial crop, there seems little way of changing this situation.

Resume

The changes in the marketing system in the last decade and a half have been substantial and should have increased the price transferred to farmers and vertically through marketing channels.

In the rice of Rio Grande do Sul, we have seen (1) a decline

in the merchant-moneylender system (and a softening in its terms
of operation), which,together with an increase in the share of cooper-
atives in the market and improved transportation in the interior,
increased competition in farm markets; (2) the progressive elimina-
tion after the late 1950's of the Porto Alegre break and the miller-
exporter transaction due to the possibility of cheaper direct
shipment by truck to the Rio and Sao Paulo markets. This has re-
duced marginal and average transactions and handling costs below
what they would have been had the old channels persisted. This
second trend has been stimulated by the state's turnover tax. Thus
the producer should receive a greater share of the miller's net (of
tax) selling price, reducing oligopsonistic profits, and the miller's
net selling price should itself have risen in relation to the Porto
Alegre price,because of increasing direct shipment with its lower
costs of marketing.

　　　　In the rice of the Sao Paulo region, an increase in compe-
tition from new entry, the decline of the merchant moneylender system,
improved truck transport in the interior and the increasing activity
of the merchant trucker in paddy rice should also have raised the
proportion of the miller's sales price paid to farmers, while the
rise of the commission agent (representantes) sales system and the
initiation of direct sales to retailers should, in turn, have increased
the miller's price in relation to those on the Sao Paulo Bolsa. Fur-
thermore, the vast improvements in transportation and warehousing in
the Minas Triangle and Goias have raised farm prices considerably in

their own right.

Much the same is also true of the beans of the region with two exceptions: the merchant-moneylender system has not yet been affected significantly by the Bank of Brazil; on the other hand, there is the competitive influence of the merchant-trucker (ambulante) both in producing areas and in Sao Paulo, where, by underselling the traditional cerealista he has reduced effective wholesale prices (in relation to the Bolsa price).

The expansion of sales to retailers at lower prices by the commission agent and the cerealista (in beans) should, in turn, have reduced retail prices in relation to those on the Sao Paulo Bolsa.

Table XIII presents the principal changes in dominant marketing channels from the early 1940's to the 1960's.

Table XIII

Principal Changes in Rice and Beans MarketingChannels, 1945-1963

Rio Grande do Sul to Rio de Janeiro (principal consumer of the state's output)

Transactions being eliminated:

1. Assembler or miller to Porto Alegre exporter.
2. In Rio, miller to wholesaler or cerealista.

Rio Grande do Sul to Sao Paulo

1. Assembler or miller to Porto Alegre exporter.

Interior of the Sao Paulo Region to Rio de Janeiro

    1. Assembler or miller to Sao Paulo cerealista.
    2. Assembler or miller to Rio wholesaler or cerealista.

Interior of the Sao Paulo Region to Sao Paulo

    1. Assembler or mill to cerealista (in the interior).
    2. Cerealista or miller to wholesaler.

All Areas to Interior Cities

    1. Transaction with cerealista or Rio de Janeiro or
       Sao Paulo.

In the next chapter, we will examine the quantitative evidence of

declines of margins.

CHAPTER VIII

FALLING MARKETING MARGINS:
THE 1950's AND EARLY 1960's (CONTINUED)

The quantitative evidence on trends in marketing margins is
sparse and ill-adapted to testing the hypothesis that structural changes
in marketing have in fact brought reductions in margins. Especially
limiting is the complete lack of any extended series on transport costs.
The available information, however, is consistent with the hypothesis that
farmers are receiving an increasing proportion of the wholesale price
of rice and beans at any point in time. We are not concerned here with
total margins, which include the gains from speculation. These will be
treated separately in the next two chapters.

1. Rice

A. Rio Grande do Sul

Available quantitative evidence points to a sizeable increase in
farm prices in relation to wholesale prices in the Porto Alegre Bolsa. Mar-
gins between prices at different levels of the distribution system empiri-
cally may have two components: one proportional and related to the level
of prices, and the other more or less fixed.[1] In estimating the relation

1. In the chain from rough rice in the farm market to milled rice at whole-
sale, relatively fixed cost items should include transportation expenses
and the direct costs of milling the rice. Proportional items should include
the net profit margin and the differential between the weight of the paddy
rice and its yield in milled rice, husks and bran. Typical yields would
be 60-70% in rice grains and the rest mainly husks of little value. On the
fixed and proportional components of marketing margins see, Allen, G.R.,
Agricultural Marketing Policies (Oxford: Basil Blackwell, 1959), pp.111-140
and his "Short-Term Variations in Retailing Margins in Fruits in East Pak-
istan", The Farm Economist, IX, 6(1959), pp. 259-66.

between farm and wholesale prices, then, a linear regression is in order, where the intercept should reflect the fixed mark-up and the coefficient of farm price, the proportional mark-up. One way of testing for trends in margins is to include a time-trend variable. An upward movement in farm prices relative to wholesale prices should be reflected in a significant <u>negative</u> time-trend in the estimated relation:

Wholesale Price = a + b (Farm Price) + c(year).

If the intercept is not significant in the regression, one can work directly with percentage margins.

Data for wholesale <u>and</u> farm prices together in Rio Grande do Sul were available to the author only for the period 1950-61.[2] Thus most of the impact of the truck and direct shipping will not be reflected in these years,[3] and most of any increase in farm prices should be due to competitive factors in the interior and improved truck and rail transport between the interior and the coast.

Wholesale prices used were the average quotations on the Porto Alegre Bolsa de Mercadorias of the "especial" (no. 2) grade of short, medium and long-grain rice during the harvest months, April-September and weighted by the proportion of each grain length in the state's

---

2. Average farm prices begin only in 1950. In 1962 the wholesale market in Porto Alegre was paralyzed because of the low ceiling prices fixed on rice by COFAP, the Federal Government price control organ.

3. In 1961, almost 80% of the rice shipped from the state still went by sea, and over half via Porto Alegre. <u>Boletim Estatistico Mensal de Associacao Comercial de Porto Alegre</u>, 336, pp. 21-22.

production.[4] Thus the wholesale price used is

$$1/6 \left(\sum_{i=1}^{3} \sum_{j=1}^{6} w_i p_{ij} \right) \qquad i=1\ldots3 \text{ (short, medium, long-grain)}$$
$$j=1\ldots6 \text{ (April-September)}$$

where w_i is the proportion of each grain length in production and p_{ij},
the average monthly quotation of each grain length in the jth month.

The turnover tax, which rose from 3.3% in 1950 to 6% in 1960/61
was then deducted from the average Bolsa price.[5] At the margin increases
in the turnover tax will be passed on by sellers and will be reflected
in a higher differential between farm and wholesale prices. Changes in
gross marketing margins arising from increases in the turnover tax
are spurious for the present hypotheses concerning trends in marketing
efficiency (although farm prices have also risen in relation to wholesale
prices gross of the turnover tax, see page 265 below). The Bolsa price
net of the sales tax represents the gross marketing return[6] to the miller
from selling in the Porto Alegre market either to exporters or (increasing-
ly) to buyers of firms in Rio, Sao Paulo, etc. It is this price which
is most relevant for the trends in marketing margins.

---

4. Over 80% of total production is sold in these months. Exact monthly
weights are not available. Observations from IRGA in 1957-59 indicate that
80-85% of rice output enters the mills by September 30, but much of the
remainder has already been sold before it is delivered.

5. Normally a turnover tax on the purchase of rice from the farmers is also
due from the mill. And proof of tax payment is necessary for farmers to re-
pay and receive new loans from the Bank of Brazil. Since, however, this
tax is sometimes evaded and farmers often pay it themselves, it was not de-
ducted from the Bolsa price to reach the net price received by millers. On
page   below, the trends in percentage margins net of both taxes are
presented for comparison.

6. i.e. to cover transportation, processing, assembly and other marketing
costs.

Farm prices used are the average of prices actually received by producers for paddy rice gathered through IRGA's annual census of rice farmers. They exclude prices paid to members of cooperatives.[7] These prices are not strictly comparable in timing and product quality to the average Bolsa price as computed here. Inevitable quality variations from year to year in paddy rice introduces bias in comparison with a fixed grade on the Bolsa. There is no indication, however, of a systematic upward trend in the quality of paddy rice produced in Rio Grande do Sul in the period under consideration. The change in the composition of output away from short-grain to the higher priced long-grain rice is taken into account by the relative weights (proportion of each in total production) applied to the average Bolsa prices of each grain length.[8] The exact timing of sales by farmers in the harvest months is not known (although the gross is sold in these months), and thus a certain distortion is introduced in applying equal monthly weights to the wholesale prices. This is unavoidable, but there is no reason to believe that this introduces a systematic bias.[9]

For the regression (as in all that follow), both price series

---

7. Thus only the indirect impact of the cooperatives is indicated in these prices.

8. One possible source of such an upward trend might be the different yields in whole and broken grains in the milling process of the three grain lengths. No evidence on this question exists for Rio Grande do Sul.

9. In addition, hwolesale prices (in current CrS) tend to be stable over the six month period, April-September.

263.

were deflated by the Conjuntura Economica's Price Index No.2 (1953=100).[10]
Due to the nature of the deflator, bias may be introduced, although without
deflation the regression would be meaningless.[11]

The estimated regressions with and without the time-trend var-
iables are presented in Table I. The intercept is not significant, and
thus it appears that proportional mark-ups predominate. The time trend
is negative and significant at the 5% level. Over the 12 year period,
the downward time trend implies a Cr$30 fall in the wholesale price,
given the farm price, or about 10% of the average wholesale price for the
period as a whole--a substantial decline.[12]

Since the intercept is not significant (indicating the predominance
of proportional mark-ups), it is more enlightening to examine the evolu-
tion of the ratio of farm prices to average Bolsa prices.[13] In Table II
three series are given, depending on the turnover taxes deducted from the
average Bolsa prices. The first is gross of all turnover taxes, the

---

10. The closest thing to a general price index in Brazil. It is the
weighted average of the Rio cost of living index, the wholesale price
index and the cost of construction index.

11. It would be principally a regression of the general price level on
itself.

12. In the cost-profit-and-expense formula which COFAP (Federal Commission
on Food Supply and Prices) attempted unsuccessfully to apply in the middle
1950's, 10% of wholesale price was the total profit and selling expenses
quota for the urban wholesaler in cereals!

13. The reader should note that farm prices are of 50 kilo sacks paddy
rice and wholesale prices of 60 kilo sacks of milled rice. To obtain the
price received for the farm equivalent of the milled rice, adjustments
must be made for the yield of the paddy rice. In Rio Grande do Sul, the
factor of equivalence seems to be about 1.5.

Table I

Regressions of Wholesale Price (Net of the Turnover Tax on the Wholesale Transaction) on Farm Prices of Rice: Rio Grande do Sul, 1950-61.

(Cr$1953)

Variable	Means	(1)	(2)
Dependent			
W	299.81		
Independent			
K		-9.9899 (-.3102)	-8.2369 (-.3014)
F	134.80	2.2883 (9.7317)*	2.3966 (11.6798)*
T	5.50		-2.7277 (-2.2132)**
R^2		.9045*	.9382*
R^2 (corrected)		.8875*	.9175*
Durbin and Watson d'		1.5801	2.3883

*Significant at the 1% level.
**Significant at the 5% level.

Notes: K is the constant. W is the wholesale price in Porto Alegre of 60 kilos of milled rice. F is the farm price of 50 kilos of paddy rice, both calculated in 1953 cruzeiros as explained in the text. The t values of the regression coefficients are below each coefficient.

second, net of the tax on the wholesale transaction, and the third, net of the tax on both the Porto Alegre sale and the farm purchases. In Rio Grande do Sul, the mill usually pays the turnover tax for the farmer in the form of a purchase tax (a question of administrative ease). Strictly speaking, the third series represents the return to the mills after

taxes of buying from farmers and selling in Porto Alegre.[14]   Because of

the increase in the tax rate (3.3% in 1950, 6.0% in 1960), the trend is

most striking in the third series.

Table II

Average Prices Paid to Farmers in Rio Grande do Sul
for Paddy Rice (50 kilos) as a Percentage of Average
Weighted Wholesale Price in Porto Alegre, April-September*

	Gross of Turnover Tax	Net of Turnover Tax on Wholesale Transaction	Net of Turnover Tax on Both Transactions
1950	39.41	40.76	41.32
1951	47.55	49.17	49.98
1952	41.21	42.62	43.23
1953	40.57	41.95	42.54
1954	44.97	46.50	47.23
1955	41.54	43.09	43.77
1956	43.75	45.39	46.14
1957	43.63	45.63	46.56
1958	43.97	45.96	46.89
1959	43.31	45.27	46.17
1960	45.08	47.96	49.38
1961	44.68	47.54	48.93
1950-53 (excluding 1951)	40.40	41.78	42.03
1954-57	43.47	45.15	45.92
1958-61	44.26	46.68	47.84
1960-61	44.88	47.75	49.16

*For an explanation of the price series used, see pp. 260-62.
Sources: IRGA and Bolsa de Mercadorias de Porto Alegre.

---

14. But the farmer sometimes pays the tax himself, and millers sometimes evade
it. Therefore it was not deducted from the wholesale price for the purposes
of the regression.

The margin in 1951 is abnormally low and probably should be excluded from the comparison (see Table II).[15] There is a sizeable upward trend in all series, especially when 1951 is excluded. In the series net of the tax on the wholesale transaction, farm prices were almost 6% more of wholesale prices in 1960-61 than they were in 1950-53 (excluding 1951). Given the wholesale prices, they had risen 14.3%. Turning the comparison around, given farm prices, wholesale prices (net of the wholesale tax) had fallen 12.5%, and margins as a percentage of wholesale price had fallen about 10.3%.[16] In the series gross of all taxes, the farm price, givenwholesale price, has risen 11.1%; the wholesale price, given farm prices, has fallen 10.0%; margins as a percentage of wholesale prices have fallen 7.5%.

Thus even if taxes are ignored (which is not legitimate) farm prices appear to have risen 11% because of changes in the marketing

---

15. The exact source of this abnormal observation is not clear. It may be related to the abnormally large (42.6% of total output) purchases by IRGA in support of a very high minimum price in relation to the market and to the freeing of exports abroad for private firms. The minimum price effectively eliminated shipments to Sao Paulo in harvest months (only 44,000 sacks April-September compared with a normal figure of over 1,000,000) However, much the same occurred also in 1950, and margins were high. The most probable explanation lies in a retention by farmers for later sale at the higher prices after September which would distort our comparison.

16. If wholesale prices are assumed fixed, the percentage rise in farm prices$=P_2/P_1-1$, where the P's are farm price as a percentage of wholesale price in the beginning and ending periods. When farm prices are assumed fixed, the decline in wholesale price is $1-(P_1/P_2)$. The decline in margins as a percentage of wholesale price is $1-(100-P_2)/(100-P_1)$.

system vertically through market channels and over space. It appears

that any previously existing oligopsony profit over space has been

reduced or eliminated, and there is serious doubt whether "normal"

competitive profits are still being made in the old market channels.

Vertical integration back through farm production and up through sales

in consumer centers has, according to all merchants and officials

(of IRGA) interviewed, become imperative for the future survival on a

profitable basis of the commercial rice mill in the state.

The minimum price program maintained by IRGA (Rice Institute

probably Rio Grande do Sul) in the state 1950-present (see Chapter X)

has not affected margins vertically through marketing channels to any

significant extent. Few farmers have sold directly to IRGA, which until

1963 bought only in the three port cities, Porto Alegre, Rio Grande

and Pelotas. In most years, at least 90% of IRGA's purchases have been

of already processed rice and from the mills.[17] Even much of the paddy

rice has been sold to IRGA by mills and not the farmer. Thus IRGA's

program affects farm prices almost entirely through the buying prices of

the mills. Although there is a rule that mills not paying minimum pri-

ces to producers can sell to IRGA, this exists only on paper, of necessity.

Otherwise, since IRGA is often unable to maintain its minimum price in

the market (see Chapter X), the mills would be forced out of business.

In general terms, then, the relation between actual prices paid for paddy

17. According to information supplied by IRGA and IRGA's annual balance
sheets.

rice and the Bolsa prices is determined by the free market; when IRGA's price is significantly above the market, the mills seem to make additional profits selling to IRGA.

B. Rice: Sao Paulo Region

Similar declines in margins are found in the Sao Paulo region. More precise comparisons between the farm prices in the important supply regions of the Minas Triangle and Goias and wholesale prices in Sao Paulo are impossible. Separate price data for the Triangle are not available, and the prices for Goias are the average harvest prices as calculated by SEP (Service of Production Statistics of the Ministry of Agriculture)--subject perhaps to significant margins of error. Still, the movement of prices is consistent with the hypothesis that farm prices have risen substantially in relation to wholesale prices. We have already seen the large increase in Goias' prices of rice relative to the Sao Paulo market after 1951, when the greatest bottlenecks were eliminated in transportation. In Table III, the average Goias farm price of paddy rice (sacks of 60 kilos) is expressed as a percentage of the average monthly price, April-September, of "amarelao especial", the no. 2 grade of the principal variety produced in Goias. The wholesale price is net of the tax on the wholesale transaction in Sao Paulo.[18]

---

18. Fixed cost items should be important in this relation, because of the great distance from Goias to Sao Paulo. But given the nature of the data, regressions are unwarranted. Percentage margins should give an accurate picture of the direction of the trend.

Table III

Goias Farm Prices of Paddy Rice as a Percentage of Average
Sao Paulo Bolsa Price of "Amarelao Especial", April-September*

(sacks of 60 kilos)

1950	27.15
1951	27.05
1952	27.66
1953	no trading on Bolsa
1954	36.35
1955	35.40
1956	37.00
1957	33.61
1958	35.65
1959	40.89
1960	38.76
1961	39.77
1962	no trading on Bolsa
1963	38.18
1950-52	27.29
1954-56	36.25
1957-59	36.72
1960-63	39.24

*Bolsa price net of wholesale tax, which rose from 2.5% to 4.8%, 1950
to 1963. Bolsa prices are monthly averages of transactions closed on
the Bolsa, rather than of quotations.

Sources: IBGE, Conselho Nacional de Estatistica, Anuario Estatistico
do Brasil, various numbers and Bolsa de Cereais de Sao Paulo.

There has apparently been some increase in relative farm prices
since 1954. In 1954-56, farm prices were 36.25% of the net Bolsa price,
while by 1960-63 they had become 39.24%, a rise of about 8% in farm pri-
ces, given Bolsa prices. The relative year to year stability of this pro-
portion indicates that the SEP data are not wildly inaccurate.[19]

19. Comparison, however, with prices paid to farmers in Goiania, Anapolis,
and other market cities in Goias in 1963, indicates that the SEP figures
may grossly underestimate the farm price.

The biggest increase in relative farm prices took place in the early 1850's, a more than **43%** increase 1950-52 to 1960-63 in farm prices, given wholesale prices, and was the result of the elimination of serious marketing bottlenecks in the relatively new region. But the evidence indicates that marketing improvements have continued in the area.

For the Minas Triangle, we are limited to three years' observations on prices paid to farmers in the important market centers, 1951, 1952, and 1963. Two percentages are presented in Table IV, one with the Bolsa price net if the wholesale tax and the other net of the tax and transportation charges to Sao Paulo.[20]

Table IV

Paddy Rice Prices Paid to Farmers in Market Centers of the Minas
Triangle as a Percentage of the "Amarelao Especial"
Price for the Same Time Period

	Net of the Tax on the Wholesale Transaction	Net of the Tax and Freight Charges to Sao Paulo*
1951		
High Price of Year	35.09	38.10
Lowest Price of Year	34.38	37.07
1952		
June	43.79	46.41
July	43.26	45.48
1963		
May-August	55.68	56.95

*Rail rates are used for 1951 and 1952 and truck rates for 1963.
Sources: See Chapter VI, Table IV.

---

20. See Chapter VI', pp. 45-49 for an explanation of the sources and procedures employed.

The increase in relative farm prices to 1963 from 1951-52 is very large,
almost 60% from 1951 and about 28% from 1952, given wholesale prices,
reflecting in large part the elimination of bottlenecks in marketing
(see Table IV). Given the absehce of observations for the 1955-63
period, it is impossible to conclude from empirical evidence that the
decline in the merchant-moneylender system, the increased sales mobility
of farmers and the expansion-of the commission agent selling system have
in fact raised farm prices.

The data situation for Sao Paulo State is much better, and
definite downward trends in margins are indicated. A monthly series on
prices paid to farmers for both paddy and milled rice is available
(although no distinctions are made by quality), primarily of the
medium grain variety known as "agulha". This variety is traded only
sporadically on the Bolsa,[21] and thus recourse was had to the wholesale
price series of "agulha primeira" (top "agulha") supplied by the County
Government of Sao Paulo (Prefeitura de Sao Paulo). This price is the aver-
age charged to retailers by a number of wholesalers in the first week
of each month, and it is always somewhat (10-15%) higher than the Bolsa
price of the same grade and variety.

These more complete farm price series permit a partial differ-
entiation in the changes in margins in the farm market itself and the
margin between the interior miller and the sale to retailers. The differ-
ence between prices paid to farmers for paddy and milled rice is an indi-

---

21. Direct sales predominate, by-passing the Sao Paulo cerealista.

cator of the miller's margin for transforming the rice. Most farmers selling milled rice are large (having their own machinery) and can easily shop around before selling. Those selling paddy rice will often be in a poorer competitive position. "If it can be assumed that the competitive alternatives of the farmer selling milled rice at least have not deteriorated, any upward trend in paddy rice prices relative to milled rice prices is a strong indication either of improved milling technology (not apparent in Sao Paulo) or an increased competitive strength of the smaller farmer.

An upward trend in the milled prices paid to farmers relative to wholesale prices in Sao Paulo, on the other hand, mostly reflects increased efficiency in marketing and/or transportation between the interior and wholesale markets. In the present case (where wholesale prices are the sale price to retailers and not to other wholesalers as on the Bolsa), it might well reflect a relative decline in wholesale prices arising from the increasing competition of the representante's direct sales to retailers.

Regressions of the average Sao Paulo wholesale price net of the turnover tax on the average price of paddy and milled rice prices paid to farmers, all for the period April-September, are presented in Tables V and VI. Regressions of milled rice on paddy rice prices paid to farmers for the same period appear in Table VII. The years covered are 1948-63, excluding in the case of the wholesale price regressions 1953 and 1962, years when the wholesale market in Sao Paulo was paralyzed by price controls. All prices were deflated by the Conjuntura Economica Price Index No.2.

Table XVIII

Regressions of Average Wholesale Price of "Agulha Primeira" (Net of
Wholesale Tax) on Average Farm Price of Milled Rice, Sao Paulo,1948-63,
April-September

(sacks of 60 kilos)
(Cr$1953)

Variable	Means	(1)	(2)
Dependent			
W	494.95		
Independent			
K		77.7965 (2.4945)**	83.5600 (2.8836)*
MF	399.53	1.0441 (13.7051)*	1.0710 (14.5116)
T	7.21		-2.2859 (-1.5818)***
R^2		.9399*	.9511*
R^2 (corrected)		.9299*	.9577*
Durbin and Watson d'		1.2357**	1.5291
Correlation between FM and T:		.2300	

Notes and Sources, see Table XX.
* significant at 1% level.
** significant at 5% level.
*** significant at 5-10% level.

Table XIX

Regressions of Wholesale Price of
"Agulha Primeira" (Net of Whole-
sale Tax) on Average Farm Price of
Paddy Rice, Sao Paulo, 1948-63,
April-September

(sacks of 60 kilos)

(Cr$ 1953)

Variable	Means	(1)	(2)
Dependent			
W	494.95		
Independent			
K		109.1415	115.5677
		(3.1967)*	(3.8478)*
PF	245.32	1.5727	1.6422
		(11.6173)	(13.0658)*
T	7.21		-3.2525
			(-2.0139)**
R^2		.9183	.9403
R^2 (corrected)		.9047	.9241
Durbin and Watson d'		1.2603**	1.7544
Correlation between PF and T:		.2744	

* Significant at 1% level.
** Significant at 5% level.

Notes and Sources see Table XX.

Table XX

Regressions of Milled on
Paddy Rice Prices Paid to Far-
mers, Sao Paulo, 1948-63.

(sacks of 60 kilos)
(Cr$ 1953)

Variable	Means	(1)	(2)
Dependent			
MF	466.62		
Independent			
K		37.1201 (2.6458)*	36.3546 (2.8095)*
PF	289.64	1.4828 (31.5653)*	1.5224 (31.5709)*
T	7.50		-1.4276 (-1.8663)**
R^2		.9861*	.9891*
R^2 (corrected)		.9842*	.9865*
Durbin and Watson d'		1.1863*	1.2898**
Correlation between PF and T: .4405			

* Significant at 1% level.
** Significant at 5% level.

Notes: All prices are averages for April-September, the harvest months.
W is the wholesale price of "agulha primeira", MF, the milled rice price
paid to farmers, PF the paddy rice price paid to farmers and T is the
time variable, which is 0 in 1948. The years 1953 and 1962 are excluded
from the regressions in Tables XVIII and XIX.

Source: Wholesale Prices: Prefeitura do Municipio de Sao Paulo, Divisao
de Estatistica o Documentacao Social, Boletim Mensal, various numbers.
Farm Prices: Divisao de Economia Rural do Estado de Sao Paulo.

In all relations there seems to be a significant downward trend in margins. Over the 16 year period, the net wholesale price of "agulha primeira" fell Cr$48.75, given the price of paddy rice, or about 9.8% of the mean wholesale price for the whole period (see Table VI). On the other hand, given-milled rice prices paid to farmers, wholesale prices have fallen Cr$34.29, or about 6.9% of the average wholesale price (see Table V). The bigger part of the relative decline in wholesale prices, then, appears to arise from the spatial or vertical distribution margin changes between Sao Paulo and the interior.[22] However, the regression of milled on paddy rice prices paid to farmers also shows a significant time trend, equivalent to Cr$21.42 over the 16 year period or about 4.6% of average milled rice prices, indicating greater competition in farm markets (see Table V).

