A PRELIMINARY ANALYSIS OF THE EFFECTS OF THE PRICING MECHANISMS USED IN THE SOYBEAN SUBSECTOR IN URUGUAY

By

Galdos G. Ugarte

A PLAN B PAPER

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF SCIENCE

Department of Agricultural Economics

Fall 1981

ACKNOWLEDGMENTS

I wish to express my graditude to Dr. Michael Weber, my major professor, for his continued support throughout all my graduate program and for his guidance and supervision of this work. Appreciation is due to Dr. Vernon Sorensen for his valuable comments and suggestions for the preparation of this paper. Thanks are extended to Dr. Norman Thompson for his participation in my examination committee.

I want to thank also my friend, Paul Aho, for his help in editing this paper.

I am specially indebted to my wife, Elena, for her understanding and encouragement and to my daughters, Elena, Victoria and Eugenia for making my life so enjoyable during my stay at Michigan State University; without them this effort would not have made any sense.

TABLE OF CONTENTS

Page

LIST OF TABLES

Table | Page

LIST OF FIGURES

CHAPTER I

INTRODUCTION

1.1. Problem Setting

Since 1974, Uruguay has adopted an export-led growth strategy of development. Macroeconomic policies implemented toward this general objective have achieved impressive results in improving the general economic situation of the country. These improvements have come in spite of adverse international factors such as the increase in oil prices and the closure of the European Economic Community market to imports of beef, the most important Uruguayan export commodity.

Increases in nontraditional manufactured exports have been largely responsible for the improvement in the overall growth performance and have brought about a substantial diversification of the export structure. Between 1954 and 1974, real per capita income increased at 0.5% per annum contrasting with 2.6% between 1973 and 1977. Nontraditional exports expanded from 26% of total exports in 1973 to 57% in 1977. Nontraditional manufactured exports expanded at an average annual rate of 45% in current prices from a

19.5% of total exports in 1973 to a 46.0% in 1977.[1]

Agriculture, in contrast, has been stagnant in Uruguay as a consequence of past economic policies oriented to income distribution, consumption and industrial protection, based on transference of resources from agriculture. Yet the country is largely dependent on its agricultural sector. Approximately 90% of merchandise exports are agriculture or agriculture originated products in different stages of processing. The recognition of this fact led the government to adopt important changes in agricultural policies in 1978. The agricultural economy was directed away from government controls toward a market orientation aimed at fostering investment and better allocation of resources. However, there have been many exceptions to this general policy over the past three years.

In the future, the economic performance of the country will continue to depend heavily on its agricultural sector. Long-term growth will depend on the recovery of stagnant traditional agricultural production and on the ability of the country to diversify its agriculture toward nontraditional export crops.

The only nontraditional export crop that has had a significant development in Uruguay is rice. Rice has become the third most important export commodity after beef

---

[1] World Bank, Uruguay. Economic Memorandum, Washington, D.C., January, 1979.

and wool. Rice exports more than doubled between 1974 and 1979 from 28.2 to 61 millions of dollars.[1] The rice success is characterized by key private sector entrepreneurial ability in organizing production and marketing, and by an effective public sector role in supporting a largely private sector effort.

Soybeans have also appeared recently as another non-traditional potentially exportable agricultural product. Uruguay has ecological conditions appropriate to grow soybeans. Soils and climate are intermediate between those of Brazil and Argentina, its two north and south neighbors, respectively. Brazil and Argentina have become the world's second and third largest soybean exporting countries after the U.S. Furthermore, soybeans yields are very acceptable; they are similar to those in Argentina and Brazil, and experimental results show that there is still room for yield improvements.

However, soybean production in Uruguay has not developed enough to make soybean exports an important and permanent source of foreign exchange. Given the need to diversify the export structure of the country, it is important to study why soybean, a crop that seems to fulfill the requirements to accomplish with those goals, has not developed more in Uruguay. It is particularly

---

[1] Oficina de Programación y Política Agropecuarie (OPYPA), personal communication and World Bank, op. cit.

important to identify those characteristics of the organization and operation of the subsector which have been determining its poor performance. Such information can be useful to the development and adoption of policy actions oriented to improving opportunities for the subsector.

1.2. Objectives of the Study

The overall objective of this study is to investigate selected aspects of the Uruguayan soybean subsector in order to provide information for use in evaluating alternative forms of market organization and operation which could lead to improvement in export performance.

To accomplish this major objective, the following more specific objectives are set:

1) To use existing information to describe, to the extent possible the structural and operational characteristics of soybean production and marketing.
2) To complete a preliminary estimate of the physical flows of outputs and inputs, and the information flows to principal subsector decision makers.
3) To examine government policy and the institutional mechanisms used to price and physically market soybean subsector output.
4) To make preliminary conclusions based on this overview diagnostic and recommendations regarding additional research needs.

1.3. Framework of Analysis

Industrial organization is a field within economics that provides an analytical framework for the study of industries and markets. The industrial organization model is based on the concept that a set of basic conditions (demand and supply characteristics; state of technology, etc.) interact with market structure influencing market conduct, which in turn determines market performance. Conduct also affects structure and basic conditions. Dimensions of market structure are the number and size of firms, entry conditions and product differentiation. Market conduct includes pricing policies, sales promotion, decisions on product characteristics, and actions by competitors to coordinate market behavior. Market performance dimensions are allocative and technical efficiency, progressiveness and equity. An extended industrial organization framework proposed by Shaffer[1] includes the influence of regulation on market structure, conduct and performance, and expands the notion of performance to dimensions such as level of employment, inflation, level of living and distribution of political and economic power.

A modified market structure-conduct-performance framework of analysis has been developed by a group of Michigan

---

[1] Shaffer, James D: "Food System Organization and Performance: Toward a Conceptual Framework," AJAE, May, 1980, pp. 310-318.

State University researchers in order to conduct diagnosis studies of food marketing systems in less developed countries.[1] This food system approach is based on the concept that market coordination is a dynamic and important element in development.

Economic development is a process that involves a sustained increase in output per capita over time. Increased output per capita can be obtained through the adoption of new production techniques and through new forms of organization of the economic activity. Specialization of production, industrialization and urbanization are implicit characteristics of the development process. As agricultural producers become more specialized and market oriented, they become also less self-sufficient. This leads to increasing dependence on purchased food, consumer goods and industrially produced farm inputs. The displaced labor force migrates from rural areas to industrialized cities. As incomes increase there is more demand for marketing services. These factors determine the need for exchange mechanisms for coordinating production, distribution and consumption of agricultural products, agricultural inputs and rural consumer goods. Constant improvement is needed in the exchange mechanisms for the transfer of

---

[1] Harrison, K. et al. Improving Food Systems in Developing Countries: Experiences From Latin America, Research Report No. 6, Latin American Studies Center, Michigan State University, 1974.

property rights and the physical flow of products.

The food system approach is oriented towards the evaluation of the system performance relative to general development goals.[1] Once general development goals are identified, specific objectives, strategies and instruments to achieve these objectives can be proposed. Analysis and planning of the entire food system is a rather difficult task. James D. Shaffer has suggested the need for research with a subsector orientation.[2] Division of the food system into subsectors provides more manageable units of research given the usual resources constraints.

The subsector as a unit of analysis is defined to include the entire set of production and marketing processes for a given commodity. Subsector analysis thus involves both vertical and horizontal marketing relationships among firms and industries. In adopting this kind of approach, vertical coordination becomes a crucial dimension for the determination of subsector performance.

Vertical coordination is defined as the process by which market participants organize the various functions of a vertical value adding system. Under the assumption of a perfectly competitive market, price is the

---

[1] Riley, Harold M. and Michael T. Weber. "Marketing in Developing Countries," Working Paper No. 6, MSU, Rural Development Series, 1979.

[2] Shaffer, James D. "On the Concept of Subsector Studies," AJAE, Vol. 55, pp. 333-335.

coordinating device. Perfect competitive markets are those where many producers of a single product perform production and marketing decision transactions with no cost on the basis of perfect knowledge. Under these circumstances completely mobile resources are optimally allocated, and price taking firms maximize profits by equating marginal cost with price. This "domestic" perfect competitive market concept can be extended to a world dimension. A "world" perfect competitive market assumes a free trade situation with absence of trade barriers and other distorting mechanisms.

In the real world, domestic and international perfect competitive markets do not exist. Imperfect information flows, high risk and uncertainty, high decision transaction costs, product differentiation, bounded rationality, differences in market power, etc., are characteristics of real world markets. Under these circumstances prices become ambiguous signals to coordinate demand and supply, and private firms and governments tend to establish alternative coordinating mechanisms.

Some alternative arrangements for vertical coordination are: contracts between participants at different stages of the production process, forward and backward vertical integration through acquisition of adjacent stages of production, bargaining associations, standards information services, marketing orders, joint ventures and

marketing boards.[1] International commodity agreement, voluntary exports restraints, bilateral trade agreements, etc. are examples of coordinating mechanisms at the international market level. Recently, inter-cooperative trade agreements, cooperative international marketing agencies and multinational cooperative enterprises have begun to be studied as potentially workable mechanisms for coordination of the international market.[2]

Poor vertical coordination is an important problem in food system subsectors in LDC's. The improvement of vertical coordination will bring about a number of advantages, like the reduction of marketing costs, the improvement of products quality, the introduction of subsistence farmers to the market system, the improvement of information flows, the creation of opportunities for the adoption of new technologies, the improvement of bargaining power of certain groups, the more efficient use of transportation, processing and storage facilities, the reduction of physical losses, etc.

Shaffer has suggested that subsector studies should have the following objectives: to describe the structural

---

[1] See for example: Forker, Olan D. and James V. Rhodes (editors). "Marketing Alternatives for Agriculture. Is There a Better Way?", November, 1976.

[2] See Knutson, Ronald D. et al. "International Cooperative Coordination in World Grain Trade," Texas Agricultural Market Research and Development Center and USDA.

and operational characteristics of the subsector; to identify opportunities for coordination between different stages of the production and marketing processes; to project future performance under current conditions and to identify private and public actions to be adopted in order to stimulate more effective vertical coordination and bring into harmony export and domestic production and consumption needs.

The success of rice in Uruguay is an example of the favorable effects that can be obtained through improvement in coordination between different stages of the value adding process of production and marketing. The rice subsector is highly vertical coordinated. Five milling/exporting firms act as coordinating agents. Three of these firms are completely vertical integrated agroindustries that process and market the production obtained from their own land. Two-thirds of rice production is processed and marketed by the remaining two firms, one a large cooperative of farmers and the other a private commercial mill. Procurement in the latter is made through contractual arrangements with farmers. These two firms are also the suppliers of inputs, machinery and financing for rice production. The price of rice to the producers is fixed annually by agreement between producers' and millers' associations. Price takes into account costs of production, export prices, domestic consumption price, and the ratio between production consumed domestically and that

going to the external market. This pooling price mechanism has allowed export sales to subsidize internal consumption at low government fixed prices, yet transferring a substantial part of world prices to farmers. Consequently, high yields, excellent quality, high technological levels of production and steady growth in area planted have been the norm in rice subsector over time.

1.4. Organization of the Paper

The remaining chapters of this paper are organized in the following way.

Chapter II includes a description of general characteristics of soybean production, consumption and exports, information helpful in assessing potential comparative advantage of soybean production in Uruguay and a description of soybean subsector organization.

Chapter III examines selected pricing mechanisms in the soybean subsector and their relationship with different performance outcomes, the effects of recently adopted Brazilian policies toward its soybean processing industry on the Uruguayan soybean subsector and a possible alternative way for organizing the soybean subsector regarding improvement of coordination.

Chapter IV contains a review of findings and questions and issues for future research.

CHAPTER II

2.1. General Characteristics of Soybean Consumption and Production

2.1.1. Characteristics of Edible Oil and Oilseed Meal Domestic Consumption and Imports

Over the period 1970-74 domestic consumption of edible oils averaged 25,000 tons a year. Traditionally this consumption had been satisfied with sunflower oil and to a less extent with peanuts and other minor sources of oil from domestic production. There have also been imports of crude soybean oil to be refined by local industry. Over the period 1970-74 oil production from domestic sources averaged 17,000 tons and imports averaged 8,000 tons. Projections of total domestic demand for 1980 and 1985 made in 1976[1] were 28,000 tons and 31,000 tons respectively. Those projections were calculated assuming a 4% increase in GNP, including a 0.5% rate of population growth and 0.4 income elasticity of demand for edible oils. Data in Table 2.1 shows an estimation of the evolution of the

---

[1] Hunting Technical Services and OPYPA. Agricultural Diversification Study, Principal Report, Annex IV: Marketing, Montevideo, 1976.

supply of oils from different sources in recent years. Over the period 1975-79 average oil production from domestic sources increased to 19,275 tons mainly due to the contribution of soybean oil. Imports were reduced to an average of 5,950 tons while domestic consumption remained around 25,000 tons.

Table 2.1. Evolution of the Supply of Oil From Different Sources in Recent Years.[a]

Year	Net Domestic Supply		Imports		Total Supply
	Sunflower Oil	Soybean Oil	Terminated Oils	Crude	
	tons				
1975	15,036	2,655	0	10,432	28,123
1976	20,726	862	1,992	3,453	27,033
1977	9,895	2,387	33	2,100	14,415
1978	18,144	4,890	33	2,129	25,196
1979	15,033	6,448	9,080	500	31,061
Averages	15,767	3,448	2,228	3,722	25,166

Sources: Estimated from DIGRA and OPYPA data, personal communications.