Whatever the exact breakdown of the increase in Sao Paulo State, farmers selling rice are receiving an increasing proportion of the wholesale price in Sao Paulo. This, combined with the similar trends in Rio Grande do Sul and the fragmentary evidence available for the Minas Triangle and Goias all indicate substantial increases in the prices transferred to farmers over space and vertically through marketing channels.

---

22. This is only very tentative. It is possible that the relative rise in milled rice prices paid to farmers has been due primarily to increased competition in the interior.

More rapid transportation,[23] more intense competition predicated in part
on the decline of the merchant-moneylender system, and the innovations
of the commission agent and direct sales to retailers all should have
played some part.   In the cases of Rio Grande do Sul and Sao Paulo, the
declines in margins occurred in older, established marketing systems in
which transportation and storage bottlenecks had already ceased to be
of major importance.   The improvements in Goias and the Minas Triangle are
more striking, arising in greater part from the elimination of social
overhead bottlenecks.

In recent years it appears that the farmer in the main commer-
cial rice producing areas of the Center-South of Brazil has received
at least the same percentage of the wholesale price during harvest
months (i.e. excluding gains and losses from specualtion) as their
U.S. counterparts. Table VIII presents data on the average paddy rice
prices received by farmers in Louisiana for the Zenith variety (medium
grain) as a percentage of its average wholesale prices in New Orleans
(milled rice)during the harvest months, August-October and August-January.[24]

---

23. The direct cost of transport does not explain much of the downward
trend in margins in Sao Paulo State. In 1953 Cr$, rail transport has
never been much more than 3% of the wholesale price of rice from the more
distant regions of the state.

24. In the first period, Louisiana farmers sell about 80% of their rice
and in the second, at least 90%. Thuroozy, Nicholas M., "Marketing Margins
for Medium Grain Rice" (U.S. Department of Agriculture, Agricultural
Marketing Service, Marketing Economics Research Division), Marketing Re-
search Report, No. 444, p.21.

along with three comparable relations in Brazil. International comparisons
of margins have limited validity, because of different relative price
structures and different services performed in the marketing systems.
On the second count, the services performed in both countries through the
wholesale stage considered here are very similar. The miller buys in
farm regions of one state, processes and sells in bags in a near-by
market center. The distances from farm to wholesale market are greater
in the Brazilian cases used. In addition, differences in the yields of
milled rice from rough rice should, if anything, be in favor of the United
States, because of more modern drying and milling equipment and generally
better seed varieties (except,perhaps,in the case of Rio Grande do Sul).
The raw material tends to be cheaper in Brazil relative to transportation
costs; on the other hand, electric power and labor are relatively cheaper
in Brazil. Without more detailed information, it is impossible to evalu-
ate the total impact of relative price differences between the two countries.

In any case, the Brazilian farmer appears to receive at least
as large a proportion of wholesale prices over space and vertically
through marketing channels as his American counterpart. There are no
indications of gross inefficiency in the Brazilian marketing system
through wholesale in the commercial rice producing areas of the Center-
South. If the United States can be taken as tolerably efficient, the
Brazilian system seems to be performing reasonably well in these areas.

II. Beans: Sao Paulo Region

The qualitative changes in bean marketing channels were seen

Table VIII

Paddy Rice Prices During Harvest
Months as a Percentage of Whole-
sale Prices of Milled Rice:
Louisiana, Rio Grande do Sul, Sao
Paulo and the Minas Triangle*

Louisiana Farm Prices to New Orleans Wholesale Prices, Zenity Variety, 1953-56 Average		Rio Grande do Sul Farm Prices to Porto Alegre Wholesale Prices, 1958-61 Average April-September		Minas Triangle Farm Prices to Sao Paulo Bolsa Price, "Aparelao Especial" 1963 May-August		Sao Paulo Farm Prices to Sao Paulo Bolsa Price, "Agulha Especial," 1960-61, 63 Average, April-September	
		Net of Whole-sale Tax	Gross of Wholesale Tax	Net of Whole-sale Tax	Gross of Wholesale Tax	Net of Whole-sale Tax	Gross of Wholesale Tax
Aug.-Oct.	Aug.-Jan.						
52.5%	53.3%	56.04%	53.2%	55.7%	53.0%	60.2%	57.3%

*All averages are simple arithmetic means, first of margins within each year and then of margins over the time period included. In each relation, the prices of equal weights of milled and paddy rice were used.

Sources: Rio Grande do Sul: Table II, p.265 Minas Triangle: farm price data from Bolsa de Cereais de Sao Paulo, Boletim do Setor de Observacao de Mercados, various numbers, May-August, 1963. Sao Paulo: farm prices from Divisao de Economia Rural do Bolsa de Cereais de Sao Paulo. Louisiana: Thuroczy, Nicholas M., op.cit, p.21.

to be more marked than in rice, with the growth after 1958 of the merchant-
trucker, who tends to pay higher prices to farmers and undersells the
cerealista by 5-10% in Sao Paulo. All merchants agreed that the cerealista's
profit margin on sales to wholesalers had been reduced as a result. The
consequent behavior (especially the cerealista's switch to sales to retail-
ers) is prima facie evidence of a reduction in effective prices both to
wholesalers and to retailers, since cerealistas have been, in turn,
underselling wholesalers in this line.

Quantitatively, however, it is difficult to verify these trends.
Actual prices paid by wholesalers and retailers to the merchant trucker
are not recorded nor are the prices paid by the merchant truckers to
farmers.[25] We have only the Bolsa prices in Sao Paulo plus a wholesale
price series collected by the Prefeitura de Sao Paulo (Sao Paulo County
Government). The Bolsa price reflects a transaction rarely undertaken to-
day (wholesale buyers can do better from merchant-truckers). It is above
the effective price to wholesalers, and this accounts in large part for
the great decline,in the volume of beans traded on the Bolsa (see Chap-
ter VII, Table VII, p.241above).[26] Outside of the Bolsa, cerealistas must
charge somewhat lower prices on transactions with wholesalers (which are
now a small part of their business) and often charge the Bolsa price or

---

25. Official data agencies rely, by and large, on the prices of estab-
lished merchants in marketing centers.

26. In 1963, the only time when the Bolsa was active in beans was during
the period of rising prices, August-October, when the larger transactions
involved in speculation were undertaken.

only slightly above[27] on sales to feirantes and larger food retailers.
Retail prices for Sao Paulo,which might reflect these changes do not
include the prices charged by the feirante, the principal beneficiary of
the ambulante and direct sales to retailers by cerealistas.[28]

Thus the major impact of the ambulante and the direct sales
to retailers is not reflected in available price series. If farm prices
have risen or at least not fallen relative to Bolsa prices, this is a
good indication that effective wholesale prices (paid to the ambulante
adn the cerealista outside the Bolsa) have fallen in relation to farm
prices.

A. Sao Paulo State
                a
There is/fairly good monthly series of bean prices paid by
established merchants to farmers in Sao Paulo State, without, however,
distinctions of varieties and quality. The ratio of the index of
the average Bolsa price (net of the turnover tax on the wholesale trans-

---

27. The highest mark-up encountered for small sales to feirantes was
7%.

28. In addition, the behavior of the retail price series for both rice
and beans is very suspect. They often undergo long periods of stability
even though wholesale prices are fluctuating widely. The retail price
for rice is for "amarelao-agulha", which is really a contradiction, since
one is long-grain and the other medium-grain rice. Regressions of retail
prices of rice and beans on the comparable Bolsa price and a time trend
yielded absurd results, partly because of high multicollinearity between
independent variables. Even without the time trend, beans showed an
almost totally fixed mark-up, which is clearly not the case, based on all
direct evidence of retail pricing procedures in Sao Paulo. Thus there
appear to be serious defects in the original retail price series published
by the Prefeitura de Sao Paulo (Sao Paulo County Government).

action) of "chumbinho especial" to average farm prices, both for the per-
iod April-March is presented[29] in Table IX. There is some downward tend-
ency of Bolsa prices in relation to farm prices after 1958, when the
ambulante began to become important in the market.

Table IX

Ratio of Index of Prices (net of trmover tax on Bolsa transaction) of
"Chumbinho Especial", Sao Paulo Bolsa to Sao Paulo Farm Prices,
April-March*

1953=100

1950	105.77
1951	103.16
1952	98.97
1953	100.00
1954	99.96
1955	105.81
1956	103.36
1957	97.65
1958	105.26
1959	no trading on Bolsa
1960	102.19
1961	101.96
1962	no trading on Bolsa
1963**	97.25
1950-52	102.63
1953-55	101.92
1956-58	102.09
1960-63	100.47

*The annual indices are constructed using annual simple averages of monthly
Bolsa (average of transactions recorded) prices and monthly farm prices.
Tax rates rose from 2.5% in 1950 to 4.8% in 1959 and after.

**April-December

Sources: Original prices: Bolsa de Cereais de Sao Paulo and Divisao de
Economia Rural do Estado do Sao Paulo.

---

29. With the two harvests, farmers are selling some beans throughout the
year. Calculation of margins is not warranted in this case, since chumbin-
ho is the lowest priced of many varieties produced in Sao Paulo State.

Table X presents the average Sao Paulo farm price as a percentage of the Prefeitura de Sao Paulo's (Sao Paulo County Government) wholesale price of "mulatinho" beans, the most common variety produced in Sao Paulo State, for the months May-March (excluding November).[30] Again, there appears to be an upward trend after 1958 in farm prices relative to wholesale prices net of the turnover tax. It should be noted that in both series the relative decline in wholesale prices was marked in 1963, the year of greatest ambulante activity, when volume traded on the Bolsa declined substantially (see Chapter VII, Table VII, p. 242 above).[31]

Table X

Ratio of the Sao Paulo State Farm Price of Beans to the Sao Paulo Whole-sale Price of "Mulatinho" (net of the turnover tax), May-March, Exclud-ing November*

1954		.9265
1955		.8713
1956		.8910
1957		.9390
1958		.8980
1959	no trading in Sao Paulo City	
1960		.8874
1961		.9333
1962	no trading in Sao Paulo City	
1963**		.9990

*Ratios computed as simple averages of monthly prices. The choice of years was determined by the availability of data at the time of writing.
**November, 1962--September, 1963.

Sources: Divisao de Estatistica e Documentacao Social, Prefeitura do Mun-icipio de Sao Paulo, Boletim Mensal, various numbers. Divisao de Economia Rural do Estadode Sao Paulo.

ns

30. The wholesale price is taken the first week of every month. In April and November, months when new harvests begin, wholesale prices inevitably lagged behind farm prices which are taken two weeks later. Thus these two months were excluded.

31. The ambulante came to dominate the market only in 1962 with the absurd-ly low ceiling prices on beans which paralyzed normal trade channels in Sao Paulo.

Thus Sao Paulo price relations seem to indicate (very crudely) some decline in margins under the impact of the truck. Unfortunately, Sao Paulo State is not an important supplier of beans to the Capital. Indeed, many parts of its interior are net deficit areas (accounting for the very low margins in Table X) and acquire beans both in Parana and the Capital. This introduces a bias in the comparison (the direction of shipments will often be the opposite of that posited), although with the large rises in beans production in the state in recent years and increasing reliance by deficit areas on direct procurement in Parana, it is not clear why this bias should have provoked a rise over time in Sao Paulo farm prices relative to prices in the Capital.[32] Both trends should, if anything, lead to an opposite movement in relative prices, since procurement in Parana is cheaper than in the older system of buying in the Capital.

---

32. Production has been as follows since 1954, excluding the years 1959 and 1962, which were not included in the comparisons:

(1,000 sacks of 60 kilos)

1954	2,016
1955	1,470
1956	1,701
1957	2,500
1958	2,500
1960	3,260
1961	2,760
1963	2,680

Source: Divisao de Economia Rural do Estado de Sao Paulo.

B. Parana

The SEP (Ministry of Agriculture) average annual farm price series for Parana is almost useless. It does not distinguish between wet and dry season crops, so that it is impossible to know with which prices in Sao Paulo it ought to be compared. Since, however, until 1963 the state's dry season crop was much the larger of the two, the ratio of an index of average Bolsa prices of "chumbinho especial" (the most important bean variety produced in Parana) during the harvest months April-September to the index of average prices paid to farmers for beans is presented in Table XI.

Table XI

Ratio of Index of Average Price of "Chumbinho Especial" on Sao Paulo Bolsa, April-September to Average Price of Beans Received by Farmers in Parana
1953=100

1950	147.90
1951	138.12
1952	133.17
1953	100.00
1954	138.48
1955	125.13
1956	123.78
1957	79.43
1958	98.43
1959	no trading in Sao Paulo
1960	82.75
1961	116.94
1962	no trading in Sao Paulo
1963**	115.24

*Bolsa price is the simple average of average monthly prices of transactions registered on the Bolsa.

**Average of January-September, since wet season crop was also large.

Sources: Bolsa de Cereais de Sao Paulo and IBGE, Conselho Nacional de Estatistica, Anuario Estatistico do Brasil, various numbers.

The downward trend after the mid-1950's is clear and arises (if the figures are to be believed) from the improvements in warehousing and transportation about that time (see Chapter VI). The wild year to year variations (cf. 1953 and 1961) indicate either substantial errors in the farm price figures, substantially different time coverage of the two indices or both.[33] The relative rise in Bolsa prices after 1960 has not occurred, while the gross margins implied in the original data in 1957 (practically0) and 1960 (12% of wholesale price), the two years when farm prices were highest in relation to the Bolsa price, are too low (see Table XII) to be correct. This suggests a decline in marketing margins, but not so abrupt as indicated in 1957 (see Table XI) nor so largely temporary as indicated in 1961 and 1963 by the index.

Other evidence for Parana is the monthly prices paid to farmers by the largest cerealista in the state.[34] The prices are the monthly averages paid in the North of Parana as taken from the bills of purchase, but include all varieties and grades without distinction.[35] These prices

33. It will be seen in Chapter IX that seasonal sales patterns of beans by farmers in Parana vary greatly from year to year depending primarily on harvest size. Just how SEP takes these variations into account in computing in average price was impossible to determine in interviews with responsible officials. It appears that often merely the price when farmers are selling most is used.

34. The author thanks Cerealista Agricola Kowalski, S.A. for this information. No other firm would supply comparable data.

35. The fact that prices are based on bills of purchase is not altogether satisfactory, since turnover tax payments are often based on them.

paid by producers were computed as a proportion of the Sao Paulo Bolsa

prices (net of the turnover tax on the Bolsa sale) of the two most im-

portant varieties in the North of Parana, "opaquinho especial" and "chum-

binho especial", all averages for the May-November period. The two

varieties are presented separately and then combined on two different

assumptions: that chumbinho entered the firm's business 2-1 and

3-1 in relation to opaquinho, reasonable approximations[36] (see Table XII).

Table XII

Average Prices Paid to Farmers for Beans in the North of Parana by "Cereal-
ista Kowalski, S.A." as a Percentage of Average Sao Paulo Bolsa Prices
(net of the turnover tax), May-November*

	Percentage of "Chum-binho Especial"	Percentage of "Opa-quinho Especial"	2-1**	3-1**
1956	81	69	77	78
1957	87	78	84	85
1958	81	73	78	80
1959	NO TRADING IN SAO PAULO			
1960	80	71	77	78
1961	80	73	78	78
1962	NO TRADING IN SAO PAULO			
1963***	85	75	82	82

*Turnover tax rose from 3.4125% in 1956 to 4.8% after 1959. All average
prices are the simple means of monthly prices, May-November.

**2-1 and 3-1 are the weights applied to the percentages of chumbinho
in relation to opaquinho.

***January-August. Because the wet season crop was large in 1963 for
the first time and stocks were nil entering December, the months January-
March can be included without distortion.

Sources: Bolsa de Cereais de Sao Paulo and Cerealista Agricola Kowalski, S.A.

---

36. We would expect these series to be somewhat different from that in
Table XI based on SEP prices, but such divergences as occur 1958-63 are
too great to be explained by the differences in buying location alone.

There is no indication whatsoever of a trend in margins, which are, in fact, remarkably stable in this data. The cerealista's prices probably represent closely those paid in market centers on the main road and rail line. It is almost certain, however, that with the merchant-trucker and better roads, prices paid to farmers away from these few centers has risen significantly. The constancy of margins with the Bolsa is a good indicator of two tendencies: farm prices in Parana have risen relative to Bolsa prices and prices in Parana's main market centers have probably risen relative to effective wholesale prices in Sao Paulo.

C. Goias

Finally, the farm prices of beans in Goias seem to have risen relative to Sao Paulo prices. Table XIII presents SEP's (Ministry of Agriculture) average farm price as a percentage of the average price (net of the wholesale turnover tax) of "roxinho especial" on the Sao Paulo Bolsa for the harvest months May-September.[37] The relative rise after 1956 in farm prices is marked, indicating a substantial increase in prices transferred to farmers. Such a large increase must have its source in bad data or the rapid elimination of marketing bottlenecks after 1956. After 1958, when direct sales to retailers and the merchant-trucker were increasing, there is no upward trend in the relation.

---

37. In Goias there is one bean harvest, in May and June.

Thus the quantitative data are not completely conclusive. The only state for which relatively good farm prices exist (Sao Paulo) and which shows some upward trend in farm prices is not a surplus producer of beans. Parana's farm price series is too much a mystery to be very useful. The prices of the Parana cerealista indicate no upward trend in farm prices. The Goias price rise, although very large, seems tied primarily to the elimination of marketing bottlenecks rather than to changes in marketing techniques. Prices actually paid by wholesalers and retailers to ambulantes and cerealistas are not available. But constancy or declines in the ratio of farm prices to the Bolsa price, exactly because the Bolsa price is increasingly too high for normal transactions, is in fact evidence of the decline in marketing margins. The qualitative and quantitative evidence together point to a significant rise in farm prices in relation to effective wholesale prices from the alleviation of bottlenecks and probable falls in both effective wholesale and retail prices due to the merchant-trucker and the virtual elimination of one transaction in the marketing chain. On the other hand, there is little indication of an increase in competition in the interior market centers of Parana, which would have been expected with the merchant-trucker. Had competition increased, prices paid by the Parana cerealista should have risen relative to the Bolsa prices, which they did not do.

Table XIII.

Average Price Paid to Goias Farmers for Beans as a Percentage of Average
Price of "Roxinho Especial" (net of the Turnover Tax), May-September*

1950	62.38
1951**	n.a.
1952	56.57
1953	50.68
1954	45.16
1955	47.67
1956	43.28
1957	55.15
1958	76.96
1959	no trading in Sao Paulo
1960	72.17
1961	76.63
1962	no trading in Sao Paulo
1963	69.41

*Turnover tax rose from 2.5% in 1950 to 4.8% after 1959. Averages for
Bolsa prices are simple means of monthly prices of transactions registered
on the Bolsa.

**Error in original source.

Sources: Bolsa de Cereais de Sao Paulo and IBGE, Conselho Nacional de
Estatistica, Anuario Estatistico do Brasil, various numbers.

D. Level of Margins: Parana to Sao Paulo

Regardless of trends in margins, it appears that marketing

costs are low today between the market centers in the interior and Sao

Paulo. Marketing margins calculated directly between Maringa, Parana

and the Sao Paulo Bolsa for selected periods in 1962 and 1963 are pre-

sented in Table XIV. The wholesale margin net of turnover tax,[38] truck

38. The cerealista is supposed to pay a turnover tax on the purchase
from the farmer, but it is often evaded and is thus not deducted. The tax
on the wholesale transaction is often underpaid, but it seems likely that
evasion of both taxes together does not exceed 50%. Probably little dis-
tortion is introduced by deducting the one tax payment.

Table XIV

Gross Margins Between Farm Sale of Beans In Maringa, Parana to Sao Paulo Bolsa, "Chumbinho Especial."

	(1) Price of "Chumbinho Especial" Bolsa do Cereais de Sao Paulo	(2) Turnover Tax, Truck Freight and Empty Sack*	(3) Farm Price, "Chumbinho Especial" Maringa Parana	$\frac{(3)}{(1)}$	Cerealista's Gross Margin: $\frac{(1) - (2) - (3)}{(1)}$
Third week of December, 1962	Cr$5,550	Cr$630	Cr$4,500	.811	.076
Third week of January, 1963	Cr$5,150	Cr$706	Cr$4,000	.777	.080
Third week of February, 1963	Cr$4,800	Cr$706	Cr$3,400	.708	.145
Month of June**	Cr$6,100	Cr$783	Cr$5,000	.820	.052
Month of July**	Cr$6,390	Cr$939	Cr$5,000	.782	.071
Third week of August	Cr$6,700	Cr$969	Cr$5,500	.821	.034

*Turnover tax rate is 5.95% on shipments leaving Parana.
**Prices both in Parana and Sao Paulo were stable throughout the month.

Sources: Price and cost information was supplied periodically by merchants and cross-checked on two trips by the author to Maringa.

freight charges and the cost of the empty sack is variable depending on the market and ranged from 3.4% to 14.5% of the Bolsa price in the periods examined (see the last column of Table XIV).

The high margin for February, 1963, is atypical and reflects the fact that the market was in decline, and further price falls were expected. Since it takes about 2-3 weeks from the purchase to the sale, on the average, merchants in buying were anticipating lower prices at the time of sale.[39] The same seems to be true in reverse for the low (3.4%) figure in August when merchants expected further price rises. On the average it appears that a 7-8% margin (net of taxes, freight and sack) was typical of the wet and dry seasons harvest, 1962-63, close to what merchants actually state as the "normal" margins.[40]

Cerealistas have difficulty in finding wholesale buyers who will pay the Bolsa price and in fact sell mostly to "feirantes" (street fair sellers) and larger retailers at about the same price as the Bolsa for larger buyers and a mark-up of about 3-5% for the smaller buyers.[41] Focusing on the sale to larger retailers, a margin of about 8% on sales during periods of bean price stability (prices were either stable or

---

39. Bolsa prices actually fell Cr$300 to Cr$4,500. Using Cr$4,500 as the sales price, realized margins were actually 8.6% of the wholesale price.

40. The range of answers was 5-10% on all sales, including to retailers.

41. This policy varies from firm to firm. Some charge the Bolsa price for all retailers, and one claimed a mark-up of 7%. In all cases, the mark-up was smaller than that which general wholesalers used to charge, at least 10% over the Bolsa price.

falling in all periods considered in Table XIV except August, 1963)
must cover the expenses of buying and assembling in the interior,
warehousing for about two weeks and the selling expenses in Sao Paulo.
Breakdowns on costs were not available. However, we can infer the gener-
al level of net profits on sales. Employing a commission agent to
perform both the buying and selling operations (essentially a labor
expense) would take about 4% of the sales price, and the cerealista's
buying and selling expenses including overhead cannot have been much
lower than this. Assuming a 3% per month interest rate[42] and a turn-
over of stocks every two weeks,[43] interest charges would be about 1.35%
of the selling price,[44] leaving perhaps 2.6% of the sales price for net
profit on the sale. If own capital is used instead of bank loans
(as it is partially by all cerealistas, but especially the small ones),
a 5% per month inflationary rate must be applied to maintain the real
value of capital, and the net profit margin falles to 1.7% of the
wholesale price, still assuming 4% buying and selling expenses and a
two week turnover period.[45] These figures are meant only to be illustra-

---

42. About what most cerealistas were paying in 1963, when inflation
exceeded 5% per month.

43. The most typical figure cited by cerealistas for buying in Parana
and selling in Sao Paulo without forming speculative stocks. The range
was from 10 days to 3 weeks.

44. Expenses financed by cash--purchase price, sack, freight and taxes
are about 90% of the wholesale price. .9x1.5 (the two-week interest
charge) = 1.35.

45. .9 x 2.5 = 2.25 and 8 - 6.25 = 1.75, the net profit margin.

tive of the general level of net profits from the activity of buying
and selling in periods of stable prices, but it does seem that both
gross and net margins are low. For example, in Puerto Rico net profit
margins in both limited and full-line food wholesaling are substantially
higher than in the buying and selling activity in beans in the Parana-
Sao Paulo chain (see Table XV).

<div align="center">

Table XV

Net Profit Margins on Sales:
Beans Sao Paulo and Wholesaling in Puerto Rico

</div>

	Net Profit Margin	Turnover of Stock per Year
Beans: Parana-Sao Paulo, 1963	1.7-2.6%	24
Puerto Rico:		
Limited-Line Food Wholesalers	8.7%	16.3
Full-Line Food Wholesalers	11.8%	16.4

Sources: Puerto Rico: Galbraith, J.K. and Holton, R.H., op.cit., pp.50-55.

Many firms felt they were losing money buying and selling
beans without speculative stocks during the period under examination
(1962/63). The competition in the field appears to keep margins to a
minimum, especially since the advent of the merchant-trucker. Large
profits are to be made in beans only through successful speculation.
Oligopsonistic profit margins between market centers in the interior and
Sao Paulo no longer exist.

III. Summary

In summary, we have traced the major structural changes in the
marketing system since about 1945. All trends--diminishing bottlenecks,

more rapid shipping and direct procurement, direct sales by assemblers to retailers, increasing competition and the decline of the merchant-moneylender system--have tended to increase prices transferred to farmers given the level of consumer demand and farm output. Quantitative confirmation of these trends was found to be strong in rice, although more ambiguous in beans. Finally observations on margins over space and vertically through wholesale market channels indicate a reasonably efficienc market system in these tasks. With the truck and the ease of entry into the cereals trade, profits over space and vertically through channels should not diverge significantly from their competitive levels in most areas not newly settled.

The quantitative evidence cited in favor of the hypothesis that marketing has absorbed an ever greater proportion of the final consumer value of food is the more rapid rises in the wholesale price index for agricultural products and the food component in the cost of living index than in farm prices (see Table XVI).[46] This is an invalid comparison for the conclusions drawn from it--quite apart from the serious question of the general accuracy of the trends in farm prices.

First, the weights applied to these different products vary considerably in the three indices. The base years are different,[47]

---

46. See for example Ministerio do Planejamento e Cooredenacao Economica, op.cit., p.91; Chacel, Julian M., op.cit., p.50; Baer, Werner, op.cit. p.153.

47. The weights in the Rio cost of living index refer to 1959, those in the wholesale index to 1949, and those in the agricultural price index have never been disclosed bythhose using it. It may use moving weights from year to year.

Table XVI

Price Indices of Food and
Agricultural Products

	Index of Prices Paid to Farmers (excluding coffee and cocoa)	Wholesale Price Index of Agricultural Products (excluding coffee)	Food Component of the Rio Cost of Living Index
1950	100	100	100
1951	116.4	123.7	112.7
1952	129.3	144.1	134.9
1953	157.8	169.5	158.7
1954	177.0	200.0	192.1
1955	216.4	249.2	239.7
1956	265.1	298.3	296.8
1957	297.7	332.2	341.3
1958	341.6	369.5	390.5
1959	459.6	525.4	566.7
1960	617.3	742.4	739.7
1961	816.8	1,025.4	905.2
1962	1,299.8	1,601.7	1,611.1

Sources: Conjuntura Economica and Ministerio do Planejamento e Coordenacao Economica, Programa de Acao do Governo 1964-66 (Sintese), 1964.

and in any case the weights of the several products in urban consumption and rural production vary widely.[48] Since relative prices of different food products have changed substantially after 1950, this may be a source of significant bias.

---

48. In cereals alone, this is serious. Corn, the price of which has fallen in real terms, has a much larger weight in production (much is used for animal food)than in consumption, whereas beans, with increases of 200-300% in real terms 1948-63 has a much larger weight in consumption than production. A very serious source of bias, although the author was unable to recalculate the indices, may be a larger weight given to meat procucts in urban consumption than in production. The prices of meat and derivatives have risen 50% more rapidly than crop products, 1953-62, according to the Conjuntura Economica wholesale price indices for the two groups.

Second, food prices at wholesale and retail refer to fixed points, Rio, Sao Paulo and for some products in the wholesale price index, Porto Alegre, whereas farm prices pertain to the <u>entire country</u>. Since production has been moving away from these centers, farm prices should <u>not</u> increase as rapidly as wholesale and retail prices in them.

Before the comparison of such aggregate indices can be of much use, they must be recalculated using farm prices only in the Center-South,[49] with constant production weights applied to the prices of each state (to eliminate the bias introduced by a shift in the locus of production) and with identical weights applied to each product price at the three stages of marketing. It would also be more enlightening if separate indices were calculated for several sub-groups of products. Until this is done, such comparisons of price indices can be of little use in testing the marketing "bottleneck" hypothesis which now seems to be the common belief among Brazilian economists.

For the cereals sub-group, we have seen that gross marketing margins over space and vertically through marketing channels have been falling in the 1950's and 1960's. Instead of reducing the response of farmers to rising demand, these developments in the marketing sector for rice and beans must have increased it.

But the picture is incomplete. It is possible that the other component of realized marketing margins, changes in prices over

---

49. The principal supply areas for the wholesale and consumer markets for which there are prices. The Northeast and North are net deficit areas. The trends in <u>their</u> farm prices are irrelevant for wholesale and retail prices in the South.

the season after farmers have sold their output, has increased, off-
setting in some part the fall in gross margins between concurrent
farm and wholesale prices. In the next two chapters, then, we
turn to the efficiency of speculation in the two products.

CHAPTER IX

SPECULATION IN BEANS

In the last three chapters, trends primarily in the price transferral mechanism over space and vertically through marketing channels were examined. Now we turn to an analysis of another important determinant of the level of farm prices, the efficiency of speculation and the carry-over. In the next chapter, it will be shown that storage in rice seems to yield on the average only the marginal cost of storage plus some small profit--an indication of relatively efficient speculation. Bean speculation, the subject of this chapter, remains highly defective.

Although it was seen in the last chapter that the bean producer of Parana, Sao Paulo and Goias is receiving an increasing portion of the wholesale value of the product in Sao Paulo and that distribution margins through marketing channels are probably low[1], inefficient speculation in the product remains a signifaant depressant

1. The farmer in Parana's market centers received in 1963 about 80-85% of the wholesale value of the product in Sao Paulo net of transport costs (see Chapter VIII, p. 391), and it appears that the relation for the Minas Triangle and Goias are not very different. In the United States as a whole in 1939, producers of dry edible beans received much less, 67.3% of the wholesale value net of transport costs. See U.S. Department of Agriculture, Bureau of Agricultural Economics, Marketing Margins and Costs for Farm Products, (Washington, D.C., 1948), p. 26.

of farm prices. It will be shown that there are serious biases against

producers in the speculative process. Although seasonal price movements

in beans tend to be highly erratic, there are two general seasonal price

patterns, depending on harvest size.[2] In large harvests, prices tend

to remain stable or more often decline over the season (April-November).

In these years, commercial stocks are generally limited to the minimum

working level necessary for rapid buying and selling of beans, while

farmers hold the bulk of stocks in the interharvest months. Resisting

the generally low and "non-compensatory" prices which usually are in

effect during the harvest months of a large crop, producers often retain

too much of their output, hoping for a price reaction in September and

October when the new crop (wet season) is planted. The result is often

a further decline in prices as farmers are forced to liquidate their

stocks before the new crop comes in (December), provoking substantial

speculative losses to farmers and price declines over the season.

In small harvests, however, prices rise rapidly over the

season (about 8% per month in real terms), and merchants hold the bulk

of the stocks in interharvest months, farmers having sold most of their

output for the relatively high and "compensatory" prices in force even

in the harvest months of small crop years. In these harvests, the low

---

2. As will be seen below, analysis of seasonal price movements is possible
only for the dry season crop, April-November. The wet season crop, which
supplied only 4 months consumption, finds few merchants speculating on
price rises and farmers holding the bulk of the stocks in most years.

producer carry-over plus merchants' stocks are insufficient to prevent
large real price increases over the season. The "inadequate" commercial
stocks in small harvests will be seen to arise from three factors: (1)
poor information and therefore (2) high risk premium (ex ante) and (3)
frequently inadequate credit facilities to finance the desired level of
commercial stocks.

Thus there is a serious bias in favor of the middleman in the
speculative process, a bias which tends to reduce farm prices received,
ceteris paribus. The high risk surrounding the farmer's decision to
sell· or retain beans produced (given the highly erratic seasonal) added
to the risk of large harvest to harvest swings in gross income per hec-
tare (see Chapter IV, pp. ᴐᖾ ıᴄ ᴐ) has significantly retarded the
expansion of bean output in response to an increasing demand (real bean
prices have risen markedly since 1950; see pp. ᴣᵻᵼ and ᴣᵬ below). Given
the erratic nature of the seasonals and their dependence upon harvest
size, it is impossible to judge whether speculation has improved in
beans in the 1950's and early 1960's. Its general inefficiency, however,
outweighs any slight trends there may be.

In this chapter, the basic elements of the speculative process
in beans--the sources of risk, the stocking behavior of farmers and
cerealistas in response to this risk in large and small harvests, and
the behavior of prices over the season--are analyzed. Then the important
factors underlying the typically large seasonal price rises in small
harvest years are examined. Finally, policy recommendations for improving
speculative efficiency are made.

Most of the material in this chapter is based upon an extensive questionnaire used woth 12 cerealistas in Sao Paulo, upon numerous inter- views and conversations with other merchants in Sao Paulo, Minas Gerais and Parana, and upon the author's personal observation of the market for the period of one year. It refers primarily to the varieties "de cores" and to a lesser extent, to the "roxo (inho, ao)" of Minas Gerais and Goias (altogether about 98% of Sao Paulo's consumption.[3] Black beans, poor substitutes for "de cores" and "roxo (inho, ao)" in consumption often show seasonal price movements which diverge widely from the former and will not be considered in this study.[4]

I. The High Risk in Beans Speculation: Its Sources.

The storage of beans is a highly risky activity. Seasonal price patterns are extremely erratic (see pp. 312-329 below). It is impossible to stock beans as a matter of routine (as happens with rice in the mills) without running a high probability of substantial losses.

A. Harvest Timing and the Storage Qualities of Beans.

This risk has many sources. There are two bean harvests per year in the Center-South, one in April-June (dry season) and the other

---

3, For a discussion of the several varieties and their substitutability, see Chapter IV, pp. 76 - 79 .

4. In addition, the timing of the principal harvest in Rio Grande do Sul, the most important source of black beans, is the reverse of thst in the Sao Paulo region, occurring in December instead of April-May.

in December-January (wet season).[5] In general, the dry season crop supplies

"de cores" for the period April-December 15, while the wet season is limited

to part of December through the first weeks of April (about four months.).

However, "roxo (inho, ao)" is produced in Minas Gerais and Goias

only in the dry season and must be carried into the subsequent wet harvest

months. The intervention of another harvest in Sao Paulo, Parana and

parts of Santa Catarina makes carry-over of "roxo (inho, ao)" from its

harvest months to December-April a very risky proposition. As was seen

in Chapter IV (pp. 79   ), "de cores" and "roxo (inho,ao)" are to some

extent substitutes in consumption. Thus even though the "roxo (inho, ao)"

carried into the December-April period may be small, if the wet season

harvest of "de cores" is large, the prices of "roxo (inho, ao)" will most

likely decline. In some instances, merchants have refused to sell at

speculative losses, carrying-over "roxo (inho, ao)" from one dry season

harvest to another.[6] Usually, however, this has merely postponed or even

increased the speculative losses. By the same token, if stocks of "roxo

(inho, ao)" carried into December-April are larger because of the expectation

of price rises, the price of "de cores" in the September-November period

---

5. In years of bad crops in either the North or the South, the August-
September harvest in the North becomes relevant for Speculation. In
most years, however, transport costs are too high to permit substantial
interregional trade in beans.

6. Since 1956, carry-over sufficient to show in the sales on the Bolsa
de Cerais has occurred in "roxo (inho, ao)" in 1956 (including some 2
years old), 1957 (including some 3 years old), 1960 and 1963.

will be somewhat higher, even though insignificant carry-over is under-
taken in these varieties (for reasons of quality changes explained on
pp. 304-5 below).

Because these two groups are but imperfect substitutes, they
will often show different magnitudes or price changes over the season.
Never in the 15 year period considered here (1949-63), however, did the
price of "roxinho" rise November-April, while that of "de cores" was
falling or vice-versa.[7]

Beginning in September with the early plantings, prospects
for the wet season crop begin to influence current bean prices. Should
the coming harvest be normal or large, people holding stocks after Sep-
tember could be burnt badly. This possibility is magnified by the changes
which the principal varieties "de cores" undergo in storage as presently
practiced in Brazil:[8] the beans begin to lose their color after 6-8
months, while hardening considerably.[9] With "roxo (inho, ao)" the
process is more drawn-out, with no appreciable changes in appearance for
about 1 year. Black beans may be stored up to three years without such
changes, although they too dry and harden. But appearance, as a visible
sign of the bean's condition is the most important element, since with no

---

7. The same cannot be said of black beans which are much more remote
substitutes.

8. Sacked in warehouses, periodically fumigated to prevent infestation by
insects.

9. This increases cooking time and makes them less desirable to consumers.

change in color the old beans may be mixed with the new, undetected by most housewives.

The result of these changes in quality is that when production from the wet season crop begins to reach consuming centers (about the first or second week in December), remnants of "de cores" from the previous dry season harvest sell at a heavy discount, especially when production is abundant (see Table I). The same is true to a lesser extent of carry-over from the wet season.

Table I

Average Price of "Chumbinho Especial",
Bolsa de Cereais de Sao Paulo
(Cr$ per sack of 60 kilos)

Month	Dry Season	Wet Season
December, 1960	1,275*	1,691
February, 1961	955*	1,273
May, 1961	1,480	1,037*
April, 1963	5,328*	6,958
November, 1956	553*	878

Source: Bolsa de Cereais de Sao Paulo. An (*) indicates the old crop.

Even "roxo (inho, ao)", which does not undergo these changes in appearance so rapidly, may be affected slightly by the discount, should the quality of the wet season harvest be good.

Thus merchants are very wary of making significant stocks of "de cores" during the harvest months (i.e., April-July) unless there are good indications that the availability of the crop will not be

sufficient to supply its demand until December without substantial price rises. Otherwise, should the wet harvest be sufficient to prevent large price increases of the new crop, December-March, anyone caught with stocks of the old crop in the months beginning in December will suffer substantial losses.

If it appears in September-November that the wet harvest will definitely be small, some carry-over will be attempted out of the dry season.[10] Then, even though the old crop sells at a discount, its price will still be higher than during the dry season.

The uncertainty involved in this two harvest pattern is further complicated by the volatility of bean yields in response to weather factors. It was seen in Chapter IV (pp. $85 - 102$) that bean yields fluctuate considerably more than those for rice, corn and cotton. Weather may also retard or put forward the time of harvest. A cerealista forming stocks in May-August in expectation of a large price rise in September-December has to cope with the possibility that yields may be excellent in the following wet season and the harvest somewhat earlier than normal. Even in forming stocks September-November for carry-over into an expected small wet season crop is fraught with uncertainty unless is is fairly clear that the planting is small and/or weather has already damaged the crop and delayed its planting. Effective arbitrage between

___

10. There are, of course, cerealistas who will stock when prices are low, thinking that they just could not go lower. Often they have found out the contrary.

large and small harvests is not, therefore, to be expected and does not
occur (see also Chapter III, pp. $\angle\theta - \angle\theta$).

Because of the short period of the wet harvest crop (December-
March), only the wildest of speculators stock hoping for a price increase
over that four month period. Commercial stocks of "de cores" formed are
dependent chiefly upon the carry-over out of the period when price increases
are expected in the subsequent dry season months.[11] Again without <u>clear</u>
indications of adverse weather effects on the crop, this carry-over will
be very ineffective

B. <u>Market Information</u>.

Implicit in what has been said above is the assumption that
reliable quantitative market information is not available to cerealistas.
An extensive section on the sources and quality of market information
was included in the questinnaire. Two aspects stand out in merchants'
responses: official production figures are completely ignored as <u>use-</u>
<u>less</u>;[12] for the rest, estimates of production, stocks and even prices
in the several areas are "empirical" at best.

---

11. In general, this storage worthiness of the wet season crop is below
that of the dry season's. More often it has been exposed to the rain,
is spotted in color and has a higher level of himidity. This leads to
greater deterioration of the product in storage, since drying is normally
not performed by the cerealista.

12. This also includes the estimates made for the State of Sao Paulo
by the Divisao de Economia Rural on a sampling basis.

Most felt that it was impossible, given their information, to estimate at all precisely the percentage change in harvest size from one year to the next. "About the same", "much larger", "much smaller" were about as far as most would go. These estimates are completely subjective and are based on a variety of sources: employees in the interior, information from "ambulatnes", what farmers say, information from "representantes" and interior merchants, etc., all these, in turn based on casual personal observation. In general, larger firms with several buyers, purchasing stations and selling branches in the region felt more confident in their estimates than smaller, more restricted firms. These larger multi-branch firms have an informational advantage which may be called the "infomational economy of scale: and which accrues from having dependable elements of the firm in many different areas.

Two important elements for predicting future price patterns, the proportion of the crop still on the farms and the stocks in commercial channels, are know only within the large margins of error. The only source of information about farm stocks (since production is not known) is the farmer himself, and all agreed that his declarations are not reliable. No official organ is responsible for a regular ennumeration of commercial stocks in the principal marketing centers in the interior and Sao Paulo. Larger firms are able to get a rough idea of these stocks through their buyers and branches. Otherwise, cerealistas are dependent upon vague rumors and the declarations of other merchants--always biased downward. No firm claims to have reasonably accurate estimates of

stocks.[13]

The informational problem has become
more severe as more areas come into production, creating new marketing
centers with stocks. The trucker, direct shipments and the decline of
the new proportion of stocks held in the large centers of consumption
have made it more difficult to accompany the processes of storage and
consumption in the resultant decentralized market.

Even in prices, the information available to most merchants is
rather poor. There is no organism in Sao Paulo (or any other city)
which receives and publishes market prices in the several market centers,
including the major consumer markets. Rather, each cerealista is depen-
dent upon his own private sources of information: buying and selling
agents, interior merchants, etc. This, in turn, severely limits the
spatial arbitrage of producer and consumer markets over shorter periods
of time and also gives the few large firms with several buyingand
selling branches additional profit opportunities.

But even for the large firm, the information gap is great
and, along with the two harvest pattern, tends to create a large ex
ante risk premium in beans. Merchants were asked in the questionnaire
how much they would have to expect bean prices to rise before they would
make significant speculative stocks of beans before September. Half

---

13. Only one firm claimed to have roughtly accurate estimates. Further
questioning indicated that in reality his estimates were very limited.

said that the calculation was irrelevant or impossible, since their
expectations do not take this form. Rather they would have to foresee
large increases over the period before forming significant speculative
stocks. The other 6, however, gave answers of from 15 to 20% per month,
including (at that time, 1963) 5% inflation monthly and a physical cost
of storage of 2-3% (at the maximum) including spoilage and loss of
weight. Thus expected real price rises of 10-15% per month and net
real profits of 7-13% per month (even more if bank credit with negative
interdst rates was used--see pages 3l7, 35q below) were necessary before
they would consider sizeable speculation in beans.

II. Seasonal Price Pattern for Beans.

A. Average Seasonal Price Indices for the Dry Season Crop.

With the high risk involved in speculation, one would expect
rather large seasonal price increases on the average during the dry
season harvest months (April-November), significantly larger than the
marginal costs of storage. Because the period is so short (4 months) and
so dependent upon dry season harvest prospects, analysis of price behavior
in the wet season months (December-March) will not be undertaken.

In tracing seasonal price changes in "de cores", two monthly
price series are available: the prices paid to farmers for beans in
general (overwhelmingly "de cores") in Sao Paulo State and the prices of
several varieties "de cores" on the Sao Paulo Bolsa.[14] Of the latter we

14. The Bolsa Prices are average monthly prices of transactions registered
on the Bolsa. The Sao Paulo farm prices are the weighted (by production)
averages of prices paid by about 150 informants throughout the interior.

will deal only with by far the most important, "chumbinho". The only other variety traded regularly enough to have a reasonably complete set of prices, "opaquinho", usually parallels rather closely the price movements of "chumbinho".[15]

Unfortunately the Bolsa series are not complete, because of paralization of the market throughout the 1959 and 1962 seasons when ceiling prices set on beans were much too low to permit normal (i.e., non-black market) trading.

The ratio.of each month's (deflated) price to the average for the period May-November was used in computing the season.[16] Moving averages, even were they advisable, are impossible when there are two harvests unequally spaced over the year. Deflation was performed monthly using the average monthly geometric rate of inflation implicit in the yearly increase in the Conjuntura Economica's Index Number 2.[17] This gives a close approximation to the seasonally adjusted monthly rate of inflation. Even though deflation may introduce its own biases, it is the only way to put the several years of the period on a comparable basis (inflation has varied from less than 10% to more than 70% per year,

---

15. The one notable exception is 1956.

16. April was excluded from the seasonal, because it has often included both wet and dry season crop prices mixed indiscriminately.

17. This is the closest thing there is to a general price index in Brazil and is a weighted average of wholesale price, cost of living (Rio) and construction cost indices. The implicit price deflator, computed indirectly, suffers from several serious defects. See Smith, Gordon W., "Agricultura e o Plano Trienal", Revista Brasileira de Economia, XVI 4, (Dezembro de 1962), pp. 113-21.

Table II

Seasonal Price Indices of Sao Paulo Farm Prices (deflated) 1949-63

	Average all years	1949	1950	1951	1952
May	105.20	114.18	110.64	128.31	87.14
June	95.90	103.40	100.11	108.16	86.17
July	91.94	95.04	96.34	96.74	90.04
August	94.92	91.87	96.34	88.00	102.14
September	101.39	93.52	198,60	87.33	107.95
October	104.73	95.58	100.11	92.04	110.38
November	105.92	104.42	97.85	99.42	116.18
	1953	1955	1956	1957	1958
May	140.26	80.09	106.88	119.06	102.49
June	119.53	78.16	106.57	104.09	99.39
July	112.48	79.52	101.24	108.52	88.19
August	108.07	96.88	100.33	100.30	83.42
September	87.34	109.24	99.41	99.88	88.66
October	70.13	117.73	91.34	83.44	109.87
November	62.19	138.38	94.24	84.71	127.99
	1959	1960	1961	1962	1963
May	64.54	136.08	83.79	95.91	103.36
June	74.00	101.15	72.32	91.41	98.24
July	79.26	96.93	64.83	86.19	91.85
August	93.94	97.01	74.10	106.95	89.60
September	109.04	78.89	122.41	121.90	115.29
October	139.64	98.24	141.07	99.78	114.84
November	139.59	91.69	141.49	97.85	86.82

Sources and comments: see Table V.

Table III

Seasonal Price Indices (deflated) of "Chumbinho Especial",
Bolsa de Cereais de Sao Paulo, 1949-63*

	Average All Years	1949	1950	1951	1952
May	107.05	102.10	113.64	126.28	84.42
June	96.04	102.70	102.25	98.97	85.42
July	95.62	96.69	100.64	96.87	98.33
August	97.95	100.65	94.48	90.46	108.42
September	99.69	101.62	99.33	87.38	103.95
October	104.06	98.49	95.64	96.02	108.42
November	99.59	97.67	90.02	104.01	111.04

	1953	1955	1956	1957	1958
May	143.99	84.31	101.84	121.26	90.00
June	120.16	74.44	104.46	110.75	87.07
July	122.45	73.93	100.44	110.68	77.97
August	104.27	99.85	101.33	100.94	82.54
September	83.49	106.78	100.71	84.83	105.16
October	68.40	130.60	92.33	86.79	125.03
November	57.23	130.11	98.89	84.74	132.22

	1960	1961	1963
May	127.41	83.50	105.87
June	98.95	72.40	94.89
July	102.44	72.09	94.93
August	92.25	100.30	95.94
September	87.79	110.05	117.20
October	109.87	130.73	106.37
November	81.29	122.93	84.81

Sources and comments: See Table V.

Table IV

Seasonal Price Indices (deflated) of "Roxinho Especial",
Bolsa de Cereais de Sao Paulo, 1949-63

	Average All Years	1949	1950	1951	1952
May	100.21	90.59	93.40	103.58	83.83
June	95.93	68.87	112.55	105.86	85.59
July	93.22	90.86	94.56	89.62	87.48
August	99.98	96.92	106.53	95.27	113.05
September	101.97	121.10	97.79	96.97	107.13
October	107.05	120.36	99.11	108.88	113.26
November	101.63	111.30	96.58	99.82	109.67
	1953	1955	1956	1957	1958
May	121.00	100.00	87.75	84.42	99.29
June	106.90	91.76	94.63	105.15	105.61
July	111.47	78.40	100.37	108.62	84.22
August	108.76	104.08	107.64	110.96	87.53
September	97.59	104.25	104.64	100.14	97.88
October	74.53	112.79	104.08	97.31	112.10
November	79.94	108.74	100.88	93.40	113.37
	1960	1961	1963		
May	145.95	83.31	109.42		
June	95.90	80.18	98.15		
July	97.75	82.35	92.98		
August	85.04	90.75	93.74		
September	79.43	109.35	107.37		
October	107.51	129.19	105.70		
November	88.42	124.87	92.64		

Sources and comments: See Table V.

Table V

Average Seasonal Price Indices (deflated)
1949-63 (excluding 1954,1959,1962)[*]

	"Chumbinho Especial"	"Roxinho Especial"	Sao Paulo Farm Prices of Beans
May	107.05	100.21	109.36
June	96.04	95.93	98.11
July	95.62	93.22	93.48
August	97.95	101.97	94.01
September	99.69	107.05	99.04
October	104.66	101.63	102.23
November	99.59		103.78

[*] The Bolsa de Cereais de Sao Paulo was paralyzed in beans in 1949 and 1962 because of price control. 1954 was excluded from all series because of its extremely erratic month to month rises and falls in price.

Sources: Bolsa de Cereais de Sao Paulo and the Divisao de Economia Rural of the Secretaria da Agricultura do Estado de Sao Paulo.

1949-63). Even had the inflation rate been constant, deflation is the
only alternative when, as occurred late in the period, monthly general
prices increases reached and even exceeded 5% per month.

The broad movements of the two "de cores" series, "chumbinho
especial" on the Bolsa and Sao Paulo farm prices, are very similar
after 1951, with only minor differences in magnitude and timing (see
Tables II and III). Even "roxinho", subject to different storage con-
ditions, is rather similar in behavior. Because the series are similar
and because 1959 and 1962 (not available in the Bolsa Series) are
important years for later analysis, reference is usually made to the
complete Sao Paulo farm price series.

The average seasonal in the Sao Paulo farm prices for the
May-November period show rather large increases when expressed in
deflated prices (see Table II). The average real price rise July-
August (when, according to merchants, most commercial stocks are
formed, in normal years) to September-November is 11.1%, a real gross
return of almost 3 1/4% per month and 1 3/4% net, assuming own capi-
tal and a 2% per month storage cost including spoilage and loss of
weight. The trough to peak rise (July-November) is 15.2%, again almost
3 3/4% per month.[18] Employing bank credit with its generally negative

---

18. For the series excluding 1959 and 1962, the monthly rises are:

	Trough to Peak	June-August to September-Nov.
Sao Paulo Farm Prices	2.3%	2.8%
Chumbinho Especial	3.2%	1.6%
Roxinho Especial	4.7%	2.5%

rates of interest throughout most of the period, the real return would
be even larger than 1 3/4% per month for own working capital. The
monetary "payment" necessary to maintain the real value of own capi-
tal (i.e., the inflation rate) is greater than the interest rate. The
rate of monetary net return from using bank credit instead of own capi-
tal is the difference between the rate of inflation and the effective
interest rate.[19] In high inflation yearslike 1963, this difference
approached 3% per month.

These averagd real increases in price are considerably above
those registered in rice in Sao Paulo, about 9.6% per cent over the 6
month period from July-September to the January-March quarters for
"Amarelao Especial" on the Bolsa de Cereais, 1946-61 (see Chapter X,
pp. 37c- 372), and probably arise in part from the higher risk in
storing beans.