[a] For details on estimation procedure see Appendix I.

Projections made in 1976[1] estimated total production of sunflower and soybeans for 1980 at 46,000 and 33,000

[1] Ibid.

tons respectively, when 1980 actual production was 47,629 and 61,718 tons for sunflower and soybeans respectively.

Domestic consumers have developed a strong resistance to using soybean oil. Two characteristics of oil production can partially explain this fact. The first is that it is widely recognized that oil industry refining equipment is obsolete. Soybean oil requires better refining technology than other edible oils. The second is that oil is generally sold in bottles instead of cans and poorly refined soybean oil is susceptible to decomposition by action of the light. Consumers' preference for other oils is thus associated with poor quality soybean oil derived from these two production characteristics.

Domestic consumption of soybean meal and other oilseed byproducts is relatively small in Uruguay. Cattle production is based on direct grazing of natural or artificial pastures. Feed is only used in poultry, hogs and relatively less in milk production. Governmental policies have always favored cheap domestic prices for beef. As a consequence poultry, hog and feed manufacturing industries have had little development. Uruguay, therefore, has always exported oilseed byproducts and since 1976 soybean meal, while at the same time being a net importer of oil.

2.1.2. Production Evolution

Soybeans are a relatively new crop in Uruguay. Very few farmers planted soybeans during the mid-sixties but the significant development of the crop began in 1973. In

October 1972 an honorary commission for promoting soybean cultivation (CHPS) composed of government officials, farmers and oil industry representatives was created within the Ministry of Agriculture. Agronomic experiments carried out by Centro de Investigaciones Agricolas Alberto Boerger (CIAAB) had proven that soybeans could be adapted to agroclimatological characteristics of the country. The country had been a net importer of edible oil and it was considered that soybeans could provide an alternative source of edible oil for domestic consumption. It was also felt that there existed interesting possibilities for exporting high protein content soybean meal and that the crop, as other legumes, had desirable characteristics for improving physico-chemical properties of soils.

As a consequence of the action of CHPS, seeds, machinery and agrochemical inputs for soybean cultivation were opened for import and exonerated of the payment of tariffs. Soybeans started to be planted in 1973 with certified seed imported from the United States. Data in Table 2.2 shows the evolution of area, production and yields from 1965 through 1980.

2.1.3. Geographic Distribution of Production

Since the beginning of soybean cultivation, two principal geographical areas of production can be clearly identified in the country. The first one in the south-west and the second one in the north-east. The south-west area is the traditional cropping area of the country with better

Table 2.2. Evolution of Area, Production and Yields of Soybeans in Uruguay: 1965-80.

Year of Harvest	Area (ha)	Production (tons)	Yields (kg/ha)
1965	3,388	1,019	301
1966	599	278	464
1967	1,039	500	481
1968	837	495	591
1970	366	265	725
1974	3,800	5,760	1,516
1975	12,000	15,000	1,250
1976	7,500	8,625	1,150
1977	9,900	14,355	1,450
1978	20,000	33,000	1,650
1979	32,000	41,600	1,300
1980	45,658	61,718	1,352

Source: Ministry of Agriculture and Fisheries, Grain Sector (DIGRA), personal communication.

soils, farmers with experience in cropping, and better communications, storage and input supplier networks. The north-east is a traditionally extensive cattle grazing/ production area with strong cultural and sociological influence from Brazil. Farmers in this area have been influenced by the success that their Brazilian counterparts have had with soybean cultivation. Soil and climate characteristics in this area never favored the development

of traditional crops like wheat or sunflower. Soybeans thus appeared to farmers in this region as an attractive alternative to extensive cattle production. However, during the first years the most important area of production was the south-west. The situation changed over time as soybeans proved to adapt very well to north-east area conditions. Data in Table 2.3 shows the distribution of planted area for the 1980 crop.

Table 2.3. Percentages of Total Area Planted to Soybeans Per Region in 1980.

Region	Percentage of Total Area
South-west	33.45
North-east	58.94
Rest of the country	7.61

Source: DIGRA. Personal communication.

Several factors help to explain the shift in geographical location of the most important area of production: 1) adaptability of soybeans to agroclimatic conditions of the north-east, 2) low productivity of soils for alternative uses and extremely low returns per unit of area in extensive cattle grazing (the only alternative of production) and 3) a kind of demonstrative effect from Brazilian production.

2.1.4. Exports of Soybeans and Soybean Products

Data in Table 2.4 show the evolution of exports of soybeans and soybean products over the period 1974-80. The information has been registered by calendar year, although exports in a particular year may not have originated in the same year crop. For example, exports of soybean meal in 1980 may in part have been originated in the 1979 crop. Similarly, exports of soybeans in 1976 were exclusively made by the Ministry of Agriculture and were originated, part in that year crop, and part on balances of unsold soybean seeds from previous planting seasons.

Table 2.4. Exports of Soybeans and Soybean Products: 1974-80.

Year	Soybeans	Soybean Meal Pellets	Soybean Oil
	tons		
1974	0	0	0
1975	0	0	0
1976	7,900	8,273	0
1977	0	2,015	0
1978	4,400	11,183	0
1979	2,710	12,238	0
1980	9,865	18,928	19

Source: DIGRA. Personal communication.

2.2. Soybean Production Costs and Potential Comparative Advantage

Over the long run, whether or not Uruguay will become a permanent exporter of significant volumes of soybeans will depend on the degree of competitiveness of local production relative to the rest of the world. A comprehensive analysis of this issue is impossible to make within the limits of time and information available. However, a preliminary assessment based on existing information will be made below.

A "required" FOB export soybean price to cover direct production costs and export costs for the 1980 cropping year will be calculated by adding up estimated direct costs of soybean production and estimated export costs for that year. The "required" FOB price will be compared with different soybean prices in the international market. Obviously this simple procedure does not permit evaluation of the competitiveness of Uruguayan soybean production relatively to the rest of the world, but provides a rough idea of the feasibility of soybean exports at that particular time.

Data in Table 2.5 show an estimation of direct cost of production of soybeans for the 1980 crop. Note that a relatively high proportion of the total cost (68.38%) is due to the cost of inputs.

Table 2.5. Estimation of Direct[a] Cost of Production Per Hectare and Per Ton of Soybeans at Prices of May 1980.

Concept	$/ha[b]	$/ton[c]
Inputs	205.36	128.35
Transport of products and inputs	23.97	14.98
Labor	18.02	11.27
Maintenance and repairs	20.44	12.78
Amortizations	18.09	11.30
Interests	14.44	9.02
Total	300.32	187.7

Source: OPYPA, personal communication.

[a] It does not include taxes, insurance, and rent on land.

[b] Calculated from values in local currency; exchange rate: 1 Nuevo Peso = 8.81 dollars.

[c] Yield: 1,600 kg/ha.

A rough estimation of export costs for July 1980 -- two months after harvest peak -- is made in Table 2.6. To calculate such cost, export costs for wheat in November 1974[1] -- the only estimation that could be obtained -- were inflated by the CPI. Some modifications to that basic cost structure were made in order to reflect differences between

[1] See OPYPA, Memorandum on Factors for Establishing Wheat Prices, November, 1974.

Table 2.6. Estimation of Export Costs at July 1980.

Concept	Costs		
	N$/ton Nov. 1974	N$/ton July 1980[a]	$/ton July 1980[b]
Storage (2 months)	7.87	107.30	11.84
Transport (450 km)	22.50	306.75	33.85
Storage in port (15 days)	2.5	34.08	3.76
Port services	5.1	69.53	7.67
Losses (storage and movements)	7.8	106.34	11.74
Bank charges	8.8	119.97	13.24
Exchange broker	0.28	3.82	0.42
Custom broker	1.39	18.95	2.09
Total	56.24	766.75	84.63

[a] CPI Nov. 1974 = 984.1, CPI July 1980 = 13,416.7.

[b] Exchange rate July 1980: $1 = N$9.06.

current and past ship loading operations and differences in geographic location of wheat and soybean production areas. For example, the 1974 wheat export cost considered an average distance of 250 km from country storage facilities to the port. In the case of soybeans, currently produced mainly in the north-east, that distance has been increased to 450 km. It is recognized that this procedure of estimation is no more than a rough approximation. Relative importance of different concepts of the export

cost may have changed over that long period of time, but lack of up-to-date information does not permit better estimates. The "required" FOB price to cover direct costs of production and exports costs at July 1980 is obtained by adding $187.7 and $84.63 to obtain $272.33 per ton. This value should be compared with FOB River Plate Port prices for soybeans at that date. That information is not available. On Table 2.7 the "required" FOB price for Uruguayan soybeans is shown together with prices of soybeans for similar dates that could be obtained. Obviously, those prices are not comparable, since they refer to very different situations. However, they can be used as a rough standard for comparison given the lack of suitable data. Considering, above all, the differences in ocean freight rates from River Plate ports and from U.S. ports to Rotterdam, prices on Table 2.7 indicate that at that particular moment, Uruguayan soybeans were not competitive. However, given the limitations of the calculating procedure for the "required" FOB price (that could be either over or under estimated); the fact that a comparison at a particular moment may not reflect the situation over even a year; and the fact that price differences are not very large; no clear conclusions about the point could be drawn. Besides, some other factors should be considered.

Since 1973 soybeans have been cultivated with a relatively high technological level. That technology has been imported. National agricultural research has been

Table 2.7. Different Prices of Soybeans in July 1980.

Price	$/ton
"Required" FOB price for Uruguayan soybeans	272.33
Farm price for soybeans in Uruguay including subsidy[a]	232.28
Farm price for soybeans in Uruguay without subsidy	209.05
Farm price for soybeans in the U.S., average (1979-80)[b]	230.75
Export prices on barges in Gulf ports[c]:	
July 2	260.32
July 10	265.84
July 17	300.00
July 24	274.83
July 31	291.55
FOB Chicago, average July[d]	274.6
CIF Rotterdam, U.S. Yellow No. 2[d]	303.0
CIF Rotterdam, Argentinian origin[d]	287.4

[a] Ex-silo estimated price less transport cost from farm to silo. In 1980 the Uruguayan government paid a subsidy of $22.08 per ton. It is not clear, however, whether this subsidy was paid for exported soybeans or only for soybeans sold to domestic oil industry.

[b] Source: Commodity Yearbook, 1981.

[c] Source: USDA, Grain Market News, Vol. 28, #27-31, July and August, 1980.

[d] Source: OPYPA with data from Reuter's Economic and Financing Services in Cotizaciones Internacionales de Productos Agropecuarios, Boletin No. 9, Enero 1981, Montevideo, Uruguay.

completely insufficient in the country for many years.[1] Agronomical research in soybeans has been limited to the evaluation of different varieties with standard technological packages. Research on cultivation practices adapted to local production conditions has almost been nonexistent. For example, it is not clear whether or not it is preferable to use mechanic cultivation instead of chemical weeding or which is the optimum combination of both practices for different types of soils and climatic conditions. There is substantial room for improvement in this area.

Relatively high yields in 1974 might have been partially associated with the fact that farmers who planted soybeans in that year were those more progressive and experienced in cropping. As geographical location of soybean production area began to shift toward the north-east, more inexperienced, traditionally cattle ranchers began to become involved. People who never had ploughed land before, began to plant soybeans. It is not unlikely that if these farmers continue to acquire experience in cropping, yields could increase.

There is substantial room for yield improvement even with current technological levels. Agronomical experiments designed to evaluate relative performance of different varieties, carried out in different experiment stations

---

[1] See for example: World Bank, Uruguay Economic Memorandum, pp. 52-53, op. cit.

sustain the validity of this assertion. In Table 2.8 yields of the best and worst varieties within each agro-ecological group obtained in the Experiment Station of the North are shown.

Table 2.8. Yields of the Best and Worst Soybean Varieties in Experiment Station of the North: 1978 and 1979.

Agroecological Group[a]	Best Variety	Worst Variety	Yields (kg/ha) 1978	1979[b]	Ave.
VII	Ramson	-	3,291	2,180	2,736
	-	Semmes	2,256	1,550	1,903
VI	IAS-4	-	3,265	2,056	2,661
	-	Lee	2,494	1,623	2,059
V	Forrest	-	2,901	2,716	2,809
	-	Dare	2,275	1,736	2,006

Source: CIAAB, Personal communication.

[a] Group VII, VI and V are the more appropriate for Uruguayan conditions.

[b] 1979 was a year with drought problems.

Yields shown in Table 2.8 can be compared with average national yields shown in Table 2.2. Yields of the best varieties duplicate those at the national level and even yields of the worst varieties are substantially higher than those at the national level.

Since the mid-1970's Uruguay has adopted a mechanism of daily mini-devaluations of the local currency. Such

mini-devaluation policy was adopted as a means to maintain a more realistic exchange rate in accordance with the pace of domestic inflation and to curb strong inflationary pressures that used to happen in previous periods due to expectations of large devaluations.