However, average returns to a fixed storage pattern year after
year greatly underestimate the realized returns when sizeable stocks of
beans were actually made by middlemen. It will be noted from Tables II-
Iv that seasonal price patterns vary widely from year to year.[20] There

---

19. In the present case, for example, let p be the rate of bean price
increases; i, the rate of inflation and r, the interest rate. Suppose
100 is invested in bean stocks for t periods and then sold. The net
returns using own capital and bak credit are $(1+p)^t$ 100 - $(1-i)^t$ 100
and $(1+p)^t$ 100 - $(1-r)^t$ 100 respectively. If the period of stocking
and the compounding of the interest correspond, the difference in rates
of return = i-r, in favor of using bank credit.

20. Steady predáctable seasonal patterns are almost by definition
associated with low risk.

is strong evidence indicating that stocks were _small_ in commerce in
years when price rose little or even declined over the season. It
was precisely during the years of large seasonal price increases that
middlemen held the bulk of existing stocks and were heavily committed
in beans. We now turn to an examination of this evidence, the factors
underlying this behavior and its effects of farm prices.

B. General Patterns of Stocking Behavior.

Cerealistas were questioned in depth about their stocking
behavior under varying conditions both through the questionaire and
through other personal interviews. In addition the author accompanied
the market closely from November 1962 to October 1963, attending the
Bolsa de Cereais almost daily and in frequent informal conversations
with several cerealistas about general market conditions.

There emerged from these sources a number of general charac-
teristics of cerealista and farmer stocking behavior depending upon
the size of the harvest. All agreed that in a "large" harvest commerce
did not usually form significant speculative stocks, but rather
worked only with the minimum necessary for a more or less efficient
rapid turnover--buying and selling.[21] Only if it became clear in

---

21. In recent years with the truck, such stocks would normally be less
than two weeks sales, according to many merchants. In the early 1950's
the figure was closer to one month's sales.

September or later that the wet season crop would be small (thus creating
the likelihood of price increases for even the old crop) would signifi-
cant stocks "de cores" be made in commercial channels in a "large" dry
season harvest year.

By contrast, during "small" harvests, large speculative
stocks are normally formed very early (as early as April in 1962). The
implication is clear: cerealistas expect large seasonal price rises
in small harvest years and slight rises or even declines when the har-
vest is large (depending upon the contingency of the wet season crop).

Furthermore, farm sales are generally much more concentrated
in the early months of a small harvest than in a large one. Some
cerealistas were able to give a very rough indication of the cumulative
percentage sales by farmers in Parana in a "normal" year (see Table VI).

Table VI

Cumulative Percentage Sales of Beans
by Farmers in Parana during a "Normal" Year

April-June	April-August	April-October
40-50%	70-80%	90-100%

Source: Interviews with Cerealistas

But practically all, including those unable to give such "precise" esti-
mates, agreed that in a small harvest the April-June and April-August
figures would be considerably higher, while in a large harvest, consider-
ably smaller than the "normal". According to most merchants, this is

related to farmers' own price expectations. 10 of 12 firms responding
to the questionnaire answered that most farmers would sell the bulk
of their crop early in the harvest if the price were high, even if
they expected it to rise even further. Only a small part will be re-
tained for speculation--a clear case of risk avoidance when the price
expectations held at the time of planting have been more than satis-
fied.

When prices are low, as in a large harvest, farmrs hold back
a much greater proportion of the crop in hopes of a reaction of prices
in September and after.

This suggests for many producers a selling behavior predi-
cated on recovering something related to "cost of production" or
prices expected when the planting was undertaken. When price is
considerably above such a level, they will sell; even though holding
might pay off; when it is considerably below that level, they will
wait much more on the theory of what have they got to lose.. There
are other elements. Farmers tend to project last year's price move-
ments into this year's expectations. Thus if price rose substantially
over the season in the preceding year, farmers tend to expect the same
thing to happen this year.[22] If it fell or did not rise, they tend
to expect somewhat the same thing this year. Now, should a large

---

22. This was clear with corn in 1962 and 1963, and beans in 1963.

harvest coincide with a year following substantial seasonal price increases (as in 1953, 1960 and 1963), both factors will tend to lead farmers to hold a substantial proportion of their output off the market in the earlier months. Or if small harvest follow years of seasonal price declines (as in 1952, 1955, and 1961) farmers will be more likely to sell early.

This is not true, of course, of all farmers. The agricultural laborers producing beans are usually unable to withold much from the market because of their heavy financial committments with the Fazenda or the small general store. But the small landholder producing several crops including coffee has ample scope for such speculation ventures, especially since, as was seen in Chapter IV, beans willnormally make up a small prportion of his total income.[23] These small landowners ("sitiantes") form a considerable part of the total bean supply in Parana.

But these different selling patterns, at least in Parana, may be partially related to inadequate commercial capacity to market the crop efficiently in very large harvests. Several cerealistas declared that many farmers, even though they might <u>want</u> to sell at the reigning low prices of very large harvests, <u>cannot</u> <u>find</u> <u>buyers</u>.

---

23. See Chapter IV, pp. *102 - 104* , which represent the analysis showing that ceteris paribus it is easier for producers to speculate with a minor crop than with one making up a large proportion of their income.

In small harvests, cerealistas with branches inthe North of
Parana aend buyers to the more distant regions in that State in
search of beans. The "ambulatne" is much more active in these areas
during small and "normal" crop years. In a large harvest, the cereal-
ista does not attempt this canvassing, and the "ambulatne" may never
appear in the more distant areas, having all the business he can han-
dle closer to the main road s and market centers. Thus the effective
capacity of markting and transportation in the more removed producing
areas is actually smaller in large harvests (a serious market imper-
fection) and may lead to involuntary retention of the crop by farmers
there.

Competition in these areas also diminishes in large harvests.
Instead of the many outside buyers, the producer is faced with the 3
or 4 general grocery wholesalers or retailers in his own local town.
It is relativdy easy for them ota act. in concert to open an oligop-
sony margn, and in fact several farmers interviewed in the Southwest
of Parana were convinced that the ambulatne would pay higher prices
than these local buyers. This lack of competition coupled with the
hope that other buyers will appear sooner or later seems to lead also
to voluntary retention of the crop by producers in more distant areas
during a large harvest.

Even in the older centers there is some doubt of the ability
of the marketing and transport system to move the crop efficiently from
the farms for all producers who want to sell at reigning prices during

very large harvests. This "bottleneck" often appears to be aggravated
by withdrawal of large firms from the marketing for extended periods
of time when the harvest is very large and they see no "future" for
the product. This capacity problem, as was seen in Cahpter VI. was
much more serious in the early and middle 1950's than it istoday.

Thus for a combination of expectational and marketing capa-
city factors, farmers tend to hold a much greater proportion of their
beans off the market in the earlier months of a large harvest year,
at the same time that cerealistas arenot making speculative stocks
of beans. As long as farmers retain large proportions of the crop,
the possibility of a price rise is remote or at least very uncertain.
Only rough ideas of the proportion of the crop remaining with farmers
can be formed, and as long as it is known that this proportion is
"large", the risk of stocking early in the hopes of a price rise in
Sptember-November is very high.[24]

In summary, then, in small harvest years, cerealistas tend
to stock early and hold the bulk of the beans in storage in the
4 or 5 interharvest months. In large harvest years, they either
stock late (if a price rise is expected inthe future wet season months)
or not at all, and farmers held the bulk of the existing stocks. Since

---

24. Some firms have taken this chance, most notably in 1957, when four
large firms in Parana stocked 100,000 sacks (not, however, a large stock
for these firms) early in the harvest. They later had to sell it off
gradually at a loss. Pedrinho Labate, Boletim Informativo (unpublished
market news:bulletin, Sao Paulo), 1957, various numbers.

many farmers use poor storage methods, deterioration of beans tends to be fairly high in large harvest years.[25]

C. Seasonal Price Patterns for Large and Small Harvest Years.

Seasonal price patterns should differ significantly for the three general marketing and stocking patterns described by cerealistas. It is difficult to give operational content to "large" and "small" harvests. Even if they could be defined theoretically as certain percentage deviations from production sizes or certain percentage deviations from production trends, available data seriosly limit their application. The Ministry of Agriculture (SEP) production estimates, upon which we must depend for all states other than Sao Paulo, seem to greatly underestimate the magnitude of year to year crop fluctuations in beans.[26] Table VII presents SEP's production estimates for Sao Paulo along with those made by a highly developed sampling procedure employed by the Divisao de Economia Rural since 1954. The percentage fluctuations from year to year are much smaller for the Ministry's figures, and average absolute

---

25. Cerealistas tend to minimize these losses, giving figures up to 15% for spoilage on the farm in large harvests. Official estimates for the early 1950's run as high as 30-40% of the crop for Parana. Klein and Saks, op. cit., p. 21. This figure is most certainly lower today with the expansion of transport and warehouse facilities in the region.

26. SEP data are notoriously bad for many crops. See Appendix I and Baer, Werner, op.cit., p. 210-11.

Table VII

Estimates of Bean Production, State of Sao Paulo

	Production		Percentage Change from Previous Year	
	SEP (tons)	Divisao de Economia Rural	DER	SEP
1954	213,943	120,960	...	
1955	209,992	88,200	-37.1	-1.8
1956	198,143	102,060	15.7	-5.6
1957	221,336	150,000	47.0	11.7
1958	201,402	150,000	00.0	-9.0
1959	165,513	116,400	-22.4	-17.8
1960	178,459	195,600	68.0	7.8
1961	178,952	141,600	-27.6	.3
1962	158,145	116,400	-17.8	-11.6
1963	177,763	160,800	38.1	12.4

Sources: SEP; IBGE, Conselho Nacional de Estatistica, Anuario Estatis-
tico do Brasil, various numbers; Divisao de Economia Rural
da Secretaria da Agricultura do Estado de Sao Paulo.

percentage change of 8.6% per year compared with the 30.4% in the

Divisao data. And, in general, the weak year to year fluctuations

shown by SEP do not correspond to the wide year to year price swings

verified in beans. It will also be noted that, in Table VII that

as the years have passed, the Ministry's estimates have come more

into line with those of the Divisao de Economia Rural in their general

order of magnitude (the reader may draw his own conclusions). The

quality of the SEP figures are undoubtedly poor,[27] but the direction

of output change should usually be correct, at least for the more

extreme swings of production.

Because the magnitudes of fluctuations are underestimated

and their relative ranking probably erroneous, distinction between

"normal", "large" and "small" harvests is unwarranted. A less pre-

cise procedure is employed here: dry season harvests are classified

as "large" when production of beans in the States primrily affecting

the price of beans "de cores" in Sao Paulo during April-November rises

from the previous year, and as "small", when this production falls.

The states included are: Sao Paulo, Parana (by far the most impor-

tant), Minas Gerias, Goias and Mato Grosso (see Table VIII).[28]

---

27. The more so for Parana, where there were (1963) three jeeps available
to the data gathering agency, IBGE, in the whole state. The head of the
Londrinha office minced no words in declaring to the author that their
production estimates were very bad, with little necessary relation to reality.

28. The two other important bean producing States in the Center-South, Santa
Catarina and Rio Grande do Sul, were excluded, since they produce mainly
black beans. None of the directional changes are modifaed, however, by the
inclusion of these.

Table VIII

Dry Season Harvests: Sao Paulo, Parana, Minas Gerais,
Goias, and Mato Grosso.

	Sao Paulo	Parana	Minas Gerais	Goias
1948	82,440	175,253	254,620	26,570
1949	77,280	227,246	286,401	36,245
1950	54,720	237,865	285,953	38,664
1951	50,040	250,557	288,637	40,116
1952	40,020	233,026	249,874	37,801
1953	77,820	295,296	307,049	50,895
1954	48,960	336,964	292,252	61,359
1955	58,200	274,264	298,395	70,009
1956	36,720	227,050	282,934	74,307
1957	78,000	238,345	337,806	65,165
1958	90,000	304,197	331,489	66,188
1959	62,400	306,997	263,925	46,216
1960	114,000	298,780	350,909	76,909
1961	74,400	322,789	324,280	76,418
1962	45,600	339,301*	244,193	69,824
1963	64,800	472,660**	217,580	84,798

Table VIII, continued

	Mato Grosso	Total	Percentage Change
1948	12,914	551,897	
1949	18,540	645,712	17.0%
1950	18,658	635,840	-1.5%
1951	16,130	645,480	1.5%
1952	21,629	582,350	-9.8%
1953	24,106	755,166	29.7%
1954	29,656	769,191	1.9%
1955	28,233	729,101	-5.2%
1956	24,217	645,288	-11.5%
1957	37,018	756,344	17.2%
1958	38,903	830,777	9.8%
1959	46,146	725,694	-12.6%
1960	49,123	889,721	22.6%
1961	51,048	848,935	-4.6%
1962	47,032	745,950	-12.1%
1963	68,168	908,006	21.7%

"Large" harvests: 1949, 1951, 1953, 1957, 1958, 1960, 1963.
"Small" harvests: 1950, 1952, 1955, 1956, 1959, 1961, 1962.

*This figure is pure fantasy, since everything--Bolsa information, conversations with farmers and interviews with cerealistas--indicates that there was a large decline in the production of beans in Parana in 1962.

** This figure overstates the increase in dry season production in Parana, because for the first time, the wet season crop was almost as large as the dry.

Sources: IBGE, Conselho Nacional de Estatistica, Anuario Estatistico do Brasil, various numbers; Divisao De Economia Rural de Secretaria da Agricutura do Estado de Sao Paulo.

Special problems arise with Sao Paulo and Parana, states with two harvests, since the SEP data does not present the dry and wet harvests separately. For Sao Paulo, Divisao de Economia Rural estimates of the dry season production were used. The Problem is less serious for Parana where, unlike Sao Paulo, the wet season crop was generally much smaller than the dry (in Sao Paulo the wet season harvest is usually larger) until 1963. Therefore the figured for total annual production in the state are less likely to misstate the directional change of the dry season crop.

This classification does not correspond to the cerealistas' three way grouping. Their "small" harvest should be classified as "small" and their "large" as "large" under the directional change criterion, but "normal" harvests will also be so classified. In any case, if there are significant differences in the price behavior in the two extreme harvest types, this will also tend to appear in the division employed here.

Seasonals for monthly deflated prices classified into "large" and "small" harvest years according to Table VIII are presented for the Sao Paulo farm series and for "chumbinho especial" and "roxinho especial" on the Sao Paulo Bolsa in Tables IX, X, and XI.

It should be noted again that though the Bolsa de Cereais did not function in beans furing 1959 and 1962 because of unrealistically low ceiling prices on the product, a black market flourished in Sao Paulo in both years, and enforcement outside Sao Paulo and Rio de

330.

Table IX
Seasonal for Sao Paulo Farm Prices (deflated) of Beans, 1949-63*

	"Large" Harvests (1)	"Small" Harvests (2)	(3) Excluding 1959 and 1962	Mann-Whitney U Statistic** For Differences Between (1) and (2) and Level of Significance
May	120.53	89.86	93.71	4(.003)
June	104.85	86.96	88.65	7(.013)
July	98.54	85.35	86.39	9(.027)
August	94.04	95.81	93.96	
September	92.99	109.79	107.52	7(.013)
October	95.16	114.29	112.12	10(.036)
November	93.89	117.94	117.63	10(.036)

* See notes at the end of Table XI.

** See Chapter V, pp 172.

*** presented for comparison with Tables X-XI.

Source: Table II.

Table X

Seasonals for "Chumbinho Especial" (deflated)
Bolsa de Cereais de Sao Paulo (excluding 1959, 1962)[*]

	"Small" Harvests	"Large" Harvests	Mann-Whitney U Statistic and Level of Significance
May	93.54	116.70	4(.015)
June	87.79	101.93	9(.101)
July	89.08	100.29	12(.216)
August	101.68	95.29	9(.101)
September	105.76	95.25	9(.101)
October	111.54	98.71	13(.265)
November	110.60	91.72	8(.074)

[*] See notes at end of Table XI

Source: Table III.

Table XI

Seasonals for "Roxinho Especial" (deflated),
Bolsa de Cereais de Sao Paulo (excluding 1959 and 1962)[*]

	"Small" Harvests	"Large" Harvests	Mann-Whitney U Statistic and Level of Significance
May	107.75	89.66	6(.037)
June	98.06	92.94	10(.134)
July	96.50	88.63	10(.134)
August	96.89	104.31	11(.172)
September	100.07	104.63	11(.172)
October	103.74	111.69	12(.216)
November	96.98	108.15	9(.101)

[*] The year 1954 is excluded from the averages, due to the very
erratic month to month price rises and declines.

Source: Table IV.

Janeiro was practically non-existent. Cerealistas did form large stocks
in these years, and the Sao Paulo farm price is a fairly good indicator
of the price rise on the stocks. Thus we will work primarily with the
complete farm price series.[29]

The average seasonal price patterns for the two groups of
years are completely different. In the "small" harvest years the
trough is reached in July (June for "chumbinho"), after which the
farm real price seasonal rises rapidly, 38.2%, to a peak in Novem-
ber, about 9% per month in real terms (see Table IX).[30] Assuming that
most commercial stocks are formed by August 1 and sold in September-
November, the average rise is 30.5% between the two periods (almost
8% per month real rise). But in large harvest years, prices fall
until September, after which they rise slightly.

1958 is unique, a very large harvest year with large seasonal
price rises (see Tables II-IV). In that year, the most severe drought
in decades occurred in the Northeast.[31] Massive purchases of beans
were made in the Sao Paulo market, both by the Federal Government and
by private merchants from the Northeast, in April-June and later

---

29. Because of the black market, prices in the City of Sao Paulo per-
mitted large distribution profits quite apart from returns in stocks--
perhaps 3 or 4 times the normal net profit on sales.

30. The rises for 1955, 1959, and 1961 are much more pronounced than
this average (see Table II).

31. On this, see Hirschman, Albert O. *Journeys Toward Progress*
(New York: The Twentieth Century Fund, 1963), pp 20-21, and p. 68.

beginning in August. These purchases prevented further declines in prices in the early harvest months when, unlike typical large harvest years, merchants formed large stocks.[32] When demand was increased substantially in August and thereafter, prices reacted strongly. But this was a totally atypical pattern arising primarily from severe external shocks to a usually more or less self-contained market in the South (see Table XII).

Table XII

Total Net Shipments from the South to the North of Brazil
by Coastal Shipping
(tons)

1956	10,588
1957	9,885
1958	82,877
1959	4,473
1960	7,202
1961	17,777

Note: Net shipments equal exports minus imports to states from Bahia Northward.

Source: Ministerio da Fazenda, Service de Estatistica Economica e Financiera, Comercio de Cabotagem do Brasil, 1956-61.

If 1958 is excluded from the average seasonal for "large" harvest years, an even clearer pattern results: on the average real prices of beans " de cores" fall over the entire season (see Table XIII). "Roxinho", which is always carried over from the period under consideration (May-November), shows a somewhat different pattern on

---

32. This information on 1958 is taken from Pedrinho Labate, op.cit, 1958, and from answers to the questionnaire.

the average, but even in it the declines in November are substantial.

Table XIII

Seasonal of Bean Prices in Large
Harvest Years Excluding 1958*

	"Chumbinho Especial"	Sao Paulo Farm Prices	"Roxinho Especial"
May	121.15	123.54	109.16
June	104.40	105.76	96.80
July	104.01	99.70	98.55
August	97.42	95.81	98.45
September	93.72	93.71	102.35
October	94.32	92.71	103.74
November	84.97	88.21	94.25

*Years included: 1949, 1951, 1953, 1957, 1960, 1963.

Source: Tables II-IV

For the Sao Paulo farm price series, the differences in season-
al price patterns between the large and small harvest groups is statis-
tically significant at the 5% level or below employing the Mann-Whitney
nonparametric U statistic (see Table IX).[33] The differences between the
two groups for "chumbinho especial" and "roxinho especial" are not gener-
ally significant at the conventional levels of acceptance, but these

---

33. The Mann-Whitney U was used to avoid the assumptions of normality
often appear not warranted. It is explained in footnote 66 , Chapter
V, p. 172 above.

series omit the two important small harvest years of 1959 and 1962 (the two years with the largest percentage harvest declines in the period) and are thus heavily biased. There can be little doubt that on the average price behavior differs greatly depending upon harvest size.

All years (excluding the very exceptional 1958) characterized by large seasonal price rises (1952, 1955, 1959, 1961 and perhaps 1962) are small harvest years, while all but one of the years with almost continual price declines (1953, 1957, 1960, but not 1956)[34] were large harvest years.

All large harvest years (still referring to the Sao Paulo farm price series) underwent price declines at least through August. What happened after that point in a large harvest year seemed dependent upon expectations about the future wet season crop. In each large crop year (except 1963) in which prices began to rise in September (or later), the following wet season harvest prices were significantly higher than those in the dry season. These years seem to correspond to the pattern described by cerealistas in which significant stocks are made late in the year for subsequent carry-over. When prices did not rise after September, real prices in the following wet season months were inevitably lower (see Table XIV).

_____

34. 1956 was a very confused year. Both Sao Paulo farm prices and "chumbinho especial" on the Bolsa declined over the season, but "roxinho especial", "opaquinho especial" and the prices paid by the largest firm in Parana tended to rise over the latter part of the season.

Table XIV

Large Dry Season Harvest Years When Sao Paulo Farm Prices
(deflated) Rose After September

Year	Percentage Change, Average Real Bean Harvest prices, Dry Season to Wet Season
1949	21.3%
1951	22.3%
1958	78.5%
1963*	n.a.

Large Dry Season Harvest Years When Sao Paulo Farm Prices
(deflated) did not Rise Significantly After September.

Year	Percentage Change, Average Real Bean Prices, Dry Season to Wet Season
1953	-48.3%
1957	-7.9%
1960	-27.4%

* The 1963 Harvest does not fit the pattern. See footnote   , p.

Sources: Average bean prices over each harvest: Divisao de Economia
Rural da Secretaria da Agricultura do Estado de Sao Paulo.
The deflation was performedby the June and January levels
of the Conjuntura Economica's Index No. 2 for the dry and
wet seasons, respectively.

Furthermore, the large crop years with continual price declines show the largest increases in production in the period (see Table VII above). Farm retention until the end of the harvest (whether voluntary or not) was so large to provoke a sizeable carry-over into the wet season, depressing in turn, its prices even further.[35]

A perfect division of seasonal price patterns is not to be expected when so many factors other than verified harvest size influence stocking and sales behavior. Nor does the pattern do justice to the many errors which cerealistas have made in judging the conditions of the market at any particular time. But most years correspond well to one of the three patterns outlined above: large price rises in small harvests, regardless of future harvest expectations; continual declines during large harvests if the subsequent wet season crop is large, and rises after September, if it is small.[36]

If these patterns are combined with cerealistas' descriptions of their stocking behavior and that of farmers, the following general

---

35. Sales of the 1953, 1957, and 1960 crops occurred in the Bolsa de Cereais well into the wet season and even into the following dry season.

36. Only 1956 and 1963 do not fit this pattern. The 1963 dry season rise was not as large relatively as the 21.7% increase shown by the SEP figures (see Table VII above), since much of the increase for Parana was due to the first wet season harvest larger than the dry in the history of the state. 1963 is more a "normal" year than anything else. The price rises after August were caused primarily by a retardation in the planting of the wet season crop because of the worst drought in the hostory of the Center-South of Brazil. 1956 was a confused year in which cerealistas could not make up their minds.

tendencies can be derived for the period April-November, depending
on harvest size. Let:

C_1 = average monthly farm sales, April-August;

C_2 = average monthly farm sales, September-November;

S_1 = commercial stocks formed, April-August;

S_2 = commercial stocks formed, September-November.

Large Dry Season Crop Followed
by Large Wet Season Crop:

$C_1 \leq C_2$

S_1--small

S_2--0 or negative

Seasonal Price Pattern: Down

Large Dry Season Crop Followed
by Small Wet Season Crop

$C_1 \leq C_2$

S_1--small

S_2--significant

Seasonal Price Pattern: Down
until September,
then up.

Small Dry Season Harvest

C_1 C_2

S_1--large

S_2--negative

Seasonal Price Pattern: Up
After Some Early Month,
April-May

Normally, when farmers hold the bulk of existing stocks, prices tend
tobe stable or fall except when the following wet season harvest is
small. However, when cerealistas hold most of the stocks, prices
tend to rise rapidly. Clearly, many cerealistas have lost along
with farmers in many large harvest years,[37] and many farmers have
gained from retentions in small harvests. However, the aggregate
tendencies are as stated.

In a general sense, then, it can be said that when prices
do not rise or rise but little over the season, this is due primarily
to large producer carry-over of beans out of the early harvest months.
When prices do rise a great deal over the season, producer carry-over
is relatively small and middleman stocks insufficient to prevent large
price rises.

---

37. In 1957, for example, four firms in Parana stocked 100,000 sacks
before July expecting a price rise. Most of commerce did not agree,
and in fact price declined over the season. See Pedrinho Labate, op.
cit., various numbers, 1958.

D. Factors Leading to Large Seasonal Price Rises in Small Harvest Years.

A very important question, then, is why, when most farmers sell during the early months of a small harvest year, the seasonals should be as large on the average as they are (cf. especially, 1955, 1959, and 1961, Tables II-IV).

Several factors are important. First, as was seen above (pp. 369-310) even when price rises are expected by cerealistas in the early months of the harvest, they are held with a high degree of uncertainty and therefore must be high enough to pay a substantial ex ante risk premium. By July or August the future situation in a small harvest is clearer to cerealistas, but by thattime, given the relatively large farm sales in April-June, average monthly availabilities remaining for the rest of the season tend to be significantly smaller than in May. Thus price rises will tend to be substantial in small harvests because of poor information and the risk premium.

The risk of stocking beans in a small harvest has been increased by the possibility of government intervention in the market since the formation of COFAP (now SUNAB)[38] in 1951. In 1959, for the first time, COFAP fixed ceiling prices on beans at levels far below those dictated by demand and harvest size (an action repeated in 1962). COFAP (SUNAB) has the power to expropriate stocks at the unrealistic

---

38. Comissao Federal de Abastecimento e Precos--essentially a Brazilian OPA without the effective possibility of rationing.

ceiling prices (usually below the cost of aquisition by cerealistas).
Although it was usually possible to operate in the black market by
bribing COFAP's officials in the field,[39] confiscations and even im-
prisonments did occur in 1959 and 1962, thus raising considerably
the risks of making big stocks during small harvest years. It is dif-
ficult to appraise the effects of COFAP on bean speculation before
1959, when it took its first serious actions in the market. It inter-
vened in rice as early as 1953, and this may be influenced speculators
in beans to some extent also. Since COFAP has never taken adequate
measures to guarantee the supply of beans (or rice) at the ceiling
prices fixed, the principal effect of its actions have been to reduce
stocks, increase effective (i.e. black market) prices in a few cities
and probably increase the ex post profits of middlemen.[40]

Apart from any risk premium, cerealistas also seem to have
underestimated the extent of harvest declines in some years (especi-
ally 1959 and 1961).[41] These errors appear to have reduced carry-over
out of the havest months, aggravating seasonal price movements.

---

39. Enforcement was the province of the state COAP's and the local
COMAP's.

40. Both through higher black market margins and through larger
seasonal price increases. The latter should raise total commerical
profits. See pp. 360-363 below.

41. Bolsa de Cereais de Sao Paulo, Boletim do Setor de Observacao de
Mercados (unpublished, for internal circulation only), various num-
bers, April-September, 1961; pedrinho Labate, op. cit. several numbers,
1959.

In one or two small harvest years, small wet season crops may
have augmented the rise in prices over the dry season months, probably
in 1955 and most certainly in 1961. Carry-over of "de cores" was pro-
bably small in both years, given the changes in appearance which it
undergoes by November, and influence of an anticipated small wet
season crop operated primarily through an increased carry-over of
"roxo (inho, ao)", which, as a partial substitute for "de cores", had
repercussions on the prices of the latter varieties. However, it is
likely that carry-over in expectation of even higher prices, December-
March, was a minor factor influencing seasonal price rises, even in
the two years cits.[42]

But even with the risk premium and frequent misjudgment of
the market, most cerealistas claim that they have been unable to
stock in small harvests all they desired. This was never due to
insufficient suitable storage space, according to them, but to lack
of financial resources.

The magnitude of the swings in the middleman's need for
working capital in beans is tremendous. Moving, for example, from
a large harvest when prices are low and commercial stocks are fairly
small until late in the season to a small one, in which prices are

---

42. Only in 1961 were real prices "de cores" during the wet season
higher than those in the last three months of the preceding dry
season (i.e. September-November).

high and desired stocks are substantial in the early months of the harvest, requires a very large increase in real capital applied in beans speculation.[43] Cerealistas argued emphatically that usually their financial capacity was not able to expand sufficiently to attain the desired level of stocks in these small harvest years. This is completely plausible.

Existing credit facilities are not adapted to efficient speculation in beans. The guarantee of bank credit is not the inventory in stock but the personal and firm net worth of the cerealista. Warrants and negotiable warehouse receipts are very rare in beans. Cerealistas are very reluctant to use public ware-housess where storage charges are significantly higher than in their own warehouses and, perhaps more importantly, there is a much greater possibility of confiscation by the authorities. Finally, and most importantly, cerealistas said that banks, because of the high risk of the product, were very reluctant to discount warrants for beans from public warehouses. When they did, the basis of the financing was very low, e.g. 30-40% of the value of the stocks when credit is extended. For these reasons, no cerealista interviewed admitted to storing beans in bonded public warehouses (either private or govern-

---

43. Even were the same proportion of each harvest stocked by cereal-istas in the early months, working capital needs for beans would be considerably larger in small harvest years, because of the product's inelastic demand with respect to price.

ment owned) as a source of additional financing.

Rather, his main outside source of working capital for specu-
lation is commercial bank loans, either personal promissory notes of
90-120 days or lines of credit, both secured by the net worth of the
cerealista (both inside and outside the firm), a "normal" ceiling
for a medium size cerealista from all banks being 50-100% of net
worth.[44] Even under this system, most larger Sao Paulo banks <u>refuse</u>
to work with cerealistas, preferring the safer and more rapid turn-
over involved in "duplicatas" (a peculiar Brazilian form of the bill
of exchange) tied to sales actually made. These instruments are more
easily rediscounted with the Bank of Brazil, while in the case of
open credit lines, rediscounting is impossible.

Now, these credit limits for speculative purposes are some-
what flexible, depending on the prospects for profit. A cerealista
wanting to stock when the outlook for a price rise is very good will
receive considerably more credit than when it is bad or cloudy. Of
this there is no doubt. But whether these limits are sufficiently
flexible or whether the net worth of the cerealista is sufficient to
guarantee the desired level of financing without unacceptable risk to

44. Other factors are also important in determining this limit: average
level of the account with the bank, the composition of the cerealista's
assets, the amount of collection business the firm gives the bank, sale
levels, etc. But the upper limit is net worth, except for a few large
cerealistas, who by working clandestinely with several banks are able
to reach 2, even 3 times their net worth (see pp. 352 below).

the bank is doubtful.[45] No independent empirical verification was possible. Bankers interviewed refused to give samples, preserving anonymity, of a number of cerealistas' net worth and their credit limits and utilization over the years. No cerealista (understandably, given their distrust of outsiders and heavy tax evasion) would divulge concrete bookkeeping figures on this subject which might have given some indication of the flexibility of such credit and just how far it can be expanded in relation to the cerealista's net worth.

The upward trends in bean prices since 1949 lend some credence to the hypothesis that, at least in later years, lack of financial resources may have been a serious limitation on stocks (see Table IV). Except for 1961, there has been a continual upward trend in small dry season harvest prices. Tostock one sack of beans in 1959 required almost twice as much real capital as in 1955, another small harvest year, and in 1962 more than 2 1/2 times as much. The substantial rise in real prices may have created severe strains on the cerealists's ability to stock.[46]

---

45. Sometimes it appears that SUMOC, the organ charged with monetary policy, attempts to restrict credit extended by commercial banks for speculative purposes during years when harvests are small on the assumption that it is speculation that creates high prices. SUMOC may set percentage limits on such credit or may diminish the rediscounting possibilities of promissory notes to cerealistas. These regulations are all confidential (i.e. not available to the public), but several bankers mentioned the use of these restrictions during 1963.

46. Since beans has an inelastic demand, the total value of any given proportion of the harvest stocked is greater in the high price years.

Table XV

Real Sao Paulo Farm Price of Beans
(1948 Cr$)

	Average Dry Season Harvest Price**	Three Year Average
1949	75	
1950*	113	100
1951	112	
1952*	136	
1953	147	141
1954	140	
1955*	203	
1956*	225	189
1957	139	
1958	107	
1959*	389	236
1960	212	
1961*	177	
1962*	539	328
1963	267	

*Indicates "small" harvest year under the directional change criterion adopted in this chapter.

** Weights: April-September: 70%; October-November: 30%.

Sources: Divisao deEconomia Rural da Secretaria da Agricultura do
           Estado de Sao Paulo for average harvest prices. Deflation
           was performed by the June level of Conjuntura Economica's
           index No. 2.

Against this rise in prices must be placed two trends in real working capital available to cerealistas for speculation in beans. First, there has been a marked increase during the 1950's and early 1960's in the cerealista's ability to obtain credit in relation to his net worth.[47] At the same time, however, there has been a severe dis-investment (or reduction in retained earnings in the form of cash) in the cerealista's own real working capital[48] primarily into real estate.

Cerealistas have always "diversified" their assest somewhat through real estate holdings,[49] but with the quickening of inflation in the 1950's and the improved possibilities of bank financing, at negative rates of interest, the rush into real estate has augmented considerably. In the words of one cerealista when asked whether he was taking his profits out of the firm for real estate, "of course,

---

47. The principal causes of this increase seem to be an increasing degree of "respectability" of the cerealista and a generally easier monetary policy. In addition, the cerealista's increase in credit sales, which supply a more secure guarantee for loans, must havebeen an important factor (see below, pp. 349 -351   ).

48. This statement is based primarily upon bankers' general statements about the cerealista's financial condition. It is a theme common to the Bank of Brazil and private banks. Most cerealistas also agreed to this general statement in reference to the "average" cerealista, although naturally enough, individual cases depart widely from the norm.

49. Some of the old oligopolists (see Chapter V) have become substantial rentiers. One firm which has continued under the management of its founder's sons has one entire department dealing only with the administration of the partners' real estate holdings. Another large cerealista of that time (who has ceased to operate) owns several city blocks of buildings in the wholesale district.

I'm no fool!"

In addition to providing a certain hedge aginst the inflationary
"tax" on occasionally idle funds, real estate holdings may also be
included in the net worth of the cerealista and serve as collateral for
bank financing. Thus the net effect of working capital dis-investment
upon the potential liquidity available to the cerealista has probably
been minor.[50] On balance, then, it would appear that real working
capital available to cerealistas has expanded (taking out the trends
of production) in the last decade.

Another consideration is important. Although there has been
a signficant increase in real working capital available from banks,
its composition has turned heavily agianst the type of credit preferred
by cerealistas: the line of credit and to a lesser extent, the promis-
sory note. More and more of his credit limit is confined to facilities
for discounting "duplicatas" (see page #15 above) on his own sales,
normally of 45 days maturity.[51] The "duplicata", essentially an ex-
tension of credit to the buyer, may be used to finance stocks only if

---

50. Many banks prefer real estate holding outside of the cereals busi-
ness as collateral. It diversifies assets and does not involve as much
risk. However, the value of real estate must be discounted somewhat
because ot its illiquidity.

51. With the industrial spurt of the 1950's, banks are increasingly able
to utilize theirloan capacity to discount commercial paper, which is more
desirable for the banks given its more rapid turnover, its lower risk
and the greater facilities for rediscount than the promissory note or
the open line of credit.

the cerealista buys from another merchant who will extend this
credit. It is an important source of finance (especially in rice),
but its short duration (45 days) makes it a much less satisfactory
instrument for speculation. How much of the increase in bank credit
available to cerealistas is accounted for by such discounting
facilities is impossible to say, but it must be substantial.

Now, whether these trends--rising real bean prices, greater
working capital accompanied by an adverse change in its composition--
mean that financial limitations in the late 1950's and early 1960''s
have reduced stocks formed in beans by comparison with earlier years
is impossible to say in the absence of detailed and accurate financial,
stocking and production statistics. Most cerealistas felt that
stocks had been so reduced, but there was significant disagreement
with this proposition.

Quite apart from this trend problem--can commerce today
stock as much as it could in the past--cerealistas were emphatic in
the declarations that lack of financial resources had limited their
level of stocks in small harvest years. For a small minority, all
potential financial resources have at times been employed in beans,
and even further stocks were desired. In these cases, financial
limitations were an absolute constraint on stocks in beans. But most
frequently, even though large price increases were expected in beans,
cerealistas have never devoted their whole financial capacity to
that crop alone. The risk is far too great, and only under very

unusual circumstances would a bank knowingly permit concentration

in beans when the cerealista is "loaned up". For the majority, had

greater total financing been available at constant or slightly

higher costs,[52] stocks of beans in small harvest years would also have

been larger--while preserving some degree of diversification in

stock composition between beans, rice and corn. As it was, overall

limitations on their credit coupled with the need for diversification

and the prospective gains from stocking other crops "restricted"

the quantity of beans they stocks.

If the credit were more flexible, more closely linked with

the value of stocks instead of the value of net worth, both the

absolute constraint on the more adventuresome cerealistas and the

reluctance of the majority to concentrate their stocks too heavily

in one risky product would be alleviated to some extent. As it is,

a credit "bottleneck" may often appear, especially when all cereals

harvests are small.

Besides restricting stocks to levels causing larger seasonal

price rises in some small harvest years, the existing credit system

has other undesirable consequences. Because of it, competition in

speculation is restricted and the gains from it concentrated among

the larger firms with good bank credit. Bankers and cerealistas

---

52. i.e. excluding private moneylenders who normally charge high
real rates of interest, usually too high for cerealistas who almost
all denied having recourse to them.

alike agreed that small firms may receive bank loans only with great
difficulty. The larger the firm, the greater the potential credit
in relation to net worth. Whereas a small firm may receive nothing,
medium size firms may approach with difficulty the 100% limit on
credit, and the largest, by working with several banks may (clandes-
tinely) achieve 2, even 3 or 4 times their net worth in loans.[53]
Primarily because of this factor, stocks of beans are much more con-
centrated that total sales. In the words of one large cerealista
in Parana, because of the existing system of credit, 5 or 6 firms
"take control of the market" (tomam conta do mercado) in Sao Paulo
and Parana. In Parana there are perhaps 5 firms able to stock beans
in quantity.[54] In addition to these, there are perhaps 4 or 5 others
in Sao Paulo City who have the capacity to form sizeable bean stocks
(i.e. greater than 10,000 sacks). The rest are all considerably
smaller. The ambulante, who has taken a large chunk of all the cereal-
istas' sales (see Chapter VII, pp 26-33), is of practically no im-
portance in stocking. The small interior merchant accounts for some

---

53.According to some bankers. One cerealista went so far as to say
15-20 times net worth, surely an exaggeration. The author knows of
one large Sao Paulo cerealista with capital in a new bank. Strangely
enough, the firm, contrary to the universal practice of large firms,
works only with one bank.

54. Only this number of firms had total warehouse capacity exceeding
20,000 sacks

stocks, but according to information obtained in Porto Alegre and
Sao Paulo, all these merchants in Rio Grande do Sul, Santa Catarina
and Parana combined may have had about 150,000 sacks of beans in
stock in Early August, 1963, whereas one large cerealista alone
possessed at least 50,000 sacks in September, 1963.[55] Were credit
for stocking clearly related to the value of the inventory this
situation could not persist to the present degree.

The results of this concentration for the general efficiency
of speculation are not clear. Many times the author was told that
one or more firms regularly dumped on the Sao Paulo Bolsa during
the harvest months in attempts to panic farmers (and other merchants)
into sales at lower prices (an exercise similar to the Rio Grande
do Sul rice oligopsony). Frequent speculative manipulation by the
largest firms on the Sao Paulo Bolsa were reported.[56] The largest

---

55. The figure on interior merchants' stocks was given by Glitz, S.A.,
a Porto Alegre firm which deals with hundreds of these merchants; the
50,000 figure was common knowledge on the Sao Paulo Bolsa. In earlier
years, this same cerealista (with 50,000 sacks in stock) normally formed
100,000-200,000 sacks of beans when price rises were expected. The
decline in stocks was often given by cerealistas as proof of the decline
of their capacity to stock. However, in this case it probably arose
fom the firm's shrewd concentration incorn in 1963, a product which almost
tripled in price before the season ended--and without the threat of
government intervention.

56. e.g. 1958, when the market situation was unclear, the largest firm
was supposed to have ordered substantial sales forcing lower prices,
succeeding in creating general expectations of further price declines.
At the same time, this firm was able to buy up from panicked merchants
several times its original sales. After the episode, it was supposed
to have begun an upward price movement.

firm, in particular, is feared and respected, by most cerealistas.
In a market where information is so poor and where one firm with better
information than most is felt capable of moving prices should it so
desire, the possibilities for leadership and followership in price
rises and declines should be substantial. Most cerealistas, however,
felt that this did <u>not</u> occur to any significant extent. In the words
of one, "the other large cerealistas would not follow, and even if the
small ones did, they would make no difference." <u>Combinations</u> of
large merchants to depress and raise prices were held impossible in
beans. Rather the possibility of short-term gain at the expense of
other firms overrides such a potential combine in beans. There is
little tangible evidence to contradict these statements.

In summary, then, high risk, financial limitations, and under-
estimation of the extent of harvest declines in some years appear to
be the principal elements accounting for large average seasonal price
rises in small harvest years when farmers themselves are selling off
their crop rapidly in the early months. Because of risk and credit
restrictions, the marginal cost of storage to the cerealista is
high, and large price increases must be expected before sizeable
stocks are formed. These reduced stocks combined with the small farm
carry-over lead to large price increases in the 4 or 5 interharvest
months.

555.

III. The Effects of Speculation Upon Farm Incomes and Commercial Profits.

These large seasonals in small harvest years have almost certainly reduced the average price received by farmers for their crop and likely have increased total commercial profits at the same time. In Chapter II it was shown for a two period time horizon, with farmers selling the bulk of their output in the first period (harvest months), the smaller the level of commercial carry-over (i.e. the higher the consumption in the first period), the lower the average farm price received. Continuing with the same notation,[57] the partial derivate of farm income with respect to consumption in period 1 (reduction in commercial carry-over into period 2) is:[58]

$$(1) \quad \frac{\partial V_f}{\partial Q_1} = (1-\pi)(C_1 \frac{df}{dQ_1} - C_2 \frac{df}{dQ_2}$$

For linear and concave demand curves, this derivative is always negative (when $Q_1 < Q_2$ and $C_1 < C_2$), and in the convex case, it is negative over a large range before turning positive (see Chapter II, pp. 3-4 and Appendix 1). A small dry-season bean harvest fits this pattern fairly well: farmers sell most of their output in the

---

57. See Chapter II, pp. 21-22. Q_1 = consumption in period i, V_f = total farm receipts given the division of a fixed harvest, H, between farm sales in periods 1 and 2, C_1 and C_2. $f(Q)$ is the consumer demand function, and π, the (oligopsonistic) profit function.

58. See Chapter II, p 34 .

early months, middleman carry-over into the interharvest is relatively small, creating the large price increases. The effect is to reduce farm incomes. Similar results follow in a 3 or 4 period model (which is perhaps more realistic) when farm sales are concentrated in the harvest (i.e. the first 2) periods, as is the case in small dry season harvests.[59]

A qualification is necessary: commercial carry-over of the wet season crop into the dry season has often been significant in small harvest years. Carry-over of "de cores" out of the dry season has generally been very small, owing to the deterioration of appearance noted above. If it can be assumed to be negligible, then

$$Q_1 + Q_2 = C_1 + C_2 + S_o$$

where S_o is the carry-over into the current dry season. The derivatives of farm receipts with respect to increases in Q_1/Q_2 (i.e. $\frac{\div V_f}{\div Q_1}$) are unaffected in form and sign by this modification, and the general conclusions still hold.

When significant carry-over out of a small dry season has

---

59. It is necessary to show only that when $C_1 > C_2 > C_3 > C_4$, any increases in consumption in periods 1 or 2 at the expense of that in 3 or 4 reduces farm receipts. It is clear that in linear or concave demand functions an increase in $Q_{1 (2)}$ at the expense of $Q_{3(4)}$, with the C's fixed, reduces V_f in equation (1), p 355, as long as the specific pattern of C's holds. This is also true from a broad range of $Q_{1(2)} > Q_{3(4)}$ for convex demand function.

occurred (as in 1961) in anticipation of even higher prices in the wet season, the two harvest model of Chapter II is relevant. It is very likely (given uncertainly) that expectations of future price rises in the coming harvest affected prices only after the last harvest months of the dry season, i.e. after September. Now this added carry-over would raise prices somewhat in the late months (partially accounting for the high seasonal that year) and thus farm incomes to the extent that producers still retained some of their output. Even so, average farm prices were lower than they would have been had carry-over out of the early harvest months been more adequate to prevent large seasonal price rises even in the absence of expected price rises in the future harvest. It is possible, in fact, that the net effect of carry-over into the wet season on farm incomes over the two harvest horizon is actually negative. Assume three periods, two in the dry season (8 months) and one in the wet (4 months).[60] Carry-over into the third period is assumed to affect consumption only in periods 2 and 3 (i.e. the price increase was not anticipated until September at the time of planting), reducing the former and increasing the latter. Then,[61]

---

60. Farm sales are spread out fairly evenly December-March.

61. It will be recalled that in Chapter II it was assumed that where commerce received an oligopsony profit, this was to be proportional to retail price.

$$V_f = [(1-\Upsilon)f(Q_1)-m_1']C_1 + [(1-\pi)f((Q_2)-m_2']C_2$$

$$[(1-\pi)f(Q_3)-m_3']C_3$$

$$\frac{dQ_2}{dQ_3} = -1$$

m_1' is the marginal spatial distribution cost and is a function of C_1.

(2)
$$\frac{\partial V_f}{\partial Q_3} = -\frac{df}{dQ_2} C_2 + \frac{df}{dQ_3} C_3 \quad {}^{62}$$

If $C_2 < C_3$, the derivative is negative in the concave and linear cases, and **may** be negative with a convex demand function depending upon C_2/C_3.

Thus the general conclusions about the effects of smaller carry-overs from the harvest months of the dry season into the inter-harvest seem valid even admitting carry-over in and out of a small harvest.

B. The Effect of Large Seasonal Price Rises in Small Harvests Upon Commercial Profits.

But if the farmer loses, it seems likely that middlemen in the

---

62. In the linear case, $\frac{df}{dQ_i} = -b$. Thus the negative second term of (2) has a larger absolute value than the positive first term. This holds a fortiori in the concave demand where $\left|\frac{df}{dQ_2}\right| < \left|\frac{df}{dQ_3}\right|$.

The convex demand case depends upon Q_2/C_3 (see Appendix 2).

aggregate gain by these speculative defects, even though much of the
higher profit seems necessary in order to induce them to stock as
much as they do (risk premium). Real seasonal price rises on the
average, approximately 8-9% per month in the complete Sao Paulo farm
price series,[63] are far greater than marginal costs of physical storage
which may be at most 2-3% per month, including spoilage and loss of
weight.[64] Assuming all stocks are liquidated before the next harvest,
this implies for own working capital a real profit of 5-7% per month
from stocking beans in a small harvest. If bank credit is utilized
(the greater part of working capital applied), interest rates are
almost always negative,[65] giving higher real returns with no capital
invested (see page 217 above). In 1963, for example, normal bank
rates were about 2.5-3.0% per month and the maximum about 4% (in
Minas Gerais), while inflation was about 5% per month. Because of
credit rationing, the marginal cost of credit may often have been
infinite to cerealistas, as they have claimed, but the actual realized
cost of credit at the margin was probably no higher than 4% per month
in 1963.

---

63. These are the average trough to peak and May-July to September-
November rises. See page 333 above.

64. The rates in CAGESP, a Sao Paulo owned public warehouse system,
are generally less than 1% ad valorem including insurance. Rates in
the cerealistas own warehouses should be somewhat less. 2% spoilage
and loss of weight is a high estimate for most firms. The normal
would be about 1%.

65. Legal maximum rates are 12% They are subconvented to some extent
through various service charges.

These figures indicate a carry-over generally smaller than that necessary to yield marginal total costs of storage net of the risk premium. As was seen in Chapter II, such smaller carry-óvers tend to raise the total profits of middlemen, in both two and four period models. With the linear demand function, it was seen that the profit maximizing levels of consumption implied in the carry-over pattern were for the four period, no carry-over in or out of the four period harvest year (see Chapter II, p. 49):

(3) $Q_t = H/4 + 1/2(1-\pi)(C_t-H/4) + (\sum s_t'-z)/2b$

where Q_t is consumption inperiod t, π is the oligopsonistic profit margin, C_t = farm sales in Period t, H is total harvest size, s_t' is the marginal cost of storage in period t, b is the slope of the linear demand curve and $z = (3s_3' + 2s_2' + s_1')/4$.

If the assumptions are modified to allow for commerical carry-over into the small harvest, but still assuming no carry-over out of it, the general picture is not changed significantly. If S_o is the predetermined commercial carry-over, the profit maximizing seasonal patterns of consumptions in the linear case is:[66]

---

66. In the proofs in Chapter II, pp. 46-48 , one change is required. Instead of the constraint $\sum Q_t = H$, the harvest size, we have $\sum Q_t = H + S_o$. When substitutions are made in the solutions for λ and Q_t, only the $\sum Q_t$ terms are modified from H to $H + S_o$. The rest of the solution is identical.

(4) $Q_t = (H+S_o)/4 + 1/2(1-\pi)(C_t-H/4) + (\Sigma s_t^i-z)/2b$

The additional availability (S_o) is, so to speak, allocated equally between all periods in the profit maximizing solution, as can be seen by comparing the first terms of (3) to (4).

In this 4 period model suppose, as is the case in small harvest years, the $C_1 \approx C_2$, and both are much larger than C_3, which in turn exceeds C_4. Each period refers to two months beginning with April-May and ending with October-November. Profit maximization requires, in the linear case, that prices in the first two periods be more or less equal, while large rises should occur in both periods 3 and 4. Suppose $C_1 = 45$, $C_2 = 40$, $C_3 = 10$ and $C_4 = 5$, with S_G at 20. Then the Q's required for profit maximization, if π .1 and storage costs are 0 would be: 39, 36, 23.25 and 21. The higher the marginal storage cost and the lower the π, the greater the seasonal distortion required to maximize profits.[67]

Now, it is <u>not</u> maintained here that speculation in small harvests ever reached profit maximizing degrees of distortion. What is argued is that the distortions in stocking which do occur, by reducing consumption in periods 3 and 4 (below the level necessary to

---

67. Although it is impossible to solve explicitly the profit maximizing patterns of consumption in concave and convex demand functions, large distortions are required to maximize profits in these cases also.

marginal realized costs of storage) when they are still above their
profit maximizing levels, augments middleman profits considerably
above what they would be were dredit and information better adapted
to efficient speculation.[68] Imperfections which, under current
conditions of farmer selling behavior, tend to reduce producer incomes
and consumer welfare tend on the other side to increase the profits
of cerealistas in small harvest years.

If price actually rises in the following wet season harvest
and some carry-over is undertaken into it from the late periods of
a small dry season crop, commerical profits are increased even more
(the value of their stocks in period 3 and 4 is increased). It is
very likely that only under such conditions will carry-over out of
a small dry season harvest be undertaken by cerealistas.[69] There
is one notable exception. With the variety "roxo (inho, ao)" signi-
ficant carry-over into the December-April period almost always
occurs, even out of a small dry season harvest, and it is undertaken
primarily by the merchants and "fazedeiros" of Minas Gerais and
Goias. This carry-over, because de cores and "roxo (inho,ao)" are
partial substitutes, tends to raise prices of "de cores" even more

68. As long as consumption in periods 3 and 4 is above, and that in
periods 1 and 2 below their profit maximizing levels, a shift from 3
or 4 to 1 or 2 will increase profits.