Since 1977, however, the pace of mini-devaluations has not followed that of domestic inflation. Currently, domestic currency is considered to be overvalued. Available information does not allow us to estimate the percentage of overvaluation, but in Table 2.9 the disparity of the rates of growth of CPI and exchange rate since 1977 can be seen. While over the period 1974-77 the ratio CPI/exchange rate never was above 700, since 1977 on it began to increase, to reach 1,376 in 1980. The competitiveness of domestically produced goods have conversely diminished. Even rice, a high yielding (4,300 kg/ha in 1980) and highly competitive crop begins to be considered not profitable enough by farmers due to high local production costs related to international price levels.[1] An increase in the rate of mini-devaluations is called for by all domestic productive sectors. As an indication that this might happen, the Central Bank eliminated (in September of 1981) the future market for financial operations in local currency.

---

[1] See for example: USDA, Uruguay Annual Situation Agricultural Attache Report, p. 7, Buenos Aires, January 28, 1981.

Table 2.9. Evolution of Prices Received by Farmers for Soybeans Delivered to Buyers' Storage Facilities.

Harvested Area (ha)	Date[a]	Price			CPI	Exchange Rate (N$/dollar)	CPI / Exch. Rate
		Nominal (N$/ton)	Real (N$/ton/CPI)	In Dollars (N$/ton/exch. rate)			
3,800	March 1974	420	0.662	420.64	634.3	0.99848	635.27
12,000	April 1975	530	0.418	237.88	1,266.6	2.228	568.49
	July 1975	550	0.401	239.13	1,370.0	2.30	595.37
	October 1975	610	0.392	255.23	1,557.5	2.39	651.67
7,500	April 1976	640	0.342	212.62	1,872.0	3.01	621.93
	October 1976	700	0.294	190.22	2,379.5	3.68	646.00
9,900	April 1977	850	0.287	197.67	2,964.0	4.30	689.30
20,000	April 1978	1,100	0.250	199.28	4,396.0	5.52	796.38
	May 1978	1,150	0.255	202.82	4,517.0	5.67	796.65
32,000	1979	n.a.[b]	-	-	6,781.0[d]	7.56[e]	846.95
45,658	1980	2,000[c]	0.169	232.28	11,849.9[d]	8.61[e]	1,376.30

[a] Date of governmental decrees establishing prices from 1974 through 1978. 1979 and 1980 prices were free.

[b] Not available.

[c] Includes a subsidy of N$200.

[d] For April.

[e] Average for April.

Sources: OPYPA and DIGRA, personal communications.

If the exchange rate is adjusted to more realistic levels, the competitiveness of domestically produced goods will increase; the degree of improvement depending, for different products, on the proportion of imported and domestically produced factors of production of each product. In this sense the relative position of soybeans to other products may deteriorate since the proportion of the imported component in the production cost of soybeans is relatively greater than in other agricultural products.

Soybeans are less risky than other crops grown during the summer in Uruguay. Risks faced by farmers are mainly associated with yields variabilities, prices variabilities and marketing condition variabilities. The main source of yield variability in summer crops in Uruguay is the occurrence of dry periods. If those periods coincide with plant flowering periods, yields are severely reduced. Soybeans have a more extended flowering period than, for example, sunflower or corn, which makes soybeans a more flexible crop to overcome this problem. Also, the fact that soybeans are planted with higher levels of technology contributes to diminish yield variability. The fall in yields of summer crops in 1979, a dry year, relative to the fall in soybean yields can be seen in Table 2.10.

With respect to price and marketing risks, Uruguayan farmers have always expressed their willingness to accept risks derived from international prices variability rather than those derived from unpredictable and inconsistent

Table 2.10. Yields of Principal Summer Crops: 1974-80.

Crop	Yield (kg/ha)						
	1974	1975	1976	1977	1978	1979	1980
Corn	n.a.	1,025	1,191	763	964	541	904
Sorghum	n.a.	1,299	2,021	1,517	1,945	1,234	1,692
Sunflower	n.a.	494	567	336	504	396	553
Soybeans	1,516	1,250	1,150	1,450	1,650	1,300	1,352

Sources: OPYPA and DIGRA, personal communications.

price and marketing policies set up by the government. The steady growth in production of rice and wool have been the response of Uruguayan farmers to consistent free market oriented policies. The increase in area planted to soybeans in 1979 and 1980 (see Table 2.9) can be partially associated with the announcement in August 1978 that the government was intending to redirect the agricultural economy away from administrative controls toward a more market orientation. In Table 2.9 it can be seen that in spite of the sharp decline of real prices received by farmers for soybeans since 1978, area planted continues to increase. This increase in area cannot be associated with increasing profitability of the crop, because prices of inputs have increased more than prices of outputs,[1] rather

[1] See USDA, Uruguay, Annual Agricultural Attache Report, op. cit.

it may be associated with favorable farmers' expectations regarding marketing possibilities and with the relative profitability of the crop with respect to alternative production enterprises.

There are 3 million hectares of potentially suitable land for cropping in Uruguay. Land under cultivation never exceeded 1.3 million hectares, even during the 1950's when price relationships were relatively favorable for cropping. The most potentially usable land for cropping is under extensive cattle grazing, in areas where traditional crops like wheat have failed. The fact that soybean production has been increasing in the north-east tends to confirm that it is an attractive alternative to cattle production.

Development of soybeans in the traditional cropping area of the country is not likely to occur while government continues with its policy of promotion of inefficient wheat production through establishment of support prices well above international market levels. Uruguay recently exported 150,000 tons of wheat at $145/ton FOB while price paid to farmers was $275/ton. Data in Table 2.11 show that wheat yield in Uruguay is 46.08% of that in the U.S. while soybean yield is 72.68% of that in the U.S.

Whether or not it is convenient for Uruguay to continue promoting wheat production in detriment of apparently more competitive productions requires careful evaluation.

Table 2.11. Yields of Soybeans and Wheat in Uruguay and in the USA: 1974-80.

Year	Yields			
	Wheat		Soybeans	
	Uruguay	U.S.	Uruguay	U.S.
	kg/ha			
1974	1,016	1,836	1,516	1,594
1975	1,153	2,058	1,250	1,944
1976	984	2,038	1,150	1,755
1977	929	2,064	1,450	2,058
1978	539	2,118	1,650	1,984
1979	795	2,300	1,300	2,165
1980	1,342	2,246	1,352	1,802
Average	965	2,094	1,381	1,900
Average Uruguayan yields as a percentage of average U.S. yields	46.08		72.68	

Sources: Commodity Yearbook and OPYPA personal communication.

The competitiveness of Uruguayan soybean production will depend on the interrelationships among a series of economic and institutional factors. Some of them have been mentioned in previous paragraphs. Previous discussion seems to indicate that it is worthwhile to undertake research in order to assess the possibility of future expansion of soybean production in Uruguay.

2.3. Soybean Subsector Organization

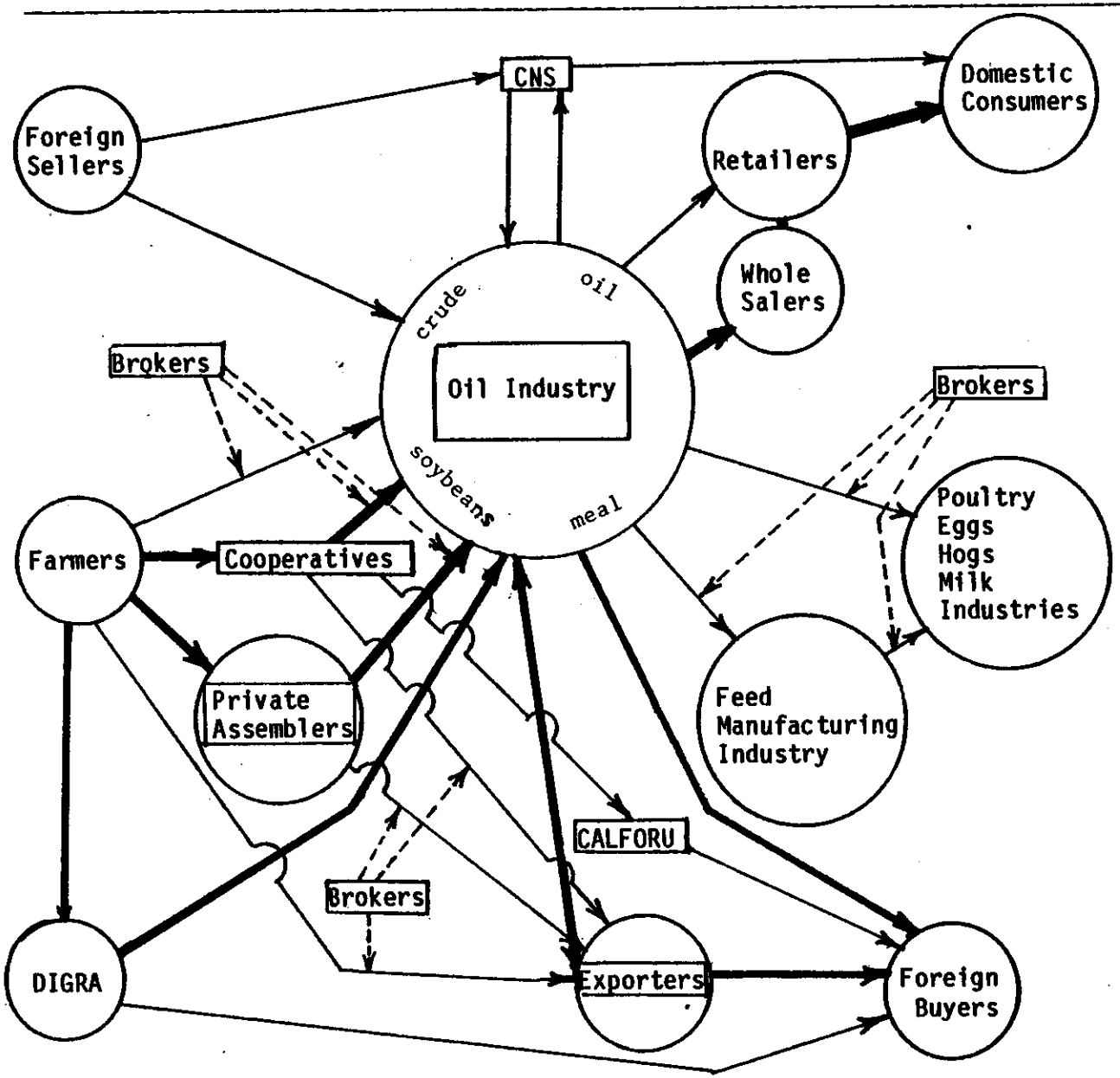
2.3.1. Marketing Channels

The principal buying and selling patterns, and marketing channels in the soybean production and marketing system are summarized graphically in Figure 2.1. This is not an exhaustive representation of all the marketing channels and relationships that exist in reality; for the sake of simplicity only the more important ones are shown.

Circles in the diagram represent agents that always become owners of soybeans or their products when they participate in the marketing process. When solid lines connect two circles there is a change in ownership of soybeans or their products. Rectangles in the diagram represent agents that never buy or sell the merchandise, they simply perform some services for the owner. These agents can be either in the preceding or in the following circle of the channel. Agents represented by rectangles included in circles are those that can behave in either one of the previous manners. Dashed lines connecting brokers with full lines indicate that they can or cannot act in the transaction between the buyer and the seller connected by the solid line. For simplicity of the diagram brokers appear as several rectangles. This does not indicate that there are different kinds of brokers or that there are specialized brokers for each type of transaction; they are all the same.

The width of the lines is not quantitatively related

Figure 2.1
Principal Marketing Channels for Soybeans and Soybean Products in Uruguay.



to the relative importance of each flow, but wider lines are used for flows that are more common. Figure 2.1 also does not represent marketing channels at a particular moment in time, because there are agents shown that did not participate contemporaneously. For example, the governmental grain purchasing agency (DIGRA) has not had direct intervention in buying and selling soybeans since 1978 and CALFORU, a second grade cooperative, began to operate in soybeans only in 1978. Thus, marketing channels passing through those two agencies are not contemporary. However, experience indicates that the fact that DIGRA does not have direct intervention on marketing soybeans currently, does not mean that it is not going to intervene in the future. In fact, in the 1980 crop DIGRA intervened, though in a different way, paying a subsidy to farmers. Figure 2.1 represents then a whole set of the most important marketing alternatives for soybeans since 1974.

Finally, for simplicity, transporters are not represented in the diagram, although they play a role whenever soybeans or soybean products are transported by trucks that do not belong to the buying or selling agents.

2.3.2. Agents and Functions

In order to understand the structure and operational characteristics of the soybean subsector it is necessary to identify the different agents that play a role in the production and marketing processes of soybeans, and the functions that each of these agents perform. A description

of the functions that the most important agents in the soybean subsector perform is given below.

A) Farmers. Production characteristics were examined in sections 2.1.2 and 2.1.3. Farmers' behavior after harvest is briefly described here. On farm storage is practically nonexistent in Uruguay. Thus, after harvest, farmers store their soybeans in silos of farmers' cooperatives, private assemblers, DIGRA and oil factories. When soybeans are stored at oil factories facilities, there is usually no charge for the service but there is a tacit obligation to sell the merchandise to that particular firm. This is not a frequent procedure because farmers generally do not make decisions related to when and to whom they sell before harvesting. Rather they begin after harvesting to explore different possibilities and to wait for governmental decrees that are not always issued prior to the harvesting season.