69. It is possible that if the wet season crop is very small cerealistas
profits could have higher had they stocked more in periods 1 and 2. This
of course, they could not foresee at all before the planting in September.
But as was seen in Chapter II, it is also possible that actual realized
carry-overs in beans were even in these conditions greater than those
which would have maximized profits.

in the interharvest months, thus increasing both the profits of
merchants dealing with "de cores" and farm incomes to the extent
that some output was retained by them for later sale. Often how-
ever, as in 1955, 1959, and 1962 the extent of the carry-over has
not been justified by market conditions (i.e. the wet season harvest
was larger), with consequent speculative losses by the merchants,
primarily of Minas and Goias, who stocked "roxo (inho, ao)".
Without great distortion, we can divide commerce into two segments,
that of Sao Paulo and Parana working primarily with "de cores" and
that of Minas Gerais and Goias, stocking "roxo (inho, ao)". When
these speculative errors are made by the generally less adequately
informed merchants and fazendeiros of these last two states, it is in
effect a gain for the Paulista holding stocks of "de cores" in the
interharvest months.

Thus aggregate (non-Minas Gerais-Goias) commercial profits
are most likely higher because of the defects of speculation in
"de cores" in small harvest years. As was seen above, primarily
because of the existing credit system, stocks and therefore the
profits from speculation in small harvest years tend to be highly
concentrated among the larger cerealistas. There appears to be a
definite conflict of interest between larger and smaller merchants.
The former gain most when harvests are small and the profits from
speculation large. The latter thrive in large harvests when there
is a more or less even availability of the product from the farm

which allows them to turn over their small capital rapidly at more
or less full capacity. In small harvests, their utilization of
capacity is very uneven and their volume of business much smaller.
In the interior many small merchants close up for lack of business.
Even though total commercial profits are probably higher in most
small harvests, the bulk of this gain accrued to larger cerealistas
able to stock. It is even likely that for the small firms with
little access to bank credit profits on beans are even smaller in
the short harvest years.

Speculation in beans, then, suffers from serious defects.
When farmers sell early and the burden of stocking is placed on
commerce, prices rise rapidly over the season. It is also quite
likely that if, instead of holding back large parts of their pro-
duction for later months, farmers attempted to sell an equally large
proportion of their output in large harvests, inadequate off-farm
storage in Parana coupled with the high risk of forming very large
stocks early in the harvest year would lead to equally serious
price rises over the season. Even though farmers have often over-
shot the mark in retention--and thus in this sense are unsuccessful
speculators on the whole--there is little doubt that their total
incomes would have been even smaller had they instead sold most in
the early harvest months. When prices remained constant or fell
over the season as they did in several large harvests, farm income

was reduced considerably below what it would have been in a fairly
efficient competitive market, to which must be added the high rate
of crop spoilage in farm storage. Thus speculative defects have
reduced prices transferred to farmers both in small and large har-
vests, and thus, to the extent that producers respond to price in-
centives, the level of production.

Commercial speculation is poor (and biased), and in most
cases farmers must rely on their only recourse against such defects,
viz. their own carry-over. Since farmers are genrally badly informed
on longer range market prospects, this often leads to mistakes.

But if the average price received by farmers has been de-
pressed by speculative defects. the uncertainties and risks sur-
rounding the average return have been increased. The best defense
against the uncertainties and instability of the bean market is
not to plant the crop (regardless of the level of price transferred).
Added to the uncertainty of yields, this has been a strong force
retarding the commercialization and technical progress of the crop.[70]
Beans has been a frontier product, grown primarily on new lands and
often in conjunction with coffee. After a few years, yields begin
to fall off rapidly, and the crop must move on. As the coffee expan-
sion has almost come to a halt and the practice of interplanting

---

70. For instance, marketing uncertainties have led several Japanese
cooperatives in Sao Paulo State to discourage production of beans
by their members.

between the mature trees has declined considerably (see Chapter IV,
pp. 270), the most important of the traditional expansion paths
has been closed. More and more the increase of bean production depends
upon its adoption by commercial farmers employing more intensive
techniques on the older lands. This response has not been forth-
coming, in good part because of the marketing defects highlighted
above. The result has been the precipitous increase in the real
price of an important food staple for the Brazilian working classes
(see Table XV, page 347 above). Thus while marketing over space and
vertically through distribution channels has improved to some extent
and is relatively efficient, raising farm prices in relation to
effective wholesale prices, defective speculation remains a serious
marketing retardant to the commercial production of beans.

Several measures should be taken to improve the efficiency
of beans speculation. First, serious efforts must be made by commerce
and the public authorities alike to improve the quantity and quality
of production, stock and price information available to farmers and
merchants. The ultimate goal should be the complete revamping of
Brazil's agricultural data system and its methods of dissemination.
That will take years. In the short-run the Ministry of Agriculture
in cooperation with the State Department of Agriculture should place
marketing agents in every important interior market center to report
regularly on prices and stocks in addition to general longer-run con-
ditions of production and market outlook. A declaration of stocks by

merchants should be made compulsory (if the threat of expropriation were removed), punishable by heavy fines. The information so gathered should be disseminated promptly on the several commodity exchanges, (Porto Alegre, Sao Paulo, Belo Horizonte and Rio de Janeiro), on the radio and in newspapers with regular circulation in the interior.

A second front requiring action is the system of credit for speculation. Every effort should be made to guarantee the adequacy and flexibility of credit for stocking by introducing financing based on goods in stock in addition to the credit now based on net worth. Bank financing for 50% of the inventory value (a discount of 50% should cover all risk for the bank) should be relatively easy to introduce if inducements were given by the monetary authorities in the way of rediscount facilities and if commercial organizations such as the Bolsa de Cereais cooperated. in the liquidation of such stocks as had to be possessed by the banks. This measure would be plitically unpopular--giving more money to merchants "to speculate with the hunger of the people", and it would have to be approached very carefully.

Third, the whole question of the adequacy of transportation and storage space in Parana for large harvests must be studied in detail. As it is, we have only the vaguest notions of existing capacity and the demands for its use. The possibility of the construction of public warehouses in Parana with facilities for discounting by

farmers should be examined critically.[71] It may be, with the generally small lots and wide variations in quality, that this is not an economically feasible alternative.

Finally, the Federal Government's minimum price program, ignored heretofore because of its very marginal impact on the bean market,[72] should be strengthened and revised in its goals toward a buffer stock arrangment directed to preventing the large harvest to harvest price swings and to preventing substantial seasonal price rises (limiting them to some level, say 4% per month, still yielding some profit to storage. In other words, the government itself should probably undertake much of the stocking burden. Such moves, given present informational and bureaucratic capacity, often would destabilize the market. Because of the necessity of the rotation of such buffer stocks of "de cores" before or at the beginning of each new harvest (to avoid the deterioration in the quality of the stock), highly capable personnel with good market information would be required for a generally beneficial working of such an operation.

---

71. Even when there is a large statistical deficit in storage space, the provision of these facilities does not guarantee their use, especially by small farmers. The most blatant example of this fact is CAGEP (General Warehouse Company of Pernambuco), where facilities with a capacity of over 66,000 tons were utilized at most at 7.6% of capacity in 6.7% in 1961. Instituto Joaquim Nabuco de Pesquisas Sociais, Problemas do Abastecimento Alimenter no Recife (Recife: Ministerio da Educacao e Cultura, 1962), pp. 186-88.

72. See Agricultura em Sao Paulo, VII, 8 (Agusto de 1960), pp. 1-26.

SPECULATION IN RICE

Speculation and seasonal price movements in rice are much more satisfactory than in beans, accounting in part for the better long run performance of the crop in the post-war period. In this chapter quantitative evidence on the magnitudes of price seasonals in the crop is presented, indicating that on the average the return to storage of rice has not diverged greatly from the probable marginal cost of storage. Several factors accounting for the differences between rice and beans on this count will be examined briefly: the physical qualities of the crop in storage, better market information, more adequate credit facilities, and probably the minimum price program of IRGA (Rice Institute of Rio Grande do Sul). It will be shown that there are no significant trends in seasonals in the post-war period in Porto Alegre and Sao Paulo wholesale prices and in farm prices in Sao Paulo State, while there have probably been declines in seasonals in the newer producing regions (Minas Triangle and Goias). These facts, in combination with the downward trends in margins over space and vertically through market channels, permit us to conclude that realized total margins have declined through the wholesale transaction and that rice producers today are receiving a considerably larger proportion of the real wholesale value of the crop. This reduction in margins has, contrary to the hypothesis commonly accepted in Brazil, stimulated the production of rice.

1. Magnitude of the Seasonals in Rice

Tables II-III present average quarterly seasonal price indices

for "Amarelao Especial" on the Bolsa in Sao Paulo (1946-61), for medium
and short grain rice on the Porto Alegre Bolsa (1948-60 and 1950-60) and
for Sao Paulo farm prices of paddy rice (1949-63).[1] Each quarterly
seasonal was computed as a ratio to the average price for the commercial
year, April-March (for farm prices, March-February). In symbols,

Seasonal for quarter t in any given year i =

$$\frac{\sum\limits_{i=1}^{3} Pit}{\sum\limits_{t=1}^{4} \sum\limits_{i=1}^{3} Pit}$$

t = 1...4, the quarter

i = 1...3, the month of the quarter

Average quarterly prices used in the calculation were deflated (quarterly)
by the geometric rate of price increase implicit in the rise in the
Conjuntura Economica's price index No.2.[2] That is, the rate of price in-
crease applied to each quarter, April-June to January-March of commercial
year t is "i" in the equation, (annual average of index no.2) $t+1=(1+i)^4$
(annual average of index no.2)$_t$, where the annual averages are on a calendar
year basis. There is a close correspondence between the rise in the general
level of prices from April-June quarter to the following April-June quar-
ter and in the rise of annual averages calculated on a calendar year

1. The choice of years was dictated by the availability of data at the
time of writing. Since there are no significant trends in seasonals
(see pp.371 below), averages were computed for the period as a whole.

2. A weighted average of the wholesale price index, the Rio cost of living
index and the cost of construction index. This, to repeat, is the closest
thing to a general price index which exists in Brazil.

basis (see Table I). That is,

$$\frac{\text{April-June}_{t+1}}{\text{April-June}_t} \approx \frac{\text{Annual Average}_{t+1}}{\text{Annual Average}_t}$$

Thus the present method of deflation closely approximates deflation by the seasonally adjusted general level of pirces.

Quarterly and monthly seasonals for Sao Paulo farm prices using the method of ratios to 12 month centered moving averages are presented in Tables III and IV.[3] Comparison of the two procedures (deflation by the general price index and moving averages) indicates a close correspondence between average quarterly seasonals for farm prices. (See Table III)

Table I

Rises in the Conjuntura Economica Price Index Number 2

	April-June to Following April-June*	Calendar Year Average Year to Year
1952/53	13.1%	14.9%
1953/54	30.6%	27.0%
1954/55	14.8%	16.5%
1955/56	18.0%	19.6%
1956/57	16.8%	14.1%
1957/58	13.8%	13.4%
1958/59	37.0%	38.0%
1959/60	28.8%	28.8%
1960/61	34.7%	37.4%
1961/62	51.2%	51.7%
1962/63	72.0%	73.7%
1963/64	91.9%	91.0%

*Both quarterly and annual averages are simple arithmetic means.
Source: Conjuntura Economica

---

3. Instead of deflation by a general price index, this method deflates by a moving average of rice price itself, thus eliminating most of the general inflationary bias of the raw series.

Table II

Average Quarterly Deflated
Price Seasonals of Rice

	"Amarelao Especial", (long grain), Sao Paulo Bolsa, 1946-61, excluding 1952-54 and 1958	"Blue Rose Especial" (medium grain), Porto Alegre Bolsa, 1948-60	"Japones Especial" (short grain), Porto Alegre Bolsa, 1950-60
April-June	96.90	98.96	99.24
July-September	96.24	98.24	98.05
October-December	101.44	100.43	99.50
January-March	105.45	102.37	103.21
Percentage Rise: July-September to January-March	9.57%	4.20%	5.26%

Sources for original price data: Bolsa de Cereais de Sao Paulo and Bolsa de Mercadorias de Porto Alegre. "Amarelao especial" prices are the monthly averages of transactions registered. Porto Alegre prices are the monthly simple averages of daily quotations.

Table III

Quarterly Seasonals of Paddy Rice Prices
Paid to Sao Paulo Farmers, 1949-63

	12 Month Moving Average Method*	Deflation by General Price Index
March-May	94.45	94.87
June-August	95.36	93.67
September-November	104.09	104.20
December-February	106.10	107.26
Percentage Rise, March-May to December-February	10.2%	14.5%

*Each quarterly seasonal was calculated as a simple average of the monthly seasonals on Table IV.

Source: See Table IV.

Table IV

Monthly Seasonals of Paddy Rice Prices Paid to Sao Paulo Farmers,
1949-63, 12 Month Moving Average Method

January	108.29
February	101.42
March	95.11
April	92.75
May	95.48
June	94.40
July	94.21
August	97.46
September	100.72
October	104.34
November	107.22
December	108.60
Percentage Rise,	
April-December	17.1%

Source: Original price data from Divisao de Economia Rural da Secretaria
da Agricultura do Estado de Sao Paulo.

The average rises in prices from trough to peak are moderate,
a monthly arithmetic mean of about 2% per month in paddy rice farm pri-
ces (both in the quarterly and monthly seasonals), of 1.6% per month in
"Amarelao Especial" and less than 1% per month in the Porto Alegre mar-
ket. 2% per month or less seems, then, to be the typical seasonal real
price rise in the Center-South.

Although no reliable information is available on realized costs
of storage, including weight loss and spoilage, this gross return to
storage does not seem obviously above marginal costs of storage plus some
"normal profit" on capital. In public warehouses, storage costs of <u>milled</u>
rice have fluctuated around 1% of value per month (higher for paddy rice),

depending upon the price of the product at the time.[4] To this must be
added loss of weight in storage and spoilage, for which no estimates
are available. Real profits, including risk premium, on own working
capital employed[5] at the margin are thus moderate, probably not exceed-
ing 1% per month. In Porto Alegre, storage on the average seemed to
create losses, instead of gains, the seasonals were so small.

II. Factors Explaining the Small Seasonal

Several factors seem to account for the much more satisfactory
performance of storage in rice than in beans. First, unlike beans,
there is only one major harvest influencing price patterns over the year
instead of two. The market situation is thus not changing so rapidly in
rice. In addition, unlike beans, rice does not deteriorate in quality in
storage. Paddy rice may be stored indefinitely in the mills using
rudimentary procedures (sack storage with periodic fumigation)[6] without
any appreciable decline in quality. In fact, when the new harvest has
begun to flow into consuming centers, old crop rice sells at a premium

---

4. Based on the rates of CAGESP (The General Warehouse Company of Sao
Paulo), 1960-62, including fumigation and assuming that the depositor
performs all the freight and loading services himself.

5. In several years (with Amarelao Especial, in 1946, 1949, 1950, 1957, and
1960), prices declined over the seasons, giving losses to storage. Al-
though the seasonal is small and stable compared with other cereal pro-
ducts in Brazil, losses still frequently occur on storage, probably creat-
ing a certain ex ante risk premium in rice.

6. The biggest problem has been the control of humidity in the warehouse.
Humidity higher than the optimal is the single most important factor
causing losses in commercial storage.

in the wholesale market, exactly the opposite of the situation in beans.
Thus speculators need not liquidate their stocks before the new crop to
avoid strong price discounts, thus adding greater stability to the market.

Second, even though public information is little better than
in beans,[7] private information in the course of marketing operations is
easier to obtain in rice and is likely to be more accurate. The seasonal
pattern of farm sales does not, as in beans, vary greatly year to year.
Farmers do not retain large proportions for sale in the interharvest
months, but rather have usually sold the great bulk (perhaps 80-90%) in
the first 5-6 months of the commercial year. It is therefore much
easier to judge the size of production by farm sales in the early months
of the harvest.

As was seen in Chapter IV, in a commercial crop (such as rice)
composing a substantial proportion of its producers' total gross incomes,
retention of large proportions for sale in the interharvest months is
generally much more expensive in terms of the opportunity cost of income
foregone (the producer must either reduce consumption or borrow to
finance current expenses) and is less likely to be undertaken. This,
together with farmers' own storage costs and the fact that seasonals are
not large in rice, leads producers to sell most of their crop in a few
months. This, in turn, facilitates more efficient speculation in the
product.

---

7. With the notable exception of Rio Grande do Sul harvest estimates
which are of high quality and become available early in the commercial
year.

Third, in beans substantial commercial stocks are undertaken only as a speculative venture. In rice, because processing in the mills must be performed, stocks have a convenience yield from assuring fuller utilization of milling capacity over the season. If a mill does not form large stocks in the harvest months, it will generally have to close down (as many small mills do) soon after the harvest months. Sales of paddy rice from one mill to another during the interharvest are very rare. Thus mills form large stocks during harvest months almost as a matter of routine, and therefore the likelihood of large price rises over the season in the absence of the expectation of a small crop next year (which will be felt only after September as a rule) is much smaller.

A fourth factor explaining the smaller seasonal in rice seems to be the better credit system which exists for this product. Rice millers, as food processors, may receive the Bank of Brazil's industrial loan for the purchase of raw material. These are one year loans liquidated in equal payments during the last 5 months of the commercial year. Although each firm's limit on these loans is set somewhat arbitrarily by the Bank,[8] the collateral is the value of inventory in stock (discounted 40% below market prices). These loans are limited to the larger mills and in the aggregate do not account for a large percentage

───

8. Based in part on the net worth and sales of the firm.

of the working capital applied in inventories in most areas.[9] But they are an additional source of credit which does not exist for the pure middleman who will normally form the bulk of bean stocks.

Beyond this type of loan, many larger mills have good access to commercial credit from the Bank of Brazil (from its General Credit Department), but amounts extended are not available from the Bank. Finally, rice mills generally have better credit facilities in private banks than the pure cerealista middleman, related in part to the lower risk in rice milling. It was rare to encounter a rice miller of moderate size or above who felt that his operations had been limited by effective access to bank credit, except during periods of tight money in Brazil, as in the first 5 or 6 months of 1963. Thus it seems much less likely that lack of working capital funds could provoke small carry-overs in rice as it seems to have done in beans during many small harvests.

---

9. Rio Grande do Sul benefits most from this type of Bank of Brazil credit, partly because of the larger size of its mills. Even in that state, however, the total amount of such financing is small in relation to the total value of farm production of rice (see Table).

Rio Grande do Sul

	Value of Rice Production	Credits for the Purchase of Rice as a Raw Material
	(Cr$1,000)	(Cr$1,000)
1959	6,100,865	411,943
1960	8,622,340	572,947
1961	13,442,398	678,993

Sources: IBGE, Conselho Nacional de Estatistica, Anuario Estatistico do Brasil, 1962. CREAI, Banco do Brasil.

III. The Minimum Price Program of the Rice Institute of Rio Grande do Sul

The minimum price program maintained by IRGA since 1950[10] in Rio Grande do Sul has probably affected seasonal price fluctuations in several years, although because of the small quantities involved, the impact in the aggregate has usually been small. The primary aim of the program is to secure high compensatory prices for the Rio Grande do Sul producer, covering at least "cost of production"[11] plus some reasonable return to producer and landowner. As a consequence of purchases to secure this goal and later sales out of stocks, IRGA has probably reduced both seasonal and year-to-year price fluctuations. Both buffer-stock functions, over the season and year to year, will be examined briefly.

A. Buffer Stock Harvest to Harvest

IRGA generally resists holding buffer stocks from big harvests (when its purchases are largest) to subsequent smaller harvests, preferring, with its limited financial and physical resources, to export

---

10. The Rice Institute of Rio Grande do Sul is an independent state "autarchy" similar, say, to the "authorities" which have developed in the United States in recent years. Although minimum prices have been fixed since 1943, the Institute has bought sizeable quantities in the market only since 1950, and earlier minima existed only "on paper".

11. "Cost of production" is computed annually by IRGA using current prices and a model of cultivation and harvesting inputs based on the "mean" technique as determined through a survey of farms in the rice zones of the state. It does not appear to be very accurate even as an indicator of the average aggregate cost of production. Supply curve estimates deflating lagged prices by the general price index gave far better fits than those deflating by this cost of production figure, something which should not happen if the estimates accurately reflect the trends in costs.

overseas during the same crop year. This was permitted by the Federal Government in 1950 and 1951, when IRGA purchased 30.5% and 42.6% respectively of the state's output,[12] but as a result, its carry-over into the small crop year of 1953 was 0 (see Table V for purchases by IRGA).[13] Since that time, the Federal Government through CACEX (Foreign Trade Department of the Bank of Brazil) has prohibited exports during the same crop year, forcing IRGA into substantial carry-overs from the harvests of 1954, 1955, 1957, 1960, and 1961, in effect a buffer stock of 3-7% of Brazil's total rice output (see Table VI). But IRGA, because it fixes minimum prices high in relation to the market, generally has not sold these carry-overs in the domestic market in subsequent years to reduce average rice prices.

This requires further explanation. When real prices in the market rose to new highs in the small harvests 1952-54, IRGA's real minimum price was also increased to accompany this movement and never lowered (see Table VII). The result has been that the minimum price fixed by IRGA since 1955 has usually been above market prices in Porto Alegre during the harvest months (see Table VIII). Instead of selling its accumulated stocks in the domestic market after larger harvests (as in 1955, 1957, and 1959), IRGA has actually purchased more in the domestic market than it has sold, in an attempt to maintain or even increase

---

12. After these years, IRGA became more cautious in setting minimum prices far above the market, and its maximum purchase of Rio Grande do Sul's production was 22.0% in 1961.

13. Stock figures from IRGA, op.cit., no. 13 (1958), p. 109.

Table V

Percentage of Total Rice Production in
Rio Grande do Sul Purchased by IRGA

Harvest

1950	30.5%
1951	42.6%
1952	13.7%
1953	6.6%
1954	9.8%
1955	16.7%
1956	8.7%
1957	11.0%
1958	6.2%
1959	9.9%
1960	20.3%
1961	22.0%
1962	20.8%

Source: Data supplied by IRGA

Table VI

Stocks Held by IRGA, March 31.*
(sacks of 60 kilos of milled rice)

1953	0
1954	149,000
1955	1,000,000-1,100,000
1956	about 2,000,000
1957	723,643
1958	1.262,000
1959	278,332
1960	532,327
1961	2,330,523
1962	1,369,454
1963	43,227

* Figures before 1957 are estimates based on IRGA's purchases and
total stocks held in the state of Rio Grande do Sul by all parties,
most of which was in the hands of IRGA.

Source: IRGA.

Table VII

Paddy Rice: Real Minimum Prices Fixed by IRGA
and Real Average Prices Received by Producers
in Rio Grande do Sul and Sao Paulo*

(Cr$1953)

	IRGA's Real Minimum Price	Real Prices Received by Farmers	
	(sacks of 50 kilos)	Rio Grande do Sul	Sao Paulo
		(sacks of 50 kilos)	(sacks of 60 kilos)
1950	128	116	166
1951	131	109	133
1952	117	110	236
1953	102	172	384
1954	134	155	298
1955	145	119	251
1956	144	132	282
1957	176	164	282
1958	155	148	309
1959	158	142	244
1960	157	136	208
1961	147	115	184
1962	162	157	340

* Minimum price is the weighted (by proportion in production) average of
the minima fixed for the three grain lengths and refers to grade 2 (espe-
cial) rice delivered in Porto Alegre. Prices received by farmers include
all qualities. Deflation was performed by the Conjuntura Economica Price
Index No. 2.

Sources: IRGA, op.cit, various numbers and Divisao de Economia Rural,
Sao Paulo.

throughout the later 1950's and early 1960's the high real minimum

prices set in 1955 in response to the unusually small crops, 1952-54

(see Table IX). Thus most of IRGA's purchases have in the end been exported

overseas in spite of the generally higher real prices of rice after 1952.[14]

14. IRGA has been permitted to sell at least at cost to CACEX (the Bank of
Brazil's Foreign Trade Department) which then exported the product at what-
ever exchange which was necessary.

Table VIII

Minimum Prices Fixed by IRGA for Milled Rice and Price Range
on the Porto Alegre Bolsa de Mercadorias during April-August[**]
(CrS per sack of 60 kilos)

	"Blue Rose Especial" (medium-grain)		"Japones Especial" (short-grain)	
	Minimum Price	Range Bolsa Prices, April-August	Minimum Price	Range Bolsa Prices, April-August
1950	194	188-208	181	189-203
1951	226	174-190	217	160-181
1952	220	222-252	215	218-242
1953	220	366-487	215	347-473
1954	353	429-478	334	419-437
1955	485	420-447	465	400-426
1956	580	497-540	560	477-522
1957	770	720-755	750	710-770
1958	770	750-770	750	730-740
1959	1,095	980-1,100	1,035	930-1,020
1960	1,415	1,180-1,290	1,375	1,180-1,250
1961	1.925	1,380-1,450	1,725	1,250-1,400
1962	3,330	no trading	3,115	no trading
1963	6,440	5,976-6,174[*]	6,130	5,563-5,938

[*]April-July
[**]Bolsa prices are simple monthly averages of daily quotations. Minimum prices are delivered in Porto Alegre.

Sources: IRGA, op.cit., No.18 (1963), p.104 and Bolsa de Mercadorias de Porto Alegre.

Thus, in fact, IRGA has usually been able to avoid the pressure

of the Federal Government to act as a buffer-stock reducing rice prices

in smaller harvests. Only in three years of the period 1950-62 did

IRGA sell more in the domestic market than it bought. In two of the

three, 1952 and 1956, net sales were insignificant (much less than 1% of

Brazil's total rice production). In only one year, 1962, (an accident

since exports of all of IRGA's stocks had been planned), did IRGA sell

large net quantities in the domestic market (then only 2% of Brazil's

output).[15] In 1954 and 1958, when real prices in the Center-South were

relatively high, IRGA actually purchased more in the domestic market than

it sold.

Table IX

Net Sales of IRGA in
the Domestic Market
during the Commercial
Year, April 1-March 31*

(sacks of 60 kilos of milled rice)

1952	100,000
1953	-149,000
1954	-833,000 to -960,000
1955	-1,500,000
1956	275,000
1957	-540,000
1958	-34,400
1959	-255,000
1960	-1,980,000
1961	-1,485,000
1962	1,054,000

*Figures for the years after 1957 were supplied directly by IRGA. Esti-
mates for earlier are based on end of year stocks in Rio Grande do Sul,
purchases by IRGA and overseas exports (all made out of IRGA's stocks).
They are approximate, but reflect the general order of magnitude.