B) Farmers' Cooperatives. These agencies perform essentially the following functions: 1) provide services related to the physical handling of soybeans; 2) help farmers sell their produce; 3) act as suppliers of inputs for agricultural production.

Physical services include drying, when it is necessary, grading and storing. These services are provided to both members and nonmembers of the cooperative, the reasons for this being explained below. The merchandise is generally stored in common lots, losing a particular farmer's

identity, although in some cases, when there is storage availability and it is required by the farmer, the lots remain identified. Cooperatives charge fees for the physical services they provide.

Cooperatives negotiate with different buyers for selling the common or individual soybean lots. Of course previous clearance with farmers is made before settling a transaction. In this sense cooperatives act as brokers, although no fees are charged for this service. When common lots are sold, price obtained is related to the average quality of the lot. Prices obtained by each individual farmer are obtained after adjustment in accordance with quantity and quality delivered by each farmer.[1] Farmers do not use the cooperative services for selling their soybeans. Sometimes they prefer to negotiate directly with the buyer. In this case the farmer uses only cooperative facilities for drying, grading and storing. When an individual farmer sells his soybeans and those soybeans have lost identity in a common lot, the quality of the lot delivered by the cooperative to the buyer is different from that delivered by the farmer to the cooperative. Also in this case, the cooperative does not know the price that the farmer received, it has no base price on which to make adjustments for differences between

---

[1] For details on system of discounts and premiums for quality see section 2.3.5.

quality received and delivered. The amount of money that has to be changed or paid to or by the farmer for that difference is calculated taking as a base price the official government price for soybeans or the quoted price at the Mercantile Chamber[1] at the date of delivery.

Additionally, cooperatives provide services of storage to, 1) DIGRA, when this agency has contracted with them for storage of its soybeans; and 2) to different buyers when the transference of ownership from farmers to buyers takes place before the actual physical delivery of the merchandise.

As input suppliers, cooperatives act as final distributors of agricultural inputs to farmers. Usually farmers' purchases of inputs are not paid in full. Each farmer has a current account to which purchases are charged. Actual payment takes place when produce is sold and the cooperative deducts the owed amount from the total value of the soybeans sold. Since farmers are not obliged to sell their soybeans through the cooperative, it is not uncommon that large debts for purchases of inputs remain unpaid for a long time. Some cooperatives have run into financial problems due to this farmers' behavior.

In order to understand why cooperatives act as they do it is necessary to describe briefly some of the main

---

[1] For details on Mercantile Chamber functions, see section 2.3.2, L.

features of recent farmers' cooperatives history. Until the late 1960's, the role of farmers' cooperatives in the production and marketing processes of grains and oilseeds was limited to the supply of inputs for agricultural production. Farmers' cooperatives neither had storage facilities nor capital to build them. Grains and oilseeds were physically marketed through private assemblers' facilities, and through government storage facilities. At the beginning of the 1970's the government began to promote farmers' cooperatives involvement in grains and oilseeds trading, mainly by providing them with storage facilities. The Bank of the Republic (BROU), the government bank, had a network of warehouses that were used for grain storage when BROU acted as the government purchasing agency for wheat. When the wheat purchasing function was transferred from BROU to the Ministry of Agriculture, the BROU warehouse network began to be ceded to farmers' cooperatives for their use. Simultaneously, the government initiated a program of silo construction financed with AID funds and, in very small proportion, with revenues from a 2.5% tax directly deducted by the Ministry of Agriculture from payments of wheat to farmers. Storage facilities built under this program were also ceded to farmers' cooperatives. During the period when storage facilities were being delivered to farmers' cooperatives, the government had the monopoly on wheat marketing. Initial farmers' cooperatives involvement with grain and oilseed marketing was thus

limited to providing storage services for DIGRA.

It is beyond the scope of this paper to describe the endless, legal, institutional, administrative and economic problems created by the process of transference of storage facilities property of the government to farmers' cooperatives. But some main features should be pointed out.

First, under the terms of cession contracts, cooperatives became administrators of government owned goods. It was considered that government facilities should provide services to whoever required them. That is the reason why cooperatives provide services to nonmember farmers, exporters, oil industry firms, etc.

Second, it must be noted that the government was paying for storage services provided in its own facilities. This could have been interpreted as an intentional policy of transference of resources to capitalize farmers' cooperatives, had it not been for the fact that farmers' cooperatives had to pay back to the government 80% of the profits obtained by the operation of the storage facilities. The auditing of cooperatives' balances was neceesary in order to determine amounts to be paid to the government. During some years government payments for storage services, usually made on a monthly basis, had a delay of more than a year. Cooperatives' balances were prepared on an accrual basis of accounting, so, in some years, cooperatives were required to pay to the government 80% of profits that actually had not been received; moreover,

farmers' cooperatives had to pay value added taxes for services provided to a client, the government, that did not pay its debts in time. The decapitalizing effects of such policies are obvious, but what may have been worse was the demoralization on farmers who did not understand such inconsistent behavior on the part of the government.

C) Private Assemblers. These agents basically perform the same functions as farmers' cooperatives. The traditional assemblers' function of buying from farmers, maintaining the merchandise at their own risk and selling it afterwards, has almost disappeared. Factors explaining this behavior are: 1) during years of government monopoly on the marketing of wheat (the most important crop in Uruguay) the private assemblers' role was limited to providing storage services for DIGRA; 2) the fact that the government fixed maximum prices for final products on an annual basis, combined with high inflation rates made it impossible to maintain merchandise over time and recover costs when selling. Investment was therefore redirected to less risky durable assets that provided a hedge against inflation; 3) the nonexistence of official lines of credit for marketing operations, reflecting the generalized anti-middleman mentality at governmental levels; and 4) the existence of a law of Repression of Economic Offenses, that anticipated sanctions for speculation on foodstuffs and other merchandise, that although not directed to private rural assemblers, was sufficiently ambiguous as to

prevent normal assembling operations because of the fear of being sanctioned.

However, there have been some exceptions to this general behavior, especially after the beginning of the process of governmental withdraw from price determination of final products. Since 1977 some private assemblers have begun to behave as actual traders with small soybean lots.

D) Government Grain Agency (DIGRA). This is a governmental agency dependent on the Ministry of Agriculture. Its main function is to buy soybeans directly from producers when support prices are established. DIGRA owns storage facilities but they are located mainly in ports, it usually contracts with cooperatives and private assemblers for storage of the soybeans it buys from farmers. DIGRA usually sells its soybeans to the domestic oil industry, but sometimes, like in 1976, DIGRA's soybeans were exported.

DIGRA also establishes the quality standards for soybeans and norms regarding sampling procedures, as well as carrying out the Register of First Hand Transactions of Grains and the Register of Grain Traders established by governmental decrees of August, 1978.[1] DIGRA can also act as Appeals Tribunal to settle disagreements between private

---

[1] For details on these two Registers and on decrees of August of 1978, see section 3.3.

agents regarding grain and oilseed transactions.

DIGRA has also played an important role in the process of production of commercial soybean seed. From 1974 to 1978 DIGRA bought from farmers seed produced in previously selected fields and after processing, sold it for the following year production. Domestic certified soybean seed was not available in the country until 1978. DIGRA also was the agency that imported certified seed from the United States when the crop started in 1973 and imported certified seed again in 1977.

E) Oil Firms. There are only three oil firms in Uruguay that have factories with solvent extraction equipment and that can process soybeans. Two of those firms belong to the same owner. In Table 2.12 the total annual capacity for solvent extraction of those three firms is shown.

Table 2.12. Solvent Extraction Capacity Per Year and Per Firm.

Firm	Solvent extraction capacity expressed in tons of soybeans that can be processed in 300 working days per year
Torino-SAIM	48,000
COUSA	72,000
ADU	12,000
Total	132,000

Source: DIGRA, personal communication.

Oil industry sources consider that generally 50% of this capacity is used in processing sunflower seed and re-extraction of oil from sunflower byproducts. Although those firms have made substantial investment in solvent extraction equipment, refining equipment is still considered obsolete.

The oil processing firms purchase soybeans from farmers, coops, assemblers or from DIGRA. They can import crude oil for selling in the domestic market after refining, or they can refine under contract crude oil which is the property of Consejo Nacional de Subsistencias (CNS), a governmental agency whose function it is to purchase foodstuffs abroad to complement domestic supply.

These oil industry firms sell soybean oil, generally blended with other edible oils, to wholesalers and sometimes directly to retailers. Soybean meal is sold domestically to the feed manufacturing industry or directly to poultry, eggs, milk and hog industries that in turn produce their own feed. Soybean meal is also exported directly by oil industry firms or through independent local exporters. So far, there are no other kinds of soybean processing industries in the country, the only products obtained from soybean processing are soybean oil and meal.

F) Wholesalers and Retailers. These participants are fairly specialized in their functions in the distribution process of soybean oil. There is only one retail chain vertically integrated backwards. This firm owns a

small oil crushing and refining plant and a wheat mill, but does not operate with soybeans.

G) Exporters. The traditional grain and grain by-product exporters are subsidiaries of multinational grain corporations. Recently some new local exporting firms, some larger farmers, and a second grade cooperative, (CALFORU), have begun to participate in soybean exports. Oil industry firms have exported soybean meal since 1976 and DIGRA exported soybeans in 1976.

No matter who the local exporter is, the foreign buyer is generally a multinational grain corporation. Recently, however, some exports have also been made directly to Brazilian oil processing firms.

Essentially, exporters carry out the paper work for exports within the country, a rather complicated bureaucratic procedure that requires specialized expertise. Sometimes these exporters can directly purchase merchandise, but usually they simply behave as brokers, putting the domestic seller and the foreign buyer in contact. Almost all exports are made on a FOB basis.

H) Rural Promotion Agricultural Cooperative (CALFORU). This is a second grade cooperative of some of the farmers' cooperatives in the country. CALFORU has traditionally been involved with fruit and vegetables marketing but in 1977 it began operating with soybeans. CALFORU exported soybeans in 1978 and 1979. CALFORU officials have always been worried about the monopolistic characteristics of

local processing industries, and therefore, their operations have always been oriented towards exports as a means to provide alternative marketing opportunities to farmer members. Although CALFORU has been acting as a seed and inputs supplier for soybean production, it has not implemented a mechanism to ensure soybean procurement like, for example, contracting future delivery of soybean production with farmers. In soybeans, CALFORU has essentially behaved as any other exporter.

I) Feed Manufacturing, Poultry, Milk, and Hog Industries. These are the domestic consumers of soybean meal. The poultry industry is by far the most important user of feed. The hog industry has almost disappeared, and the utilization of feed in the milk industry occurs only during winter months in quantities which depend on the severity of climatic conditions in that season. As previously mentioned, the development of poultry and hog industries has always been limited by relatively low beef prices, associated with strong consumers' preference toward beef rather than chicken and pork.

J) Brokers. There are a few of these agents, no more than ten, who have an active role in trading soybeans and soybean meal. They do not sell or buy merchandise by themselves, they simply participate in the negotiation of transactions, trying to help buyers and sellers reach agreement regarding price, installment conditions, place of delivery and so forth. They charge a 1% fee of the

value of the transaction to each part involved. They are intensively used by oil industry, feed manufacturing industry, rural private assemblers, exporters and even by some farmers. Farmers coops prefer to bypass brokers, but sometimes must use their services.

It is amazing that in a relatively small market, where a rather few number of sellers and buyers operate and know each other well, brokers have managed to survive. Factors explaining brokers' success can be: 1) the knowledge they have about supply and demand conditions and 2) the high degree of trust that both, buyers and sellers have in them. There are no standardized contracts specifying rights and obligations of the parts involved in grain and oilseed transactions in Uruguay, except for those in which the seller is a farmer. Under these circumstances trade is limited to transactions based on mutual trustfulness of the parts involved. Even when brokers generally set up transactions by telephone, there is practically no failure in accomplishment of what has been stipulated.

K) Governmental Agencies. Besides the previously mentioned DIGRA and CNS, there are many other governmental agencies that directly or indirectly have influence on the soybean production and marketing process. Worth mentioning are: the Bank of the Republic (BROU) which provides credit for agricultural production; the Prices and Income Control Agency (DINACOPRIN), an agency of the

Ministry of Economy that fixed wholesale and retail prices for every imaginable consumer item. Over the last years its activity has been substantially reduced as government moved away from price control policies. Currently, DINACOPRIN fixes prices for a few foodstuffs, like wheat flour and bread, and gathers information on wholesale and retail prices of different products. The Plant Protection Agency (DSV), a dependency of the Ministry of Agriculture, establishes sanitary norms regarding grain and oilseed storage and handling. This agency performs inspections wherever grains are stored and can order sanitary treatments and apply fines. The Ministry of Transport and Public Works (MTOP) set up norms regarding maximum weights allowed for trucks and is in charge of enforcement of such norms.

L) Private Commerce Organizations and Associations. There are several other organizations that have indirect involvement in the soybean marketing process. The National Chamber of Edible Oils represents oil industry interests; the Mercantile Chamber includes, among others, the Brokers' Association, the Grain and Oilseeds Exporters Center, the Assemblers Association and the Feed Manufacturing Association. Basically, these are trade unions, but the Mercantile Chamber, though not acting as a real exchange chamber, collects information on prices of different agricultural products on a biweekly consultation with different members. It also carries on the Register of Second Hand Operations

of Agricultural Products and Byproducts, and publishes a weekly bulletin with prices and volumes traded. It is compulsory by law to register second hand transactions, but the Mercantile Chamber does not have the power to enforce the law, and there are no established sanctions for omission in registering such transactions. This law was passed in the early sixties, after a series of bankruptcies of wool marketing firms that damaged creditors throughout the marketing system.