Source: IRGA.

Thus, over the period IRGA may have reduced year to year price

fluctuations, especially for the Rio Grande do Sul product,[16] but almost

always by raising prices in larger harvests without lowering them signif-

15. Total output figures used were those of SEP, subject to large errors.
This was converted into milled rice using the factor of equivalence em-
ployed by IRGA.

16. Primarily short and medium-grain. Even its long grain rice is only an
imperfect substitute for the "Amarelao" of Minas and Goias. See Chapter IV.

icantly in smaller crop years. There is some justification to the charge often heard in Brazil that IRGA tends to increase rice prices (in effect, through exports), but given the relatively small participation of the Institute in the domestic market, the effect in the aggregate seems to have been small. In fact, by stimulating the long-run expansion of capital intensive production in Rio Grande do Sul (see Chapter IV), IRGA may indirectly have raised both domestic availabilities and exports above what they would otherwise have been.

B. Buffer Stock Over the Season

To maintain its minimum price in Rio Grande do Sul far above that dictated by supply and demand conditions would require the Institute to support rice prices throughout Brazil. This IRGA has not been able to do, because of both financial and physical limitations on capacity.[17] Thus in several years, prices in the Porto Alegre market have fallen significantly below IRGA's minimum (see Table VIII). In such conditions, IRGA has been completely eliminated from sales in the domestic market during the interharvest months because of its selling policy: it will not sell below cost of acquisition (including minimum price, handling, credit, shipping and other charges) and aims also for a 10% profit margin on sales. When market prices are substantially below IRGA's buying price during the harvest months, market prices must rise considerably more than the average seasonal before IRGA may sell at cost or a profit to

17. Financing comes from the Bank of Brazil and cannot be expanded to the amounts necessary for the complete implementation of the program.

stabilize the market.[18] This would appear to be a severe limitation on IRGA's effectiveness in smoothing seasonal price fluctuations. In fact, seasonals in the large harvest years to which this limitation applies (1950, 1951, 1955, 1957, 1960) were all very small in Porto Alegre, the real price actually having declined over the year in 1955, 1957, and 1960, while remaining about stationary in 1950. Only in 1951 did current prices rise (in the January-March quarter) to levels at which IRGA could sell covering costs in the domestic market. The stability or decline in the seasonals in these years suggest that IRGA's purchases during harvest months may actually have provoked real losses on storage, although empirical verification of this is impossible. In any case, during the years in which IRGA's share of the state's output was greatest (1950, 1951, 1955, 1957 and 1960, but not 1961), virtually no sales were made in the domestic market during the interharvest months and either export or carry-over into the next harvest was necessary (see Tables V and X).[19]

However, in 1953, 1956, 1958, 1959 and 1961, IRGA sold rice in the interharvest months.[20] In 1962, it made massive sales throughout the

---

18. IRGA pays its own way and does not receive the government subsidies which would probably be necessary for other, perhaps more economically valid sales policies.

19. In 1954, IRGA bought 960,000 sacks of milled rice even though its minimum prices were far below the market. It made few, if any sales, since 833,000 sacks of this rice were sold to CACEX in January, 1956.

20. Monthly distributions of sales and purchases by IRGA are not available to the public. But the inference is that when it did sell it was primarily during the period after farmers had placed most of their output.

year, when, because of its minimum price was far above ceiling prices
set by COFAP, IRGA and the cooperatives were made the sole exporters
of rice from the state. The difference between the two prices was made
up by Bank of Brazil subsidies.

Table X

Gross Sales of Milled Rice by IRGA
in the Domestic Market*
(sacks of 60 kilos)

1952	410,000
1953	406,000
1954	very little
1955	very little
1956	1,000,000 approximately
1957	very little
1958	532,000
1959	596,107
1960	21,867
1961	803,354
1962	3,142,629

*Sales figures after 1957 were supplied directly by IRGA. 1952-57 es-
timates are based upon carry-over of rice in Rio Grande do Sul on
March 31, most of which was IRGA's and the Institute's purchases of
rice in these years.

Yearly price seasonals indicate that when IRGA did sell in
the domestic market, it tended to have a stabilizing effect on prices[21]
(see Table XI) and thus probably reduced seasonals, especially on Rio
Grande do Sul rice. But the quantities sold in the interharvest have
usually been so small--even in 1956, IRGA's sales were less than 3% of
Brazil's total output[22]--that the effects on price fluctuations do not

21. I.e., seasonals were either normal or above normal.

22. 88,500 tons of paddy rice equivalent compared with a total rice output
in Brazil of 3,489,000 tons, according to SEP.

appear to have been very large in most years. One aspect of IRGA--its impact on the stocks held privately--is impossible to appraise. If IRGA's purchases during the harvest months or its possession of large stocks are more than offset in many years by a decline in the stocks held in commerce, the net effect on seasonals in some years may be negative.

Table XI

Annual Real Seasonals of "Blue Rose Especial" in Porto Alegre
during Years when IRGA Made Significant Sales in the Domestic Market

	April-June	July-September	October-December	January-March
1952	85.97	93.65	98.54	121.83
1953	99.40	108.57	105.05	86.97
1956	89.32	89.05	100.99	120.63
1958	100.01	93.07	101.54	105.38
1959	98.33	95.00	105.37	101.30
1961*	97,81	93.86	108.33	no trading

*Seasonal as ratio to three quarters average price.
Source: see Table II.

IRGA's own justification for its buffer stock function <u>over the season</u> (in addition to raising farm prices during the harvest) is based on the oligopsony hypothesis: if IRGA did not act in the market, the mills would depress prices below competitive levels during the interharvest, harming farmer and consumer alike.[23] In the conditions existing today in Rio Grande do Sul--good financing for cultivation, large producers, tolerably good and rapid transportation links with other markets, the threat of the cooperatives and the existence of dozens of

_____

23. This appears in many pamphlets published by IRGA.

larger mills[24]--such oligopsonistic behavior seems most unlikely.

If in fact such behavior is improbable, the principal positive functions which IRGA may perform are off-setting speculative errors and cushioning price fluctuations from year to year. The latter function has been badly fulfilled. Ard until IRGA is integrated into a national program of effective minimum prices coupled with a buffer stock, it will have only marginal effects on smoothing speculative errors.[25]

IV. No Trends in Rice Price Seasonals in the 1946-1960 Period

There is no evidence of a trend in the seasonals of rice prices in Sao Paulo and Porto Alegre before 1961. The period 1961-63 shows unusual price instability. This was not a result of fundamental changes in the efficiency of marketing, but was rooted in two serious droughts (1961 and 1963) and the disorganization of the market provoked by clumsy government intervention in 1962.

Drought well into the planting season in 1961 postponed and reduced rice planting (already smaller because of the very low

---

24. In 1957, 45 mills processed 100,000 sacks of rice or more. IRGA, op.cit., no. 13 (1958), p.133.

25. A federal minimum price program has existed on paper since 1951 (Law 1506) for corn, rice, beans, cotton, peanuts, soybeans and castor beans. Until 1963, prices were set so low as to almost always be below market prices. When for some reason market prices did fall below the minimum in certain farther removed regions, the government was not equipped to buy sufficient quantities to support the market. The program has never been tied to a year-to-year buffer stock arrangement, as the government seeks to rid itself of the stocks in the same year or by export. See Agricultura em Sao Paulo, VII, 4 (Agosto de 1960), pp. 1-26.

prices received for the 1961 crop) for the 1962 harvest.[26] As a result
the 1962 crop was both smaller and delayed, and prices rose rapidly in
the last months of 1961 and early 1962.[27] Then COFAP (The Federal
Commission of Food Supply and Prices) intervened, fixing ceiling prices
on rice far below those warranted by the size of production. Shipments
were prohibited from Rio Grande do Sul, Minas Gerais and Goias for two
or three months. The black market flourished outside of Rio, etc., etc.[28]
In 1963, probably the worst drought in the recorded history of the Center-
South hit all major rice producing areas except Rio Grande do Sul (where
there were floods!). Again planting was retarded, and prices reacted to
the situation.

If these turbulent years are excluded, it appears that seasonals
in the late 1950's are about the same as in the earlier years of the post-
war period, and none of the differences is statistically significant
(see Tables XII-XV). Not reflected in these particular indices are the
much smaller seasonals that exist today in the Minas Triangle (and prob-
ably Goias)because of the disappearance of the oligopsony power of a
few firms. And a comparison of rice seasonals in Porto Alegre in the

---

26. See Constantino Carneiro Fraga, "As Dificuldades no Abastecimento e
Elevacaes nos Precos de Milho, Feijao e Arroz", Agricultura em Sao Paulo,
VIII, 10 (Outubro de 1961), pp. 39-48.

27. The political crisis following the resignation of President Janio Quadros
in August, 1961 may have had some effect, but certainly cannot explain
the sustained price rise.

28. See Arlindo Borba Oliveira, "Situacao dos Cereais", Agricultura em
Sao Paulo, IX, 5 (Maio de 1962), pp. 27-33.

1950's (Tables XIV and XV) with those in the 1930 oligopsony period

(Table XVI) shows the large decline in price swings resulting primarily

from the competization of the Rio Grande do Sul market.

The continuation of similar seasonal price patterns through-

out the post-war period (and a decline in relation to the 1930's) coupled

with the increase in farm prices in relation to wholesale prices over

space and vertically through market channels means that for any given

level of consumer demand and of production, the average price received

by farmers has increased (with non-increasing retail margins).[29]   In the

two period model of Chapter II, the total value of production,

$$V_f = \left[Q_1 f(Q_1)(1-\pi) - m_1' \right] C_1 + \left[Q_2 f(Q_2)(1-\pi) - m_2' \right] C_2$$

where $f(Q)$ is the consumer demand function, π the oligopsonistic profit

coefficient, the C's, farm sales, and m' the marginal distribution costs

over space and vertically through market channels. $\Sigma C = \Sigma Q$

We have seen that both π and m' have declined in the 1950's and early

1960's, raising farm prices received in both harvest and interharvest

periods. The absence of any trend in seasonals indicates that $f(Q_1)/f(Q_2)$

has not changed significantly (or has fallen in the Minas Triangle). If

C_1/C_2 is about the same, then total average price transferred to farmers

has increased.

---

29. As indicated in Chapter VIII, information on retail prices is not suffi-
cient to permit judgment one way or the other, even in Sao Paulo, let
alone in the Center-South. The increase in the importance of the "feirante"
(street fair seller) and the supermarket in Sao Paulo, both of which
operate on lower margins than the typically small food retailer, suggests
that retail margins may in fact have fallen.

Table XII

Average Deflated Quarterly Seasonals "Ama-relao Especial" Bolsa de Cereais, Sao Paulo

	April-June	July-September	October-December	January-March
1946-51	97.92	97.34	99.26	105.46
1955-60*	97.56	97.52	102.76	102.16

*Excluding 1958, for which trading did not occur in all months. Complete monthly price series not available for 1952, 1953, 1954, and 1958.

Source: See Table II.

Table XIII

Average Deflated Seasonals, Prices Paid to Farmers in Sao Paulo for Paddy Rice

	March-May	June-August	September-November	December-February
1949/53	91.60	96.76	106.02	105.63
1956/60	94.57	95.31	105.01	105.11
1961/63	92.59	84.79	103.01	119.62

Source: See Table II.

Table XIV

Average Quarterly Deflated Seasonals, "Blue Rose Especial", Bolsa de Mercadorias, Porto Alegre

	April-June	July-September	October-December	January-March
1948/53	95.30	99.64	101.59	103.46
1955/60	100.55	96.73	100.41	102.31

Source: See Table II.

Table XV

Average Quarterly Deflated Seasonals, "Japones
Especial", Bolsa de Mercadorias Porto Alegre

	April-June	July-September	October-December	January-March
1950/54	97.71	101.06	97.48	103.74
1956/60	99.38	94.87	101.96	103.79

Source: See Table II.

Table XVI

Average Quarterly Deflated Seasonals, "Ja-
pones" Bolsa de Mercadorias in the 1930's

	April-June	July-September	October-December	January-March
1931/37	91.57	95.98	106.25	106.20

Source: See Table IV, Chapter

But, according to merchants, rice producers in Sao Paulo, the Minas Triangle and Goias now <u>retain</u> a larger proportion of their rice for sales in period 2 or the interharvest months,[30] primarily because of higher real rice prices, better access to Bank of Brazil credit, the facility of depositing rice with the millers without selling (at a nominal or no warehouse fee, if he sells ultimately to the same miller) and the proliferation of public warehouse facilities with the possibility of discounting warrants. If this is true and seasonals have remained about the same, farmers will tend to receive a higher average price on this count also.

---

30. Perhaps 20-30% after September instead of about 10% in the middle and late 1950's.

Thus trends in the marketing system for rice in the Center-
South of Brazil, instead of reducing farmer response to a rising con-
sumer demand have tended to increase it through reductions in margins
up through the wholesale level. The relative stability of rice prices
over the season and the consequent low risk in choosing the time of
sale have probably, in contrast to beans, stimulated (or at least not
retarded) the long-term growth of rice output, facilitating its transi-
tion from a subsistence to a commercial crop in many areas. Differential
stability of prices over the season must be one factor explaining the
much smaller increase of the real prices of rice in Brazil's period of
most rapid growth (1947-62) (see Table XVII).

Table XVII

Average Real Prices Paid to Sao Paulo
Farmers for Rice and Beans, 1949-1963

(1949-51 = 100)

	Rice	Beans (Dry Season Harvest)
1949/51	100	100
1952/54	159	141
1955/57	141	189
1958/60	131	236
1961/63	146	328

Source: Average Farm Prices as calculated by the Divisao de Economia
Rural da Secretaria da Agricultura do Estado de Sao Paulo were deflated
annually by the Conjuntura Economica's price index no. 2.

SUMMARY AND POLICY SUGGESTIONS

I. Summary

         This has been a study of marketing in a rapidly growing and
urbanizing region of Brazil and its effects on the supply of two important
food products. We have seen, in direct contradiction to the widely
accepted marketing lag hypothesis, that trends in the distribution of
rice and beans in the 1950's and early 1960's have generally reduced
marketing costs and increased marketing efficiency, thereby raising the
price transferred to farmers and stimulating increases in food output.

         The evolution of the marketing system has been analyzed under
the impact of truck transportation, the decline of the merchant-moneylender
system and the expansion of production into new regions. We began in
the 1930's and early 1940's with a high cost marketing system, dependent
upon the railroad and coastal shipping, centered on two or three entrepot
cities and highly oligopsonistic in market structure. We have seen the
gradual reduction or elimination of several marketing breaks, made
possible by direct truck shipment and the development of the represen-
tante (commission agent)selling system. We have also seen commercial
innovation and competitive pressure from the merchant-trucker lead to the
rapid decline of the assembler (miller)-wholesaler transaction both in
Sao Paulo and Rio de Janeiro, where direct sales to retailers have be-
come the most important selling channel.

         We have also seen the successive elimination of regional
oligopsonies under the pressure of new entry in Rio Grande do Sul,

Sao Paulo, the Minas Triangle and, in part, in the North of Parana.
These oligopsonies, in combination with the merchant-moneylender system
and pressures on marketing capacity often led to purchases at less than
competitive prices from farmers. The principal quantitative manifestation
of this development was the large average rises in rice prices over the
season encountered in Rio Grande do Sul in the 1930's and in the Minas
Triangle in the early 1950's.

Intimately related to these oligopsonies, as production expanded
in new regions was the development of critical, but temporary, bottlenecks
in transportation and warehousing. Both the non-competitive profits and
quasi-rents accruing to middlemen have usually been sufficient stimulus,
through new entry and re-investment, to eliminate both the non-competitive
buying behavior and the bottlenecks in storage. Given adequate in-
vestment in transportation, the response of private commerce seems
sufficient in most cases.

In addition to new entry, the decline of the merchant-moneylender
system (in rice), the merchant-trucker (in beans), and the flexibility
given producers and merchants by the truck have increased competition
considerably in producing regions.

The result of these structural trends has been a substantial
decline in margins over space and vertically through wholesale in marketing
channels, while average seasonal price increases in rice have declined
significantly in Rio Grande do Sul since the 1930's and in the Minas
Triangle since the 1940's and early 1950's. Today, it appears that on

average the return to speculation in rice approximates the marginal cost
of storage plus some reasonable return on working capital invested.
Comparisons with margins in the United States indicate no obvious in-
efficiencies in distribution through marketing channels in either product.

Although trends have been favorable in the distribution of
beans over space, speculation in the product remains grossly inefficient
and erratic, and this has constituted, in contrast with rice, a serious
obstacle to the expansion of commercial production of the crop. Much of
the inefficiency is rooted in the two-harvest production pattern in beans.
Speculation could be substantially improved, however, through more and
better price, production and stock information and an increase in the
availability of credit to merchants for stocking.

Thus the trends in marketing directly contradict the hypothesis
that distribution has been a growing impediment to the non-inflationary
expansion of the supply of the two products.

It is impossible to generalize to the whole marketing system
from two crops, however important. Nevertheless, it was seen that the
aggregate price index comparisons which are the principal evidence for
the marketing lag hypothesis suffer serious biases, and the indices must
be completely recalculated if firm conclusions are to be made. The
trends in transportation are applicable to all agricultural products,
and the gradual elimination of the wholesaler in the large urban centers
has also affected grocery items. Thus the present analysis places in
great doubt the hypothesis of increasing margins for other products
as well.

II. Policy Suggestions

Despite this progress, wide areas remain for improvement in marketing. First, many producers remain dependent upon the middleman for financing because they have no other alternative. Official bank credit to producers should be further increased in rice and extended in quantity to beans. This will require much greater efforts to reach small producers than have been made thus far by the Bank of Brazil.

In the commercial sector, the desirability of relating credit for stocking to the value of the product in stock is undeniable. This would tend to insure that carry-over would not be limited merely because of insufficient financial resources, as it often appears to have been in beans. When the products are stored in the merchants' own warehouses, it is difficult to verify the quantity and quality stored, giving rise to the possibility of fraud. Perhaps merchants themselves could be bonded or the cooperation of commercial organizations enlisted in policing the accuracy of merchants' declarations. In any case, every avenue should be explored which would permit this changeover.

The question of the adequacy of the combined transportation and storage capacity in Parana remains unresolved. This, and the advisability of the construction of off-farm storage facilities for producers in areas where summer storage is already adequate (which is being done in the Minas Triangle) requires a thorough study, which was beyond the scope of the present inquire.

Although generally responsive to profit opportunities, the

cereals dealer and rice miller have lacked the technical know-how to
appreciate the commercial possibilities of innovation in storage, handling,
and processing methods. They often express interest in such matters, but
the cost of learning new techniques has been a barrier to their adoption.
Losses in storage can be reduced, and, especially in rice, bulk storage
may be more economical than storage in bags in flat warehouses. No
work has been done in this area in Brazil, and a study of these technical
problems and the profitabllity of alternative methods should be made.
Technical assistance through commercial organizations should be provided.
If the greater profitability of newer methods is demonstrated to him
and assistance provided in adopting them, there is little doubt that
the larger cerealista and miller would utilize cost-reducing innovations.

The most serious problem for cereals marketing today is the
almost total lack of good statistics on prices, production and stocks.
Not only does this often lead to substantial speculative errors, but
t he full advantages of the decentralized marketing system which has
developed with the truck can be realized only if accurate information is
available for all principal market centers. Today, no public authority
provides and disseminates these data to merchants and producers. A
complete revamping of the present system of data collection and
dissemination is indicated.

The Effects of Small Carry-Overs on Farm Receipts, Consumer Ex-
penditures and Commercial Profits with Concave and Convex Demand Functions

For ease of exposition, only the ease of linear consumer demand
functions was treated in Chapter II. In this appendix, the analysis of
the effects of large seasonals and small carry-overs is extended to
concave and convex demand functions for which the same basic conclusions
apply. The notation of Chapter II is retained.

1. Two-Period Model

In the two-period model, with no carry-over in or out of the
harvest unit, it was seen that the basic equations are:

$$(1) \quad \frac{\partial V_f}{\partial Q_1} = (1-\bar{v})(C_1 \frac{df}{dQ_1} - C_2 \frac{df}{dQ_2})$$

$$(2) \quad \frac{\partial V_c}{\partial Q_1} = Q_1 \frac{df}{dQ_1} - Q_2 \frac{df}{dQ_2} + f(Q_1) - f(Q_2)$$

$$(3) \quad \frac{\partial R}{\partial Q_1} = \frac{\partial V_c}{\partial Q_1} - \frac{\partial V_f}{\partial Q_1} - \frac{\partial s}{\partial Q_1} = \frac{\partial V_c}{\partial Q_1} - \frac{\partial V_f}{\partial Q_1} + s_1'$$

A. Concave Consumer Demand Function

1. Effect of Small Carry-Overs on Farm Receipts.

$$\frac{\partial V_f}{\partial Q_1} = (1-\bar{v})(C_1 \frac{df}{dQ_1} - C_2 \frac{df}{dQ_2})$$

Total receipts clearly fall as consumption in period 1 is increased at
the expense of that in period 2. At any point where $Q_1 > Q_2$, the partial

is negative. $\left|\dfrac{df}{dQ_1}\right| > \left|\dfrac{df}{dQ_2}\right|$. In addition, $C_1 > C_2$ by assumption. Thus,

$\left|C_1 \cdot \dfrac{df}{dQ_1}\right| > \left|C_2 \dfrac{df}{dQ_2}\right|$. Since the slope of the demand curve is negative,

$(C_1 \dfrac{df}{dQ_1} - C_2 \dfrac{df}{dQ_2})$ is also negative.

2. Effects on Consumer Expenditures

$$\frac{\partial V_c}{\partial Q_1} = Q_1 \frac{df}{dQ_1} - Q_2 \frac{df}{dQ_2} + f(Q_1) - f(Q_2)$$

If $Q_1 > Q_2$, $\left|\dfrac{df}{dQ_1}\right| > \left|\dfrac{df}{dQ_2}\right|$, and the sum of the first two terms is negative,

as is the difference in prices. Thus consumer expenditure on the given

crop declines as consumption in period 1 is increased.

3. Effects on Commercial Profits

$$\frac{\partial R}{\partial Q_1} = \frac{\partial V_c}{\partial Q_1} - \frac{\partial V_f}{\partial Q_1} + s'_1 \quad \text{and} = 0 \text{ at its maximum.}$$

Combining terms from $\dfrac{\partial V_c}{\partial Q_1}$ and $\dfrac{\partial V_f}{\partial Q_1}$ yields:

$$(4) \quad 0 = \frac{df}{dQ_1}\left[Q_1 - (1-\pi)C_1\right] - \frac{df}{dQ_2}\left[Q_2 - (1-\pi)C_2\right] + f(Q_1) - f(Q_2) + s'_1$$

When $Q_1 = Q_2$, with $C_1 > C_2$, both the first and second terms are positive,

$f(Q_1) - f(Q_2)$ is 0 and s'_1 is positive. As Q_1 is increased (and carry-over

reduced), both of the first two terms decline, and the differences in

prices become increasingly negative. There is a convergence to a maximum

as Q_1 increases. At this maximum, prices will rise by more than the

marginal costs of storage, because under reasonable assumptions as to

C_1, C_2 and π, the first two terms of (4) will be positive at the maximum.

For example, if $C_1 = 80$, $C_2 = 20$ and $\pi = .1$, Q_1 must be greater than 72 and

Q_2 less than 16 before terms 1 and 2 become negative. Before this
occurs with either term, it is almost certain that $f(Q_2) - f(Q_1) > s_1'$.

Thus for concave demand functions, reductions in carry-over
into the interharvest period (increase in Q_1) reduce farm receipts,
reduce consumer expenditures on the product and increase commercial pro-
fits up to some point where more than marginal costs of storage are
covered.

B. Convex Demand Functions

We consider the most common form of convexity used in statis-
tical estimation, the constant price elasticity demand function. Let n
be the price elasticity of demand. Then $\frac{1}{n} = \frac{df}{dQ} \cdot \frac{Q}{f}$ and $\frac{df}{dQ} = \frac{1}{n} \frac{f}{Q}$.

1. Effects on Farm Receipts.

Substituting $\frac{1}{n} \frac{f}{Q}$ for $\frac{df}{dQ}$ in (1) yields:

(5) $\quad \frac{\partial Y_f}{\partial Q_1} = \frac{1}{n} (1-n)(C_1 \frac{f(Q_1)}{Q_1} - C_2 f \frac{(Q_2)}{Q_2})$

When $Q_1 = Q_2$ and $C_1 > C_2$ (by assumption), the derivative is negative,
since n is negative. The derivative will continue negative until
$C_1 \frac{f(Q_1)}{Q_1} = C_2 \frac{f(Q_2)}{Q_2}$, i.e. until $\frac{f(Q_1)}{Q_1} \cdot \frac{Q_2}{f(Q_2)} = \frac{C_2}{C_1}$ After

this point, the derivative becomes positive and farm receipts actually
begin to rise as carry-over into period 2 is reduced even further. How-
ever, with reasonable assumptions about C_2/C_1, which in Brazil would he
perhaps .11-.25 for both products, seasonal distortions within a wide
range will reduce farm receipts from any given crop size.

2. Effects on Consumer Expenditure

This depends upon whether $n \gtrless -1$. If $n > -1$, very probably for the products considered here, V will _increase_ as Q_1 rises. Substituting $\frac{1}{n}\frac{f}{Q}$ for $\frac{df}{dQ}$ in (2) yields:

$$(6) \quad \frac{\partial R}{\partial Q_1} = \frac{1}{n}\left[\frac{Q_1}{Q_1} f(Q_1) - \frac{Q_2}{Q_2} f(Q_2)\right] + f(Q_1) - f(Q_2)$$

With inelastic demand, commercial profits will be maximized at some level of $Q_1 > Q_2$ after which farm receipts have again begun to rise as Q_1 is increased. Below that level of Q_1, $\frac{\partial V_c}{\partial Q_1} > 0$, $\frac{\partial V_f}{\partial Q_1} < 0$ and $\frac{\partial S}{\partial Q_1} < 0$. The effect of increases in Q_1 on all three components of commercial profits is positive. The total sales value is increasing and both cost items, farm receipts and storage costs, are falling.