The law established the obligation to perform transactions of agricultural products through standardized contracts that should be registered and that would be "executive title," a legal technical feature that permits substantial reduction of the time required to carry out judicial procedures for nonfulfillment of what was stipulated in the contract. Apparently, it would have been of interest to both parts involved in a transaction to have the guarantees provided by formal contracting. But since registered contracts could be used as a means to control payment of certain taxes; and enforcement was difficult and expensive, considerable omission has existed. This is a clear example of a regulation that was apparently designed to improve the soundness of the marketing process, but by virtue of the complexity of its enforcement has become a barrier for improvement of coordination.

2.3.3. Soybean Storage Capacities

There was in 1976 a total of approximately one million tons of grain and oilseed storage capacity in the country.[1] That total capacity was considered enough to satisfy storage demand in the country. Total production of grain and oilseeds was 900,000 tons in 1974-75 season[2] and was estimated to be 811,000 tons in 1980.[3] Since 1976 there have also been increases in storage capacity, mainly related to investment by private assemblers in the construction of silos. However, most storage facilities are located in the south-west, the traditional crop production area. It is probable that, if the present tendency of increasing soybean production in the north-west continues, storage may become an important constraint for developing soybean production in that area. In addition, more recent exports of soybeans have been made by trucks to Brazil. This option will probably make it uneconomical to move the crop south to idle storage facilities and then to move it back north for export. In-port storage and boat loading facilities are considered adequate for handling current quantities of exported grain. However, they also may become a limitation if volumes are increased. The National

---

[1] Hunting-OPYPA, op. cit., Annex VI, Grain Storage and Processing, Table 6.3, Montevideo, 1976.

[2] Ibid.

[3] USDA, Uruguay: Annual Situation Report, op. cit.

Silo Plan Office (PNS), a governmental agency in charge of building storage facilities, had a project in 1979 to build a terminal elevator in Nueva Palmira, a port located over the Uruguay river in the south-west. The Port Authority (ANP) also had a project to build another terminal at the Montevideo harbor. The current status of these projects is unknown.

2.3.4. Soybean Transport

Uruguay has a relatively well distributed railroad network and railroad fares per ton/kilometer are substantially less than those for road transport. Yet most soybeans, and other grain and oilseeds are transported by trucks. This situation can be explained by the poor quality of railroad services, such as sluggishness and complexity of bureaucratic procedures, and reduced availability of suitable rail cars. Development of soybeans in the north-west may also be hampered by the relative lack of rural penetration roads in that area.

2.3.5. Soybean Quality Standards

There has been a quality standard for soybean since 1974. The standard establishes a base of quality to which any official price or price quotation is related. There is a pre-established system of percentage discounts and premiums according to the lot content of damaged beans, heated beans, broken beans, black beans, and foreign materials. There is a maximum of 13% of moisture content

allowed for storage and there are no discounts or premiums for moisture content. If soybeans need to be dried, that process is made before storage and the cost is paid by the owner of the merchandise. Generally, DIGRA establishes maximum tariffs to be charged according to moisture content before drying. There are also official tables establishing the reduction in weight due to the drying process. Farmers do not have drying equipment, so drying, if necessary, is made on private assemblers' and cooperative facilities. The merchandise is only weighed before drying and after drying weight is calculated with the official tables.

Although the existence of a standard of quality with fixed percentages of discount and premiums permits transactions without physical inspection of the merchandise, it is still frequent that buyers require samples before settling transactions. Shipments are then made on the basis of that sample. The explanation for this operating procedure, which undoubtedly increases costs and wastes time, may be that the quality norms for grains and oilseeds are relatively new in the country.

When both parts involved in a transaction do not agree over the quality or over the sampling procedure, DIGRA can act as appeals tribunal to settle differences. In the case of soybeans, where quality seems not to be a problem, there have not been many of such appeals.

DIGRA is currently studying the possibility of

establishing a quality standard based on oil and protein content. The imposition of such a standard would seem to be an unnecessary sophistication for which substantial investment on laboratory equipment would have to be made by soybean traders.

2.3.6. Soybean Market Information

The Agricultural Economics Research Office (DIEA), is the governmental agency in charge of collecting and publishing statistics about agricultural production, and prices of agricultural inputs and products. However, DIEA does not collect and publish information about soybeans. The main source of information on soybeans is DIGRA, although they do not have the responsibility to collect and spread information. However, DIGRA has been collecting information about areas, yields and production by "ad hoc" procedures based on the knowledge of the market through interpersonal relationship with farmers and traders. DIEA does try to check its estimates with DIGRA's estimates before publishing information about other grains and oilseeds. Undoubtedly the accuracy of DIGRA's estimates diminishes as the number of soybean producers and production increases. Anyhow, DIGRA does not publish information and generally DIEA's information is available late, when it has no value for making transactions. One of the objectives in establishing the obligation to

register first hand transactions[1] was to obtain statistics related to volumes sold by producers, qualities and real prices obtained. The First Hand Operations Register began to work in late 1979, amidst resistance from both farmers and merchants who saw it as one more unnecessary bureaucratic requirement. So far no publication of data from this source has been made.

Radio is the almost universal means to get information to rural areas where newspapers rarely reach. There are several widely listened to daily radio programs that broadcast information on agricultural topics, among them, grain and oilseed prices. Prices reported are from the Mercantile Chamber quotations. Since the Mercantile Chamber is essentially an organization comprised only of merchants who are on the buying side of the market, there is not much trust on the part of the farmers and farmer cooperatives in the information. Generally, quotations from the Mercantile Chamber are taken as a minimum price that can be improved through bargaining. Oil industry and exporters' behavior of paying prices above these quotations, tend to confirm the validity of such beliefs.

The area where information is most lacking is the one relative to international markets. Since 1975, the

---

[1] First hand transactions are those in which the seller is a farmer. For details on the Register of First Hand Transactions of Grains and Oilseeds, see section 3.3 of this paper.

Agriculture Policies and Planning Office (OPYPA) has received, through teletype, information about international markets from the London based news agency REUTER. However, that information is not published or conveyed to the public. A weekly summary of this information is made by OPYPA and circulated internally to various offices of the Ministry of Agriculture.

In this chapter, general characteristics of soybean consumption and production, soybean production costs, potential comparative advantage, as well as soybean sub-sector organization and operating procedures, have been examined. Pricing mechanisms for soybeans and soybean products and their relationship with different outcomes are examined in more detail in the following chapter.

CHAPTER III

PRICING MECHANISMS FOR SOYBEANS AND SOYBEAN PRODUCTS

3.1. Introduction

A main concern of this paper is the identification of vertical coordination problems in soybean production and marketing processes which may be preventing a rapid expansion of soybean production and which may hamper the possibility of Uruguay becoming a soybean exporter.

The pricing system is the principal means through which demand and supply are coordinated. Specific pricing mechanisms can be seen as subsets of the price system. James D. Shaffer defines pricing mechanisms as, "the institutional arrangements, the 'rules of the game' structuring transactional relationships resulting in prices which are instrumental in coordinating economic activities." Prices thus become the results of a particular pricing mechanism and will always reflect the institutional structure of the price system and the institutions associated with that particular price mechanism. The institutional structure consists of all the rules, regulation customs, standard operating procedures, taxes and subsidies that shape the opportunity sets of

participants.[1] Thus, government rules rather than being an interference with market pricing mechanisms, define the shape of the opportunity sets of market participants; as Shaffer indicates: "Regulations are not interventions in the price system; they define the game. Prices always reflect preferences expressed through both market transactions and the political processes...."

In this chapter an intent is made to analyze pricing mechanisms for soybean output and their relationship to different subsector outcomes.

Although according to the previous definition of pricing mechanisms, governmental actions should not be isolated from the process of market price determination, over the period 1974-80 two periods are clearly identifiable from the point of view of government involvement in soybean marketing processes. The first one (from 1974 to 1976) is a time when prices of edible oils and some other products related to soybean marketing processes, like poultry and pork, were administratively fixed by the government. The second period (from 1977 on) is a time when government involvement in the pricing mechanisms of soybeans was limited to providing the regulation framework within which transactions could be carried out.

---

[1] Shaffer, James D., Pricing Mechanisms. Some Questions of Policy: An Overview From an Institutional Perspective. Paper presented by an OECD Seminar, Paris, July 1, 1980.

3.2. Pricing Mechanisms Over the Period 1974-76

During this period, DINACOPRIN fixed prices for edible oil at the oil factory level, the wholesale level and the retail level, as well as prices of intermediate and final product related to the soybean marketing system, like feed, chicken, pork, etc. It is not clear how DINACOPRIN proceeded to set up these prices. "There is no published information about the methods used by DINACOPRIN for establishing retail prices. It has not been possible to obtain from COPRIN information about this matter...."[1] What is clear is that DINACOPRIN took the official farm price set by the Ministry of Agriculture for soybeans delivered at country storage facilities, as if it were the price for soybeans delivered to the factory. DINACOPRIN, then, used that price to calculate prices of soybean oil and meal. Obviously, this procedure represented a gross mistake since it did not take into account price differences over time and space. Storage, financing and transport costs incurred before delivery of soybean to factories were simply ignored. Moreover, prices of oil at factory, wholesale, and retail levels fixed at the beginning of each year's marketing period were maintained until the next harvesting season. In an economy with high

---

[1] Hunting Technical - OPYPA. Agricultural Diversification Study Principal Report, Annex IV, Marketing. Montevideo, 1976, p. 33.

rates of inflation, this procedure meant a substantial erosion of returns in real terms.

Below, the effects of this behavior are analyzed year by year in order to determine who benefited and who lost in each case. The loser in each case depended on the interaction between governmental fixed prices for final products and the government pricing policies for soybeans to farmers.

Data on Table 3.1 show the evolution of nominal and real prices of soybeans to farmers and the characteristics of the prices established. After having promoted the initiation of the crop through the creation of the Honorary Commission to Promote Soybean Cultivation (CHPS) and the adoption of measures described in section 2.1.1, the government decided to buy all 1974 soybean production to be used as seed in the next planting season. Decree 220/974 of March 21, 1974 stated that the government had set up a goal of 150,000 ha of soybean area for the 1975 crop. Considering the area planted in the previous season (3,800 ha) this goal appeared, at best, unrealistic. Soybeans were a new crop, and there were obvious problems with the availability of suitable machinery, equipment, pesticides, herbicides, seeds, etc.

No soybeans were marketed for processing or exports during 1974 because DIGRA purchased total production to be used as seed for the next planting season.

The statement of the goal of 150,000 ha of soybeans

Table 3.1. Nominal and Real Farm Prices of Soybeans and Characteristics of Those Prices.

Dates of Decrees	Nominal Price (N$/ton)[a]	Real Price (N$/ton/CPI)	Price Characteristic
March 1974	420	.662	Support for seed
April 1975	530	.418	Minimum
July 1975	550	.401	Minimum (adjustment)
October 1975	610	.392	Orientation
April 1976	640	.342	Support
October 1976	700	.294	Orientation
April 1977	850	.287	Support
April 1978	1,100	.250	Minimum
May 1978	1,150	.255	Minimum
1979[b]	n.a.[c]	-	Free market
1980[b]	2,000[d]	.169	Free market

[a] N$: symbol for new peso, the Uruguyan currency.

[b] No decrees in 1979 and 1980.

[c] n.a.: not available.

[d] Estimated, includes a subsidy of N$200 paid by the government to farmers.

Sources: Registro Nacional de Leyes y Decretos and Diario Oficial: Soybean Marketing Decrees.

for the 1975 crop and the extremely high price paid by the government for the 1974 crop (see Table 3.1), may have explained in part why the area planted for the 1975 crop was 12,000 ha, three times larger than in the previous season.

For the 1975 crop the rules of the game were completely changed. A minimum compulsory price to be paid to farmers by all buyers was established. It was the first time that a minimum compulsory price was established for any crop and there were no appropriate mechanisms to verify if the law was really met. This minimum price referred to a standard quality and to a delivery place, "in the buyer's storage facilities." This was a rather vague specification since the buyer's storage facilities could be either a rural private assembler's facility, geographically located near production fields, or an oil factory storage facility, located hundreds of miles away in the capital city. Farmers had to pay transport cost from country elevators to oil factory because DINACOPRIN considered the minimum price as an ex-factory price and reduced margins did not allow the oil industry to pay for transport.

Also, at that time, oil industry officials, wholesalers, and retailers complained that prices set up by DINACOPRIN resulted in reduced or nonexistent margins. To compensate for these reduced margins, common operating procedures were to delay payments of purchased merchandise

as much as possible. Money received from the sale of products was invested at prevailing high interest rates during the period between the moment money was received and the moment when payments had to be done. Minimum price of soybeans was apparently paid to farmers but on a nominal basis because it was made in long term installments of around 6 months. With rates of inflation of around 70%[1] this procedure meant a substantial discount in real price received by farmers. Also, oil industry firms received soybeans slowly and farmers had to bear storage and financing costs until they could sell their production. Not strangely, soybean planted area for the 1976 crop was reduced to 7,500 ha.