$\frac{\partial^2 V_c}{\partial Q_1^2} = (1 + \frac{1}{n})(\frac{df}{dQ_1} - \frac{df}{dQ_2})$ and is negative with inelastic demand functions. $(1+\frac{1}{n})$ is negative, and since $\left|\frac{df}{dQ_1}\right| < \left|\frac{df}{dQ_2}\right|$, the second term is positive.

$$\frac{\partial^2 V_f}{\partial Q_1^2} = \frac{1}{n}(1-n)\left[\frac{C_1}{Q_1}\frac{df}{dQ_1} - \frac{C_1}{Q_1^2} f(Q_1) + \frac{C_2}{Q_2}\frac{df}{dQ_2} - \frac{C_2}{Q_2^2} f(Q_2),\right]$$

and is positive. All terms in parentheses are negative and $\frac{1}{n}$ is also negative. This assures a maximum at some large level of price distortion, when farm receipts may actually be above their competitive levels. We would not, however, encounter such pronounced ·pronounced price increases in practice.

II. Four-Period Model

The two-harvest, four-period case, in which a bumper crop is followed by a harvest failure, can be analyzed by pairing the consumptions of two different periods: an increase in consumption in one period must be compensated by a decrease in consumption in another. Let $C_1 > C_3 > C_2 > C_4$. First, we are interested in the effects on farm receipts of small carry-overs from period 1 to periods 2 and 4 and from period 3 to period 4. The two period analysis applied in tact. For example, in the concave demand case

$$(7) \quad \frac{\partial V_f}{\partial Q_{1(2,4)}} = (1-\Lambda)(C_1 \frac{df}{dQ_1} - C_{(2,4)} \frac{df}{dQ_{(2,4)}})$$

where the numbers in parentheses in the subscripts are the periods in which consumption is being reduced. When $Q_1 \geq Q_2 \geq Q_4$ and $C_1 > C_2 > C_4$, $\left| C_1 \frac{df}{dQ_1} \right| > \left| C_{(2,4)} \frac{df}{dQ_{(2,4)}} \right|$ and the derivative is negative. The smaller carry-over from the harvest months of the bumper crop year lowers farm receipts. Similarly, it can be shown that smaller carry-overs from period 3 to period 4 also lower farm receipts.

With convex demand, the same analysis applies as in the two-period case, using the device of paired consumptions. Increases in consumption in periods 1 and 3 at the expense of consumption in 2 and 4 reduces farm receipts. No new proofs are necessary to show that smaller c arry-overs will over a broad range reduce farm receipts.

The situation with profit maximization is considerably more complicated in the four-period case, but the general direction of de-

partures from the competitive solution when profits are maximized may
be determined. Assume that consumption is distributed in such a way that
only marginal costs are covered. Then a number of departures from this
pattern will increase profits. It follows from the two-period analysis
that any increase of Q_1 at the expense of Q_2 or Q_4 will raise profits in
the concave demand case and if demand is inelastic in the convex case.
The same holds for increases in Q_3 at the expense of Q_4. Thus departures
provoking price increases larger than the marginal costs of storage will
raise profits, while at the same time lowering farm receipts over the
two-period horizon.

The extent of these departures from competition cannot be
determined as in the linear case, but the conclusions are the same:
small carry-overs both from the harvest to interharvest months and from
large to small harvests tend to lower total farm receipts and within
a wide range, increase commerical profits.

BIBLIOGRAPHY

I. BOOKS

Abbot, J.C.. Marketing--Its Role in Increasing Productivity. Freedom
    from Hunger Campaign Basic Study No. 4 (Rome: F.A.O., 1962).

---. Marketing Problems and Improvement Programs. F.A.O. Marketing
    Guide No. 1 (Rome: F.A.O., 1958).

Allen, G.R. Agricultural Marketing Policies. (Oxford: Basil Blackwell,
    1959).

Amaral, Luis. Historia Geral da Agricultura Brasileira. 2 Vols.
    (Sao Paulo: Companhia Editora Nacional, 1958).

Baarsh, Marius. Estrutura e Desenvolvimento Economico do Rio Grande do
    Sul. (Porto Alegre: Livraria Sulina, 1959).

Baer, Werner. Industrialization and Economic Development in Brazil.
    (Homewood, Ill.: Richard D.Irwin, Inc., 1965).

Bauer, P.T.. West African Trade. (Cambridge: Cambridge University Press,
    1954).

Belshaw, Horace. Agricultural Credit in Underdeveloped Countries. (Rome:
    F.A.O., 1959).

Burger, Ary. A Conjuntura da Economia Orizicola no Rio Grande do Sul.
    (Porto Alegre: Instituto Rio Grandense do Arroz, 1952).

---. As Flutuacoes na Economia Orizicola do Rio Grande do Sul. (Porto
    Alegre: Edicao Sulina, 1955).

Camargo, Lenita Correa. O Cooperativismo e a Formacao dos Precos (Sao
    Paulo). (Sao Paulo: Faculdade de Ciencias Economicas e Administra-
    tivas, Universidade de Sao Paulo, 1958).

---. Cooperacao e Cooperativismo (Sao Paulo). (Sao Paulo: Faculdade
    de Ciencias Economicas e Administrativas, Universidade de Sao Paulo,
    1960).

Chaturvedi, J.M. Theory of Marketing in Underdeveloped Countries.
    (Allahabad, India: Kitab Mahal Publishers, 1959).

Davis, John H. and Goldberg, Ray A. A Concept of Agribusiness. (Boston:
    Division of Research, Graduate School of Business, Harvard Univer-
    sity, 1957).

Ellis, Alfredo, Junior. A Evolucao da Economia Paulista e Suas Causas. (Sao Paulo: Companhia Editora Nacional, 1937).

Furtado, Celso. Formacao Economica do Brasil. (Rio de Janeiro, Editora Fundo de Cultura, 1959). Also published in English as The Economic Growth of Brazil. (Berkeley: University of California Press, 1963).

Galbraith, John K. and Holton, Richard N. Marketing Efficiency in Puerto Rico. (Cambridge: Harvard University Press, 1955).

Graner, E.A. and Godoy, E.C., Junior. Culturas da Fazenda Brasileira. (Sao Paulo: Edicoes Melhoramentos, 1962).

Hirsch, Leon. Marketing in an Underdeveloped Economy: The North Indian Sugar Industry. (Englewood Cliffs, N.J.: Prentice Hall, Inc., 1961).

Hirschman, A.O. Journeys toward Progress: Studies of Economic Policy-making in Latin America. (New York: The Twentieth Century Fund, 1963).

Instituto Joaquim Nabuco de Pesquisas Sociais, Problemas do Abastecimento Alimentar no Recife. (Recife: Ministerio da Educacao e Cultura, 1962).

James, Preston E. Latin America. 3rd ed. (New York: The Odyssey Press, 1959).

Kuznets, Simon, et.al. (eds.) Economic Growth: Brazil, India, Japan. (Durham, N.C.: Duke University Press, 1955).

Loeb, G.F. Industrialization and Balanced Growth: With Special Reference to Brazil. (Groningen, Netherlands, 1957).

Luz, Nicia Vilela. A Luta Pela Industrializacao do Brasil. (Sao Paulo: Difusao Europeia do Livro, 1961).

Mehren, George L. Agricultural Marketing in Venezuela. (Caracas: Consejo de Bienestar Rural, February, 1954).

Meijer, H. Rural Brazil at the Cross-Roads. (Wageningen, Netherlands: H. Veenman & Zonen, 1951).

Prado, Caio, Junior. Historia Economica do Brasil. 7th ed. (Sao Paulo: Editora Brasiliense, 1962).

Schilling, Paulo R. Crise Economica no Rio Grande do Sul: I: Crise Agro-Pecuaria. (Porto Alegre: Difusao de Cultura Tecnica, 1961).

Shephard, Geoffrey. Marketing Farm Products. 3rd ed. (Ames, Iowa: Iowa State University Press, 1961).

Stilman, Meyer. O Comercio Varejista e os Supermercados na Cidade de Sao Paulo. 2 Vols. (Sao Paulo: Faculdade de Ciencias Economicas e Administrativas, Universidade de Sao Paulo, 1962).

Thomsen, Frederick L. Agricultural Marketing. (New York: McGraw-Hill Book Company, Inc., 1951).

Wickizer, V.D. Rice in the Western Hemisphere: Wartime Developments and Postwar Problems. (Palo Alto, California: Food Research Institute of Stanford University, 1945).

Wythe, George. Brazil: An Expanding Economy. (New York: Twentieth Century Fund, 1949).

II. ARTICLES AND JOURNALS

Abbott, J.C. "The Role of Marketing in the Development of Backward Agri-
cultural Economies," Journal of Farm Economics, XLIV, 2 (May, 1962),
pp.349-62.

———. "The Role of Marketing in the Growth of Agricultural Production and
Trade in Less Developed Countries," Monthly Bulletin of Agricultural
Economics and Statistics, F.A.O., Vol. IX (September, 1960), pp.1-7.

Agricultura em Sao Paulo, monthly journal of Divisao de Economia Rural of
the State of Sao Paulo.

Aliber, Robert Z. "Speculation and Price Stability Once Again," Journal
of Political Economy, LXXII, 6 (December, 1964), pp.607-09.

Allen, G.R. "Short-term Variations in Retailing Margins on Fruite in
East Pakistan," The Farm Economist, IX, 6 (1959), pp. 259-66.

Bauer, P.T. "Concentration in Tropical Trade: Some Aspects and Impli-
cations of Oligopoly," Economica (November, 1953), pp.302-321.

Bauer, P.T. and Yamey, B.S. "Competition and Prices: A Study of
Groundnut Buying Nigeria," Economica (February, 1952), pp.31-43.

———. "The Economics of Marketing Reform," Journal of Political Economy,
LXII, 3 (June, 1954), pp.210-235.

Baumol, William J. "Speculation, Profitability and Stability," Review
of Economics and Statistics, XXXIX, 3 (August, 1957), pp. 263-71.

———. "The Cost of Administering Loans in Underdeveloped Rural Areas,"
Oxford Economic Papers, XV, 2 (June, 1963), pp. 154-63.

Bottomley, Anthony. "The Determination of Pure Rates of Interest in Under-
developed Rural Areas," Review of Economics and Statistics, XLVI,
3 (August, 1964), pp.301-04.

Brandt, Sergio Alberto, et.al. "Relacoes Area-Preco de Algodao no Estado
de Sao Paulo," Agricultura em Sao Paulo, XII, 1-2 (Janeiro-
Fevereiro, 1965), pp.31-38.

Brennan, Michael J. "The Supply of Storage," American Economic Review,
XLVIII, 1 (March, 1958), pp.50-72.

Bulhoes, Octavio Gouveiade. "Agriculture and Economic Development," Rostow, W.W. (ed.), The Economics of Take-off into Sustained Growth (New York: St. Martin's Press, Inc., 1963), pp.225-39.

Chacel, Julian M. "Precos e Custosna Agricultura Brasileira," Revista Brasileira de Eocnomia, XVII, 3 (Setembro de 1963), pp.39-67.

Chandevarkar, A.G. "The Premium for Risk as a Determinant of Interest Rates in Underdeveloped Rural Areas: Comment," Quarterly Journal of Economics, LXXIX, 2 (May, 1965), pp.322-25.

Collins, Herman R. and Holton, Richard H. "Programming Changes in Marketing in Planned Economic Development," Kyklos, XVI, 1 (January, 1963), pp.123-36. Reprinted in Agriculture in Economic Development, Eicher, C. and Witt, L. (eds.) (New York: McGraw-Hill Book Co., Inc., 1964), pp.359-69.

Conjuntura Economica, Funcacao Getulio Vargas, monthly review of economic conditions in which most economic indices are published.

Cook, Hugh L. "Marketing Sturcture and Economic Development in the Philippines," Journal of Farm Economics, XLI, 4 (December, 1959), pp. 1316-22.

Cootner, Paul H. "Common Elements in Futures Markets for Commodities and Bonds," American Economic Review, LI, 2 (May, 1961), pp.173-83.

——. "Returns to Speculators: Telser vs. Keynes," Journal of Political Economy, LXVIII, 4 (August, 1960), pp. 396-404. Telser's "Reply" pp.404-15 and Cootner's "Rejoinder," pp.415-18.

Cunha, Thiago Ferreira da Cunha, "O Problema do Abastecimento de Generos Alimenticios," Desenvolvimento e Conjuntura, VI, 10 (Outubro de 1962), pp.65-93.

Desenvolvimento e Conjuntura, quarterly journal of the Confederacao Nacional das Industrias.

Drucker, Peter F. "Marketing and Economic Development," Journal of Marketing, XXII, 1 (January, 1958), pp.252-59.

Dutia, B.P. "Theory of the Choice of Products by a Cash·cum Subsistence Grower," The Indian Economic Journal, V, 2 (October, 1957), pp.215-21.

Eisgruber, L.M. and Schuman, L.S. "The Usefulness of Aggregated Data in the Analysis of Farm Income Variability and Resource Allocation," Journal of Farm Economics, XKV, 3 (August, 1963), pp.587-91.

Faiseol, Speridao. "Desenvolvimento Agricola do Sudeste do Planalto Central," Revista Brasileira de Geografia, XIX, 1 (Janeiro--Marco, 1957).

Fei, J.C.H. "Arbitrage--An Introduction to Activity Analysis," Review of Economics and Statistics, XLVI, 3 (August, 1964), pp.245-59.

Fellner, William, "Profit as the Risk-Taker's Surplus: a Probabilistic Theory," Review of Economics and Statistics, XLV, 2 (May, 1963), pp. 173-84.

Fox, K.A. and Taeuber, R.C. "Spatial Equilibrium Models of the Livestock-Feed Economy," American Economic Review, XLV, 4 (September, 1955), pp.584-608.

Gersdorff, Ralph von. "Agricultural Credit Problems in Brazil," Inter-American Economic Affairs, XV, 1 (Summer, 1961), pp.31-57.

Gilason, Conrad. "Grain Storage Rules," Journal of Farm Economics, XLII, 3 (August, 1960), pp.576-95.

Graf, Truman F. "Hedging--How Effective is It?", Journal of Farm Economics, XXXV, 3 (August, 1953), pp.398-413.

Gray, Roger W. "The Search for a Risk Premium," Journal of Political Economy, LXIX, 3 (June, 1961), pp.250-60.

Hawtrey, R.G. "Mr. Kaldor and the Futures Market," Review of Economic Studies, VII, 3 (1939-40), pp.203-05.

Hillman, Jimmye S. "Some Aspects of Brazilian Agricultural Policy," Inter-American Economic Affairs, XII, 1(Summer, 1958), pp. 3-29.

Holton, Richard N. "Marketing Structure and Eocnomic Development," Quarterly Journal of Economics, LXVII, 3 (August, 1953), pp.344-61.

———. "On the Measurement of Excess Capacity in Retailing", Review of Economic Studies, XXIV, 1 (1956-57), pp.43-48.

Houthakker, Hendrik S. "Can Speculators Forecast Prices?", Review of Economics and Statistics, XXXIX, 2 (May, 1957), pp.153-57.

411.

—. "An International Comparison of Household Expenditure Patterns Commemorating the Centenary of Engel's Law," Econometrica, XXV, 4 (October, 1957), pp.532-51. Includes an estimate of Brazil's urban income elasticity of demand for food.

—. "The Scope and Limits of Futures Trading," Abramovitz, M. (ed.), The Allocation of Economic Resources (Stanford, California: Stanford University Press, 1959), pp.134-59.

—. "Systematic and Random Elements in Short-term Price Movements," American Eocnomic Review, LI, 2 (May, 1961), pp.164-72.

Indian Society of Agricultural Economists, "Trends in the Operation, Techniques and Organization of Agricultural Marketing in India," Indian Journal of Agricultural Economics, XII, 2 (April-June, 1957).

Johnston, Bruce F. and Mellor John W. "The Nature of Agriculture's Contribution to Economic Developemnt," Stanford Research Institute Studies, I, 3 (November, 1960), pp.335-56.

Judge, G.G. and Wallace, I.D. "Estimation of Spatial Price Equilibrium Models," Journal of Farm Economics, XL, 4 (November, 1958), pp.801-20.

Kafka, A. "Brazil," Beckhart, B.H. (ed.), Banking Systems (New York, 1954).

Kaldor, Nicholas. "A Note on the Theory of the Forward Market," Review of Economic Studies, VII, 3 (1939-40), pp.196-201

—. "Speculation and Economic Stability," Review of Economic Studies, VII, 1 (1939-40), pp. 1-27.

Kemp, Murray C. "Speculation, Profitability and Price Stability," Review of Economics and Statistics, XLV, 2 (May, 1963), pp.185-89.

Lavoura Arrozeira, the monthly publication of the Instituto Rio Grandense do Arroz.

Madalgi, S.S. "Stabilization of Agricultural Prices in India," Indian Journal of Agricultural Economics, XI, 4(October-December, 1956), pp.31-37.

Madan, B.K. "Some Observations on the Essentials of a Price Policy for Foodgrains in India," Indian Journal of Agricultural economics, XIV, 4 (October-December, 1959), pp.54-60.

Mehren, George L. "Market Organization and Economic Development," Journal of Farm Economics, XLI, 4 (December, 1959), pp.1307-15.

——. "Market Structure and Procedures in Economic Development," Malayan Economic Review, IV, 2 (April, 1959), pp.94-100.

Mesquita, Myriam Gomes Coelho. "Aspectos Geograficas do Abastecimento do Distrito Federal em generos alimenticios de base," Revista Brasileira de Geografia, XXI, 2 (Abril-Junho, 1959), pp.165-89.

Moyses, M.A. and Thomazini Ettori, O.J. "Aspectos Economicos de Producao de Arroz em Sao Paulo," Agricultura em Sao Paulo, IX, 10 (Outubro, 1962) pp.3-52.

Netto, Antonio Delfim. "Nota Sobre Alguns Aspectos do Problema Agrario," Temase Problemas, 1 (1964), pp.5-41.

Nicholls, William H. "Domestic Trade in an Underdeveloped Country—Turkey," Journal of Political Economy, LIX, 6 (December, 1951), pp.463-480.

——. "The Place of Agriculture in Economic Development," Eicher, Carl K. and Witt, Lawrence W. (eds.), Agriculture in Economic Development (New York: McGraw-Hill Book Company, 1964), pp.11-44.

——. "Perspectiva Estatistica da Estrutura Agraria do Brasil," Revista Brasileira de Economia, XVII, 2 (Junho de 1963).

Nicholls, William H. and Paiva, Rui Miller, "The Structure and Productivity of Brazilian Agriculture," Journal of Farm Economics, XLVII, 2 (May, 1965), pp.347-61.

O Observador Economico e Financeiro (Rio de Janeiro), a weekly economics and financial journal, no longer published.

Paiva, Rui Miller, "Evolucao da Agricultura no Brasil," Agricultura em Sao Paulo, VIII, 12 (Dezembro, 1961), pp.1-12.

——. "Retorno da Agricultura para as Zonas Velhas: Fator Imprescindivel para o Desenvolvimento Economico do Pais," Agricultura em Sao Paulo, VII, 9 (September, 1960), pp.1-22.

Pereira, I.F., et.al. "Variacao Estacional dos Precos Agricolas no Estudo de Sao Paulo," Agricultura em Sao Paulo, X, 4 (Abril, 1963), pp.1-67.

Porter, Richard C. "The Inflationary Impact of Crop Failure," The Pakistan Development Review, II, 1 (Apring, 1962), pp.1-23.

Prado, Caio, Junior, "Nova Contribuicao para a Analise da Questao Agraria no Brasil," Revista Brasiliense, No.43 (Setembro-Outubro, 1962), pp. 27-78.

"Producao e Consumo de Feijao no Brasil," Conjuntura Economica, XI, 4 (Abril de 1957), pp.25-28.

Rameshwara Rao, T.B. "Underdeveloped Economy and Agricultural Marketing," The Indian Journal of Economics, XXXX, 3 (July, 1959), pp.95-100.

Revista Brasileira de Economia, quarterly journal of the Brazilian Institute of Economics of the Fundacao Getulio Vargas.

Samuelson, Paul A. "Intertemporal Price Equilibrium: A Prologue to the Theory of Speculation," Weltwirstschaftliches Archiv, LXXIX, 2, pp.181-221.

Smith, Gordon W. "A Agricultura e O Plano Trienal," Revista Brasileira de Economia, XVI, 4 (Dezembro de 1962), pp.113-22.

Solomon, M. "The Sturcture of the Market in Underdeveloped Economies," Quarterly Journal of Economics, LXII, 3 (August, 1948), pp.519-41.

Taylor, Donald A. "Retailing in Brazil," Journal of Marketing, XXIII, 3 (July, 1959), pp.54-58.

Telser, Lester G. "Futures Trading and the Storage of Cotton and Wheat," Journal of Political Economy, LXVI, 3 (June 1958), pp.233-55.

——. "A Theory of Speculation Relating Profitability and Stability," Review of Economics and Statistics, XLI, 3 (August, 1959), pp. 295-301, and "Reply" by W.J.Baumol, pp.301-02.

Thomazini Ettori, Oscar J, "Mao de Obra na Agricultura de Sao Paulo," Agricultura em Sao Paulo, VIII, 12 (Dezembro, 1961), pp.13-39.

——. "Produtividade Fisica da Agricultura em Sao Paulo," Agricultura em Sao Paulo, XI, 7 (Julho, 1964), pp.3-48.

Tobin, James, "Liquidity Preference as Behavior towards Risks," Review of Economic Studies, XXV, 2 (February, 1958), pp.65-86.

Ward, Barbara. "Cash or Credit Crops? An Examination of Some IMplica-
    tions of Peasant Commercial Production with Special REference to the
    Multiplicity of Traders and Middlemen," Economic Development and
    Cultural Change, VIII, 2 (June, 1960), pp.148-63.

"Warehouses and Silos in Brazil: Requirements and Prospects," Conjuntura
    Economica, International Edition, VII, 4 (April, 1960), pp.35-43.

Wharton, Clifton R. Jr. "Marketing, Merchandising and Moneylending: A
    Note on Middleman Monopsony in Malaya," Malayan Economic Review,
    VII, 2 (October, 1962), pp.24-44.

Williams, J.B. "Speculation and Carry-over," Quarterly Journal of
    Economics, L, 2 (May, 1936), pp.436-55.

Working, Holbrook. "The Theory of the Price of Storage," American Econom-
    ic Review, XXXIX, 4 (December, 1949), pp. 1254-62.

III. OFFICIAL PUBLICATIONS

Banco do Brasil, Relatorio.

Banco do Brasil, Carteira de Credito Agricola e Industrial, Relatorio.

Banco do Nordeste do Brasil, Departmento de Estudos Economicos, Abastecimento de Generos Alimenticios da Cidade do Recife. (Fortaleza, 1962).

Conselho do Desenvolvimento, Programa das Metas (Rio de Janeiro, 1958).

Economic Commission for Latin America, Coffee in Latin America: Productivity Problems and Future Prospects of Production II: Brazil, State of Sao Paulo, E/CN.12/545 (New York, 1960).

Escritorio Tecnico de Agricultura, Brazilian Ministry of Agriculture and USAID, Marketing Facilities for Grain and Tuberous Crops: Brazil, 2 Vols. (Kansas City, Missouri: Weitz-Hettelsater Engineers, 1964).

Estado de Sao Paulo, Secretaria de Viacao e Obras Publicas, Departamento de Agnas e Energia, Plano de Eletrificacao do Estado de Sao Paulo, 1956. Volume IV contains reprots on rice, beans and corn marketing in Sao Paulo State, pp.329-70.

Instituto Brasileiro de Geografia e Estatistica, Anuario Estatistico do Brasil.

——. Recenseamento Geral do Brasil, 1940, 1950 and preliminary results for 1960.

Instituto Rio Grandense do Arroz, Anuario Estatistico do Arroz.

Joint Brazil-United States Economic Development Commission, The Development of Brazil (Washington, D.C.: Institute of Inter-American Affairs, Foreign Operations Administration, 1954).

——. Brazilian Technical Studies (Washington, D.C.: Institute of Inter-American Affairs, Foreign Operations Administration, 1955).

Joint Brazil-United States Technical Commission, Report (Washington, D.C.: U.S.Department of State, 1949).

Klein and Saks, O Problema da Alimentacao no Brasil. (Rio de Janeiro: Comissao de Desenvolvimento Industrial, 1954).

Ministerio para o Planejamento e Coordenacao Economico, Programa de Acao do Governo, 1964/1966 (Sintese), Rio de Janeiro, 1964.

Presidencia da Republica, Plano Trienal de Desenvolvimento Economico e Social 1963/1965 (Sintese), Rio de Janeiro, 1962.

IV. UNPUBLISHED

Carmia, R.L. "Anapolis, Brazil: Regional Change of an Agricultural
    Frontier," Unpublished doctoral dissertation, University of Chi-
    cago, Chicago, Illinois, 1953.

Grupo de Trabalho do IRGA, Economia Orizicola no Rio Grande do Sul.
    Unpublished report of a working group of the Rice Institute of
    Rio Grande do Sul, Porto Alegre, 1961.

Grupo Tecnico de Sao Paulo, several unpublished reports on cereals
    marketing in Sao Paulo, Minas Gerais, Parana and Rio Grande do Sul.

Knoke, William. "Brazilian and U.S. Supermarkets Compared and Contrasted."
    Unpublished paper, 1963.

Ornellas de Souza, Alvaro, "Alguns Aspectas da Economia Arrozeira no Rio
    Grande do Sul." Unpublished paper presented to the First Seminar
    on Agricultural Marketing in Latin America and the Caribbean, Jamaica,
    1959.

Simonsen, Mario Henrique, "Os Controles de Precos na Economia Brasileira,"
    Unpublished study prepared for a Harvard University project on
    government and business in Brazil, Rio de Janeiro, 1961.

Webb, K. "A Geography of the Food Supply in Central Minas Gerais,
    Brazil. Unpublished doctoral dissertation, Syracuse University,
    Syracuse, New York, 1958.