It is likely that the few private assemblers who bought soybeans from farmers at the beginning of the marketing season, had substantial losses during the year.

For the next cropping year (1976) a new change in government pricing policies for soybeans occurred. In October 1975, previous to the planting season for the 1976 crop, the government issued a decree establishing an orientation or indicative price for soybeans. The orientation price was a procedure that was widely used in other crops, for example wheat, as a means to promote the expansion of planted areas. When the orientation price was

---

[1] CPI December 1974: 1065.4, idem December 1975: 1777.8.

announced, the government committed itself to support the crop at harvest, buying directly from farmers, at the orientation price generally adjusted for inflation. In spite of this announcement, the area planted for 1976 was, as previously mentioned, 7,500 ha. In April 1976 the government fixed the support price and most of the crop was immediately sold by farmers to DIGRA.

During the 1976 crop marketing period, it was DIGRA who had to bear the losses involved in the process, because: 1) governmental price determination over edible oil and other soybean related products was still functioning and 2) DINACOPRIN still took the support price as an ex-factory price for all year. This was not a new situation for DIGRA because in the marketing process of wheat this had been happening for years. DIGRA lost money with this soybean operation, despite a 2.5% deduction in the price paid to farmers to cover administrative charges. Also, in the bargaining process for selling the soybeans, DIGRA got oil industry firms to pay transportation costs from rural storage to oil factories. DIGRA's losses, which were financed by the National Treasury funds, represented an implicit subsidy to farmers. Criticism of DIGRA because of its "inefficiency" was common within the government, even though the government itself was to blame for its inability to coordinate the action of its own agencies.

Inconsistence over time of government pricing policies toward soybeans and lack of coordination within the

government were the main features of this period and perhaps the main reason why soybean development has not been faster in Uruguay.

3.3. Pricing Mechanisms From 1977 On

During this period problems derived from uncoordinated government determination of prices of soybeans and soybean products disappeared. Uncertainty with respect to government pricing policy toward soybeans also disappeared when in August 1978, the government issued a series of decrees aimed at redirecting the agricultural economy away from direct government involvement toward a market orientation.

However, as agricultural markets began to operate in a more free environment, there appeared the need for institutional arrangements to facilitate exchange and physical activities, and the need for additional coordinating mechanisms other than prices. The lack of credit for financing market operations, the lack of suitable mechanisms to provide market information, and the lack of marketing research, continue to be outstanding features of grain and oilseed production and marketing processes in Uruguay.

In the case of soybeans, recent events in the international market have also shown the undesirability of using only the prevailing pricing mechanisms for articulating domestic and external demand with supply.

Pricing mechanisms from 1977 on are examined below.

In 1977 the government withdrew from direct

determination of edible oil prices. Governmental price determination over intermediate and final products related to the soybean marketing system, like feed, poultry, and pork had been removed sometime earlier. However, the government still maintained the mechanism of orientation and support prices for soybeans.

The different feature in this year was that most of the soybean crop was marketed through private channels. Oil industry firms, now without the constraint of fixed oil prices, paid prices above the support price level. DIGRA had no problem in selling its reduced stocks to the oil industry and recovering its costs. Soybean planted area duplicated in the following season to 20,000 ha.

For the 1978 crop the government returned to the minimum compulsory price. Again the oil industry firms paid prices above the minimum price. During this year for the first time there were private exports of soybeans.

The essential objective of the new policies, enacted in August 1978, was to provide economic conditions for profitable agricultural activities. In the case of grains and oilseeds it was explicitly stated that prices were going to be determined in the future by forces of supply and demand. An essential characteristic of these policy measures was that for the first time the government was announcing what it was planning to do in the long run. This was a substantial improvement with respect to previous behavior. In the past, decrees were issued for every

cropping season establishing the rules for the marketing process for each year. Permanent policy changes related mainly to personal preferences of policy makers.[1] Different actors in the marketing process had become so used to this operating procedure that no actions were taken without knowing first what the government had to say about a particular commodity. Decrees were not always issued in time, increasing uncertainty and costs.

The government at this time also created the Register of First Hand Transactions of Grains and Oilseeds, the Register of Grain and Oilseed Traders and created the rule that required that all transactions of grains and oilseeds be made according to official quality standards. The "Register of First Hand Transactions of Grains and Oilseeds" established the obligation that all transactions in which the farmer was a seller should be formalized in standard contracts and that these should be registered at DIGRA's offices.

The objectives of this norm were to provide farmers with the security of an instrument that specified rights and obligations on the parties involved, and to obtain statistical information about prices received by farmers, transaction characteristics, qualities, relative participation of different agents in the marketing process, etc.

---

[1] Since 1973 through the present Uruguay has had seven Ministers of Agriculture.

The existence of standardized and reliable contracts, that protect the rights of the parties involved in a transaction, greatly contributes to improve vertical coordination of production and marketing processes. Without contracts, transactions are limited to those that can be performed with reliable counterparts. Contracts permit the expansion of the number of potential buyers and sellers of a particular market participant from those who are personally known, to theoretically, all other marketing actors. Marketing alternatives for farmers and other marketing agents are increased. Marketing firms can achieve economies of scale in organization. Contracting for future delivery at determinated dates, or determinated quantities and qualities of merchandise, can substantially reduce procurement costs of processing and exporting firms. The information obtained from registered contracts can be used for marketing research and can be diffused to market system participants in order to facilitate decision making about market operations.

However, the utility of contracting for improving performance is restricted if different actors in the marketing system do not understand the benefits that can be obtained from its use.

The Register of First Hand Transaction of Grains and Oilseeds started to function in Uruguay in late 1979, amidst the resistance of farmers and other market participants who perceived the norm as one more unnecessary

bureaucratic requirement.

Previous to the establishment of the obligation of contracting and registering first hand transactions, it would have been necessary to educate marketing participants and especially farmers on the advantages and benefits that could be obtained from the adoption of that operation procedure. Perhaps, it would have been better to establish contracting on a voluntary basis in order to give marketing participants time to learn about the advantages of the system before making it obligatory.

Available information does not permit evaluation of the contribution of this norm for improving performance of the grain and oilseed marketing system. Given the resistance of market participants to operate in this way and the difficulties and costs associated with its enforcement it is highly probable that its application remains restricted.

The Register of Grain Traders established the obligation of all participants in grain and oilseed marketing to be registered, otherwise they could not operate. This appeared as a necessary complement of the First Hand Transaction Register.

Another decision adopted by the government at this time was to begin a process of tariff reductions on several products. Tariffs on imports of grains and oilseeds, that before this period were above 100% of CIF values, are currently at the 35% level. Also, tariffs on imports of

agricultural imputs were eliminated, and tariffs on tractors and agricultural implements were substantially reduced.

This set of measures shaped the institutional framework within which marketing processes of some grains[1] and all oilseeds have been carried out since August 1978.

Consequently, with the above described policy measures, the government did not establish any prices for the 1979 and 1978 crops. There is little information on what happened during the 1979 crop marketing period. But two facts seem to indicate that the oil industry purchased soybeans at prices and conditions relatively favorable for farmers: 1) soybean exports reduced from 4,400 tons in 1978 to 2,710 tons in 1979 and 2) planted area of soybeans increased for the 1980 crop from 32,000 ha to 46,000 ha.

During the 1980 crop marketing period the government considered that soybean prices being paid to farmers were very low and paid them a subsidy of 23 dollars per ton (approximately 10% of the total price). There is no available information to show how the payment of this subsidy was implemented. Neither is there information to determine whether it was paid only for domestically consumed soybeans or for both domestically consumed and exported soybeans.

---

[1] Wheat still has support prices.

At the end of 1980 and the beginning of 1981 the effects of Brazilian protectionist policies toward its soybean processing industry began to be felt in Uruguay. Brazil has a soybean processing capacity that largely exceeds total production. The Brazilian government implemented credit lines for purchasing soybeans by the soybean processing industry at very low subsidized interest rates for 180 days. The Brazilian oil industry began to buy Argentinian and Uruguayan soybeans at relatively high prices which were then processed and sold within 60 days. Revenues from this operation were invested at substantially higher interest rates for the remaining 120 days, thus allowing Brazilian oil industry firms to obtain large financial profits. Prices of Brazilian oil went down under the selling pressure from the Brazilian oil industry firms, seeking to sell final product in order to recover funds and invest in the financial market. One market analyst believes that lower prices for May, June and July soybean oil contracts in Rotterdam futures were in part due to larger than normal Brazilian sales of oil. In mid-April 1981, prices of soybean oil in Rotterdam for May, June and July futures contracts were around $530/ton. For the period after Brazilian oil is sold (August, September and October) future contracts were around $570/ton.[1]

---

[1] All the information in this paragraph was obtained from the: Economic Survey, Weekly Bulletin, April 28, 1981, Buenos Aires.

The price in April of exported Uruguayan soybeans was around $300/ton FOB Brazilian border. At the same time soybean prices FOB Buenos Aires were $270/ton. This difference is explained mainly by the fact that Uruguayan soybeans can easily be transported to Brazil by trucks without the usual delays and traffic congestion of Argentinian ports.

The Uruguayan soybean processing industry could not compete with its Brazilian counterpart, because to pay $300 per ton of soybeans would have required them to increase either oil prices or soybean meal prices. Oil prices could not be increased because lower priced Brazilian oil was entering the country through informal channels. Soybean meal prices could not be increased because they were determined by the international market. The highest price the Uruguayan soybean processing industry could offer at this time was $269 per ton of soybeans.[1]

Under these circumstances, the prevailing price mechanism was unable to synchronize domestic and external demand with supply. It was also unable to adapt quickly to the new emerging situation.

---

[1] For details on how this price was calculated, see Table 3.2 in the following section.

3.4. Effects of Brazilian Soybean Policy Changes in 1981

Bruce W. Marion says that the vertical coordination process includes two dimensions, synchronization and adaptation. The synchronizing process consists of the fine tuning of an existing system regarding what is produced and marketed, as well as when and where it is produced and marketed. Coordination as an adaptive process involves making adjustments or changes in the existing system in order to respond promptly to changes in demand, new technology or other shifts in profit incentives.[1]

When the effects of Brazilian protectionist policies towards their soybean processing industry began to be felt in Uruguay, coordination problems in the adaptive dimension of the Uruguayan soybean subsector became evident. Prevailing pricing mechanisms were not able to balance in a sound manner domestic oil industry needs with foreign demand needs.

To understand how Brazilian demand for soybeans disrupted the marketing processes of soybeans in Uruguay it is necessary to know more about the factors determining prices in the Uruguayan domestic market. Since the withdrawal of the government from the direct price determination of soybeans, domestic oil industry firms have become

---

[1] Marion, Bruce W., "Vertical Coordination and Exchange Arrangements: Concepts and Hypotheses," in Coordination and Exchange in Agricultural Subsectors, Monograph No. 2, NC-117, 1976, pp. 179-195.

the key element in the process of price determination. The procedure used by oil industry firms for calculating the price that they could pay for soybeans in April 1981, is shown in a document which oil industry firms prepared in order to ask the Minister of Economy for increases in subsidies to soybean meal exports. This was done to help them cope with the situation created by the Brazilian demand for soybeans.

The procedure for calculating an offer price is reproduced here because it is likely that it has been used for pricing soybeans during 1979 and 1978, and because it contributes to a better understanding as to why Uruguayan oil industry firms could not compete at the beginning of 1981 with their Brazilian counterparts.

The calculation takes into account prices of imported crude oil CIF and of exported soybean meal pellets FOB, import and export costs, import tariffs, export subsidies and processing costs. Data in Table 3.2 summarizes the steps of the calculating procedure.

The maximum price that could be established for the domestic sale of soybean oil (to wholesalers) was $783 (see Table 3.2) and was calculated by adding up the CIF price of imported crude, a 35% import tarrif, the import cost and the refining margin. The price of soybean oil (to wholesalers) could not be higher than $783/ton for two reasons: 1) terminated oil for sale to wholesalers enters into the county paying the same import tariff (35%) as

Table 3.2. The Procedure Used By Oil Industry Firms to Calculate Prices of Soybeans and Their Products. Prices in Dollars in April 1981.

Steps	Concept	Prices (dollars/ton)
1	Imported crude oil CIF	550.00
2	Import tariff (35% of 1)	192.50
3	Import costs (5% of 1 + 2)	37.13
4	Refining margin*	3.00
5	Price of 1 ton of oil to wholesalers (1 + 2 + 3 + 4)	782.63
6	Exported soybean meal pellets FOB	230.00
7	"Reintegro" (export subsidy) (9% of 6)	20.7
8	Export costs (5% of 6)	11.50
9	Price of 1 ton of soybean meal pellets at oil factory (6 + 7 - 8)	239.20
	1 ton of soybeans yields 770 kg of soybean meal and 185 kg of soybean oil	
10	Processing margin of 1 ton of soybeans*	60.00
11	Price to be paid by oil industry for 1 ton of domestically produced soybeans ** (782.63 x 0.185) + (239.20 x .77) - 60.00 =	268.79

* In the original document these are referred to as costs. I have preferred to call them margins under the assumption that they include actual costs and profits.

** [(Domestic Price Oil x 0.185) + (Soybean Meal Price x .77) - Soybean Processing Cost] = Offer Price to Domestic Soybean Producers.

crude. Assuming that the refining margin of the Uruguayan oil industry is the same as that of the foreign oil industry, the terminated oil would be priced in the domestic market at some $783/ton; and 2) there also existed pressure for lower domestic oil prices because cheap Brazilian soybean oil was entering illegally into the country.

The dock price of soybean meal at the oil factory was $239/ton (see Table 3.2) and was calculated by deducting the export cost from the FOB export price plus the prevailing 9% export subsidy. The price of soybean meal could not be increased above this level because: 1) the international price of soybean meal was given and could not be modified and 2) the price of domestically consumed soybean meal could not be increased because of the low price of beef and the strong preference of consumers for beef relative to chicken and pork. Domestic consumption of soybean meal was only 20% of total production. An increase in the price of soybean meal would have meant a reduction in the quantity of soybean meal domestically demanded.

The maximum price of soybean oil for domestic consumption ($783/ton) and the maximum price for soybean meal ($239/ton) as well as the processing margin determined the price that could be offered by oil industry firms for soybeans. This offer price was $269/ton (see again Table 3.2) and was obtained by deducting processing margin from

the weighted average of soybean oil price and soybean meal price, the weights being the percentages of soybean oil and meal that can be obtained from processing a ton of soybeans.

Since the price of soybeans FOB the Brazilian border was, at that time, $300/ton, it is clear why the Uruguayan oil industry firms could not compete. There was a difference of $31/ton between the export price and the price that could be offered by Uruguayan oil industry firms.

In light of the above, if nothing is done, and current Brazilian policies continue, it appears likely that the Uruguayan soybean processing industry will have to stop or greatly reduce the processing of soybeans. On the other hand, if import tariffs on terminated oil are increased and the Brazilian border is closed to illegal oil entrance, then the domestic oil industry could compete by transfering the higher costs of purchasing soybeans to the final price of oil. This would imply that Uruguayan consumers, who are already paying 35% more than the international price of oil, would be the losers. Also, the government has stated several times that current policies are to reduce tariffs, if any changes are going to be made.

An alternative could be to increase the soybean meal export subsidy, as was requested by oil industry firms, but this measure will also go against general economic policies of progressive reductions of export subsidies.

Finally, if the Uruguayan government prohibits the

export of soybeans until domestic needs are satisfied (something that has been done many times before for different commodities), farmers could easily become discouraged, and this could endanger future soybean development opportunities.

Projection of the likely effect of the current situation brought on by Brazilian policy results in such undesirable outcomes that it seems that priority should be given to developing improved mechanisms for adapting the system. One alternative way of organization of soybean subsector that could, in my judgement, improve both vertical coordination in the synchronization and in the adaptive dimensions is proposed in the following section.

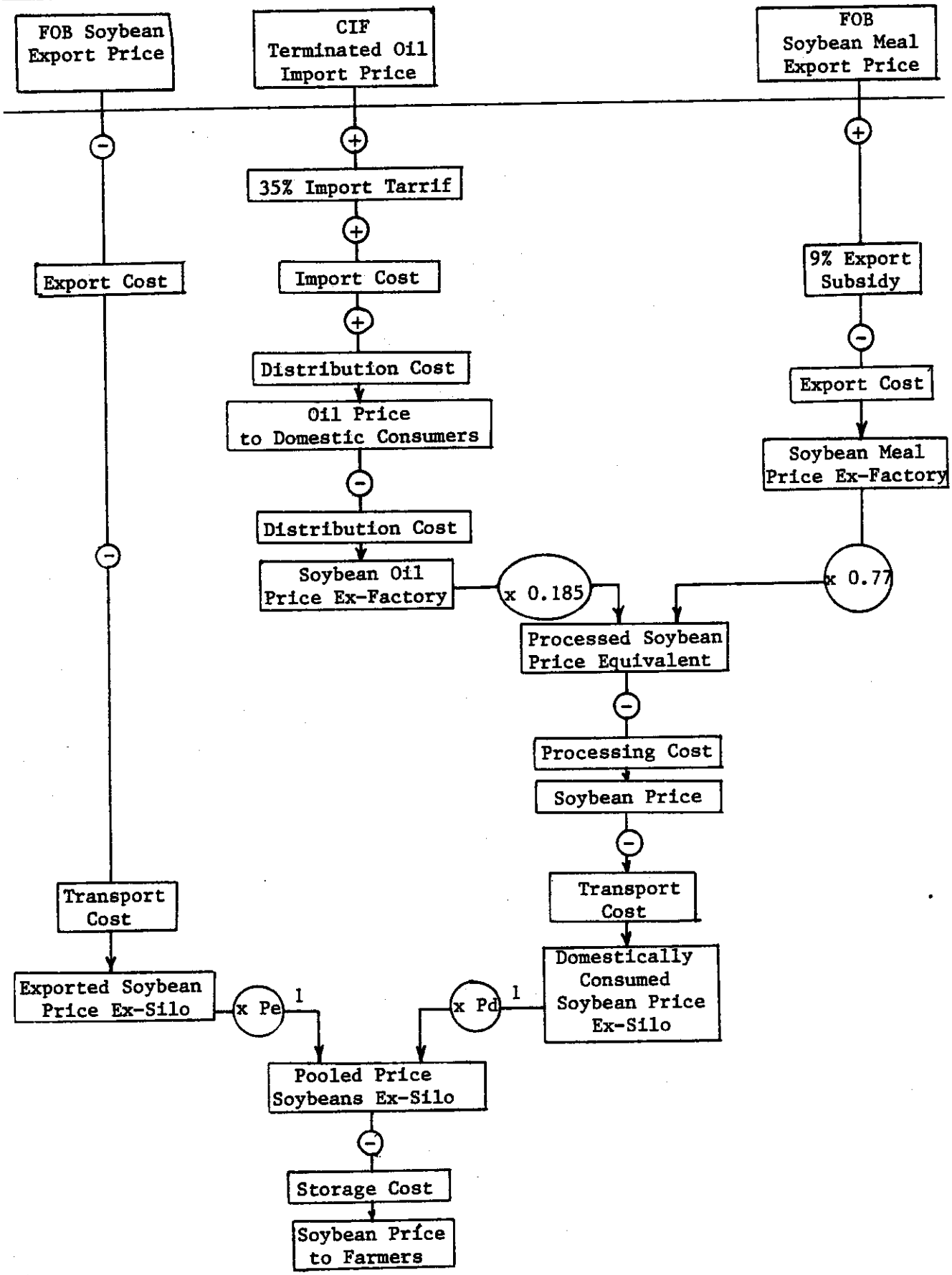
3.5. An Alternative Coordination Mechanism for the Soybean Subsector

The proposed mechanism for improved organization of the soybean subsector is very similar to one which already exists in the rice subsector.

A key element of success in the rice subsector organization is the existence of a pooling price mechanism which determines that prices received by farmers are the result of a weighed average of rice prices in the domestic and international market.

A similar mechanism could be adopted for soybeans. Figure 3.1 shows a diagram that depicts how the proposed pooled price could be arranged. The pooled price of

Figure 3.1 Diagram of Proposed Pooling Price Mechanism for Soybeans



[1] Pe and Pd indicate the proportion of soybeans going to external and domestic markets, respectively.

soybeans to farmers would be obtained as a weighted average of the prices obtained for soybeans going to external and domestic markets.

The price of soybeans going for exports (ex-silo) would be the FOB export price less the export costs.

The price of soybeans to be paid by domestic oil industry would be obtained in a similar fashion to that explained before in the previous section. The CIF import price of terminated oil, plus the prevailing 35% import tariff and the import cost would determine the domestic price of oil. The domestic price of oil less the distribution cost would then determine the soybean oil ex-factory price. And the FOB price of soybean meal plus the prevailing export subsidy less the export cost would determine the soybean meal ex-factory price.

The weighted average of soybean meal ex-factory price and soybean oil ex-factory price (with weights reflecting the industrial yields of oil and meal) less processing cost and transport cost from silo to oil factory would determine the price of soybeans going to the domestic market ex-silo.

If these pooling price mechanisms would be implemented, farmers would be partially bearing the cost of supporting the domestic oil industry, because the price they would be receiving for their soybeans would be diminished relatively to the price at the Brazilian border. Domestic consumers are already supporting domestic oil industry by paying prices 35% above international price levels.

Apparently, the implementation of this mechanism would require that domestic soybean production be "more" than efficient compared to the rest of the world in order that exports could finance domestic consumption. However, some factors should be considered:

1) What may be profitable for an Uruguayan farmer may not be profitable for an American farmer for example. An American farmer may decide not to plant soybeans if he expects that corn for example may be more profitable. An Uruguayan farmer's alternative production possibility may be extensive cattle grazing that usually has negative returns. Note that in 1980 Uruguayan farmers received roughly the same price that American farmers did but with lower yields and higher production costs (see Table 2.7). Despite this, the area sown to soybeans was expected to be the same as for the 1980 crop according to USDA Agricultural Attache Report of February 1981,[1] and was estimated to be 55,000 ha by DIGRA.

2) As long as increases in domestic demand for soybeans remain below the rate of increase in soybean production, the proportion of soybeans demanded for domestic consumption relative to that going for exports will diminish, diminishing conversely the incidence of domestic soybean price in the pooled price. Note that domestic consumption of oil has remained around 25,000 tons since

---

[1] USDA Agricultural Attache Report, loc. cit.

1970. Sunflower oil is likely to continue providing 15,000 tons of oil annually because sunflower, a very cheap crop planted as a second crop after wheat in the traditional cropping area of the south-west, is likely to continue being grown.

The proposed pooling price mechanism would require a number of critical changes. First, there must be a willingness of soybean producers to accept the risks of international price variations and to subsidize the domestic oil industry. It may seem difficult to achieve farmers' consensus in these matters. Yet the fact that this is what rice producers have been doing for years, indicates that it is not an impossible task. Second, there must be the acceptance of a subsector coordinating agency, either public or private, to make it possible for all farmers to receive the same price. The pooling mechanism cannot function if individual farmers are allowed to choose between selling for exports or to the domestic oil industry.

The organization of the pricing mechanism for the soybean subsector in this way would have a number of advantages. First, it would provide a suitable means for balancing domestic and foreign demand needs with domestic supply, and at the same time it would have the flexibility to adapt to changes within or outside the system. Second, the existence of a coordinating agency could facilitate the implementation of coordinating mechanisms in the

synchronization sense. That is, the agency could act as a leader in promoting marketing research, in collecting and spreading information, in coordinating agricultural input supply with farmers' needs, in coordinating transportation, in providing the linkage with the government for provision of credits for production, etc. Note that no need for contracting future production would exist, nor would the adoption of measures for restricting supply be necessary. Uruguay will always be a price taker in the international market and the possibility of restriction of production to obtain better prices is unthinkable. Uruguay could sell as many soybeans as it could produce as long as production costs remain competitive.

It is beyond the scope of this paper to analyze which of the existing agents in the soybean subsector could become the coordinating agency or if it would be necessary to create a new one to perform such function. But some alternatives can simply be enumerated.

Following the example of rice, oil processing firms could group together to become the coordinating agency. However, considering the historic untrustfulness that has existed between the oil processing industry and farmers it is extremely unlikely that both groups could reach an agreement.

DIGRA, the governmental grain marketing agency would be another possible candidate. However, given current government policies of progressive withdrawal from direct

involvement in marketing processes, the probability of DIGRA becoming the coordinating agency is very low.

The second grade cooperative, CALFORU could be a more suitable alternative. CALFORU's activities in marketing grains have been restricted and its staff should be strengthened with people with expertise in the grain and oilseed marketing processes.

Finally, the possibility of the creation of a new agency, like a soybean marketing board integrated by farmers, oil industry officials, and government officials should be considered.

CHAPTER IV

REVIEW OF FINDINGS AND FUTURE RESEARCH NEEDS

4.1. Review of Findings

Increasing soybean production in Uruguay has contributed to diminish the dependence of the country on edible oil imports and has contributed also to the diversification of exports, mainly through soybean meal exports.

Whether Uruguay may become an exporter of significant volumes of soybeans will depend basically on the degree of competitiveness of local soybean production relative to the rest of the world, and on the competitiveness of soybeans relative to other domestic production alternatives.

It has not been possible with the information available to determine if the country has comparative advantage for soybean production, but the discussion of some of the institutional and technical factors affecting its competitiveness seems to indicate that it is worthwhile undertaking research in order to answer this question.

Neither has it been possible to determine if soybeans are competitive relative to alternative production activities. However, the recent development of soybean cultivation in the north-east area of the country seems to indicate that soybeans may be an attractive alternative

in this area.

Future development of soybeans in other areas of the country, like the traditional cropping south-west area is unlikely to occur, as long as the government continues insisting on promoting wheat cultivation through the establishment of support prices well above those in the international market.

Soybean subsector structural characteristics do not appear to be an important constraint for future development. At the assembling stage of the marketing process there are many private assemblers and farmers' cooperatives that compete in providing services to farmers. Concentration at the processing stage seems unavoidable given the reduced size of the market. Prevention of oligopsonistic practices requires the maintenance of soybean exports as a marketing alternative. On the other hand, imports of terminated oils function as a constraint to undue enhancement of domestically produced oil prices. Oil industry sources indicate that the 35% import tariff on oil and the 9% export subsidy on soybean meal, scarcely compensate for larger industrial costs in Uruguay, relatively to those in other countries. Those larger industrial costs are derived from higher fuel costs, higher public service costs, higher port charges, higher ocean freight rates, and smaller scales of production.

At the wholesale and retail level information is scarcer but concentration at this stage of the marketing

process has never been mentioned as a problem in the country.

Notwithstanding the above, the current operating procedures for marketing soybeans seem to be reflecting the effects of past government policies toward the marketing processes of grain and oilseeds. Particularly worth noting has been assemblers' resistance to invest in carrying inventories.

Grain and oilseed storage capacity is enough to handle currently produced volumes, but may become a constraint in the north-east if soybean production continues expanding in that area. Lack of suitable port storage and loading facilities is an obvious constraint for future expansion of soybean exports.

Transportation costs are very high in Uruguay. Data in Table 2.6 showed that transportation costs are some 40% of estimated export cost. Reasons explaining this may be high prices of fuel and high prices of trucks. Adoption of measures aimed to better railroad services quality would improve efficiency of the system.

Quality standards usefulness has not yet been completely understood by different marketing participants. Full adoption of operating procedures that take advantage of the existence of quality standards may be hampered in the future if soybeans begin to be graded according to protein and oil content.

It is necessary that the Agricultural Economics

Research Office of the Ministry of Agriculture begin collecting data about soybeans. There is also the need for more efficient market information services. The lack of information is particularly felt with respect to international markets.

Major distortions in the soybean production and marketing processes, due to inconsistent and uncoordinated government determination of prices, may have been the main reason why soybeans have not developed faster in Uruguay. Prices that were established did not recognize the existence of storage, transportation, and financing costs. After the government withdrew from direct determination of prices, the need for the government to undertake the development of better market facilitating mechanisms became more evident. One such effort by the government was to require firms to perform first hand transactions in standardized contracts. However, the imposition of the obligation to operate in this way was not preceded by the necessary education of marketing actors on the benefits that could be derived from contracting. Thus far, this policy measure may have been of relatively low usefulness in improving vertical coordination in the system, as long as it's application remains restricted. It is necessary that the government undertake an extension program on the advantages of contracting for performing transactions, in order to accelerate the rate of adoption of this operating procedure.

Government efforts should also be directed toward the provision of currently lacking market transaction facilitating mechanisms such as marketing research, market information services and credit for market operations.

4.2. Future Research Needs

Most of this study has been based on incomplete secondary data and on the author's personal knowledge of soybean production and marketing processes in Uruguay. Future research would have to start with the collection of more complete and reliable data.

A complete assessment of the potential soybean comparative advantage should be completed as a first priority. This should include the study of institutional and technical factors determining the competitiveness of soybean production in Uruguay relative to that in the rest of the world and the competitiveness of soybeans relative to other production alternatives. This analysis should be done for at least the two most important regions of soybean production in the country.

Specific related research questions and needs already identifiable are listed below. This list is by no means exhaustive.

a) Determination of detailed enterprise budgets for soybeans and production alternatives as well as actual export costs should be done in both financial and economic terms.

b) Why have prices of agricultural inputs and machinery not diminished in line with the reduction of import tariffs? How many importers of inputs and machinery are there? Do they have enough market power to maintain inputs prices high? If so, what are the barriers to entry?

c) What determines the difference between experimental and farm soybean yields?

d) Why are road transport costs so high in the country? Is it because of high prices of fuel and trucks? Why are railroad services not improved?

e) What are the projections of demand for soybean meal and oil? How would domestic demand for soybean meal be affected if prices of beef are allowed to increase?

A more complete description of the structure and operational characteristics of the soybean subsector is also needed. Some questions related to this are listed below.

a) Why have oil industry firms invested considerably in solvent extraction equipment but not in better refining equipment?

b) What is the number and size of firms at each stage of the soybean production and marketing processes?

c) What is the relative importance of different

market channel flows?

d) What are the costs and margins in each stage of the marketing process?

e) Particularly lacking is information about the wholesaling and retailing structure as well as its operational characteristics.

An important area where research is particularly needed is that of the government role in determining the institutional framework within which soybean production and marketing processes are carried out. Evaluation of current regulations in improving soybean subsector performance and determination of the reasons why the government does not provide certain marketing services should be done. In this sense some questions to be answered are:

a) Why are soybean statistics on area, production and yields not collected in a systematic and scientific manner?

b) Why does the Ministry of Agriculture not spread information about international markets?

c) Why does the government not have a service of market information?

d) Why are there no lines of credit for market operations?

e) How is the Register of First Hand Transaction of Grains and Oilseeds functioning? What proportion of the total crop is sold in standard contracts? How many of those contracts are registered? Do

farmers and other marketing agents feel, two years after its implementation, that it is a useful mechanism? What should be done for accelerating of adoption?

f) What measures, if any, have been adopted to cope with the situation created by Brazilian demand for soybeans? Who has benefited and who has lost with those measures?

If after more detailed analysis of the soybean subsector the implementation of a pooling price mechanism is still considered feasible, a detailed analysis on how this has been functioning in rice should be carried out. Determination of similarities and differences between rice and soybean production and marketing processes would permit an evaluation of the feasibility of the mechanism for soybeans.

Finally, the receptiveness of different market participants to alternative ways of organizing the production and marketing processes of soybeans should be tested.

APPENDIX I

ESTIMATION OF TOTAL SUPPLY OF EDIBLE OILS

Total supply of edible oil has been calculated from supply of sunflower oil, soybean oil, and imports of crude and terminated oil. Edible oil is also obtained in Uruguay from peanuts, corn and some other minor sources, but their contribution to total supply of edible oil is negligible.

Data in Tables I and II below show the calculation of sunflower and soybean oil supply over periods 1975-79 and 1974-79 respectively. There is no available information to estimate 1974 and 1980 sunflower oil supply and 1980 soybean oil supply.

In both cases the following formula was used:

$$OO = (P - S + SI - E)\ R - OE$$

where;

OO = Oil supply

P = Total production

S = Seed used in the following crop year

SI = Seed imports

E = Exports

R = Percentage of oil extracted from rough material

OE = Oil exports

Assumptions made in both cases were:

- Total production is completely processed in the calendar crop year.
- Seed imported is completely used in the following crop year.
- Sunflower or soybean exports in a calendar year come from that year's production.
- Oil exports in a calendar year come from that year's production processing.

Table I. Evolution of Sunflower Oil Supply From 1975 Through 1979.[a]

Harvesting Year	Planted Area	Production	Seed for Next Planting Season[b]	Seed Imports	Sunflower Exports	Sunflower to Crushing	Sunflower Oil		
							Produced[c]	Exported	Supplied
	— ha —				tons				
1975	104,132	51,448	1,360	32	0	50,120	15,036	0	15,036
1976	136,052	77,120	1,023	5	0	76,102	22,830	2,104	20,726
1977	102,342	34,381	1,420	21	0	32,982	9,895	0	9,895
1978	142,026	71,567	1,300	21	0	70,288	21,086	2,342	18,144
1979	129,927	51,402	862	16	0	50,556	15,167	134	15,033
1980	86,184	47,629	-	-	-	-	-	-	-

[a] Estimated from OPYPA and DIGRA data, personal communications.

[b] Planting rate: 8.5 kg/ha. 10 kg of sunflower have to be processed to obtain 8.5 kg of clean seed.

[c] Sunflower yields around 30% of oil in Uruguay.

Table II. Evolution of Soybean Oil Supply From 1974 Through 1979.[a]

Harvesting Year	Planted Area	Production	Seed for Next Planting Season[b]	Seed Imports	Soybean Exports	Soybeans to Crushing	Soybean Oil		
							Produced[c]	Exported	Supplied
	— ha —	tons							
1974	3,800	5,760	1,080	0	4,680[d]	0	0	0	0
1975	12,000	15,000	675	17	0	14,350	2,655	0	2,655
1976	7,500	8,625	891	25	3,100	4,659	862	0	862
1977	9,900	14,355	1,800	349	0	12,904	2,387	0	2,387
1978	20,000	33,000	2,880	713	4,400	26,433	4,890	0	4,890
1979	32,000	41,600	4,104	68	2,710	34,854	6,448	0	6,448
1980	45,600	61,718	-	-	9,865	-	-	15	-

[a] Estimated from OPYPA and DIGRA data, personal communications.

[b] Planting rate: 80 kg/ha. 90 kg of soybeans have to be processed to obtain 80 kg of soybean seed.

[c] Soybeans yield 18.5% of soybean oil.

[d] This corresponds to seed that was actually exported by DIGRA in 1976, but since it was produced in 1974 it is deducted here from 1974 total production.

BIBLIOGRAPHY

1. Collins, N. R. and R. H. Holton. "Programming Changes in Marketing in Planned Economic Development." In Agriculture and Economic Development, edited by C. Eicher and L. W. Witt. McGraw-Hill, 1964.

2. Commodity Yearbook, New York, 1981.

3. Economic Survey, Weekly Bulletin, Buenos Aires, April 28, 1981.

4. Forker, Olan D. and James V. Rhodes (editors). Marketing Alternatives for Agriculture. Is There a Better Way? Cornell University, November, 1976.

5. French, Ben. "The Subsector as a Conceptual Framework for Guiding and Conducting Research." American Journal of Agriculture Economics, 56, 5, p. 1014.

6. Harrison, Kelly et al. Improving Food Systems in Developing Countries: Experiences From Latin America. Research Report No. 6, Latin American Studies Center, Michigan State University, 1974.

7. Heid, Walter G., Jr. U.S. Wheat Industry. U.S. Department of Agriculture; Economics, Statistics and Cooperatives Service; Agricultural Economic Report No. 432, Washington, D.C., April, 1980.

8. Hunting Technical Services and Oficina de Programacion y Politica Agropecuaria. Agricultural Diversification Study. Montevideo, 1976.

9. Instituto Interamericano de Ciencias Agricolas - OEA, Direccion Regional-Zona Sur. Organizacion Institucional de Comercializacion Agropecuaria en Argentina, Chile, Paraguay, Uruguay. Montevideo, 1975.

10. Jackson, David M. et al. U.S. Sorghum Industry. U.S. Department of Agriculture; Economics, Statistics and Cooperatives Service; Agricultural Economic Report No. 457. Washington, D.C., June 1980.

11. Knutson, Ronald D. et al. International Cooperative Coordination in World Grain Trade. Texas Agricultural Market Research and Development Center, Texas A and M University and the Cooperatives Program of Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture.

12. Kriesberg, M. and M. Steele. Majoramiento de los Sistemas de Comercializacion en los Paises en Desarrollo. Serie Desarrollo Internacional No. 3, Instituto Interamericano de Ciencias Agricolas, San Jose, Costa Rica, Abril, 1974.

13. Kriesberg, Martin. "Marketing Efficiency in Developing Countries." In Marketing Systems for Developing Countries, Vol. I, edited by Dov Izraels et al. New York, N.Y.: John Wiley and Sons, 1976.

14. Marion, Bruce W. "Vertical Coordination and Exchange Arrangements: Concepts and Hypotheses." In Coordination and Exchange in Agricultural Subsectors, Monograph No. 2, NC-117, 1976, pp. 179-195.

15. Oficina de Programacion y Politica Agropecuaria. Cotizaciones Internacionales de Productos Agropecuarios. Boletin No. 9, Montevideo, Uruguay, Enero, 1981.

16. Oficina de Programacion y Politica Agropecuaria. Memorandum: Antecedentes Para la Fijacion del Precio al Productor del Trigo (Cosecha 1974/75). Montevideo, November, 1974.

17. Riley, Harold et al. Market Coordination in the Development of the Cauca Valley Region - Colombia. Research Report No. 5, Latin American Studies Center, Michigan State University.

18. Riley, Harold M. and Michael T. Weber. Marketing in Developing Countries. Working Paper No. 6, Michigan State University, Rural Development Series, 1979.

19. Schrader, Lee R. et al. The Egg Subsector of U.S. Agriculture: A Review of Organization and Performance. Monograph No. 6, NC-117, 1978.

20. Shaffer, James D. "Food System Organization and Performance: Toward a Conceptual Framework." American Journal of Agriculture Economics, May 1980, pp. 310-318.

21. Shaffer, James D. "On the Concept of Subsector Studies." American Journal of Agriculture Economics, Vol. 55, pp. 335-

22. Shaffer, James D. Pricing Mechanisms. Some Questions of Policy: An Overview From an Institutional Perspective. Paper presented by an OECD Seminar, Paris, July, 1980.

23. Slater, Charles et al. "Market Processes in the Recife Area of Northeast Brazil." Research Report No. 2, Latin American Center, Michigan State University.

24. Sorenson, Vernon. International Trade Policy: Agriculture and Development. Bureau of Business and Economic Research, Michigan State University, 1975.

25. United States Department of Agriculture. Grain Market News, 28, 27-31, Washington, D.C., 1980.

26. United States Department of Agriculture, Foreign Agricultural Service. Uruguay: Annual Situation Report. Agricultural Attache Report, Buenos Aires, January, 1981.

27. United States Department of Agriculture, Foreign Agricultural Service. Uruguay: Grain and Feed Report. Agricultural Attache Report, Buenos Aires, September, 1981.

28. World Bank. Uruguay Economic Memorandum. Washington, D.C., January, 1979.